

Appendix F Physical Environment

Part 4

January 3, 2020

Prepared for



Prepared by



Appendix B

LABORATORY CERTIFICATES OF ANALYSIS

Your Project #: 161-17781-00
 Site Location: HSR FACILITY
 Your C.O.C. #: 601902-34-01

Attention: Rachel Bryan

WSP Canada Inc
 4 Hughson Street South
 Suite 300
 Hamilton, ON
 CANADA L8N 3Z1

Report Date: 2017/04/13
 Report #: R4426391
 Version: 4 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B754939

Received: 2017/03/20, 09:56

Sample Matrix: Soil
 # Samples Received: 19

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum	15	N/A	2017/03/24	CAM SOP-00301	EPA 8270D m
Hot Water Extractable Boron	18	2017/03/23	2017/03/23	CAM SOP-00408	R153 Ana. Prot. 2011
1,3-Dichloropropene Sum	15	N/A	2017/03/24		EPA 8260C m
Free (WAD) Cyanide	17	2017/03/22	2017/03/23	CAM SOP-00457	OMOE E3015 m
Free (WAD) Cyanide	1	2017/03/23	2017/03/25	CAM SOP-00457	OMOE E3015 m
Conductivity	1	2017/03/23	2017/03/23	CAM SOP-00414	OMOE E3530 v1 m
Conductivity	17	2017/03/24	2017/03/24	CAM SOP-00414	OMOE E3530 v1 m
Hexavalent Chromium in Soil by IC (1)	1	2017/03/22	2017/03/22	CAM SOP-00436	EPA 3060/7199 m
Hexavalent Chromium in Soil by IC (1)	16	2017/03/22	2017/03/23	CAM SOP-00436	EPA 3060/7199 m
Hexavalent Chromium in Soil by IC (1)	1	2017/03/23	2017/03/23	CAM SOP-00436	EPA 3060/7199 m
Petroleum Hydrocarbons F2-F4 in Soil (2)	15	2017/03/23	2017/03/24	CAM SOP-00316	CCME CWS m
F4G (CCME Hydrocarbons Gravimetric)	4	2017/03/25	2017/03/25	CAM SOP-00316	CCME PHC-CWS m
Strong Acid Leachable Metals by ICPMS	18	2017/03/23	2017/03/23	CAM SOP-00447	EPA 6020B m
Moisture	1	N/A	2017/03/22	CAM SOP-00445	Carter 2nd ed 51.2 m
Moisture	18	N/A	2017/03/23	CAM SOP-00445	Carter 2nd ed 51.2 m
PAH Compounds in Soil by GC/MS (SIM)	4	2017/03/22	2017/03/22	CAM SOP-00318	EPA 8270D m
PAH Compounds in Soil by GC/MS (SIM)	11	2017/03/22	2017/03/23	CAM SOP-00318	EPA 8270D m
Polychlorinated Biphenyl in Soil	3	2017/03/22	2017/03/22	CAM SOP-00309	EPA 8082A m
pH CaCl2 EXTRACT	18	2017/03/23	2017/03/23	CAM SOP-00413	EPA 9045 D m
Sodium Adsorption Ratio (SAR)	18	N/A	2017/03/24	CAM SOP-00102	EPA 6010C
SAR - ICP Metals	1	2017/03/23	2017/03/23	CAM SOP-00408	EPA 6010C m
SAR - ICP Metals	17	2017/03/24	2017/03/24	CAM SOP-00408	EPA 6010C m
Volatile Organic Compounds and F1 PHCs	15	N/A	2017/03/22	CAM SOP-00230	EPA 8260C m

Remarks:

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

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

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data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.

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

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

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

(1) Soils are reported on a dry weight basis unless otherwise specified.

(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ashton Gibson, Project Manager

Email: AGibson@maxxam.ca

Phone# (905) 817-5700

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

RESULTS OF ANALYSES OF SOIL

Maxxam ID			EBS145			EBS146			EBS147		
Sampling Date			2017/03/14			2017/03/14			2017/03/14		
COC Number			601902-34-01			601902-34-01			601902-34-01		
	UNITS	Criteria	17-01 SS2	RDL	QC Batch	17-01 SS7	RDL	QC Batch	17-01 SS10	RDL	QC Batch
Calculated Parameters											
Sodium Adsorption Ratio	N/A	12	0.22		4906291	0.41		4906291	0.64		4906291
Inorganics											
Conductivity	mS/cm	1.4	0.26	0.002	4911191	0.33	0.002	4910867	0.26	0.002	4911191
Free Cyanide	ug/g	0.051	0.01	0.01	4909380	0.03	0.02	4909380	<0.01	0.01	4909380
Moisture	%	-	16	1.0	4910608	23	1.0	4909059	21	1.0	4910608
Available (CaCl2) pH	pH	-	7.48		4909404	6.99		4909404	7.55		4909404
Metals											
Soluble Calcium (Ca)	mg/L	-	28.3	0.5	4911187	38.2	0.5	4910861	25.9	0.5	4911187
Soluble Magnesium (Mg)	mg/L	-	7.2	0.5	4911187	3.6	0.5	4910861	5.2	0.5	4911187
Soluble Sodium (Na)	mg/L	-	<5	5	4911187	10	5	4910861	14	5	4911187
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture											

Maxxam ID			EBS148	EBS149	EBS150		EBS151		
Sampling Date			2017/03/14	2017/03/14	2017/03/14		2017/03/14		
COC Number			601902-34-01	601902-34-01	601902-34-01		601902-34-01		
	UNITS	Criteria	17-02 SS1	17-02 SS6	17-03 SS2	QC Batch	17-03 SS4	RDL	QC Batch
Calculated Parameters									
Sodium Adsorption Ratio	N/A	12	0.23	0.93	0.24	4906291			4906291
Inorganics									
Conductivity	mS/cm	1.4	0.20	0.28	1.3	4911191		0.002	4911191
Free Cyanide	ug/g	0.051	<0.01	<0.01	<0.01	4909380		0.01	4909380
Moisture	%	-	17	20	20	4910608	22	1.0	4910715
Available (CaCl2) pH	pH	-	7.58	7.66	7.65	4909404			
Metals									
Soluble Calcium (Ca)	mg/L	-	25.2	24.5	118	4911187		0.5	
Soluble Magnesium (Mg)	mg/L	-	5.7	4.6	88.2	4911187		0.5	
Soluble Sodium (Na)	mg/L	-	<5	19	14	4911187		5	
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture									

RESULTS OF ANALYSES OF SOIL

Maxxam ID			EBS152	EBS153		EBS154		EBS155		
Sampling Date			2017/03/14	2017/03/14		2017/03/14		2017/03/15		
COC Number			601902-34-01	601902-34-01		601902-34-01		601902-34-01		
	UNITS	Criteria	17-03 SS10	QA/QC1	RDL	QA/QC2	QC Batch	17-08 SS1	RDL	QC Batch
Calculated Parameters										
Sodium Adsorption Ratio	N/A	12	1.9	0.37		0.81	4906291	0.24		4906291
Inorganics										
Conductivity	mS/cm	1.4	0.76	0.35	0.002	0.27	4911191	0.28	0.002	4911191
Free Cyanide	ug/g	0.051	0.08	0.03	0.02	<0.01	4909380	<0.01	0.01	4910840
Moisture	%	-	31	23	1.0	20	4910608	14	1.0	4910608
Available (CaCl2) pH	pH	-	7.61	7.16		7.71	4909404	7.70		4909453
Metals										
Soluble Calcium (Ca)	mg/L	-	19.0	35.5	0.5	24.4	4911187	27.5	0.5	4911187
Soluble Magnesium (Mg)	mg/L	-	6.7	4.0	0.5	4.3	4911187	9.6	0.5	4911187
Soluble Sodium (Na)	mg/L	-	38	9	5	17	4911187	6	5	4911187
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture										

Maxxam ID			EBS156		EBS157			EBS158		
Sampling Date			2017/03/15		2017/03/15			2017/03/15		
COC Number			601902-34-01		601902-34-01			601902-34-01		
	UNITS	Criteria	17-09 SS2	RDL	17-09 SS7	RDL	QC Batch	17-05 SS6	RDL	QC Batch
Calculated Parameters										
Sodium Adsorption Ratio	N/A	12	0.50		1.0		4906291	0.51		4906291
Inorganics										
Conductivity	mS/cm	1.4	0.34	0.002	0.34	0.002	4911191	0.33	0.002	4911191
Free Cyanide	ug/g	0.051	0.04	0.02	<0.01	0.01	4909380	0.17	0.02	4909380
Moisture	%	-	26	1.0	21	1.0	4910608	22	1.0	4910715
Available (CaCl2) pH	pH	-	7.35		7.36		4909404	7.27		4909404
Metals										
Soluble Calcium (Ca)	mg/L	-	32.0	0.5	33.0	0.5	4911187	23.1	0.5	4911187
Soluble Magnesium (Mg)	mg/L	-	7.8	0.5	3.8	0.5	4911187	3.5	0.5	4911187
Soluble Sodium (Na)	mg/L	-	12	5	23	5	4911187	10	5	4911187
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture										

RESULTS OF ANALYSES OF SOIL

Maxxam ID			EBS159	EBS160	EBS161		EBS162		
Sampling Date			2017/03/15	2017/03/16	2017/03/16		2017/03/16		
COC Number			601902-34-01	601902-34-01	601902-34-01		601902-34-01		
	UNITS	Criteria	17-04 SS2	17-04 SS5	17-07 SS3	QC Batch	17-10 SS3	RDL	QC Batch
Calculated Parameters									
Sodium Adsorption Ratio	N/A	12	0.31	1.4	1.2	4906291	0.28		4906291
Inorganics									
Conductivity	mS/cm	1.4	0.91	0.49	0.35	4911191	0.30	0.002	4911191
Free Cyanide	ug/g	0.051	<0.01	<0.01	<0.01	4909380	<0.01	0.01	4909038
Moisture	%	-	11	34	16	4910608	19	1.0	4910715
Available (CaCl2) pH	pH	-	10.4	8.82	8.30	4909404	7.34		4909453
Metals									
Soluble Calcium (Ca)	mg/L	-	156	31.2	27.8	4911187	30.4	0.5	4911187
Soluble Magnesium (Mg)	mg/L	-	0.8	5.5	4.5	4911187	10.5	0.5	4911187
Soluble Sodium (Na)	mg/L	-	14	32	26	4911187	7	5	4911187
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture									

RESULTS OF ANALYSES OF SOIL

Maxxam ID			EBS163		
Sampling Date			2017/03/16		
COC Number			601902-34-01		
	UNITS	Criteria	QA/QC3	RDL	QC Batch
Calculated Parameters					
Sodium Adsorption Ratio	N/A	12	0.98		4906291
Inorganics					
Conductivity	mS/cm	1.4	0.36	0.002	4911191
Free Cyanide	ug/g	0.051	<0.01	0.01	4909380
Moisture	%	-	27	1.0	4910608
Available (CaCl2) pH	pH	-	8.83		4909404
Metals					
Soluble Calcium (Ca)	mg/L	-	34.2	0.5	4911187
Soluble Magnesium (Mg)	mg/L	-	5.2	0.5	4911187
Soluble Sodium (Na)	mg/L	-	23	5	4911187
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)					
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water					
Condition					
Soil - Industrial/Commercial/Community- Medium and Fine Texture					

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			EBS145		EBS146		EBS147		
Sampling Date			2017/03/14		2017/03/14		2017/03/14		
COC Number			601902-34-01		601902-34-01		601902-34-01		
	UNITS	Criteria	17-01 SS2	QC Batch	17-01 SS7	QC Batch	17-01 SS10	RDL	QC Batch
Inorganics									
Chromium (VI)	ug/g	10	<0.2	4909409	<0.2	4909409	<0.2	0.2	4909409
Metals									
Hot Water Ext. Boron (B)	ug/g	2	0.93	4911102	0.51	4910651	0.19	0.050	4911102
Acid Extractable Antimony (Sb)	ug/g	50	2.2	4910877	<0.20	4910724	<0.20	0.20	4910877
Acid Extractable Arsenic (As)	ug/g	18	11	4910877	1.9	4910724	3.8	1.0	4910877
Acid Extractable Barium (Ba)	ug/g	670	130	4910877	29	4910724	110	0.50	4910877
Acid Extractable Beryllium (Be)	ug/g	10	0.65	4910877	0.27	4910724	0.73	0.20	4910877
Acid Extractable Boron (B)	ug/g	120	9.2	4910877	<5.0	4910724	7.9	5.0	4910877
Acid Extractable Cadmium (Cd)	ug/g	1.9	0.65	4910877	<0.10	4910724	<0.10	0.10	4910877
Acid Extractable Chromium (Cr)	ug/g	160	55	4910877	9.6	4910724	28	1.0	4910877
Acid Extractable Cobalt (Co)	ug/g	100	9.5	4910877	4.6	4910724	12	0.10	4910877
Acid Extractable Copper (Cu)	ug/g	300	73	4910877	11	4910724	39	0.50	4910877
Acid Extractable Lead (Pb)	ug/g	120	180	4910877	64	4910724	20	1.0	4910877
Acid Extractable Molybdenum (Mo)	ug/g	40	5.7	4910877	<0.50	4910724	0.76	0.50	4910877
Acid Extractable Nickel (Ni)	ug/g	340	27	4910877	8.0	4910724	29	0.50	4910877
Acid Extractable Selenium (Se)	ug/g	5.5	0.93	4910877	<0.50	4910724	<0.50	0.50	4910877
Acid Extractable Silver (Ag)	ug/g	50	0.25	4910877	<0.20	4910724	<0.20	0.20	4910877
Acid Extractable Thallium (Tl)	ug/g	3.3	0.16	4910877	0.066	4910724	0.17	0.050	4910877
Acid Extractable Uranium (U)	ug/g	33	0.65	4910877	0.33	4910724	0.57	0.050	4910877
Acid Extractable Vanadium (V)	ug/g	86	30	4910877	16	4910724	32	5.0	4910877
Acid Extractable Zinc (Zn)	ug/g	340	320	4910877	27	4910724	74	5.0	4910877
Acid Extractable Mercury (Hg)	ug/g	20	0.38	4910877	<0.050	4910724	<0.050	0.050	4910877
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture									

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			EBS148		EBS149		EBS150		
Sampling Date			2017/03/14		2017/03/14		2017/03/14		
COC Number			601902-34-01		601902-34-01		601902-34-01		
	UNITS	Criteria	17-02 SS1	QC Batch	17-02 SS6	RDL	17-03 SS2	RDL	QC Batch
Inorganics									
Chromium (VI)	ug/g	10	0.2	4909409	<0.2	0.2	<0.2	0.2	4909409
Metals									
Hot Water Ext. Boron (B)	ug/g	2	0.32	4911102	0.31	0.050	8.9	0.050	4911102
Acid Extractable Antimony (Sb)	ug/g	50	1.1	4910724	<0.20	0.20	210	0.20	4910877
Acid Extractable Arsenic (As)	ug/g	18	5.9	4910724	3.0	1.0	67	1.0	4910877
Acid Extractable Barium (Ba)	ug/g	670	72	4910724	84	0.50	570	0.50	4910877
Acid Extractable Beryllium (Be)	ug/g	10	0.64	4910724	0.62	0.20	0.64	0.20	4910877
Acid Extractable Boron (B)	ug/g	120	6.4	4910724	9.5	5.0	83	5.0	4910877
Acid Extractable Cadmium (Cd)	ug/g	1.9	0.26	4910724	<0.10	0.10	130	0.10	4910877
Acid Extractable Chromium (Cr)	ug/g	160	17	4910724	22	1.0	390	1.0	4910877
Acid Extractable Cobalt (Co)	ug/g	100	6.6	4910724	9.9	0.10	36	0.10	4910877
Acid Extractable Copper (Cu)	ug/g	300	31	4910724	24	0.50	3400	0.50	4910877
Acid Extractable Lead (Pb)	ug/g	120	57	4910724	12	1.0	6000	10	4910877
Acid Extractable Molybdenum (Mo)	ug/g	40	1.1	4910724	<0.50	0.50	47	0.50	4910877
Acid Extractable Nickel (Ni)	ug/g	340	16	4910724	23	0.50	670	5.0	4910877
Acid Extractable Selenium (Se)	ug/g	5.5	<0.50	4910724	<0.50	0.50	2.7	0.50	4910877
Acid Extractable Silver (Ag)	ug/g	50	<0.20	4910724	<0.20	0.20	29	0.20	4910877
Acid Extractable Thallium (Tl)	ug/g	3.3	0.13	4910724	0.14	0.050	1.1	0.050	4910877
Acid Extractable Uranium (U)	ug/g	33	0.67	4910724	0.51	0.050	1.1	0.050	4910877
Acid Extractable Vanadium (V)	ug/g	86	21	4910724	29	5.0	30	5.0	4910877
Acid Extractable Zinc (Zn)	ug/g	340	78	4910724	55	5.0	28000	50	4910877
Acid Extractable Mercury (Hg)	ug/g	20	0.11	4910724	<0.050	0.050	22	0.50	4910877
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)									
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition									
Soil - Industrial/Commercial/Community- Medium and Fine Texture									

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			EBS152		EBS153	EBS154	EBS155		
Sampling Date			2017/03/14		2017/03/14	2017/03/14	2017/03/15		
COC Number			601902-34-01		601902-34-01	601902-34-01	601902-34-01		
	UNITS	Criteria	17-03 SS10	RDL	QA/QC1	QA/QC2	17-08 SS1	RDL	QC Batch
Inorganics									
Chromium (VI)	ug/g	10	<0.2	0.2	<0.2	<0.2	0.3	0.2	4909409
Metals									
Hot Water Ext. Boron (B)	ug/g	2	1.5	0.050	0.37	0.28	1.1	0.050	4911102
Acid Extractable Antimony (Sb)	ug/g	50	1.2	0.20	<0.20	<0.20	3.7	0.20	4910877
Acid Extractable Arsenic (As)	ug/g	18	5.7	1.0	3.5	2.3	11	1.0	4910877
Acid Extractable Barium (Ba)	ug/g	670	78	0.50	35	150	120	0.50	4910877
Acid Extractable Beryllium (Be)	ug/g	10	0.28	0.20	0.36	0.73	0.71	0.20	4910877
Acid Extractable Boron (B)	ug/g	120	6.2	5.0	<5.0	9.1	15	5.0	4910877
Acid Extractable Cadmium (Cd)	ug/g	1.9	0.72	0.10	<0.10	<0.10	3.2	0.10	4910877
Acid Extractable Chromium (Cr)	ug/g	160	10	1.0	13	26	260	1.0	4910877
Acid Extractable Cobalt (Co)	ug/g	100	4.6	0.10	6.4	12	12	0.10	4910877
Acid Extractable Copper (Cu)	ug/g	300	200	0.50	14	22	290	0.50	4910877
Acid Extractable Lead (Pb)	ug/g	120	370	1.0	230	14	250	1.0	4910877
Acid Extractable Molybdenum (Mo)	ug/g	40	0.55	0.50	0.55	<0.50	9.9	0.50	4910877
Acid Extractable Nickel (Ni)	ug/g	340	15	0.50	10	29	86	0.50	4910877
Acid Extractable Selenium (Se)	ug/g	5.5	<0.50	0.50	<0.50	<0.50	0.55	0.50	4910877
Acid Extractable Silver (Ag)	ug/g	50	3.4	0.20	<0.20	<0.20	0.44	0.20	4910877
Acid Extractable Thallium (Tl)	ug/g	3.3	0.12	0.050	0.10	0.18	0.17	0.050	4910877
Acid Extractable Uranium (U)	ug/g	33	0.37	0.050	0.36	0.58	0.88	0.050	4910877
Acid Extractable Vanadium (V)	ug/g	86	14	5.0	20	31	63	5.0	4910877
Acid Extractable Zinc (Zn)	ug/g	340	410	5.0	39	57	770	5.0	4910877
Acid Extractable Mercury (Hg)	ug/g	20	7.9	0.25	<0.050	<0.050	0.45	0.050	4910877
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture									

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			EBS156		EBS157		EBS158		
Sampling Date			2017/03/15		2017/03/15		2017/03/15		
COC Number			601902-34-01		601902-34-01		601902-34-01		
	UNITS	Criteria	17-09 SS2	QC Batch	17-09 SS7	QC Batch	17-05 SS6	RDL	QC Batch
Inorganics									
Chromium (VI)	ug/g	10	<0.2	4909409	<0.2	4909409	<0.2	0.2	4909409
Metals									
Hot Water Ext. Boron (B)	ug/g	2	2.2	4911102	1.9	4911102	0.52	0.050	4911102
Acid Extractable Antimony (Sb)	ug/g	50	4.0	4910877	<0.20	4910724	0.52	0.20	4910877
Acid Extractable Arsenic (As)	ug/g	18	190	4910877	3.2	4910724	4.4	1.0	4910877
Acid Extractable Barium (Ba)	ug/g	670	72	4910877	52	4910724	53	0.50	4910877
Acid Extractable Beryllium (Be)	ug/g	10	0.62	4910877	0.52	4910724	0.61	0.20	4910877
Acid Extractable Boron (B)	ug/g	120	20	4910877	9.0	4910724	8.3	5.0	4910877
Acid Extractable Cadmium (Cd)	ug/g	1.9	1.3	4910877	<0.10	4910724	0.19	0.10	4910877
Acid Extractable Chromium (Cr)	ug/g	160	34	4910877	17	4910724	19	1.0	4910877
Acid Extractable Cobalt (Co)	ug/g	100	9.8	4910877	8.1	4910724	9.4	0.10	4910877
Acid Extractable Copper (Cu)	ug/g	300	92	4910877	20	4910724	60	0.50	4910877
Acid Extractable Lead (Pb)	ug/g	120	220	4910877	10	4910724	42	1.0	4910877
Acid Extractable Molybdenum (Mo)	ug/g	40	4.4	4910877	<0.50	4910724	0.70	0.50	4910877
Acid Extractable Nickel (Ni)	ug/g	340	39	4910877	17	4910724	21	0.50	4910877
Acid Extractable Selenium (Se)	ug/g	5.5	1.0	4910877	<0.50	4910724	<0.50	0.50	4910877
Acid Extractable Silver (Ag)	ug/g	50	0.27	4910877	<0.20	4910724	<0.20	0.20	4910877
Acid Extractable Thallium (Tl)	ug/g	3.3	0.29	4910877	0.096	4910724	0.096	0.050	4910877
Acid Extractable Uranium (U)	ug/g	33	0.45	4910877	0.50	4910724	0.54	0.050	4910877
Acid Extractable Vanadium (V)	ug/g	86	22	4910877	26	4910724	28	5.0	4910877
Acid Extractable Zinc (Zn)	ug/g	340	360	4910877	43	4910724	150	5.0	4910877
Acid Extractable Mercury (Hg)	ug/g	20	0.24	4910877	<0.050	4910724	0.30	0.050	4910877
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture									

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			EBS159			EBS160		EBS161		
Sampling Date			2017/03/15			2017/03/16		2017/03/16		
COC Number			601902-34-01			601902-34-01		601902-34-01		
	UNITS	Criteria	17-04 SS2	RDL	QC Batch	17-04 SS5	QC Batch	17-07 SS3	RDL	QC Batch
Inorganics										
Chromium (VI)	ug/g	10	<0.2	0.2	4909409	<0.2	4910870	<0.2	0.2	4909409
Metals										
Hot Water Ext. Boron (B)	ug/g	2	6.2	0.050	4911102	3.0	4911102	1.8	0.050	4911102
Acid Extractable Antimony (Sb)	ug/g	50	23	0.20	4910877	9.7	4910877	1.8	0.20	4910877
Acid Extractable Arsenic (As)	ug/g	18	55	1.0	4910877	13	4910877	7.2	1.0	4910877
Acid Extractable Barium (Ba)	ug/g	670	500	0.50	4910877	210	4910877	89	0.50	4910877
Acid Extractable Beryllium (Be)	ug/g	10	0.41	0.20	4910877	0.80	4910877	0.64	0.20	4910877
Acid Extractable Boron (B)	ug/g	120	87	5.0	4910877	11	4910877	9.3	5.0	4910877
Acid Extractable Cadmium (Cd)	ug/g	1.9	14	0.10	4910877	0.86	4910877	1.0	0.10	4910877
Acid Extractable Chromium (Cr)	ug/g	160	430	1.0	4910877	44	4910877	40	1.0	4910877
Acid Extractable Cobalt (Co)	ug/g	100	30	0.10	4910877	12	4910877	9.8	0.10	4910877
Acid Extractable Copper (Cu)	ug/g	300	610	0.50	4910877	130	4910877	210	0.50	4910877
Acid Extractable Lead (Pb)	ug/g	120	880	1.0	4910877	450	4910877	91	1.0	4910877
Acid Extractable Molybdenum (Mo)	ug/g	40	28	0.50	4910877	6.2	4910877	2.0	0.50	4910877
Acid Extractable Nickel (Ni)	ug/g	340	180	0.50	4910877	35	4910877	25	0.50	4910877
Acid Extractable Selenium (Se)	ug/g	5.5	1.0	0.50	4910877	1.9	4910877	<0.50	0.50	4910877
Acid Extractable Silver (Ag)	ug/g	50	1.3	0.20	4910877	0.93	4910877	0.28	0.20	4910877
Acid Extractable Thallium (Tl)	ug/g	3.3	0.19	0.050	4910877	0.25	4910877	0.14	0.050	4910877
Acid Extractable Uranium (U)	ug/g	33	0.74	0.050	4910877	0.78	4910877	0.57	0.050	4910877
Acid Extractable Vanadium (V)	ug/g	86	92	5.0	4910877	41	4910877	29	5.0	4910877
Acid Extractable Zinc (Zn)	ug/g	340	10000	25	4910877	600	4910877	290	5.0	4910877
Acid Extractable Mercury (Hg)	ug/g	20	3.1	0.050	4910877	0.20	4910877	0.53	0.050	4910877
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture										

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			EBS162		EBS163		
Sampling Date			2017/03/16		2017/03/16		
COC Number			601902-34-01		601902-34-01		
	UNITS	Criteria	17-10 SS3	QC Batch	QA/QC3	RDL	QC Batch
Inorganics							
Chromium (VI)	ug/g	10	<0.2	4908881	<0.2	0.2	4909409
Metals							
Hot Water Ext. Boron (B)	ug/g	2	1.1	4911102	2.7	0.050	4911102
Acid Extractable Antimony (Sb)	ug/g	50	1.2	4910877	2.8	0.20	4910877
Acid Extractable Arsenic (As)	ug/g	18	11	4910877	8.5	1.0	4910877
Acid Extractable Barium (Ba)	ug/g	670	81	4910877	100	0.50	4910877
Acid Extractable Beryllium (Be)	ug/g	10	0.58	4910877	0.57	0.20	4910877
Acid Extractable Boron (B)	ug/g	120	15	4910877	11	5.0	4910877
Acid Extractable Cadmium (Cd)	ug/g	1.9	0.40	4910877	1.7	0.10	4910877
Acid Extractable Chromium (Cr)	ug/g	160	22	4910877	53	1.0	4910877
Acid Extractable Cobalt (Co)	ug/g	100	7.0	4910877	9.3	0.10	4910877
Acid Extractable Copper (Cu)	ug/g	300	68	4910877	250	0.50	4910877
Acid Extractable Lead (Pb)	ug/g	120	39	4910877	160	1.0	4910877
Acid Extractable Molybdenum (Mo)	ug/g	40	1.7	4910877	2.7	0.50	4910877
Acid Extractable Nickel (Ni)	ug/g	340	29	4910877	27	0.50	4910877
Acid Extractable Selenium (Se)	ug/g	5.5	0.50	4910877	0.85	0.50	4910877
Acid Extractable Silver (Ag)	ug/g	50	<0.20	4910877	0.94	0.20	4910877
Acid Extractable Thallium (Tl)	ug/g	3.3	0.15	4910877	0.13	0.050	4910877
Acid Extractable Uranium (U)	ug/g	33	0.43	4910877	0.54	0.050	4910877
Acid Extractable Vanadium (V)	ug/g	86	28	4910877	31	5.0	4910877
Acid Extractable Zinc (Zn)	ug/g	340	120	4910877	430	5.0	4910877
Acid Extractable Mercury (Hg)	ug/g	20	<0.050	4910877	0.96	0.050	4910877
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)							
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition							
Soil - Industrial/Commercial/Community- Medium and Fine Texture							

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID			EBS145		EBS146		EBS147	EBS148		
Sampling Date			2017/03/14		2017/03/14		2017/03/14	2017/03/14		
COC Number			601902-34-01		601902-34-01		601902-34-01	601902-34-01		
	UNITS	Criteria	17-01 SS2	RDL	17-01 SS7	RDL	17-01 SS10	17-02 SS1	RDL	QC Batch
Calculated Parameters										
Methylnaphthalene, 2-(1-)	ug/g	85	0.16	0.0071	0.015	0.0071	<0.0071	0.35	0.0071	4905796
Polyaromatic Hydrocarbons										
Acenaphthene	ug/g	96	0.050	0.0050	<0.0050	0.0050	<0.0050	0.059	0.0050	4909768
Acenaphthylene	ug/g	0.17	0.12	0.0050	0.0052	0.0050	<0.0050	0.38	0.0050	4909768
Anthracene	ug/g	0.74	0.22	0.0050	0.051	0.0050	<0.0050	0.51	0.0050	4909768
Benzo(a)anthracene	ug/g	0.96	0.79	0.0050	0.028	0.0050	0.010	1.6	0.0050	4909768
Benzo(a)pyrene	ug/g	0.3	0.81	0.0050	0.021	0.0050	0.010	1.5	0.0050	4909768
Benzo(b/j)fluoranthene	ug/g	0.96	1.2	0.0050	0.034	0.0050	0.016	2.2	0.0050	4909768
Benzo(g,h,i)perylene	ug/g	9.6	0.53	0.0050	0.019	0.0050	0.0073	0.92	0.0050	4909768
Benzo(k)fluoranthene	ug/g	0.96	0.39	0.0050	0.0097	0.0050	0.0054	0.85	0.0050	4909768
Chrysene	ug/g	9.6	0.78	0.0050	0.038	0.0050	0.011	1.4	0.0050	4909768
Dibenz(a,h)anthracene	ug/g	0.1	0.16	0.0050	<0.0050	0.0050	<0.0050	0.33	0.0050	4909768
Fluoranthene	ug/g	9.6	1.4	0.0050	0.050	0.0050	0.022	2.7	0.0050	4909768
Fluorene	ug/g	69	0.060	0.0050	<0.020 (1)	0.020	<0.0050	0.12	0.0050	4909768
Indeno(1,2,3-cd)pyrene	ug/g	0.95	0.61	0.0050	0.018	0.0050	0.0076	1.1	0.0050	4909768
1-Methylnaphthalene	ug/g	85	0.079	0.0050	<0.0050	0.0050	<0.0050	0.16	0.0050	4909768
2-Methylnaphthalene	ug/g	85	0.080	0.0050	0.015	0.0050	<0.0050	0.19	0.0050	4909768
Naphthalene	ug/g	28	0.091	0.0050	<0.0050	0.0050	<0.0050	0.12	0.0050	4909768
Phenanthrene	ug/g	16	0.81	0.0050	0.17	0.0050	0.016	1.4	0.0050	4909768
Pyrene	ug/g	96	1.1	0.0050	0.068	0.0050	0.019	2.2	0.0050	4909768
Surrogate Recovery (%)										
D10-Anthracene	%	-	95		97		96	93		4909768
D14-Terphenyl (FS)	%	-	97		99		96	97		4909768
D8-Acenaphthylene	%	-	94		96		93	94		4909768
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture (1) DL was raised due to matrix interference.										

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID			EBS149		EBS150		EBS152	EBS155		
Sampling Date			2017/03/14		2017/03/14		2017/03/14	2017/03/15		
COC Number			601902-34-01		601902-34-01		601902-34-01	601902-34-01		
	UNITS	Criteria	17-02 SS6	RDL	17-03 SS2	RDL	17-03 SS10	17-08 SS1	RDL	QC Batch
Calculated Parameters										
Methylnaphthalene, 2-(1-)	ug/g	85	<0.0071	0.0071	0.26	0.071	0.50	0.15	0.0071	4905796
Polyaromatic Hydrocarbons										
Acenaphthene	ug/g	96	<0.0050	0.0050	0.12	0.050	0.85	0.16	0.0050	4909768
Acenaphthylene	ug/g	0.17	<0.0050	0.0050	0.074	0.050	0.40	0.044	0.0050	4909768
Anthracene	ug/g	0.74	<0.0050	0.0050	0.35	0.050	2.6	0.27	0.0050	4909768
Benzo(a)anthracene	ug/g	0.96	<0.0050	0.0050	1.4	0.050	5.3	0.80	0.0050	4909768
Benzo(a)pyrene	ug/g	0.3	<0.0050	0.0050	1.6	0.050	3.9	0.92	0.0050	4909768
Benzo(b/j)fluoranthene	ug/g	0.96	<0.0050	0.0050	2.3	0.050	5.3	1.2	0.0050	4909768
Benzo(g,h,i)perylene	ug/g	9.6	<0.0050	0.0050	1.2	0.050	2.6	0.85	0.0050	4909768
Benzo(k)fluoranthene	ug/g	0.96	<0.0050	0.0050	0.73	0.050	1.9	0.44	0.0050	4909768
Chrysene	ug/g	9.6	0.0090	0.0050	1.2	0.050	4.3	0.74	0.0050	4909768
Dibenz(a,h)anthracene	ug/g	0.1	<0.0050	0.0050	0.27	0.050	0.74	0.19	0.0050	4909768
Fluoranthene	ug/g	9.6	<0.0050	0.0050	2.7	0.050	14	1.7	0.0050	4909768
Fluorene	ug/g	69	<0.0050	0.0050	0.17	0.050	1.2	0.14	0.0050	4909768
Indeno(1,2,3-cd)pyrene	ug/g	0.95	<0.0050	0.0050	1.2	0.050	3.1	0.86	0.0050	4909768
1-Methylnaphthalene	ug/g	85	<0.0050	0.0050	0.11	0.050	0.23	0.071	0.0050	4909768
2-Methylnaphthalene	ug/g	85	<0.0050	0.0050	0.15	0.050	0.26	0.083	0.0050	4909768
Naphthalene	ug/g	28	<0.0050	0.0050	0.15	0.050	0.83	0.067	0.0050	4909768
Phenanthrene	ug/g	16	<0.0050	0.0050	1.2	0.050	8.3	1.3	0.0050	4909768
Pyrene	ug/g	96	<0.0050	0.0050	2.6	0.050	11	1.4	0.0050	4909768
Surrogate Recovery (%)										
D10-Anthracene	%	-	99		113		96	100		4909768
D14-Terphenyl (FS)	%	-	99		112		108	100		4909768
D8-Acenaphthylene	%	-	96		106		96	97		4909768
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture										

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID			EBS156	EBS157	EBS158	EBS159		EBS160		
Sampling Date			2017/03/15	2017/03/15	2017/03/15	2017/03/15		2017/03/16		
COC Number			601902-34-01	601902-34-01	601902-34-01	601902-34-01		601902-34-01		
	UNITS	Criteria	17-09 SS2	17-09 SS7	17-05 SS6	17-04 SS2	RDL	17-04 SS5	RDL	QC Batch

Calculated Parameters

Methylnaphthalene, 2-(1-)	ug/g	85	0.13	<0.0071	0.16	0.13	0.0071	4.1	0.71	4905796
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Polyaromatic Hydrocarbons

Acenaphthene	ug/g	96	0.0061	<0.0050	0.083	0.19	0.0050	4.3	0.50	4909768
Acenaphthylene	ug/g	0.17	0.0099	<0.0050	0.22	0.047	0.0050	1.4	0.50	4909768
Anthracene	ug/g	0.74	0.026	<0.0050	0.60	0.44	0.0050	9.9	0.50	4909768
Benzo(a)anthracene	ug/g	0.96	0.059	<0.0050	1.3	0.92	0.0050	12	0.50	4909768
Benzo(a)pyrene	ug/g	0.3	0.062	<0.0050	1.4	0.94	0.0050	9.4	0.50	4909768
Benzo(b/j)fluoranthene	ug/g	0.96	0.095	<0.0050	1.7	1.2	0.0050	12	0.50	4909768
Benzo(g,h,i)perylene	ug/g	9.6	0.044	<0.0050	0.85	0.66	0.0050	5.0	0.50	4909768
Benzo(k)fluoranthene	ug/g	0.96	0.030	<0.0050	0.60	0.45	0.0050	3.8	0.50	4909768
Chrysene	ug/g	9.6	0.055	0.0052	1.1	0.80	0.0050	9.2	0.50	4909768
Dibenz(a,h)anthracene	ug/g	0.1	0.011	<0.0050	0.24	0.16	0.0050	1.6	0.50	4909768
Fluoranthene	ug/g	9.6	0.11	<0.0050	2.1	2.2	0.0050	28	0.50	4909768
Fluorene	ug/g	69	0.0073	<0.0050	0.25	0.19	0.0050	5.8	0.50	4909768
Indeno(1,2,3-cd)pyrene	ug/g	0.95	0.044	<0.0050	1.0	0.72	0.0050	5.9	0.50	4909768
1-Methylnaphthalene	ug/g	85	0.058	<0.0050	0.060	0.059	0.0050	1.7	0.50	4909768
2-Methylnaphthalene	ug/g	85	0.070	<0.0050	0.096	0.072	0.0050	2.4	0.50	4909768
Naphthalene	ug/g	28	0.040	<0.0050	0.16	0.087	0.0050	3.8	0.50	4909768
Phenanthrene	ug/g	16	0.094	<0.0050	1.9	1.7	0.0050	31	0.50	4909768
Pyrene	ug/g	96	0.098	<0.0050	2.2	1.8	0.0050	22	0.50	4909768

Surrogate Recovery (%)

D10-Anthracene	%	-	95	97	96	99		128		4909768
D14-Terphenyl (FS)	%	-	95	98	96	96		113		4909768
D8-Acenaphthylene	%	-	96	94	91	98		101		4909768

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)

Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

Soil - Industrial/Commercial/Community- Medium and Fine Texture

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID			EBS161		EBS162		
Sampling Date			2017/03/16		2017/03/16		
COC Number			601902-34-01		601902-34-01		
	UNITS	Criteria	17-07 SS3	RDL	17-10 SS3	RDL	QC Batch
Calculated Parameters							
Methylnaphthalene, 2-(1-)	ug/g	85	0.042	0.0071	0.090	0.0071	4909768
Polyaromatic Hydrocarbons							
Acenaphthene	ug/g	96	0.10	0.0050	0.041	0.0050	4909768
Acenaphthylene	ug/g	0.17	0.021	0.0050	0.096	0.0050	4909768
Anthracene	ug/g	0.74	0.18	0.0050	0.15	0.0050	4909768
Benzo(a)anthracene	ug/g	0.96	0.63	0.0050	0.71	0.0050	4909768
Benzo(a)pyrene	ug/g	0.3	0.76	0.0050	0.74	0.0050	4909768
Benzo(b/j)fluoranthene	ug/g	0.96	1.0	0.0050	1.2	0.0050	4909768
Benzo(g,h,i)perylene	ug/g	9.6	0.53	0.0050	0.42	0.0050	4909768
Benzo(k)fluoranthene	ug/g	0.96	0.35	0.0050	0.38	0.0050	4909768
Chrysene	ug/g	9.6	0.58	0.0050	0.62	0.0050	4909768
Dibenz(a,h)anthracene	ug/g	0.1	0.13	0.0050	0.15	0.0050	4909768
Fluoranthene	ug/g	9.6	1.4	0.0050	1.1	0.0050	4909768
Fluorene	ug/g	69	0.077	0.0050	0.028	0.0050	4909768
Indeno(1,2,3-cd)pyrene	ug/g	0.95	0.61	0.0050	0.52	0.0050	4909768
1-Methylnaphthalene	ug/g	85	0.022	0.0050	0.041	0.0050	4909768
2-Methylnaphthalene	ug/g	85	0.021	0.0050	0.048	0.0050	4909768
Naphthalene	ug/g	28	<0.030 (1)	0.030	0.063	0.0050	4909768
Phenanthrene	ug/g	16	0.78	0.0050	0.45	0.0050	4909768
Pyrene	ug/g	96	1.2	0.0050	0.89	0.0050	4909768
Surrogate Recovery (%)							
D10-Anthracene	%	-	100		87		4909768
D14-Terphenyl (FS)	%	-	97		95		4909768
D8-Acenaphthylene	%	-	98		92		4909768
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture (1) DL was raised due to matrix interference.							

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			EBS145	EBS146	EBS147	EBS148	EBS149		
Sampling Date			2017/03/14	2017/03/14	2017/03/14	2017/03/14	2017/03/14		
COC Number			601902-34-01	601902-34-01	601902-34-01	601902-34-01	601902-34-01		
	UNITS	Criteria	17-01 SS2	17-01 SS7	17-01 SS10	17-02 SS1	17-02 SS6	RDL	QC Batch
Calculated Parameters									
1,3-Dichloropropene (cis+trans)	ug/g	0.21	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4905530
Volatile Organics									
Acetone (2-Propanone)	ug/g	28	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4907150
Benzene	ug/g	0.4	<0.020	<0.020	<0.020	0.051	<0.020	0.020	4907150
Bromodichloromethane	ug/g	18	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Bromoform	ug/g	1.7	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Bromomethane	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Carbon Tetrachloride	ug/g	1.5	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Chlorobenzene	ug/g	2.7	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Chloroform	ug/g	0.18	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Dibromochloromethane	ug/g	13	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,2-Dichlorobenzene	ug/g	8.5	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,3-Dichlorobenzene	ug/g	12	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,4-Dichlorobenzene	ug/g	0.84	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Dichlorodifluoromethane (FREON 12)	ug/g	25	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,1-Dichloroethane	ug/g	21	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,2-Dichloroethane	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,1-Dichloroethylene	ug/g	0.48	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
cis-1,2-Dichloroethylene	ug/g	37	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
trans-1,2-Dichloroethylene	ug/g	9.3	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,2-Dichloropropane	ug/g	0.68	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
cis-1,3-Dichloropropene	ug/g	0.21	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	4907150
trans-1,3-Dichloropropene	ug/g	0.21	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	4907150
Ethylbenzene	ug/g	19	<0.020	<0.020	<0.020	0.10	<0.020	0.020	4907150
Ethylene Dibromide	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Hexane	ug/g	88	<0.050	<0.050	<0.050	0.15	<0.050	0.050	4907150
Methylene Chloride(Dichloromethane)	ug/g	2	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Methyl Ethyl Ketone (2-Butanone)	ug/g	88	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4907150
Methyl Isobutyl Ketone	ug/g	210	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4907150
Methyl t-butyl ether (MTBE)	ug/g	3.2	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Styrene	ug/g	43	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,1,1,2-Tetrachloroethane	ug/g	0.11	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)									
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition									
Soil - Industrial/Commercial/Community- Medium and Fine Texture									

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			EBS145	EBS146	EBS147	EBS148	EBS149		
Sampling Date			2017/03/14	2017/03/14	2017/03/14	2017/03/14	2017/03/14		
COC Number			601902-34-01	601902-34-01	601902-34-01	601902-34-01	601902-34-01		
	UNITS	Criteria	17-01 SS2	17-01 SS7	17-01 SS10	17-02 SS1	17-02 SS6	RDL	QC Batch
1,1,2,2-Tetrachloroethane	ug/g	0.094	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Tetrachloroethylene	ug/g	21	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Toluene	ug/g	78	0.023	<0.020	<0.020	0.39	<0.020	0.020	4907150
1,1,1-Trichloroethane	ug/g	12	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,1,2-Trichloroethane	ug/g	0.11	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Trichloroethylene	ug/g	0.61	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Trichlorofluoromethane (FREON 11)	ug/g	5.8	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Vinyl Chloride	ug/g	0.25	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4907150
p+m-Xylene	ug/g	-	0.039	<0.020	<0.020	0.78	<0.020	0.020	4907150
o-Xylene	ug/g	-	0.035	<0.020	<0.020	0.61	<0.020	0.020	4907150
Total Xylenes	ug/g	30	0.074	<0.020	<0.020	1.4	<0.020	0.020	4907150
F1 (C6-C10)	ug/g	65	<10	<10	<10	18	<10	10	4907150
F1 (C6-C10) - BTEX	ug/g	65	<10	<10	<10	16	<10	10	4907150
Surrogate Recovery (%)									
4-Bromofluorobenzene	%	-	97	97	98	97	98		4907150
D10-o-Xylene	%	-	88	86	91	89	90		4907150
D4-1,2-Dichloroethane	%	-	105	105	105	104	103		4907150
D8-Toluene	%	-	103	100	101	103	100		4907150
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture									

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			EBS151	EBS152	EBS155	EBS156	EBS157		
Sampling Date			2017/03/14	2017/03/14	2017/03/15	2017/03/15	2017/03/15		
COC Number			601902-34-01	601902-34-01	601902-34-01	601902-34-01	601902-34-01		
	UNITS	Criteria	17-03 SS4	17-03 SS10	17-08 SS1	17-09 SS2	17-09 SS7	RDL	QC Batch
Calculated Parameters									
1,3-Dichloropropene (cis+trans)	ug/g	0.21	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4905530
Volatile Organics									
Acetone (2-Propanone)	ug/g	28	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4907150
Benzene	ug/g	0.4	0.054	0.15	0.021	<0.020	<0.020	0.020	4907150
Bromodichloromethane	ug/g	18	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Bromoform	ug/g	1.7	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Bromomethane	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Carbon Tetrachloride	ug/g	1.5	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Chlorobenzene	ug/g	2.7	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Chloroform	ug/g	0.18	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Dibromochloromethane	ug/g	13	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,2-Dichlorobenzene	ug/g	8.5	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,3-Dichlorobenzene	ug/g	12	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,4-Dichlorobenzene	ug/g	0.84	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Dichlorodifluoromethane (FREON 12)	ug/g	25	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,1-Dichloroethane	ug/g	21	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,2-Dichloroethane	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,1-Dichloroethylene	ug/g	0.48	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
cis-1,2-Dichloroethylene	ug/g	37	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
trans-1,2-Dichloroethylene	ug/g	9.3	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,2-Dichloropropane	ug/g	0.68	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
cis-1,3-Dichloropropene	ug/g	0.21	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	4907150
trans-1,3-Dichloropropene	ug/g	0.21	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	4907150
Ethylbenzene	ug/g	19	0.054	0.073	0.022	<0.020	<0.020	0.020	4907150
Ethylene Dibromide	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Hexane	ug/g	88	0.078	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Methylene Chloride(Dichloromethane)	ug/g	2	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Methyl Ethyl Ketone (2-Butanone)	ug/g	88	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4907150
Methyl Isobutyl Ketone	ug/g	210	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4907150
Methyl t-butyl ether (MTBE)	ug/g	3.2	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Styrene	ug/g	43	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,1,1,2-Tetrachloroethane	ug/g	0.11	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)									
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition									
Soil - Industrial/Commercial/Community- Medium and Fine Texture									

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			EBS151	EBS152	EBS155	EBS156	EBS157		
Sampling Date			2017/03/14	2017/03/14	2017/03/15	2017/03/15	2017/03/15		
COC Number			601902-34-01	601902-34-01	601902-34-01	601902-34-01	601902-34-01		
	UNITS	Criteria	17-03 SS4	17-03 SS10	17-08 SS1	17-09 SS2	17-09 SS7	RDL	QC Batch
1,1,2,2-Tetrachloroethane	ug/g	0.094	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Tetrachloroethylene	ug/g	21	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Toluene	ug/g	78	0.088	1.7	0.060	0.056	<0.020	0.020	4907150
1,1,1-Trichloroethane	ug/g	12	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,1,2-Trichloroethane	ug/g	0.11	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Trichloroethylene	ug/g	0.61	0.069	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Trichlorofluoromethane (FREON 11)	ug/g	5.8	<0.050	<0.050	0.067	<0.050	<0.050	0.050	4907150
Vinyl Chloride	ug/g	0.25	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4907150
p+m-Xylene	ug/g	-	0.12	0.050	0.082	0.11	<0.020	0.020	4907150
o-Xylene	ug/g	-	0.066	<0.020	0.076	0.081	<0.020	0.020	4907150
Total Xylenes	ug/g	30	0.19	0.050	0.16	0.19	<0.020	0.020	4907150
F1 (C6-C10)	ug/g	65	<10	<10	<10	<10	<10	10	4907150
F1 (C6-C10) - BTEX	ug/g	65	<10	<10	<10	<10	<10	10	4907150
Surrogate Recovery (%)									
4-Bromofluorobenzene	%	-	97	98	97	98	98		4907150
D10-o-Xylene	%	-	88	85	89	100	97		4907150
D4-1,2-Dichloroethane	%	-	104	104	104	102	103		4907150
D8-Toluene	%	-	100	101	101	101	101		4907150
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture									

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			EBS158	EBS159	EBS160	EBS161	EBS162		
Sampling Date			2017/03/15	2017/03/15	2017/03/16	2017/03/16	2017/03/16		
COC Number			601902-34-01	601902-34-01	601902-34-01	601902-34-01	601902-34-01		
	UNITS	Criteria	17-05 SS6	17-04 SS2	17-04 SS5	17-07 SS3	17-10 SS3	RDL	QC Batch
Calculated Parameters									
1,3-Dichloropropene (cis+trans)	ug/g	0.21	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4905530
Volatile Organics									
Acetone (2-Propanone)	ug/g	28	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4907150
Benzene	ug/g	0.4	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4907150
Bromodichloromethane	ug/g	18	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Bromoform	ug/g	1.7	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Bromomethane	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Carbon Tetrachloride	ug/g	1.5	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Chlorobenzene	ug/g	2.7	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Chloroform	ug/g	0.18	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Dibromochloromethane	ug/g	13	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,2-Dichlorobenzene	ug/g	8.5	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,3-Dichlorobenzene	ug/g	12	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,4-Dichlorobenzene	ug/g	0.84	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Dichlorodifluoromethane (FREON 12)	ug/g	25	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,1-Dichloroethane	ug/g	21	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,2-Dichloroethane	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,1-Dichloroethylene	ug/g	0.48	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
cis-1,2-Dichloroethylene	ug/g	37	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
trans-1,2-Dichloroethylene	ug/g	9.3	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,2-Dichloropropane	ug/g	0.68	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
cis-1,3-Dichloropropene	ug/g	0.21	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	4907150
trans-1,3-Dichloropropene	ug/g	0.21	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	4907150
Ethylbenzene	ug/g	19	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4907150
Ethylene Dibromide	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Hexane	ug/g	88	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Methylene Chloride(Dichloromethane)	ug/g	2	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Methyl Ethyl Ketone (2-Butanone)	ug/g	88	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4907150
Methyl Isobutyl Ketone	ug/g	210	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4907150
Methyl t-butyl ether (MTBE)	ug/g	3.2	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Styrene	ug/g	43	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,1,1,2-Tetrachloroethane	ug/g	0.11	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)									
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition									
Soil - Industrial/Commercial/Community- Medium and Fine Texture									

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			EBS158	EBS159	EBS160	EBS161	EBS162		
Sampling Date			2017/03/15	2017/03/15	2017/03/16	2017/03/16	2017/03/16		
COC Number			601902-34-01	601902-34-01	601902-34-01	601902-34-01	601902-34-01		
	UNITS	Criteria	17-05 SS6	17-04 SS2	17-04 SS5	17-07 SS3	17-10 SS3	RDL	QC Batch
1,1,2,2-Tetrachloroethane	ug/g	0.094	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Tetrachloroethylene	ug/g	21	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Toluene	ug/g	78	0.47	<0.020	0.024	0.073	0.028	0.020	4907150
1,1,1-Trichloroethane	ug/g	12	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
1,1,2-Trichloroethane	ug/g	0.11	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Trichloroethylene	ug/g	0.61	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Trichlorofluoromethane (FREON 11)	ug/g	5.8	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4907150
Vinyl Chloride	ug/g	0.25	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4907150
p+m-Xylene	ug/g	-	0.048	<0.020	0.052	0.096	<0.020	0.020	4907150
o-Xylene	ug/g	-	<0.020	<0.020	0.030	0.044	<0.020	0.020	4907150
Total Xylenes	ug/g	30	0.048	<0.020	0.082	0.14	<0.020	0.020	4907150
F1 (C6-C10)	ug/g	65	<10	<10	<10	<10	<10	10	4907150
F1 (C6-C10) - BTEX	ug/g	65	<10	<10	<10	<10	<10	10	4907150
Surrogate Recovery (%)									
4-Bromofluorobenzene	%	-	98	98	98	96	98		4907150
D10-o-Xylene	%	-	64	96	86	99	71		4907150
D4-1,2-Dichloroethane	%	-	106	104	104	105	103		4907150
D8-Toluene	%	-	101	100	100	101	101		4907150
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture									

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			EBS145	EBS146	EBS147	EBS148	EBS149		
Sampling Date			2017/03/14	2017/03/14	2017/03/14	2017/03/14	2017/03/14		
COC Number			601902-34-01	601902-34-01	601902-34-01	601902-34-01	601902-34-01		
	UNITS	Criteria	17-01 SS2	17-01 SS7	17-01 SS10	17-02 SS1	17-02 SS6	RDL	QC Batch

F2-F4 Hydrocarbons

F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	6600		610				100	4913930
F2 (C10-C16 Hydrocarbons)	ug/g	250	<10	59	<10	<10	<10	10	4910595
F3 (C16-C34 Hydrocarbons)	ug/g	2500	170	550	<50	50	<50	50	4910595
F4 (C34-C50 Hydrocarbons)	ug/g	6600	60	92	<50	<50	<50	50	4910595
Reached Baseline at C50	ug/g	-	Yes	No	Yes	Yes	Yes		4910595

Surrogate Recovery (%)

o-Terphenyl	%	-	104	107	100	99	109		4910595
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RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)

Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

Soil - Industrial/Commercial/Community- Medium and Fine Texture

Maxxam ID			EBS151	EBS152	EBS155	EBS156	EBS157		
Sampling Date			2017/03/14	2017/03/14	2017/03/15	2017/03/15	2017/03/15		
COC Number			601902-34-01	601902-34-01	601902-34-01	601902-34-01	601902-34-01		
	UNITS	Criteria	17-03 SS4	17-03 SS10	17-08 SS1	17-09 SS2	17-09 SS7	RDL	QC Batch

F2-F4 Hydrocarbons

F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	6600			900			100	4913930
F2 (C10-C16 Hydrocarbons)	ug/g	250	17	130	<10	<10	<10	10	4910595
F3 (C16-C34 Hydrocarbons)	ug/g	2500	960	1800	460	<50	<50	50	4910595
F4 (C34-C50 Hydrocarbons)	ug/g	6600	250	360	250	<50	<50	50	4910595
Reached Baseline at C50	ug/g	-	Yes	Yes	No	Yes	Yes		4910595

Surrogate Recovery (%)

o-Terphenyl	%	-	104	103	98	102	99		4910595
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RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)

Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

Soil - Industrial/Commercial/Community- Medium and Fine Texture

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			EBS158	EBS159	EBS160	EBS161	EBS162		
Sampling Date			2017/03/15	2017/03/15	2017/03/16	2017/03/16	2017/03/16		
COC Number			601902-34-01	601902-34-01	601902-34-01	601902-34-01	601902-34-01		
	UNITS	Criteria	17-05 SS6	17-04 SS2	17-04 SS5	17-07 SS3	17-10 SS3	RDL	QC Batch
F2-F4 Hydrocarbons									
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	6600	690		1300			100	4913930
F2 (C10-C16 Hydrocarbons)	ug/g	250	62	25	80	16	<10	10	4910595
F3 (C16-C34 Hydrocarbons)	ug/g	2500	930	1200	1200	300	110	50	4910595
F4 (C34-C50 Hydrocarbons)	ug/g	6600	190	290	380	71	<50	50	4910595
Reached Baseline at C50	ug/g	-	No	Yes	No	Yes	Yes		4910595
Surrogate Recovery (%)									
o-Terphenyl	%	-	102	129	102	99	97		4910595
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture									

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID			EBS146	EBS151	EBS162		
Sampling Date			2017/03/14	2017/03/14	2017/03/16		
COC Number			601902-34-01	601902-34-01	601902-34-01		
	UNITS	Criteria	17-01 SS7	17-03 SS4	17-10 SS3	RDL	QC Batch
PCBs							
Aroclor 1242	ug/g	-	<0.010	0.027	<0.010	0.010	4908951
Aroclor 1248	ug/g	-	<0.010	<0.010	<0.010	0.010	4908951
Aroclor 1254	ug/g	-	<0.010	0.24	<0.010	0.010	4908951
Aroclor 1260	ug/g	-	<0.010	0.33	0.021	0.010	4908951
Total PCB	ug/g	1.1	<0.010	0.59	0.021	0.010	4908951
Surrogate Recovery (%)							
Decachlorobiphenyl	%	-	71	74	76		4908951
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture							

GENERAL COMMENTS

Revised Report[2017/4/13]: O.Reg 153/04 Table 3 med/fine criteria added to report.

Revised Report[3/29/2017]: Sample ID EBS162 renamed to 17-03 SS10 per client request

Sample EBS145 [17-01 SS2] : SAR Analysis: Sodium was not detected. To report SAR the sodium detection limit was used in the calculation. This value represents a maximum ratio.

Sample EBS148 [17-02 SS1] : SAR Analysis: Sodium was not detected. To report SAR the sodium detection limit was used in the calculation. This value represents a maximum ratio.

Sample EBS150 [17-03 SS2] : PAH Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample EBS159 [17-04 SS2] : VOCF1 Analysis: Greater than 10g of soil was submitted in the field preserved vial. This significantly exceeds the protocol specification of approximately 5g. Additional methanol was added to the vial to ensure extraction efficiency.

Sample EBS160 [17-04 SS5] : PAH Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
PAH ANALYSIS: Detection limits were adjusted for high moisture content.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4907150	KH2	Matrix Spike	4-Bromofluorobenzene	2017/03/22		98	%	60 - 140
			D10-o-Xylene	2017/03/22		90	%	60 - 130
			D4-1,2-Dichloroethane	2017/03/22		104	%	60 - 140
			D8-Toluene	2017/03/22		101	%	60 - 140
			Acetone (2-Propanone)	2017/03/22		103	%	60 - 140
			Benzene	2017/03/22		97	%	60 - 140
			Bromodichloromethane	2017/03/22		102	%	60 - 140
			Bromoform	2017/03/22		99	%	60 - 140
			Bromomethane	2017/03/22		96	%	60 - 140
			Carbon Tetrachloride	2017/03/22		99	%	60 - 140
			Chlorobenzene	2017/03/22		103	%	60 - 140
			Chloroform	2017/03/22		100	%	60 - 140
			Dibromochloromethane	2017/03/22		103	%	60 - 140
			1,2-Dichlorobenzene	2017/03/22		100	%	60 - 140
			1,3-Dichlorobenzene	2017/03/22		99	%	60 - 140
			1,4-Dichlorobenzene	2017/03/22		99	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2017/03/22		90	%	60 - 140
			1,1-Dichloroethane	2017/03/22		102	%	60 - 140
			1,2-Dichloroethane	2017/03/22		102	%	60 - 140
			1,1-Dichloroethylene	2017/03/22		106	%	60 - 140
			cis-1,2-Dichloroethylene	2017/03/22		103	%	60 - 140
			trans-1,2-Dichloroethylene	2017/03/22		96	%	60 - 140
			1,2-Dichloropropane	2017/03/22		100	%	60 - 140
			cis-1,3-Dichloropropene	2017/03/22		95	%	60 - 140
			trans-1,3-Dichloropropene	2017/03/22		97	%	60 - 140
			Ethylbenzene	2017/03/22		101	%	60 - 140
			Ethylene Dibromide	2017/03/22		103	%	60 - 140
			Hexane	2017/03/22		103	%	60 - 140
			Methylene Chloride(Dichloromethane)	2017/03/22		104	%	60 - 140
			Methyl Ethyl Ketone (2-Butanone)	2017/03/22		106	%	60 - 140
			Methyl Isobutyl Ketone	2017/03/22		105	%	60 - 140
			Methyl t-butyl ether (MTBE)	2017/03/22		103	%	60 - 140
			Styrene	2017/03/22		98	%	60 - 140
			1,1,1,2-Tetrachloroethane	2017/03/22		101	%	60 - 140
			1,1,2,2-Tetrachloroethane	2017/03/22		102	%	60 - 140
			Tetrachloroethylene	2017/03/22		98	%	60 - 140
			Toluene	2017/03/22		98	%	60 - 140
			1,1,1-Trichloroethane	2017/03/22		98	%	60 - 140
			1,1,2-Trichloroethane	2017/03/22		103	%	60 - 140
			Trichloroethylene	2017/03/22		98	%	60 - 140
Trichlorofluoromethane (FREON 11)	2017/03/22		101	%	60 - 140			
Vinyl Chloride	2017/03/22		99	%	60 - 140			
p+m-Xylene	2017/03/22		98	%	60 - 140			
o-Xylene	2017/03/22		95	%	60 - 140			
F1 (C6-C10)	2017/03/22		92	%	60 - 140			
4907150	KH2	Spiked Blank	4-Bromofluorobenzene	2017/03/22		98	%	60 - 140
			D10-o-Xylene	2017/03/22		102	%	60 - 130
			D4-1,2-Dichloroethane	2017/03/22		104	%	60 - 140
			D8-Toluene	2017/03/22		100	%	60 - 140
			Acetone (2-Propanone)	2017/03/22		101	%	60 - 140
			Benzene	2017/03/22		96	%	60 - 130
			Bromodichloromethane	2017/03/22		100	%	60 - 130
			Bromoform	2017/03/22		97	%	60 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC			Parameter	Date	Value	Recovery	UNITS	QC Limits
Batch	Init	QC Type		Analyzed				
			Bromomethane	2017/03/22		93	%	60 - 140
			Carbon Tetrachloride	2017/03/22		98	%	60 - 130
			Chlorobenzene	2017/03/22		102	%	60 - 130
			Chloroform	2017/03/22		99	%	60 - 130
			Dibromochloromethane	2017/03/22		101	%	60 - 130
			1,2-Dichlorobenzene	2017/03/22		100	%	60 - 130
			1,3-Dichlorobenzene	2017/03/22		101	%	60 - 130
			1,4-Dichlorobenzene	2017/03/22		101	%	60 - 130
			Dichlorodifluoromethane (FREON 12)	2017/03/22		89	%	60 - 140
			1,1-Dichloroethane	2017/03/22		100	%	60 - 130
			1,2-Dichloroethane	2017/03/22		100	%	60 - 130
			1,1-Dichloroethylene	2017/03/22		105	%	60 - 130
			cis-1,2-Dichloroethylene	2017/03/22		102	%	60 - 130
			trans-1,2-Dichloroethylene	2017/03/22		98	%	60 - 130
			1,2-Dichloropropane	2017/03/22		98	%	60 - 130
			cis-1,3-Dichloropropene	2017/03/22		91	%	60 - 130
			trans-1,3-Dichloropropene	2017/03/22		92	%	60 - 130
			Ethylbenzene	2017/03/22		100	%	60 - 130
			Ethylene Dibromide	2017/03/22		100	%	60 - 130
			Hexane	2017/03/22		102	%	60 - 130
			Methylene Chloride(Dichloromethane)	2017/03/22		103	%	60 - 130
			Methyl Ethyl Ketone (2-Butanone)	2017/03/22		104	%	60 - 140
			Methyl Isobutyl Ketone	2017/03/22		102	%	60 - 130
			Methyl t-butyl ether (MTBE)	2017/03/22		101	%	60 - 130
			Styrene	2017/03/22		97	%	60 - 130
			1,1,1,2-Tetrachloroethane	2017/03/22		99	%	60 - 130
			1,1,2,2-Tetrachloroethane	2017/03/22		100	%	60 - 130
			Tetrachloroethylene	2017/03/22		99	%	60 - 130
			Toluene	2017/03/22		97	%	60 - 130
			1,1,1-Trichloroethane	2017/03/22		96	%	60 - 130
			1,1,2-Trichloroethane	2017/03/22		101	%	60 - 130
			Trichloroethylene	2017/03/22		99	%	60 - 130
			Trichlorofluoromethane (FREON 11)	2017/03/22		100	%	60 - 130
			Vinyl Chloride	2017/03/22		98	%	60 - 130
			p+m-Xylene	2017/03/22		97	%	60 - 130
			o-Xylene	2017/03/22		94	%	60 - 130
			F1 (C6-C10)	2017/03/22		99	%	80 - 120
4907150	KH2	Method Blank	4-Bromofluorobenzene	2017/03/21		99	%	60 - 140
			D10-o-Xylene	2017/03/21		92	%	60 - 130
			D4-1,2-Dichloroethane	2017/03/21		102	%	60 - 140
			D8-Toluene	2017/03/21		101	%	60 - 140
			Acetone (2-Propanone)	2017/03/21	<0.50		ug/g	
			Benzene	2017/03/21	<0.020		ug/g	
			Bromodichloromethane	2017/03/21	<0.050		ug/g	
			Bromoform	2017/03/21	<0.050		ug/g	
			Bromomethane	2017/03/21	<0.050		ug/g	
			Carbon Tetrachloride	2017/03/21	<0.050		ug/g	
			Chlorobenzene	2017/03/21	<0.050		ug/g	
			Chloroform	2017/03/21	<0.050		ug/g	
			Dibromochloromethane	2017/03/21	<0.050		ug/g	
			1,2-Dichlorobenzene	2017/03/21	<0.050		ug/g	
			1,3-Dichlorobenzene	2017/03/21	<0.050		ug/g	
			1,4-Dichlorobenzene	2017/03/21	<0.050		ug/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dichlorodifluoromethane (FREON 12)	2017/03/21	<0.050		ug/g	
			1,1-Dichloroethane	2017/03/21	<0.050		ug/g	
			1,2-Dichloroethane	2017/03/21	<0.050		ug/g	
			1,1-Dichloroethylene	2017/03/21	<0.050		ug/g	
			cis-1,2-Dichloroethylene	2017/03/21	<0.050		ug/g	
			trans-1,2-Dichloroethylene	2017/03/21	<0.050		ug/g	
			1,2-Dichloropropane	2017/03/21	<0.050		ug/g	
			cis-1,3-Dichloropropene	2017/03/21	<0.030		ug/g	
			trans-1,3-Dichloropropene	2017/03/21	<0.040		ug/g	
			Ethylbenzene	2017/03/21	<0.020		ug/g	
			Ethylene Dibromide	2017/03/21	<0.050		ug/g	
			Hexane	2017/03/21	<0.050		ug/g	
			Methylene Chloride(Dichloromethane)	2017/03/21	<0.050		ug/g	
			Methyl Ethyl Ketone (2-Butanone)	2017/03/21	<0.50		ug/g	
			Methyl Isobutyl Ketone	2017/03/21	<0.50		ug/g	
			Methyl t-butyl ether (MTBE)	2017/03/21	<0.050		ug/g	
			Styrene	2017/03/21	<0.050		ug/g	
			1,1,1,2-Tetrachloroethane	2017/03/21	<0.050		ug/g	
			1,1,1,2,2-Tetrachloroethane	2017/03/21	<0.050		ug/g	
			Tetrachloroethylene	2017/03/21	<0.050		ug/g	
			Toluene	2017/03/21	<0.020		ug/g	
			1,1,1-Trichloroethane	2017/03/21	<0.050		ug/g	
			1,1,2-Trichloroethane	2017/03/21	<0.050		ug/g	
			Trichloroethylene	2017/03/21	<0.050		ug/g	
			Trichlorofluoromethane (FREON 11)	2017/03/21	<0.050		ug/g	
			Vinyl Chloride	2017/03/21	<0.020		ug/g	
			p+m-Xylene	2017/03/21	<0.020		ug/g	
			o-Xylene	2017/03/21	<0.020		ug/g	
			Total Xylenes	2017/03/21	<0.020		ug/g	
			F1 (C6-C10)	2017/03/21	<10		ug/g	
			F1 (C6-C10) - BTEX	2017/03/21	<10		ug/g	
4907150	KH2	RPD	Acetone (2-Propanone)	2017/03/22	NC		%	50
			Benzene	2017/03/22	NC		%	50
			Bromodichloromethane	2017/03/22	NC		%	50
			Bromoform	2017/03/22	NC		%	50
			Bromomethane	2017/03/22	NC		%	50
			Carbon Tetrachloride	2017/03/22	NC		%	50
			Chlorobenzene	2017/03/22	NC		%	50
			Chloroform	2017/03/22	NC		%	50
			Dibromochloromethane	2017/03/22	NC		%	50
			1,2-Dichlorobenzene	2017/03/22	NC		%	50
			1,3-Dichlorobenzene	2017/03/22	NC		%	50
			1,4-Dichlorobenzene	2017/03/22	NC		%	50
			Dichlorodifluoromethane (FREON 12)	2017/03/22	NC		%	50
			1,1-Dichloroethane	2017/03/22	NC		%	50
			1,2-Dichloroethane	2017/03/22	NC		%	50
			1,1-Dichloroethylene	2017/03/22	NC		%	50
			cis-1,2-Dichloroethylene	2017/03/22	NC		%	50
			trans-1,2-Dichloroethylene	2017/03/22	NC		%	50
			1,2-Dichloropropane	2017/03/22	NC		%	50
			cis-1,3-Dichloropropene	2017/03/22	NC		%	50
			trans-1,3-Dichloropropene	2017/03/22	NC		%	50
			Ethylbenzene	2017/03/22	NC		%	50

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Ethylene Dibromide	2017/03/22	NC		%	50
			Hexane	2017/03/22	NC		%	50
			Methylene Chloride(Dichloromethane)	2017/03/22	NC		%	50
			Methyl Ethyl Ketone (2-Butanone)	2017/03/22	NC		%	50
			Methyl Isobutyl Ketone	2017/03/22	NC		%	50
			Methyl t-butyl ether (MTBE)	2017/03/22	NC		%	50
			Styrene	2017/03/22	NC		%	50
			1,1,1,2-Tetrachloroethane	2017/03/22	NC		%	50
			1,1,2,2-Tetrachloroethane	2017/03/22	NC		%	50
			Tetrachloroethylene	2017/03/22	NC		%	50
			Toluene	2017/03/22	NC		%	50
			1,1,1-Trichloroethane	2017/03/22	NC		%	50
			1,1,2-Trichloroethane	2017/03/22	NC		%	50
			Trichloroethylene	2017/03/22	NC		%	50
			Trichlorofluoromethane (FREON 11)	2017/03/22	NC		%	50
			Vinyl Chloride	2017/03/22	NC		%	50
			p+m-Xylene	2017/03/22	NC		%	50
			o-Xylene	2017/03/22	NC		%	50
			Total Xylenes	2017/03/22	NC		%	50
			F1 (C6-C10)	2017/03/22	NC		%	30
			F1 (C6-C10) - BTEX	2017/03/22	NC		%	30
4908881	SAC	Matrix Spike	Chromium (VI)	2017/03/22		78	%	75 - 125
4908881	SAC	Spiked Blank	Chromium (VI)	2017/03/22		81	%	80 - 120
4908881	SAC	Method Blank	Chromium (VI)	2017/03/22	<0.2		ug/g	
4908881	SAC	RPD	Chromium (VI)	2017/03/22	NC		%	35
4908951	LPG	Matrix Spike [EBS146-02]	Decachlorobiphenyl	2017/03/22		69	%	60 - 130
			Aroclor 1260	2017/03/22		68	%	60 - 130
			Total PCB	2017/03/22		68	%	60 - 130
4908951	LPG	Spiked Blank	Decachlorobiphenyl	2017/03/22		93	%	60 - 130
			Aroclor 1260	2017/03/22		105	%	60 - 130
			Total PCB	2017/03/22		105	%	60 - 130
4908951	LPG	Method Blank	Decachlorobiphenyl	2017/03/22		96	%	60 - 130
			Aroclor 1242	2017/03/22	<0.010		ug/g	
			Aroclor 1248	2017/03/22	<0.010		ug/g	
			Aroclor 1254	2017/03/22	<0.010		ug/g	
			Aroclor 1260	2017/03/22	<0.010		ug/g	
			Total PCB	2017/03/22	<0.010		ug/g	
4908951	LPG	RPD [EBS146-02]	Aroclor 1242	2017/03/22	NC		%	50
			Aroclor 1248	2017/03/22	NC		%	50
			Aroclor 1254	2017/03/22	NC		%	50
			Aroclor 1260	2017/03/22	NC		%	50
			Total PCB	2017/03/22	NC		%	50
4909038	XQI	Matrix Spike	Free Cyanide	2017/03/23		104	%	75 - 125
4909038	XQI	Spiked Blank	Free Cyanide	2017/03/23		103	%	80 - 120
4909038	XQI	Method Blank	Free Cyanide	2017/03/23	<0.01		ug/g	
4909038	XQI	RPD	Free Cyanide	2017/03/23	NC		%	35
4909059	MYG	RPD	Moisture	2017/03/22	0		%	20
4909380	XQI	Matrix Spike	Free Cyanide	2017/03/23		102	%	75 - 125
4909380	XQI	Spiked Blank	Free Cyanide	2017/03/23		96	%	80 - 120
4909380	XQI	Method Blank	Free Cyanide	2017/03/23	<0.01		ug/g	
4909380	XQI	RPD	Free Cyanide	2017/03/23	NC		%	35
4909404	TA1	Spiked Blank	Available (CaCl2) pH	2017/03/23		98	%	97 - 103
4909404	TA1	RPD	Available (CaCl2) pH	2017/03/23	0.66		%	N/A

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4909409	SAC	Matrix Spike	Chromium (VI)	2017/03/23		80	%	75 - 125
4909409	SAC	Spiked Blank	Chromium (VI)	2017/03/23		87	%	80 - 120
4909409	SAC	Method Blank	Chromium (VI)	2017/03/23	<0.2		ug/g	
4909409	SAC	RPD	Chromium (VI)	2017/03/23	NC		%	35
4909453	TA1	Spiked Blank	Available (CaCl2) pH	2017/03/23		98	%	97 - 103
4909453	TA1	RPD	Available (CaCl2) pH	2017/03/23	1.1		%	N/A
4909768	RAJ	Matrix Spike	D10-Anthracene	2017/03/22		99	%	50 - 130
			D14-Terphenyl (FS)	2017/03/22		99	%	50 - 130
			D8-Acenaphthylene	2017/03/22		97	%	50 - 130
			Acenaphthene	2017/03/22		98	%	50 - 130
			Acenaphthylene	2017/03/22		97	%	50 - 130
			Anthracene	2017/03/22		94	%	50 - 130
			Benzo(a)anthracene	2017/03/22		98	%	50 - 130
			Benzo(a)pyrene	2017/03/22		97	%	50 - 130
			Benzo(b/j)fluoranthene	2017/03/22		92	%	50 - 130
			Benzo(g,h,i)perylene	2017/03/22		85	%	50 - 130
			Benzo(k)fluoranthene	2017/03/22		95	%	50 - 130
			Chrysene	2017/03/22		99	%	50 - 130
			Dibenz(a,h)anthracene	2017/03/22		94	%	50 - 130
			Fluoranthene	2017/03/22		97	%	50 - 130
			Fluorene	2017/03/22		97	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2017/03/22		94	%	50 - 130
			1-Methylnaphthalene	2017/03/22		99	%	50 - 130
			2-Methylnaphthalene	2017/03/22		97	%	50 - 130
			Naphthalene	2017/03/22		93	%	50 - 130
			Phenanthrene	2017/03/22		95	%	50 - 130
			Pyrene	2017/03/22		98	%	50 - 130
4909768	RAJ	Spiked Blank	D10-Anthracene	2017/03/22		97	%	50 - 130
			D14-Terphenyl (FS)	2017/03/22		94	%	50 - 130
			D8-Acenaphthylene	2017/03/22		93	%	50 - 130
			Acenaphthene	2017/03/22		95	%	50 - 130
			Acenaphthylene	2017/03/22		93	%	50 - 130
			Anthracene	2017/03/22		91	%	50 - 130
			Benzo(a)anthracene	2017/03/22		87	%	50 - 130
			Benzo(a)pyrene	2017/03/22		94	%	50 - 130
			Benzo(b/j)fluoranthene	2017/03/22		99	%	50 - 130
			Benzo(g,h,i)perylene	2017/03/22		74	%	50 - 130
			Benzo(k)fluoranthene	2017/03/22		93	%	50 - 130
			Chrysene	2017/03/22		95	%	50 - 130
			Dibenz(a,h)anthracene	2017/03/22		76	%	50 - 130
			Fluoranthene	2017/03/22		94	%	50 - 130
			Fluorene	2017/03/22		92	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2017/03/22		81	%	50 - 130
			1-Methylnaphthalene	2017/03/22		97	%	50 - 130
			2-Methylnaphthalene	2017/03/22		94	%	50 - 130
			Naphthalene	2017/03/22		92	%	50 - 130
			Phenanthrene	2017/03/22		94	%	50 - 130
			Pyrene	2017/03/22		94	%	50 - 130
4909768	RAJ	Method Blank	D10-Anthracene	2017/03/22		94	%	50 - 130
			D14-Terphenyl (FS)	2017/03/22		92	%	50 - 130
			D8-Acenaphthylene	2017/03/22		92	%	50 - 130
			Acenaphthene	2017/03/22	<0.0050		ug/g	
			Acenaphthylene	2017/03/22	<0.0050		ug/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Anthracene	2017/03/22	<0.0050		ug/g	
			Benzo(a)anthracene	2017/03/22	<0.0050		ug/g	
			Benzo(a)pyrene	2017/03/22	<0.0050		ug/g	
			Benzo(b/j)fluoranthene	2017/03/22	<0.0050		ug/g	
			Benzo(g,h,i)perylene	2017/03/22	<0.0050		ug/g	
			Benzo(k)fluoranthene	2017/03/22	<0.0050		ug/g	
			Chrysene	2017/03/22	<0.0050		ug/g	
			Dibenz(a,h)anthracene	2017/03/22	<0.0050		ug/g	
			Fluoranthene	2017/03/22	<0.0050		ug/g	
			Fluorene	2017/03/22	<0.0050		ug/g	
			Indeno(1,2,3-cd)pyrene	2017/03/22	<0.0050		ug/g	
			1-Methylnaphthalene	2017/03/22	<0.0050		ug/g	
			2-Methylnaphthalene	2017/03/22	<0.0050		ug/g	
			Naphthalene	2017/03/22	<0.0050		ug/g	
			Phenanthrene	2017/03/22	<0.0050		ug/g	
			Pyrene	2017/03/22	<0.0050		ug/g	
4909768	RAJ	RPD	Acenaphthene	2017/03/22	NC		%	40
			Acenaphthylene	2017/03/22	NC		%	40
			Anthracene	2017/03/22	NC		%	40
			Benzo(a)anthracene	2017/03/22	NC		%	40
			Benzo(a)pyrene	2017/03/22	NC		%	40
			Benzo(b/j)fluoranthene	2017/03/22	NC		%	40
			Benzo(g,h,i)perylene	2017/03/22	NC		%	40
			Benzo(k)fluoranthene	2017/03/22	NC		%	40
			Chrysene	2017/03/22	NC		%	40
			Dibenz(a,h)anthracene	2017/03/22	NC		%	40
			Fluoranthene	2017/03/22	NC		%	40
			Fluorene	2017/03/22	NC		%	40
			Indeno(1,2,3-cd)pyrene	2017/03/22	NC		%	40
			1-Methylnaphthalene	2017/03/22	NC		%	40
			2-Methylnaphthalene	2017/03/22	NC		%	40
			Naphthalene	2017/03/22	NC		%	40
			Phenanthrene	2017/03/22	NC		%	40
			Pyrene	2017/03/22	NC		%	40
4910595	KLI	Matrix Spike	o-Terphenyl	2017/03/24		99	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/03/24		95	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2017/03/24		104	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2017/03/24		103	%	50 - 130
4910595	KLI	Spiked Blank	o-Terphenyl	2017/03/24		103	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/03/24		95	%	80 - 120
			F3 (C16-C34 Hydrocarbons)	2017/03/24		104	%	80 - 120
			F4 (C34-C50 Hydrocarbons)	2017/03/24		107	%	80 - 120
4910595	KLI	Method Blank	o-Terphenyl	2017/03/24		104	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/03/24	<10		ug/g	
			F3 (C16-C34 Hydrocarbons)	2017/03/24	<50		ug/g	
			F4 (C34-C50 Hydrocarbons)	2017/03/24	<50		ug/g	
4910595	KLI	RPD	F2 (C10-C16 Hydrocarbons)	2017/03/24	NC		%	30
			F3 (C16-C34 Hydrocarbons)	2017/03/24	NC		%	30
			F4 (C34-C50 Hydrocarbons)	2017/03/24	NC		%	30
4910608	GYA	RPD [EBS154-01]	Moisture	2017/03/23	1.9		%	20
4910651	JOH	Matrix Spike	Hot Water Ext. Boron (B)	2017/03/23		100	%	75 - 125
4910651	JOH	Spiked Blank	Hot Water Ext. Boron (B)	2017/03/23		99	%	75 - 125
4910651	JOH	Method Blank	Hot Water Ext. Boron (B)	2017/03/23	<0.050		ug/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC			Parameter	Date	Value	Recovery	UNITS	QC Limits
Batch	Init	QC Type		Analyzed				
4910651	JOH	RPD	Hot Water Ext. Boron (B)	2017/03/23	1.3		%	40
4910715	GYA	RPD	Moisture	2017/03/23	2.1		%	20
4910724	VIV	Matrix Spike	Acid Extractable Antimony (Sb)	2017/03/23		94	%	75 - 125
			Acid Extractable Arsenic (As)	2017/03/23		96	%	75 - 125
			Acid Extractable Barium (Ba)	2017/03/23		NC	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/03/23		99	%	75 - 125
			Acid Extractable Boron (B)	2017/03/23		96	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/03/23		100	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/03/23		99	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/03/23		95	%	75 - 125
			Acid Extractable Copper (Cu)	2017/03/23		94	%	75 - 125
			Acid Extractable Lead (Pb)	2017/03/23		95	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/03/23		103	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/03/23		97	%	75 - 125
			Acid Extractable Selenium (Se)	2017/03/23		99	%	75 - 125
			Acid Extractable Silver (Ag)	2017/03/23		100	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/03/23		94	%	75 - 125
			Acid Extractable Uranium (U)	2017/03/23		94	%	75 - 125
			Acid Extractable Vanadium (V)	2017/03/23		98	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/03/23		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/03/23		96	%	75 - 125
4910724	VIV	Spiked Blank	Acid Extractable Antimony (Sb)	2017/03/23		102	%	80 - 120
			Acid Extractable Arsenic (As)	2017/03/23		100	%	80 - 120
			Acid Extractable Barium (Ba)	2017/03/23		103	%	80 - 120
			Acid Extractable Beryllium (Be)	2017/03/23		98	%	80 - 120
			Acid Extractable Boron (B)	2017/03/23		96	%	80 - 120
			Acid Extractable Cadmium (Cd)	2017/03/23		100	%	80 - 120
			Acid Extractable Chromium (Cr)	2017/03/23		99	%	80 - 120
			Acid Extractable Cobalt (Co)	2017/03/23		101	%	80 - 120
			Acid Extractable Copper (Cu)	2017/03/23		101	%	80 - 120
			Acid Extractable Lead (Pb)	2017/03/23		98	%	80 - 120
			Acid Extractable Molybdenum (Mo)	2017/03/23		104	%	80 - 120
			Acid Extractable Nickel (Ni)	2017/03/23		99	%	80 - 120
			Acid Extractable Selenium (Se)	2017/03/23		102	%	80 - 120
			Acid Extractable Silver (Ag)	2017/03/23		103	%	80 - 120
			Acid Extractable Thallium (Tl)	2017/03/23		98	%	80 - 120
			Acid Extractable Uranium (U)	2017/03/23		95	%	80 - 120
			Acid Extractable Vanadium (V)	2017/03/23		97	%	80 - 120
			Acid Extractable Zinc (Zn)	2017/03/23		101	%	80 - 120
			Acid Extractable Mercury (Hg)	2017/03/23		96	%	80 - 120
4910724	VIV	Method Blank	Acid Extractable Antimony (Sb)	2017/03/23	<0.20		ug/g	
			Acid Extractable Arsenic (As)	2017/03/23	<1.0		ug/g	
			Acid Extractable Barium (Ba)	2017/03/23	<0.50		ug/g	
			Acid Extractable Beryllium (Be)	2017/03/23	<0.20		ug/g	
			Acid Extractable Boron (B)	2017/03/23	<5.0		ug/g	
			Acid Extractable Cadmium (Cd)	2017/03/23	<0.10		ug/g	
			Acid Extractable Chromium (Cr)	2017/03/23	<1.0		ug/g	
			Acid Extractable Cobalt (Co)	2017/03/23	<0.10		ug/g	
			Acid Extractable Copper (Cu)	2017/03/23	<0.50		ug/g	
			Acid Extractable Lead (Pb)	2017/03/23	<1.0		ug/g	
			Acid Extractable Molybdenum (Mo)	2017/03/23	<0.50		ug/g	
			Acid Extractable Nickel (Ni)	2017/03/23	<0.50		ug/g	
			Acid Extractable Selenium (Se)	2017/03/23	<0.50		ug/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4910724	VIV	RPD	Acid Extractable Silver (Ag)	2017/03/23	<0.20		ug/g	
			Acid Extractable Thallium (Tl)	2017/03/23	<0.050		ug/g	
			Acid Extractable Uranium (U)	2017/03/23	<0.050		ug/g	
			Acid Extractable Vanadium (V)	2017/03/23	<5.0		ug/g	
			Acid Extractable Zinc (Zn)	2017/03/23	<5.0		ug/g	
			Acid Extractable Mercury (Hg)	2017/03/23	<0.050		ug/g	
			Acid Extractable Antimony (Sb)	2017/03/23	NC		%	30
			Acid Extractable Arsenic (As)	2017/03/23	0.69		%	30
			Acid Extractable Barium (Ba)	2017/03/23	2.1		%	30
			Acid Extractable Beryllium (Be)	2017/03/23	2.0		%	30
			Acid Extractable Boron (B)	2017/03/23	0.70		%	30
			Acid Extractable Cadmium (Cd)	2017/03/23	NC		%	30
			Acid Extractable Chromium (Cr)	2017/03/23	1.1		%	30
			Acid Extractable Cobalt (Co)	2017/03/23	2.1		%	30
			Acid Extractable Copper (Cu)	2017/03/23	4.4		%	30
			Acid Extractable Lead (Pb)	2017/03/23	1.0		%	30
			Acid Extractable Molybdenum (Mo)	2017/03/23	NC		%	30
			Acid Extractable Nickel (Ni)	2017/03/23	3.9		%	30
			Acid Extractable Selenium (Se)	2017/03/23	NC		%	30
			Acid Extractable Silver (Ag)	2017/03/23	NC		%	30
			Acid Extractable Thallium (Tl)	2017/03/23	9.7		%	30
			Acid Extractable Uranium (U)	2017/03/23	0.59		%	30
			Acid Extractable Vanadium (V)	2017/03/23	0.16		%	30
Acid Extractable Zinc (Zn)	2017/03/23	2.8		%	30			
Acid Extractable Mercury (Hg)	2017/03/23	NC		%	30			
4910840	XQI	Matrix Spike	Free Cyanide	2017/03/25		101	%	75 - 125
4910840	XQI	Spiked Blank	Free Cyanide	2017/03/25		104	%	80 - 120
4910840	XQI	Method Blank	Free Cyanide	2017/03/25	<0.01		ug/g	
4910840	XQI	RPD	Free Cyanide	2017/03/25	NC		%	35
4910861	SUK	Spiked Blank	Soluble Calcium (Ca)	2017/03/23		94	%	80 - 120
			Soluble Magnesium (Mg)	2017/03/23		95	%	80 - 120
			Soluble Sodium (Na)	2017/03/23		100	%	80 - 120
4910861	SUK	Method Blank	Soluble Calcium (Ca)	2017/03/23	<0.5		mg/L	
			Soluble Magnesium (Mg)	2017/03/23	<0.5		mg/L	
			Soluble Sodium (Na)	2017/03/23	<5		mg/L	
4910861	SUK	RPD	Soluble Calcium (Ca)	2017/03/23	5.2		%	30
			Soluble Magnesium (Mg)	2017/03/23	0.55		%	30
			Soluble Sodium (Na)	2017/03/23	3.3		%	30
4910867	NYS	Spiked Blank	Conductivity	2017/03/23		100	%	90 - 110
4910867	NYS	Method Blank	Conductivity	2017/03/23	<0.002		mS/cm	
4910867	NYS	RPD	Conductivity	2017/03/23	3.3		%	10
4910870	SAC	Matrix Spike	Chromium (VI)	2017/03/23		3.8 (1)	%	75 - 125
4910870	SAC	Spiked Blank	Chromium (VI)	2017/03/23		84	%	80 - 120
4910870	SAC	Method Blank	Chromium (VI)	2017/03/23	<0.2		ug/g	
4910870	SAC	RPD	Chromium (VI)	2017/03/23	NC		%	35
4910877	DT1	Matrix Spike	Acid Extractable Antimony (Sb)	2017/03/23		96	%	75 - 125
			Acid Extractable Arsenic (As)	2017/03/23		98	%	75 - 125
			Acid Extractable Barium (Ba)	2017/03/23		91	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/03/23		96	%	75 - 125
			Acid Extractable Boron (B)	2017/03/23		94	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/03/23		96	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/03/23		98	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/03/23		97	%	75 - 125

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Copper (Cu)	2017/03/23		93	%	75 - 125
			Acid Extractable Lead (Pb)	2017/03/23		94	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/03/23		101	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/03/23		99	%	75 - 125
			Acid Extractable Selenium (Se)	2017/03/23		97	%	75 - 125
			Acid Extractable Silver (Ag)	2017/03/23		101	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/03/23		93	%	75 - 125
			Acid Extractable Uranium (U)	2017/03/23		91	%	75 - 125
			Acid Extractable Vanadium (V)	2017/03/23		101	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/03/23		101	%	75 - 125
4910877	DT1	Spiked Blank	Acid Extractable Mercury (Hg)	2017/03/23		98	%	75 - 125
			Acid Extractable Antimony (Sb)	2017/03/23		97	%	80 - 120
			Acid Extractable Arsenic (As)	2017/03/23		98	%	80 - 120
			Acid Extractable Barium (Ba)	2017/03/23		95	%	80 - 120
			Acid Extractable Beryllium (Be)	2017/03/23		96	%	80 - 120
			Acid Extractable Boron (B)	2017/03/23		96	%	80 - 120
			Acid Extractable Cadmium (Cd)	2017/03/23		97	%	80 - 120
			Acid Extractable Chromium (Cr)	2017/03/23		96	%	80 - 120
			Acid Extractable Cobalt (Co)	2017/03/23		96	%	80 - 120
			Acid Extractable Copper (Cu)	2017/03/23		97	%	80 - 120
			Acid Extractable Lead (Pb)	2017/03/23		96	%	80 - 120
			Acid Extractable Molybdenum (Mo)	2017/03/23		99	%	80 - 120
			Acid Extractable Nickel (Ni)	2017/03/23		96	%	80 - 120
			Acid Extractable Selenium (Se)	2017/03/23		99	%	80 - 120
			Acid Extractable Silver (Ag)	2017/03/23		100	%	80 - 120
			Acid Extractable Thallium (Tl)	2017/03/23		96	%	80 - 120
			Acid Extractable Uranium (U)	2017/03/23		92	%	80 - 120
			Acid Extractable Vanadium (V)	2017/03/23		95	%	80 - 120
			Acid Extractable Zinc (Zn)	2017/03/23		95	%	80 - 120
4910877	DT1	Method Blank	Acid Extractable Mercury (Hg)	2017/03/23		100	%	80 - 120
			Acid Extractable Antimony (Sb)	2017/03/23	<0.20		ug/g	
			Acid Extractable Arsenic (As)	2017/03/23	<1.0		ug/g	
			Acid Extractable Barium (Ba)	2017/03/23	<0.50		ug/g	
			Acid Extractable Beryllium (Be)	2017/03/23	<0.20		ug/g	
			Acid Extractable Boron (B)	2017/03/23	<5.0		ug/g	
			Acid Extractable Cadmium (Cd)	2017/03/23	<0.10		ug/g	
			Acid Extractable Chromium (Cr)	2017/03/23	<1.0		ug/g	
			Acid Extractable Cobalt (Co)	2017/03/23	<0.10		ug/g	
			Acid Extractable Copper (Cu)	2017/03/23	<0.50		ug/g	
			Acid Extractable Lead (Pb)	2017/03/23	<1.0		ug/g	
			Acid Extractable Molybdenum (Mo)	2017/03/23	<0.50		ug/g	
			Acid Extractable Nickel (Ni)	2017/03/23	<0.50		ug/g	
			Acid Extractable Selenium (Se)	2017/03/23	<0.50		ug/g	
			Acid Extractable Silver (Ag)	2017/03/23	<0.20		ug/g	
			Acid Extractable Thallium (Tl)	2017/03/23	<0.050		ug/g	
			Acid Extractable Uranium (U)	2017/03/23	<0.050		ug/g	
			Acid Extractable Vanadium (V)	2017/03/23	<5.0		ug/g	
			Acid Extractable Zinc (Zn)	2017/03/23	<5.0		ug/g	
4910877	DT1	RPD	Acid Extractable Mercury (Hg)	2017/03/23	<0.050		ug/g	
			Acid Extractable Antimony (Sb)	2017/03/23	NC		%	30
			Acid Extractable Arsenic (As)	2017/03/23	NC		%	30
			Acid Extractable Barium (Ba)	2017/03/23	13		%	30
			Acid Extractable Beryllium (Be)	2017/03/23	NC		%	30

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Boron (B)	2017/03/23	NC		%	30
			Acid Extractable Cadmium (Cd)	2017/03/23	NC		%	30
			Acid Extractable Chromium (Cr)	2017/03/23	1.9		%	30
			Acid Extractable Cobalt (Co)	2017/03/23	10		%	30
			Acid Extractable Copper (Cu)	2017/03/23	11		%	30
			Acid Extractable Lead (Pb)	2017/03/23	3.1		%	30
			Acid Extractable Molybdenum (Mo)	2017/03/23	NC		%	30
			Acid Extractable Nickel (Ni)	2017/03/23	10		%	30
			Acid Extractable Selenium (Se)	2017/03/23	NC		%	30
			Acid Extractable Silver (Ag)	2017/03/23	NC		%	30
			Acid Extractable Thallium (Tl)	2017/03/23	NC		%	30
			Acid Extractable Uranium (U)	2017/03/23	4.7		%	30
			Acid Extractable Vanadium (V)	2017/03/23	10		%	30
			Acid Extractable Zinc (Zn)	2017/03/23	24		%	30
			Acid Extractable Mercury (Hg)	2017/03/23	NC		%	30
4911102	SUK	Matrix Spike [EBS158-01]	Hot Water Ext. Boron (B)	2017/03/23		95	%	75 - 125
4911102	SUK	Spiked Blank	Hot Water Ext. Boron (B)	2017/03/23		95	%	75 - 125
4911102	SUK	Method Blank	Hot Water Ext. Boron (B)	2017/03/23	<0.050		ug/g	
4911102	SUK	RPD [EBS158-01]	Hot Water Ext. Boron (B)	2017/03/23	1.9		%	40
4911187	JOH	Spiked Blank	Soluble Calcium (Ca)	2017/03/24		94	%	80 - 120
			Soluble Magnesium (Mg)	2017/03/24		93	%	80 - 120
			Soluble Sodium (Na)	2017/03/24		100	%	80 - 120
4911187	JOH	Method Blank	Soluble Calcium (Ca)	2017/03/24	<0.5		mg/L	
			Soluble Magnesium (Mg)	2017/03/24	<0.5		mg/L	
			Soluble Sodium (Na)	2017/03/24	<5		mg/L	
4911187	JOH	RPD [EBS149-01]	Soluble Calcium (Ca)	2017/03/24	0.66		%	30
			Soluble Magnesium (Mg)	2017/03/24	3.3		%	30
			Soluble Sodium (Na)	2017/03/24	0.35		%	30
4911191	NYS	Spiked Blank	Conductivity	2017/03/24		99	%	90 - 110
4911191	NYS	Method Blank	Conductivity	2017/03/24	<0.002		mS/cm	
4911191	NYS	RPD [EBS149-01]	Conductivity	2017/03/24	0.71		%	10
4913930	SK1	Matrix Spike [EBS146-02]	F4G-sg (Grav. Heavy Hydrocarbons)	2017/03/25		100	%	65 - 135
4913930	SK1	Spiked Blank	F4G-sg (Grav. Heavy Hydrocarbons)	2017/03/25		98	%	65 - 135
4913930	SK1	Method Blank	F4G-sg (Grav. Heavy Hydrocarbons)	2017/03/25	<100		ug/g	
4913930	SK1	RPD [EBS158-02]	F4G-sg (Grav. Heavy Hydrocarbons)	2017/03/25	0		%	50

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.

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

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

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

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

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

(1) The matrix spike recovery was below the lower control limit. This may be due in part to the reducing environment of the sample. The matrix spike was reanalyzed to confirm result.

VALIDATION SIGNATURE PAGE

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

Cristina Carriere

Cristina Carriere, Scientific Services

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

Your Project #: 161-17781-00
 Site Location: HSR FACILITY
 Your C.O.C. #: 601902-32-01

Attention: Rachel Bryan

WSP Canada Inc
 4 Hughson Street South
 Suite 300
 Hamilton, ON
 CANADA L8N 3Z1

Report Date: 2017/04/13
 Report #: R4426319
 Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B755837

Received: 2017/03/21, 09:45

Sample Matrix: Soil
 # Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum	7	N/A	2017/03/27	CAM SOP-00301	EPA 8270D m
Semivolatile Organic Compounds (TCLP)	1	2017/03/24	2017/03/25	CAM SOP-00301	EPA 8270D m
Hot Water Extractable Boron	9	2017/03/24	2017/03/25	CAM SOP-00408	R153 Ana. Prot. 2011
1,3-Dichloropropene Sum	8	N/A	2017/03/27		EPA 8260C m
Free (WAD) Cyanide	5	2017/03/22	2017/03/25	CAM SOP-00457	OMOE E3015 m
Free (WAD) Cyanide	4	2017/03/23	2017/03/25	CAM SOP-00457	OMOE E3015 m
Cyanide (WAD) in Leachates	1	N/A	2017/03/25	CAM SOP-00457	OMOE 3015 m
Conductivity	5	2017/03/24	2017/03/24	CAM SOP-00414	OMOE E3530 v1 m
Conductivity	4	2017/03/27	2017/03/27	CAM SOP-00414	OMOE E3530 v1 m
Hexavalent Chromium in Soil by IC (1)	9	2017/03/23	2017/03/24	CAM SOP-00436	EPA 3060/7199 m
Petroleum Hydrocarbons F2-F4 in Soil (2)	8	2017/03/23	2017/03/24	CAM SOP-00316	CCME CWS m
F4G (CCME Hydrocarbons Gravimetric)	6	2017/03/28	2017/03/28	CAM SOP-00316	CCME PHC-CWS m
Fluoride by ISE in Leachates	1	2017/03/23	2017/03/24	CAM SOP-00449	SM 22 4500-F- C m
Mercury (TCLP Leachable) (mg/L)	1	N/A	2017/03/24	CAM SOP-00453	EPA 7470A m
Strong Acid Leachable Metals by ICPMS	5	2017/03/23	2017/03/23	CAM SOP-00447	EPA 6020B m
Strong Acid Leachable Metals by ICPMS	4	2017/03/24	2017/03/24	CAM SOP-00447	EPA 6020B m
Total Metals in TCLP Leachate by ICPMS	1	2017/03/23	2017/03/23	CAM SOP-00447	EPA 6020B m
Moisture	1	N/A	2017/03/23	CAM SOP-00445	Carter 2nd ed 51.2 m
Moisture	8	N/A	2017/03/24	CAM SOP-00445	Carter 2nd ed 51.2 m
Nitrate(NO3) + Nitrite(NO2) in Leachate	1	N/A	2017/03/24	CAM SOP-00440	SM 22 4500-NO3I/NO2B
PAH Compounds in Soil by GC/MS (SIM)	5	2017/03/23	2017/03/23	CAM SOP-00318	EPA 8270D m
PAH Compounds in Soil by GC/MS (SIM)	2	2017/03/23	2017/03/24	CAM SOP-00318	EPA 8270D m
Polychlorinated Biphenyl in Soil	1	2017/03/23	2017/03/24	CAM SOP-00309	EPA 8082A m
Polychlorinated Biphenyl in Leachate	1	2017/03/24	2017/03/24	CAM SOP-00309	EPA 8082A m
pH CaCl2 EXTRACT	9	2017/03/24	2017/03/24	CAM SOP-00413	EPA 9045 D m
Sodium Adsorption Ratio (SAR)	9	N/A	2017/03/27	CAM SOP-00102	EPA 6010C
SAR - ICP Metals	5	2017/03/24	2017/03/24	CAM SOP-00408	EPA 6010C m
SAR - ICP Metals	4	2017/03/27	2017/03/27	CAM SOP-00408	EPA 6010C m
TCLP - % Solids	1	2017/03/22	2017/03/23	CAM SOP-00401	EPA 1311 Update I m

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 CANADA L8N 3Z1

Report Date: 2017/04/13
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 Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B755837

Received: 2017/03/21, 09:45

Sample Matrix: Soil
 # Samples Received: 10

Analyses	Quantity	Date		Laboratory Method	Reference
		Extracted	Analyzed		
TCLP - Extraction Fluid	1	N/A	2017/03/23	CAM SOP-00401	EPA 1311 Update I m
TCLP - Initial and final pH	1	N/A	2017/03/23	CAM SOP-00401	EPA 1311 Update I m
TCLP Zero Headspace Extraction	1	2017/03/22	2017/03/23	CAM SOP-00430	EPA 1311 m
Volatile Organic Compounds and F1 PHCs	3	N/A	2017/03/22	CAM SOP-00230	EPA 8260C m
Volatile Organic Compounds and F1 PHCs	5	N/A	2017/03/23	CAM SOP-00230	EPA 8260C m
VOCs in ZHE Leachates	1	2017/03/23	2017/03/24	CAM SOP-00226	EPA 8260C m

Remarks:

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.

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

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

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

(1) Soils are reported on a dry weight basis unless otherwise specified.

(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.



Your Project #: 161-17781-00
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Report Date: 2017/04/13
Report #: R4426319
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B755837
Received: 2017/03/21, 09:45

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ashton Gibson, Project Manager
Email: AGibson@maxxam.ca
Phone# (905) 817-5700

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

RESULTS OF ANALYSES OF SOIL

Maxxam ID			EBW870		EBW871		EBW872		
Sampling Date			2017/03/17		2017/03/17		2017/03/17		
COC Number			601902-32-01		601902-32-01		601902-32-01		
	UNITS	Criteria	17-12 SS3	QC Batch	17-12 SS5	QC Batch	17-18 SS1	RDL	QC Batch
Calculated Parameters									
Sodium Adsorption Ratio	N/A	12	5.8	4907258	12	4907258	2.1		4907258
Inorganics									
Conductivity	mS/cm	1.4	1.8	4914513	1.9	4911428	2.4	0.002	4914513
Free Cyanide	ug/g	0.051	<0.01	4910648	<0.01	4909748	<0.01	0.01	4910648
Moisture	%	-	11	4912434	17	4912434	5.4	1.0	4912434
Available (CaCl2) pH	pH	-	7.86	4912617	7.67	4910949	11.9		4912617
Metals									
Soluble Calcium (Ca)	mg/L	-	71.6	4914509	42.6	4911427	282	0.5	4914509
Soluble Magnesium (Mg)	mg/L	-	33.1	4914509	4.7	4911427	<0.5	0.5	4914509
Soluble Sodium (Na)	mg/L	-	235	4914509	308	4911427	130	5	4914509
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture									

RESULTS OF ANALYSES OF SOIL

Maxxam ID			EBW873		EBW874	EBW875		
Sampling Date			2017/03/17		2017/03/17	2017/03/17		
COC Number			601902-32-01		601902-32-01	601902-32-01		
	UNITS	Criteria	17-18 SS7	QC Batch	17-21 SS3	17-21 SS5	RDL	QC Batch
Calculated Parameters								
Sodium Adsorption Ratio	N/A	12	0.35	4907258	5.1	12		4907258
Inorganics								
Conductivity	mS/cm	1.4	0.25	4911428	0.62	1.3	0.002	4914513
Free Cyanide	ug/g	0.051	<0.01	4909748	<0.01	<0.01	0.01	4910648
Moisture	%	-	19	4912434	12	17	1.0	4912434
Available (CaCl2) pH	pH	-	7.66	4910949	7.82	7.84		4912617
Metals								
Soluble Calcium (Ca)	mg/L	-	21.7	4911427	21.2	16.5	0.5	4914509
Soluble Magnesium (Mg)	mg/L	-	9.3	4911427	3.6	6.7	0.5	4914509
Soluble Sodium (Na)	mg/L	-	8	4911427	97	219	5	4914509
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)								
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition								
Soil - Industrial/Commercial/Community- Medium and Fine Texture								

RESULTS OF ANALYSES OF SOIL

Maxxam ID			EBW876	EBW877		EBW878	EBW879		
Sampling Date			2017/03/17	2017/03/17		2017/03/17	2017/03/17		
COC Number			601902-32-01	601902-32-01		601902-32-01	601902-32-01		
	UNITS	Criteria	17-22 SS2	17-22 SS4	QC Batch	QA/QC4	TCLP	RDL	QC Batch
Calculated Parameters									
Sodium Adsorption Ratio	N/A	12	1.6	7.4	4907258	0.83			4907258
Charge/Prep Analysis									
Amount Extracted (Wet Weight) (g)	N/A	-					25	N/A	4909231
Inorganics									
Conductivity	mS/cm	1.4	2.2	0.55	4911428	0.43		0.002	4911428
Final pH	pH	-					6.27		4909388
Leachable Fluoride (F-)	mg/L	-					0.48	0.10	4911460
Free Cyanide	ug/g	0.051	<0.01	<0.01	4909748	<0.01		0.01	4909748
Leachable Free Cyanide	mg/L	-					<0.010	0.010	4911432
Initial pH	pH	-					9.37		4909388
Moisture	%	-	17	17	4912434	18		1.0	4910943
Available (CaCl2) pH	pH	-	7.64	7.52	4910949	7.69			4910949
TCLP - % Solids	%	-					100	0.2	4909384
TCLP Extraction Fluid	N/A	-					FLUID 1		4909387
Leachable Nitrite (N)	mg/L	-					<0.10	0.10	4911461
Leachable Nitrate (N)	mg/L	-					<1.0	1.0	4911461
Leachable Nitrate + Nitrite (N)	mg/L	-					<1.0	1.0	4911461
Metals									
Soluble Calcium (Ca)	mg/L	-	303	9.3	4911427	35.1		0.5	4911427
Soluble Magnesium (Mg)	mg/L	-	55.9	3.1	4911427	13.0		0.5	4911427
Leachable Mercury (Hg)	mg/L	-					<0.0010	0.0010	4911503
Soluble Sodium (Na)	mg/L	-	115	101	4911427	23		5	4911427
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture N/A = Not Applicable									

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			EBW870			EBW871		EBW872		
Sampling Date			2017/03/17			2017/03/17		2017/03/17		
COC Number			601902-32-01			601902-32-01		601902-32-01		
	UNITS	Criteria	17-12 SS3	RDL	QC Batch	17-12 SS5	QC Batch	17-18 SS1	RDL	QC Batch
Inorganics										
Chromium (VI)	ug/g	10	<0.2	0.2	4911262	0.2	4910670	1.4	0.2	4911262
Metals										
Hot Water Ext. Boron (B)	ug/g	2	1.2	0.050	4912877	0.56	4912250	0.99	0.050	4912877
Acid Extractable Antimony (Sb)	ug/g	50	1400	10	4912450	2.4	4910858	0.99	0.20	4912450
Acid Extractable Arsenic (As)	ug/g	18	1600	50	4912450	5.4	4910858	2.6	1.0	4912450
Acid Extractable Barium (Ba)	ug/g	670	380	25	4912450	130	4910858	43	0.50	4912450
Acid Extractable Beryllium (Be)	ug/g	10	<10	10	4912450	0.78	4910858	0.36	0.20	4912450
Acid Extractable Boron (B)	ug/g	120	<250 (1)	250	4912450	11	4910858	41	5.0	4912450
Acid Extractable Cadmium (Cd)	ug/g	1.9	12	5.0	4912450	0.12	4910858	0.80	0.10	4912450
Acid Extractable Chromium (Cr)	ug/g	160	<50	50	4912450	25	4910858	270	1.0	4912450
Acid Extractable Cobalt (Co)	ug/g	100	15	5.0	4912450	13	4910858	2.6	0.10	4912450
Acid Extractable Copper (Cu)	ug/g	300	3000	25	4912450	27	4910858	30	0.50	4912450
Acid Extractable Lead (Pb)	ug/g	120	64000	50	4912450	260	4910858	62	1.0	4912450
Acid Extractable Molybdenum (Mo)	ug/g	40	<25	25	4912450	<0.50	4910858	3.8	0.50	4912450
Acid Extractable Nickel (Ni)	ug/g	340	77	25	4912450	27	4910858	21	0.50	4912450
Acid Extractable Selenium (Se)	ug/g	5.5	<25 (1)	25	4912450	<0.50	4910858	<0.50	0.50	4912450
Acid Extractable Silver (Ag)	ug/g	50	<10	10	4912450	<0.20	4910858	<0.20	0.20	4912450
Acid Extractable Thallium (Tl)	ug/g	3.3	7.5	2.5	4912450	0.18	4910858	0.063	0.050	4912450
Acid Extractable Uranium (U)	ug/g	33	<2.5	2.5	4912450	0.53	4910858	0.65	0.050	4912450
Acid Extractable Vanadium (V)	ug/g	86	<250 (1)	250	4912450	32	4910858	140	5.0	4912450
Acid Extractable Zinc (Zn)	ug/g	340	2000	250	4912450	65	4910858	260	5.0	4912450
Acid Extractable Mercury (Hg)	ug/g	20	<2.5	2.5	4912450	<0.050	4910858	<0.050	0.050	4912450
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture (1) RDL exceeds criteria										

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			EBW873		EBW874	EBW875		
Sampling Date			2017/03/17		2017/03/17	2017/03/17		
COC Number			601902-32-01		601902-32-01	601902-32-01		
	UNITS	Criteria	17-18 SS7	QC Batch	17-21 SS3	17-21 SS5	RDL	QC Batch
Inorganics								
Chromium (VI)	ug/g	10	<0.2	4910670	<0.2	<0.2	0.2	4911262
Metals								
Hot Water Ext. Boron (B)	ug/g	2	0.096	4912250	0.49	1.0	0.050	4912877
Acid Extractable Antimony (Sb)	ug/g	50	<0.20	4910858	4.8	5.6	0.20	4912450
Acid Extractable Arsenic (As)	ug/g	18	2.8	4910858	9.2	27	1.0	4912450
Acid Extractable Barium (Ba)	ug/g	670	170	4910858	130	86	0.50	4912450
Acid Extractable Beryllium (Be)	ug/g	10	0.77	4910858	0.80	0.64	0.20	4912450
Acid Extractable Boron (B)	ug/g	120	12	4910858	25	17	5.0	4912450
Acid Extractable Cadmium (Cd)	ug/g	1.9	<0.10	4910858	1.4	0.77	0.10	4912450
Acid Extractable Chromium (Cr)	ug/g	160	26	4910858	21	15	1.0	4912450
Acid Extractable Cobalt (Co)	ug/g	100	11	4910858	7.0	6.7	0.10	4912450
Acid Extractable Copper (Cu)	ug/g	300	28	4910858	160	35	0.50	4912450
Acid Extractable Lead (Pb)	ug/g	120	13	4910858	780	2400	1.0	4912450
Acid Extractable Molybdenum (Mo)	ug/g	40	<0.50	4910858	2.9	1.9	0.50	4912450
Acid Extractable Nickel (Ni)	ug/g	340	26	4910858	30	16	0.50	4912450
Acid Extractable Selenium (Se)	ug/g	5.5	<0.50	4910858	<0.50	<0.50	0.50	4912450
Acid Extractable Silver (Ag)	ug/g	50	<0.20	4910858	0.42	<0.20	0.20	4912450
Acid Extractable Thallium (Tl)	ug/g	3.3	0.11	4910858	0.26	0.50	0.050	4912450
Acid Extractable Uranium (U)	ug/g	33	0.67	4910858	0.74	0.43	0.050	4912450
Acid Extractable Vanadium (V)	ug/g	86	33	4910858	27	27	5.0	4912450
Acid Extractable Zinc (Zn)	ug/g	340	60	4910858	600	97	5.0	4912450
Acid Extractable Mercury (Hg)	ug/g	20	<0.050	4910858	0.070	<0.050	0.050	4912450
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)								
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition								
Soil - Industrial/Commercial/Community- Medium and Fine Texture								

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			EBW876	EBW877	EBW878	EBW879		
Sampling Date			2017/03/17	2017/03/17	2017/03/17	2017/03/17		
COC Number			601902-32-01	601902-32-01	601902-32-01	601902-32-01		
	UNITS	Criteria	17-22 SS2	17-22 SS4	QA/QC4	TCLP	RDL	QC Batch
Inorganics								
Chromium (VI)	ug/g	10	<0.2	<0.2	0.2		0.2	4910670
Metals								
Hot Water Ext. Boron (B)	ug/g	2	0.87	0.058	0.10		0.050	4912250
Acid Extractable Antimony (Sb)	ug/g	50	2.2	<0.20	<0.20		0.20	4910858
Acid Extractable Arsenic (As)	ug/g	18	9.8	3.5	3.7		1.0	4910858
Leachable Arsenic (As)	mg/L	-				<0.2	0.2	4911314
Acid Extractable Barium (Ba)	ug/g	670	120	120	140		0.50	4910858
Leachable Barium (Ba)	mg/L	-				1.1	0.2	4911314
Acid Extractable Beryllium (Be)	ug/g	10	0.63	0.76	0.78		0.20	4910858
Acid Extractable Boron (B)	ug/g	120	14	8.3	11		5.0	4910858
Leachable Boron (B)	mg/L	-				0.2	0.1	4911314
Acid Extractable Cadmium (Cd)	ug/g	1.9	0.92	<0.10	<0.10		0.10	4910858
Leachable Cadmium (Cd)	mg/L	-				<0.05	0.05	4911314
Acid Extractable Chromium (Cr)	ug/g	160	23	27	27		1.0	4910858
Leachable Chromium (Cr)	mg/L	-				<0.1	0.1	4911314
Acid Extractable Cobalt (Co)	ug/g	100	8.5	12	13		0.10	4910858
Acid Extractable Copper (Cu)	ug/g	300	65	25	27		0.50	4910858
Acid Extractable Lead (Pb)	ug/g	120	370	35	14		1.0	4910858
Leachable Lead (Pb)	mg/L	-				<0.1	0.1	4911314
Leachable Selenium (Se)	mg/L	-				<0.1	0.1	4911314
Acid Extractable Molybdenum (Mo)	ug/g	40	1.5	<0.50	<0.50		0.50	4910858
Acid Extractable Nickel (Ni)	ug/g	340	20	28	26		0.50	4910858
Leachable Silver (Ag)	mg/L	-				<0.01	0.01	4911314
Acid Extractable Selenium (Se)	ug/g	5.5	0.58	<0.50	<0.50		0.50	4910858
Acid Extractable Silver (Ag)	ug/g	50	<0.20	<0.20	<0.20		0.20	4910858
Acid Extractable Thallium (Tl)	ug/g	3.3	0.20	0.17	0.12		0.050	4910858
Leachable Uranium (U)	mg/L	-				<0.01	0.01	4911314
Acid Extractable Uranium (U)	ug/g	33	0.62	0.54	0.63		0.050	4910858
Acid Extractable Vanadium (V)	ug/g	86	28	33	32		5.0	4910858
Acid Extractable Zinc (Zn)	ug/g	340	470	80	62		5.0	4910858
Acid Extractable Mercury (Hg)	ug/g	20	0.11	<0.050	<0.050		0.050	4910858
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture								

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID			EBW870	EBW871		EBW872		EBW873		
Sampling Date			2017/03/17	2017/03/17		2017/03/17		2017/03/17		
COC Number			601902-32-01	601902-32-01		601902-32-01		601902-32-01		
	UNITS	Criteria	17-12 SS3	17-12 SS5	RDL	17-18 SS1	RDL	17-18 SS7	RDL	QC Batch
Calculated Parameters										
Methylnaphthalene, 2-(1-)	ug/g	85	0.077	<0.0071	0.0071	0.24	0.071	<0.0071	0.0071	4907255
Polyaromatic Hydrocarbons										
Acenaphthene	ug/g	96	<0.0050	<0.0050	0.0050	<0.050	0.050	<0.0050	0.0050	4910699
Acenaphthylene	ug/g	0.17	0.0056	<0.0050	0.0050	<0.050	0.050	<0.0050	0.0050	4910699
Anthracene	ug/g	0.74	0.010	0.014	0.0050	<0.050	0.050	<0.0050	0.0050	4910699
Benzo(a)anthracene	ug/g	0.96	0.038	0.11	0.0050	0.087	0.050	<0.0050	0.0050	4910699
Benzo(a)pyrene	ug/g	0.3	0.035	0.026	0.0050	0.12	0.050	<0.0050	0.0050	4910699
Benzo(b/j)fluoranthene	ug/g	0.96	0.051	0.017	0.0050	0.14	0.050	<0.0050	0.0050	4910699
Benzo(g,h,i)perylene	ug/g	9.6	0.044	0.022	0.0050	0.23	0.050	<0.0050	0.0050	4910699
Benzo(k)fluoranthene	ug/g	0.96	0.014	<0.0050	0.0050	<0.050	0.050	<0.0050	0.0050	4910699
Chrysene	ug/g	9.6	0.041	0.14	0.0050	0.13	0.050	0.0074	0.0050	4910699
Dibenz(a,h)anthracene	ug/g	0.1	0.0071	<0.0050	0.0050	<0.050	0.050	<0.0050	0.0050	4910699
Fluoranthene	ug/g	9.6	0.060	0.018	0.0050	0.19	0.050	<0.0050	0.0050	4910699
Fluorene	ug/g	69	<0.0050	<0.0050	0.0050	<0.050	0.050	<0.0050	0.0050	4910699
Indeno(1,2,3-cd)pyrene	ug/g	0.95	0.037	<0.0050	0.0050	0.087	0.050	<0.0050	0.0050	4910699
1-Methylnaphthalene	ug/g	85	0.035	<0.0050	0.0050	0.10	0.050	<0.0050	0.0050	4910699
2-Methylnaphthalene	ug/g	85	0.042	<0.0050	0.0050	0.13	0.050	<0.0050	0.0050	4910699
Naphthalene	ug/g	28	0.022	<0.0050	0.0050	<0.050	0.050	<0.0050	0.0050	4910699
Phenanthrene	ug/g	16	0.043	0.022	0.0050	0.17	0.050	<0.0050	0.0050	4910699
Pyrene	ug/g	96	0.055	0.11	0.0050	0.19	0.050	<0.0050	0.0050	4910699
Surrogate Recovery (%)										
D10-Anthracene	%	-	85	93		86		96		4910699
D14-Terphenyl (FS)	%	-	80	84		80		83		4910699
D8-Acenaphthylene	%	-	91	100		76		108		4910699
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)										
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition										
Soil - Industrial/Commercial/Community- Medium and Fine Texture										

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID			EBW874		EBW875		EBW876	EBW879		
Sampling Date			2017/03/17		2017/03/17		2017/03/17	2017/03/17		
COC Number			601902-32-01		601902-32-01		601902-32-01	601902-32-01		
	UNITS	Criteria	17-21 SS3	RDL	17-21 SS5	RDL	17-22 SS2	TCLP	RDL	QC Batch
Semivolatile Organics										
Leachable Benzo(a)pyrene	ug/L	-						<0.10	0.10	4913309
Leachable m/p-Cresol	ug/L	-						<2.5	2.5	4913309
Leachable o-Cresol	ug/L	-						<2.5	2.5	4913309
Leachable Cresol Total	ug/L	-						<2.5	2.5	4913309
Leachable 2,4-Dichlorophenol	ug/L	-						<2.5	2.5	4913309
Leachable 2,4-Dinitrotoluene	ug/L	-						<10	10	4913309
Leachable Hexachlorobenzene	ug/L	-						<10	10	4913309
Leachable Hexachlorobutadiene	ug/L	-						<10	10	4913309
Leachable Hexachloroethane	ug/L	-						<10	10	4913309
Leachable Nitrobenzene	ug/L	-						<10	10	4913309
Leachable Pentachlorophenol	ug/L	-						<2.5	2.5	4913309
Leachable Pyridine	ug/L	-						<10	10	4913309
Leachable 2,3,4,6-Tetrachlorophenol	ug/L	-						<2.5	2.5	4913309
Leachable 2,4,5-Trichlorophenol	ug/L	-						<0.50	0.50	4913309
Leachable 2,4,6-Trichlorophenol	ug/L	-						<2.5	2.5	4913309
Calculated Parameters										
Methylnaphthalene, 2-(1-)	ug/g	85	0.090	0.0071	0.13	0.071	0.15		0.0071	4907255
Polyaromatic Hydrocarbons										
Acenaphthene	ug/g	96	0.039	0.0050	<0.050	0.050	0.0081		0.0050	4910699
Acenaphthylene	ug/g	0.17	0.11	0.0050	<0.050	0.050	0.051		0.0050	4910699
Anthracene	ug/g	0.74	0.12	0.0050	<0.050	0.050	0.052		0.0050	4910699
Benzo(a)anthracene	ug/g	0.96	0.31	0.0050	0.67	0.050	0.19		0.0050	4910699
Benzo(a)pyrene	ug/g	0.3	0.28	0.0050	0.64	0.050	0.17		0.0050	4910699
Benzo(b,j)fluoranthene	ug/g	0.96	0.30	0.0050	0.51	0.050	0.19		0.0050	4910699
Benzo(g,h,i)perylene	ug/g	9.6	0.21	0.0050	0.95	0.050	0.13		0.0050	4910699
Benzo(k)fluoranthene	ug/g	0.96	0.096	0.0050	0.051	0.050	0.060		0.0050	4910699
Chrysene	ug/g	9.6	0.25	0.0050	0.94	0.050	0.17		0.0050	4910699
Dibenz(a,h)anthracene	ug/g	0.1	0.040	0.0050	0.29	0.050	0.027		0.0050	4910699
Fluoranthene	ug/g	9.6	0.60	0.0050	0.072	0.050	0.29		0.0050	4910699
Fluorene	ug/g	69	0.047	0.0050	<0.050	0.050	0.013		0.0050	4910699
Indeno(1,2,3-cd)pyrene	ug/g	0.95	0.23	0.0050	0.27	0.050	0.15		0.0050	4910699
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)										
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition										
Soil - Industrial/Commercial/Community- Medium and Fine Texture										

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID			EBW874		EBW875		EBW876	EBW879		
Sampling Date			2017/03/17		2017/03/17		2017/03/17	2017/03/17		
COC Number			601902-32-01		601902-32-01		601902-32-01	601902-32-01		
	UNITS	Criteria	17-21 SS3	RDL	17-21 SS5	RDL	17-22 SS2	TCLP	RDL	QC Batch
1-Methylnaphthalene	ug/g	85	0.042	0.0050	0.055	0.050	0.070		0.0050	4910699
2-Methylnaphthalene	ug/g	85	0.049	0.0050	0.075	0.050	0.076		0.0050	4910699
Naphthalene	ug/g	28	0.14	0.0050	<0.050	0.050	0.037		0.0050	4910699
Phenanthrene	ug/g	16	0.34	0.0050	0.10	0.050	0.13		0.0050	4910699
Pyrene	ug/g	96	0.50	0.0050	0.25	0.050	0.28		0.0050	4910699
Surrogate Recovery (%)										
Leachable 2,4,6-Tribromophenol	%	-						82		4913309
Leachable 2-Fluorobiphenyl	%	-						78		4913309
Leachable 2-Fluorophenol	%	-						39		4913309
Leachable D14-Terphenyl (FS)	%	-						92		4913309
Leachable D5-Nitrobenzene	%	-						85		4913309
Leachable D5-Phenol	%	-						32		4913309
D10-Anthracene	%	-	89		81		99			4910699
D14-Terphenyl (FS)	%	-	79		76		86			4910699
D8-Acenaphthylene	%	-	99		70		109			4910699
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture										

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			EBW870	EBW871	EBW872	EBW873		
Sampling Date			2017/03/17	2017/03/17	2017/03/17	2017/03/17		
COC Number			601902-32-01	601902-32-01	601902-32-01	601902-32-01		
	UNITS	Criteria	17-12 SS3	17-12 SS5	17-18 SS1	17-18 SS7	RDL	QC Batch

Calculated Parameters								
1,3-Dichloropropene (cis+trans)	ug/g	0.21	<0.050	<0.050	<0.050	<0.050	0.050	4907256
Volatile Organics								
Acetone (2-Propanone)	ug/g	28	<0.50	<0.50	<0.50	<0.50	0.50	4908910
Benzene	ug/g	0.4	<0.020	<0.020	<0.020	<0.020	0.020	4908910
Bromodichloromethane	ug/g	18	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Bromoform	ug/g	1.7	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Bromomethane	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Carbon Tetrachloride	ug/g	1.5	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Chlorobenzene	ug/g	2.7	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Chloroform	ug/g	0.18	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Dibromochloromethane	ug/g	13	<0.050	<0.050	<0.050	<0.050	0.050	4908910
1,2-Dichlorobenzene	ug/g	8.5	<0.050	<0.050	<0.050	<0.050	0.050	4908910
1,3-Dichlorobenzene	ug/g	12	<0.050	<0.050	<0.050	<0.050	0.050	4908910
1,4-Dichlorobenzene	ug/g	0.84	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Dichlorodifluoromethane (FREON 12)	ug/g	25	<0.050	<0.050	<0.050	<0.050	0.050	4908910
1,1-Dichloroethane	ug/g	21	<0.050	<0.050	<0.050	<0.050	0.050	4908910
1,2-Dichloroethane	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	0.050	4908910
1,1-Dichloroethylene	ug/g	0.48	<0.050	<0.050	<0.050	<0.050	0.050	4908910
cis-1,2-Dichloroethylene	ug/g	37	<0.050	<0.050	<0.050	<0.050	0.050	4908910
trans-1,2-Dichloroethylene	ug/g	9.3	<0.050	<0.050	<0.050	<0.050	0.050	4908910
1,2-Dichloropropane	ug/g	0.68	<0.050	<0.050	<0.050	<0.050	0.050	4908910
cis-1,3-Dichloropropene	ug/g	0.21	<0.030	<0.030	<0.030	<0.030	0.030	4908910
trans-1,3-Dichloropropene	ug/g	0.21	<0.040	<0.040	<0.040	<0.040	0.040	4908910
Ethylbenzene	ug/g	19	0.037	<0.020	<0.020	<0.020	0.020	4908910
Ethylene Dibromide	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Hexane	ug/g	88	0.050	<0.050	<0.050	<0.050	0.050	4908910
Methylene Chloride(Dichloromethane)	ug/g	2	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Methyl Ethyl Ketone (2-Butanone)	ug/g	88	<0.50	<0.50	<0.50	<0.50	0.50	4908910
Methyl Isobutyl Ketone	ug/g	210	<0.50	<0.50	<0.50	<0.50	0.50	4908910
Methyl t-butyl ether (MTBE)	ug/g	3.2	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Styrene	ug/g	43	<0.050	<0.050	<0.050	<0.050	0.050	4908910

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
 Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
 Soil - Industrial/Commercial/Community- Medium and Fine Texture

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			EBW870	EBW871	EBW872	EBW873		
Sampling Date			2017/03/17	2017/03/17	2017/03/17	2017/03/17		
COC Number			601902-32-01	601902-32-01	601902-32-01	601902-32-01		
	UNITS	Criteria	17-12 SS3	17-12 SS5	17-18 SS1	17-18 SS7	RDL	QC Batch
1,1,1,2-Tetrachloroethane	ug/g	0.11	<0.050	<0.050	<0.050	<0.050	0.050	4908910
1,1,2,2-Tetrachloroethane	ug/g	0.094	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Tetrachloroethylene	ug/g	21	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Toluene	ug/g	78	0.048	<0.020	0.027	<0.020	0.020	4908910
1,1,1-Trichloroethane	ug/g	12	<0.050	<0.050	<0.050	<0.050	0.050	4908910
1,1,2-Trichloroethane	ug/g	0.11	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Trichloroethylene	ug/g	0.61	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Trichlorofluoromethane (FREON 11)	ug/g	5.8	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Vinyl Chloride	ug/g	0.25	<0.020	<0.020	<0.020	<0.020	0.020	4908910
p+m-Xylene	ug/g	-	0.24	<0.020	0.025	<0.020	0.020	4908910
o-Xylene	ug/g	-	0.17	<0.020	<0.020	<0.020	0.020	4908910
Total Xylenes	ug/g	30	0.41	<0.020	0.025	<0.020	0.020	4908910
F1 (C6-C10)	ug/g	65	<10	<10	<10	<10	10	4908910
F1 (C6-C10) - BTEX	ug/g	65	<10	<10	<10	<10	10	4908910
Surrogate Recovery (%)								
4-Bromofluorobenzene	%	-	94	95	93	94		4908910
D10-o-Xylene	%	-	104	96	105	110		4908910
D4-1,2-Dichloroethane	%	-	106	105	106	106		4908910
D8-Toluene	%	-	97	97	97	97		4908910
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture								

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			EBW874	EBW875	EBW876	EBW877		
Sampling Date			2017/03/17	2017/03/17	2017/03/17	2017/03/17		
COC Number			601902-32-01	601902-32-01	601902-32-01	601902-32-01		
	UNITS	Criteria	17-21 SS3	17-21 SS5	17-22 SS2	17-22 SS4	RDL	QC Batch

Calculated Parameters

1,3-Dichloropropene (cis+trans)	ug/g	0.21	<0.050	<0.050	<0.050	<0.050	0.050	4907256
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Volatile Organics

Acetone (2-Propanone)	ug/g	28	<0.50	<0.50	<0.50	<0.50	0.50	4908910
Benzene	ug/g	0.4	<0.020	0.042	<0.020	<0.020	0.020	4908910
Bromodichloromethane	ug/g	18	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Bromoform	ug/g	1.7	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Bromomethane	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Carbon Tetrachloride	ug/g	1.5	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Chlorobenzene	ug/g	2.7	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Chloroform	ug/g	0.18	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Dibromochloromethane	ug/g	13	<0.050	<0.050	<0.050	<0.050	0.050	4908910
1,2-Dichlorobenzene	ug/g	8.5	<0.050	<0.050	<0.050	<0.050	0.050	4908910
1,3-Dichlorobenzene	ug/g	12	<0.050	<0.050	<0.050	<0.050	0.050	4908910
1,4-Dichlorobenzene	ug/g	0.84	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Dichlorodifluoromethane (FREON 12)	ug/g	25	<0.050	<0.050	<0.050	<0.050	0.050	4908910
1,1-Dichloroethane	ug/g	21	<0.050	<0.050	<0.050	<0.050	0.050	4908910
1,2-Dichloroethane	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	0.050	4908910
1,1-Dichloroethylene	ug/g	0.48	<0.050	<0.050	<0.050	<0.050	0.050	4908910
cis-1,2-Dichloroethylene	ug/g	37	<0.050	<0.050	<0.050	<0.050	0.050	4908910
trans-1,2-Dichloroethylene	ug/g	9.3	<0.050	<0.050	<0.050	<0.050	0.050	4908910
1,2-Dichloropropane	ug/g	0.68	<0.050	<0.050	<0.050	<0.050	0.050	4908910
cis-1,3-Dichloropropene	ug/g	0.21	<0.030	<0.030	<0.030	<0.030	0.030	4908910
trans-1,3-Dichloropropene	ug/g	0.21	<0.040	<0.040	<0.040	<0.040	0.040	4908910
Ethylbenzene	ug/g	19	0.031	0.059	<0.020	0.022	0.020	4908910
Ethylene Dibromide	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Hexane	ug/g	88	0.061	0.066	<0.050	<0.050	0.050	4908910
Methylene Chloride(Dichloromethane)	ug/g	2	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Methyl Ethyl Ketone (2-Butanone)	ug/g	88	<0.50	<0.50	<0.50	<0.50	0.50	4908910
Methyl Isobutyl Ketone	ug/g	210	<0.50	<0.50	<0.50	<0.50	0.50	4908910
Methyl t-butyl ether (MTBE)	ug/g	3.2	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Styrene	ug/g	43	<0.050	<0.050	<0.050	<0.050	0.050	4908910

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
 Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
 Soil - Industrial/Commercial/Community- Medium and Fine Texture

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			EBW874	EBW875	EBW876	EBW877		
Sampling Date			2017/03/17	2017/03/17	2017/03/17	2017/03/17		
COC Number			601902-32-01	601902-32-01	601902-32-01	601902-32-01		
	UNITS	Criteria	17-21 SS3	17-21 SS5	17-22 SS2	17-22 SS4	RDL	QC Batch
1,1,1,2-Tetrachloroethane	ug/g	0.11	<0.050	<0.050	<0.050	<0.050	0.050	4908910
1,1,2,2-Tetrachloroethane	ug/g	0.094	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Tetrachloroethylene	ug/g	21	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Toluene	ug/g	78	0.12	0.15	0.026	0.065	0.020	4908910
1,1,1-Trichloroethane	ug/g	12	<0.050	<0.050	<0.050	<0.050	0.050	4908910
1,1,2-Trichloroethane	ug/g	0.11	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Trichloroethylene	ug/g	0.61	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Trichlorofluoromethane (FREON 11)	ug/g	5.8	<0.050	<0.050	<0.050	<0.050	0.050	4908910
Vinyl Chloride	ug/g	0.25	<0.020	<0.020	<0.020	<0.020	0.020	4908910
p+m-Xylene	ug/g	-	0.26	0.16	0.056	0.11	0.020	4908910
o-Xylene	ug/g	-	0.20	0.13	0.051	0.065	0.020	4908910
Total Xylenes	ug/g	30	0.46	0.30	0.11	0.17	0.020	4908910
F1 (C6-C10)	ug/g	65	<10	<10	<10	16	10	4908910
F1 (C6-C10) - BTEX	ug/g	65	<10	<10	<10	16	10	4908910
Surrogate Recovery (%)								
4-Bromofluorobenzene	%	-	95	93	94	96		4908910
D10-o-Xylene	%	-	92	96	97	116		4908910
D4-1,2-Dichloroethane	%	-	107	107	107	105		4908910
D8-Toluene	%	-	97	98	97	98		4908910
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture								

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			EBW879		
Sampling Date			2017/03/17		
COC Number			601902-32-01		
	UNITS	Criteria	TCLP	RDL	QC Batch
Volatile Organics					
Leachable Benzene	mg/L	-	<0.020	0.020	4910657
Leachable Carbon Tetrachloride	mg/L	-	<0.020	0.020	4910657
Leachable Chlorobenzene	mg/L	-	<0.020	0.020	4910657
Leachable Chloroform	mg/L	-	<0.020	0.020	4910657
Leachable 1,2-Dichlorobenzene	mg/L	-	<0.050	0.050	4910657
Leachable 1,4-Dichlorobenzene	mg/L	-	<0.050	0.050	4910657
Leachable 1,2-Dichloroethane	mg/L	-	<0.050	0.050	4910657
Leachable 1,1-Dichloroethylene	mg/L	-	<0.020	0.020	4910657
Leachable Methylene Chloride(Dichloromethane)	mg/L	-	<0.20	0.20	4910657
Leachable Methyl Ethyl Ketone (2-Butanone)	mg/L	-	<1.0	1.0	4910657
Leachable Tetrachloroethylene	mg/L	-	<0.020	0.020	4910657
Leachable Trichloroethylene	mg/L	-	<0.020	0.020	4910657
Leachable Vinyl Chloride	mg/L	-	<0.020	0.020	4910657
Surrogate Recovery (%)					
Leachable 4-Bromofluorobenzene	%	-	99		4910657
Leachable D4-1,2-Dichloroethane	%	-	104		4910657
Leachable D8-Toluene	%	-	99		4910657
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture					

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			EBW870	EBW871	EBW872	EBW873	EBW874		
Sampling Date			2017/03/17	2017/03/17	2017/03/17	2017/03/17	2017/03/17		
COC Number			601902-32-01	601902-32-01	601902-32-01	601902-32-01	601902-32-01		
	UNITS	Criteria	17-12 SS3	17-12 SS5	17-18 SS1	17-18 SS7	17-21 SS3	RDL	QC Batch
F2-F4 Hydrocarbons									
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	6600	650	160	20000		270	100	4916051
F2 (C10-C16 Hydrocarbons)	ug/g	250	10	10	33	<10	10	10	4911514
F3 (C16-C34 Hydrocarbons)	ug/g	2500	110	160	2200	<50	65	50	4911514
F4 (C34-C50 Hydrocarbons)	ug/g	6600	240	71	7000	<50	98	50	4911514
Reached Baseline at C50	ug/g	-	No	No	No	Yes	No		4911514
Surrogate Recovery (%)									
o-Terphenyl	%	-	99	99	97	99	99		4911514
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture									

Maxxam ID			EBW875	EBW876	EBW877		
Sampling Date			2017/03/17	2017/03/17	2017/03/17		
COC Number			601902-32-01	601902-32-01	601902-32-01		
	UNITS	Criteria	17-21 SS5	17-22 SS2	17-22 SS4	RDL	QC Batch
F2-F4 Hydrocarbons							
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	6600	2000	1100		100	4916051
F2 (C10-C16 Hydrocarbons)	ug/g	250	16	16	220	10	4911514
F3 (C16-C34 Hydrocarbons)	ug/g	2500	1000	210	270	50	4911514
F4 (C34-C50 Hydrocarbons)	ug/g	6600	570	270	<50	50	4911514
Reached Baseline at C50	ug/g	-	No	No	Yes		4911514
Surrogate Recovery (%)							
o-Terphenyl	%	-	102	101	104		4911514
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture							

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID			EBW872	EBW879		
Sampling Date			2017/03/17	2017/03/17		
COC Number			601902-32-01	601902-32-01		
	UNITS	Criteria	17-18 SS1	TCLP	RDL	QC Batch
PCBs						
Aroclor 1242	ug/g	-	<0.010		0.010	4910863
Aroclor 1248	ug/g	-	<0.010		0.010	4910863
Aroclor 1254	ug/g	-	<0.010		0.010	4910863
Aroclor 1260	ug/g	-	<0.010		0.010	4910863
Leachable Total PCB	ug/L	-		<3.0	3.0	4912718
Total PCB	ug/g	1.1	<0.010		0.010	4910863
Surrogate Recovery (%)						
Decachlorobiphenyl	%	-	87			4910863
Leachable Decachlorobiphenyl	%	-		100		4912718
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture						

GENERAL COMMENTS

Revised Report[2017/4/13]: O.Reg 153/04 Table 3 med/fine criteria added to report.

Cooler custody seal was present and intact.

Sample EBW870 [17-12 SS3] : Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample EBW872 [17-18 SS1] : PAH analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample EBW875 [17-21 SS5] : PAH analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4908910	YY	Matrix Spike [EBW871-02]	4-Bromofluorobenzene	2017/03/22		98	%	60 - 140
			D10-o-Xylene	2017/03/22		95	%	60 - 130
			D4-1,2-Dichloroethane	2017/03/22		105	%	60 - 140
			D8-Toluene	2017/03/22		99	%	60 - 140
			Acetone (2-Propanone)	2017/03/22		88	%	60 - 140
			Benzene	2017/03/22		91	%	60 - 140
			Bromodichloromethane	2017/03/22		95	%	60 - 140
			Bromoform	2017/03/22		92	%	60 - 140
			Bromomethane	2017/03/22		91	%	60 - 140
			Carbon Tetrachloride	2017/03/22		100	%	60 - 140
			Chlorobenzene	2017/03/22		94	%	60 - 140
			Chloroform	2017/03/22		96	%	60 - 140
			Dibromochloromethane	2017/03/22		96	%	60 - 140
			1,2-Dichlorobenzene	2017/03/22		91	%	60 - 140
			1,3-Dichlorobenzene	2017/03/22		87	%	60 - 140
			1,4-Dichlorobenzene	2017/03/22		88	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2017/03/22		66	%	60 - 140
			1,1-Dichloroethane	2017/03/22		96	%	60 - 140
			1,2-Dichloroethane	2017/03/22		94	%	60 - 140
			1,1-Dichloroethylene	2017/03/22		97	%	60 - 140
			cis-1,2-Dichloroethylene	2017/03/22		99	%	60 - 140
			trans-1,2-Dichloroethylene	2017/03/22		94	%	60 - 140
			1,2-Dichloropropane	2017/03/22		91	%	60 - 140
			cis-1,3-Dichloropropene	2017/03/22		85	%	60 - 140
			trans-1,3-Dichloropropene	2017/03/22		85	%	60 - 140
			Ethylbenzene	2017/03/22		89	%	60 - 140
			Ethylene Dibromide	2017/03/22		93	%	60 - 140
			Hexane	2017/03/22		91	%	60 - 140
			Methylene Chloride(Dichloromethane)	2017/03/22		95	%	60 - 140
			Methyl Ethyl Ketone (2-Butanone)	2017/03/22		89	%	60 - 140
			Methyl Isobutyl Ketone	2017/03/22		82	%	60 - 140
			Methyl t-butyl ether (MTBE)	2017/03/22		88	%	60 - 140
			Styrene	2017/03/22		84	%	60 - 140
			1,1,1,2-Tetrachloroethane	2017/03/22		96	%	60 - 140
			1,1,2,2-Tetrachloroethane	2017/03/22		94	%	60 - 140
			Tetrachloroethylene	2017/03/22		94	%	60 - 140
			Toluene	2017/03/22		88	%	60 - 140
			1,1,1-Trichloroethane	2017/03/22		95	%	60 - 140
			1,1,2-Trichloroethane	2017/03/22		95	%	60 - 140
			Trichloroethylene	2017/03/22		94	%	60 - 140
			Trichlorofluoromethane (FREON 11)	2017/03/22		99	%	60 - 140
			Vinyl Chloride	2017/03/22		85	%	60 - 140
			p+m-Xylene	2017/03/22		84	%	60 - 140
			o-Xylene	2017/03/22		86	%	60 - 140
			F1 (C6-C10)	2017/03/22		101	%	60 - 140
4908910	YY	Spiked Blank	4-Bromofluorobenzene	2017/03/22		98	%	60 - 140
			D10-o-Xylene	2017/03/22		81	%	60 - 130
			D4-1,2-Dichloroethane	2017/03/22		104	%	60 - 140
			D8-Toluene	2017/03/22		101	%	60 - 140
			Acetone (2-Propanone)	2017/03/22		89	%	60 - 140
			Benzene	2017/03/22		90	%	60 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Bromodichloromethane	2017/03/22		95	%	60 - 130
			Bromoform	2017/03/22		93	%	60 - 130
			Bromomethane	2017/03/22		86	%	60 - 140
			Carbon Tetrachloride	2017/03/22		99	%	60 - 130
			Chlorobenzene	2017/03/22		95	%	60 - 130
			Chloroform	2017/03/22		95	%	60 - 130
			Dibromochloromethane	2017/03/22		97	%	60 - 130
			1,2-Dichlorobenzene	2017/03/22		93	%	60 - 130
			1,3-Dichlorobenzene	2017/03/22		90	%	60 - 130
			1,4-Dichlorobenzene	2017/03/22		91	%	60 - 130
			Dichlorodifluoromethane (FREON 12)	2017/03/22		63	%	60 - 140
			1,1-Dichloroethane	2017/03/22		95	%	60 - 130
			1,2-Dichloroethane	2017/03/22		93	%	60 - 130
			1,1-Dichloroethylene	2017/03/22		95	%	60 - 130
			cis-1,2-Dichloroethylene	2017/03/22		98	%	60 - 130
			trans-1,2-Dichloroethylene	2017/03/22		94	%	60 - 130
			1,2-Dichloropropane	2017/03/22		90	%	60 - 130
			cis-1,3-Dichloropropene	2017/03/22		81	%	60 - 130
			trans-1,3-Dichloropropene	2017/03/22		79	%	60 - 130
			Ethylbenzene	2017/03/22		90	%	60 - 130
			Ethylene Dibromide	2017/03/22		95	%	60 - 130
			Hexane	2017/03/22		90	%	60 - 130
			Methylene Chloride(Dichloromethane)	2017/03/22		94	%	60 - 130
			Methyl Ethyl Ketone (2-Butanone)	2017/03/22		90	%	60 - 140
			Methyl Isobutyl Ketone	2017/03/22		82	%	60 - 130
			Methyl t-butyl ether (MTBE)	2017/03/22		87	%	60 - 130
			Styrene	2017/03/22		85	%	60 - 130
			1,1,1,2-Tetrachloroethane	2017/03/22		97	%	60 - 130
			1,1,2,2-Tetrachloroethane	2017/03/22		95	%	60 - 130
			Tetrachloroethylene	2017/03/22		96	%	60 - 130
			Toluene	2017/03/22		89	%	60 - 130
			1,1,1-Trichloroethane	2017/03/22		94	%	60 - 130
			1,1,2-Trichloroethane	2017/03/22		96	%	60 - 130
			Trichloroethylene	2017/03/22		93	%	60 - 130
			Trichlorofluoromethane (FREON 11)	2017/03/22		97	%	60 - 130
			Vinyl Chloride	2017/03/22		84	%	60 - 130
			p+m-Xylene	2017/03/22		85	%	60 - 130
			o-Xylene	2017/03/22		87	%	60 - 130
			F1 (C6-C10)	2017/03/22		98	%	80 - 120
4908910	YY	Method Blank	4-Bromofluorobenzene	2017/03/22		95	%	60 - 140
			D10-o-Xylene	2017/03/22		104	%	60 - 130
			D4-1,2-Dichloroethane	2017/03/22		104	%	60 - 140
			D8-Toluene	2017/03/22		97	%	60 - 140
			Acetone (2-Propanone)	2017/03/22	<0.50		ug/g	
			Benzene	2017/03/22	<0.020		ug/g	
			Bromodichloromethane	2017/03/22	<0.050		ug/g	
			Bromoform	2017/03/22	<0.050		ug/g	
			Bromomethane	2017/03/22	<0.050		ug/g	
			Carbon Tetrachloride	2017/03/22	<0.050		ug/g	
			Chlorobenzene	2017/03/22	<0.050		ug/g	
			Chloroform	2017/03/22	<0.050		ug/g	
			Dibromochloromethane	2017/03/22	<0.050		ug/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,2-Dichlorobenzene	2017/03/22	<0.050		ug/g	
			1,3-Dichlorobenzene	2017/03/22	<0.050		ug/g	
			1,4-Dichlorobenzene	2017/03/22	<0.050		ug/g	
			Dichlorodifluoromethane (FREON 12)	2017/03/22	<0.050		ug/g	
			1,1-Dichloroethane	2017/03/22	<0.050		ug/g	
			1,2-Dichloroethane	2017/03/22	<0.050		ug/g	
			1,1-Dichloroethylene	2017/03/22	<0.050		ug/g	
			cis-1,2-Dichloroethylene	2017/03/22	<0.050		ug/g	
			trans-1,2-Dichloroethylene	2017/03/22	<0.050		ug/g	
			1,2-Dichloropropane	2017/03/22	<0.050		ug/g	
			cis-1,3-Dichloropropene	2017/03/22	<0.030		ug/g	
			trans-1,3-Dichloropropene	2017/03/22	<0.040		ug/g	
			Ethylbenzene	2017/03/22	<0.020		ug/g	
			Ethylene Dibromide	2017/03/22	<0.050		ug/g	
			Hexane	2017/03/22	<0.050		ug/g	
			Methylene Chloride(Dichloromethane)	2017/03/22	<0.050		ug/g	
			Methyl Ethyl Ketone (2-Butanone)	2017/03/22	<0.50		ug/g	
			Methyl Isobutyl Ketone	2017/03/22	<0.50		ug/g	
			Methyl t-butyl ether (MTBE)	2017/03/22	<0.050		ug/g	
			Styrene	2017/03/22	<0.050		ug/g	
			1,1,1,2-Tetrachloroethane	2017/03/22	<0.050		ug/g	
			1,1,2,2-Tetrachloroethane	2017/03/22	<0.050		ug/g	
			Tetrachloroethylene	2017/03/22	<0.050		ug/g	
			Toluene	2017/03/22	<0.020		ug/g	
			1,1,1-Trichloroethane	2017/03/22	<0.050		ug/g	
			1,1,2-Trichloroethane	2017/03/22	<0.050		ug/g	
			Trichloroethylene	2017/03/22	<0.050		ug/g	
			Trichlorofluoromethane (FREON 11)	2017/03/22	<0.050		ug/g	
			Vinyl Chloride	2017/03/22	<0.020		ug/g	
			p+m-Xylene	2017/03/22	<0.020		ug/g	
			o-Xylene	2017/03/22	<0.020		ug/g	
			Total Xylenes	2017/03/22	<0.020		ug/g	
			F1 (C6-C10)	2017/03/22	<10		ug/g	
			F1 (C6-C10) - BTEX	2017/03/22	<10		ug/g	
4908910	YY	RPD [EBW871-02]	Acetone (2-Propanone)	2017/03/22	NC		%	50
			Benzene	2017/03/22	NC		%	50
			Bromodichloromethane	2017/03/22	NC		%	50
			Bromoform	2017/03/22	NC		%	50
			Bromomethane	2017/03/22	NC		%	50
			Carbon Tetrachloride	2017/03/22	NC		%	50
			Chlorobenzene	2017/03/22	NC		%	50
			Chloroform	2017/03/22	NC		%	50
			Dibromochloromethane	2017/03/22	NC		%	50
			1,2-Dichlorobenzene	2017/03/22	NC		%	50
			1,3-Dichlorobenzene	2017/03/22	NC		%	50
			1,4-Dichlorobenzene	2017/03/22	NC		%	50
			Dichlorodifluoromethane (FREON 12)	2017/03/22	NC		%	50
			1,1-Dichloroethane	2017/03/22	NC		%	50
			1,2-Dichloroethane	2017/03/22	NC		%	50
			1,1-Dichloroethylene	2017/03/22	NC		%	50
			cis-1,2-Dichloroethylene	2017/03/22	NC		%	50
			trans-1,2-Dichloroethylene	2017/03/22	NC		%	50

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,2-Dichloropropane	2017/03/22	NC		%	50
			cis-1,3-Dichloropropene	2017/03/22	NC		%	50
			trans-1,3-Dichloropropene	2017/03/22	NC		%	50
			Ethylbenzene	2017/03/22	NC		%	50
			Ethylene Dibromide	2017/03/22	NC		%	50
			Hexane	2017/03/22	NC		%	50
			Methylene Chloride(Dichloromethane)	2017/03/22	NC		%	50
			Methyl Ethyl Ketone (2-Butanone)	2017/03/22	NC		%	50
			Methyl Isobutyl Ketone	2017/03/22	NC		%	50
			Methyl t-butyl ether (MTBE)	2017/03/22	NC		%	50
			Styrene	2017/03/22	NC		%	50
			1,1,1,2-Tetrachloroethane	2017/03/22	NC		%	50
			1,1,2,2-Tetrachloroethane	2017/03/22	NC		%	50
			Tetrachloroethylene	2017/03/22	NC		%	50
			Toluene	2017/03/22	NC		%	50
			1,1,1-Trichloroethane	2017/03/22	NC		%	50
			1,1,2-Trichloroethane	2017/03/22	NC		%	50
			Trichloroethylene	2017/03/22	NC		%	50
			Trichlorofluoromethane (FREON 11)	2017/03/22	NC		%	50
			Vinyl Chloride	2017/03/22	NC		%	50
			p+m-Xylene	2017/03/22	NC		%	50
			o-Xylene	2017/03/22	NC		%	50
			Total Xylenes	2017/03/22	NC		%	50
			F1 (C6-C10)	2017/03/22	NC		%	30
			F1 (C6-C10) - BTEX	2017/03/22	NC		%	30
4909748	XQI	Matrix Spike	Free Cyanide	2017/03/25		106	%	75 - 125
4909748	XQI	Spiked Blank	Free Cyanide	2017/03/25		103	%	80 - 120
4909748	XQI	Method Blank	Free Cyanide	2017/03/25	<0.01		ug/g	
4909748	XQI	RPD	Free Cyanide	2017/03/25	NC		%	35
4910648	XQI	Matrix Spike	Free Cyanide	2017/03/25		107	%	75 - 125
4910648	XQI	Spiked Blank	Free Cyanide	2017/03/25		106	%	80 - 120
4910648	XQI	Method Blank	Free Cyanide	2017/03/25	<0.01		ug/g	
4910648	XQI	RPD	Free Cyanide	2017/03/25	NC		%	35
4910657	JPN	Matrix Spike	Leachable 4-Bromofluorobenzene	2017/03/24		104	%	70 - 130
			Leachable D4-1,2-Dichloroethane	2017/03/24		104	%	70 - 130
			Leachable D8-Toluene	2017/03/24		99	%	70 - 130
			Leachable Benzene	2017/03/24		100	%	70 - 130
			Leachable Carbon Tetrachloride	2017/03/24		104	%	70 - 130
			Leachable Chlorobenzene	2017/03/24		99	%	70 - 130
			Leachable Chloroform	2017/03/24		101	%	70 - 130
			Leachable 1,2-Dichlorobenzene	2017/03/24		97	%	70 - 130
			Leachable 1,4-Dichlorobenzene	2017/03/24		101	%	70 - 130
			Leachable 1,2-Dichloroethane	2017/03/24		98	%	70 - 130
			Leachable 1,1-Dichloroethylene	2017/03/24		103	%	70 - 130
			Leachable Methylene Chloride(Dichloromethane)	2017/03/24		98	%	70 - 130
			Leachable Methyl Ethyl Ketone (2-Butanone)	2017/03/24		103	%	60 - 140
			Leachable Tetrachloroethylene	2017/03/24		98	%	70 - 130
			Leachable Trichloroethylene	2017/03/24		100	%	70 - 130
			Leachable Vinyl Chloride	2017/03/24		103	%	70 - 130
4910657	JPN	Spiked Blank	Leachable 4-Bromofluorobenzene	2017/03/24		102	%	70 - 130
			Leachable D4-1,2-Dichloroethane	2017/03/24		96	%	70 - 130
			Leachable D8-Toluene	2017/03/24		102	%	70 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Leachable Benzene	2017/03/24		96	%	70 - 130
			Leachable Carbon Tetrachloride	2017/03/24		98	%	70 - 130
			Leachable Chlorobenzene	2017/03/24		99	%	70 - 130
			Leachable Chloroform	2017/03/24		95	%	70 - 130
			Leachable 1,2-Dichlorobenzene	2017/03/24		95	%	70 - 130
			Leachable 1,4-Dichlorobenzene	2017/03/24		96	%	70 - 130
			Leachable 1,2-Dichloroethane	2017/03/24		96	%	70 - 130
			Leachable 1,1-Dichloroethylene	2017/03/24		100	%	70 - 130
			Leachable Methylene Chloride(Dichloromethane)	2017/03/24		93	%	70 - 130
			Leachable Methyl Ethyl Ketone (2-Butanone)	2017/03/24		100	%	60 - 140
			Leachable Tetrachloroethylene	2017/03/24		94	%	70 - 130
			Leachable Trichloroethylene	2017/03/24		93	%	70 - 130
			Leachable Vinyl Chloride	2017/03/24		94	%	70 - 130
4910657	JPN	Method Blank	Leachable 4-Bromofluorobenzene	2017/03/24		99	%	70 - 130
			Leachable D4-1,2-Dichloroethane	2017/03/24		102	%	70 - 130
			Leachable D8-Toluene	2017/03/24		99	%	70 - 130
			Leachable Benzene	2017/03/24	<0.020		mg/L	
			Leachable Carbon Tetrachloride	2017/03/24	<0.020		mg/L	
			Leachable Chlorobenzene	2017/03/24	<0.020		mg/L	
			Leachable Chloroform	2017/03/24	<0.020		mg/L	
			Leachable 1,2-Dichlorobenzene	2017/03/24	<0.050		mg/L	
			Leachable 1,4-Dichlorobenzene	2017/03/24	<0.050		mg/L	
			Leachable 1,2-Dichloroethane	2017/03/24	<0.050		mg/L	
			Leachable 1,1-Dichloroethylene	2017/03/24	<0.020		mg/L	
			Leachable Methylene Chloride(Dichloromethane)	2017/03/24	<0.20		mg/L	
			Leachable Methyl Ethyl Ketone (2-Butanone)	2017/03/24	<1.0		mg/L	
			Leachable Tetrachloroethylene	2017/03/24	<0.020		mg/L	
			Leachable Trichloroethylene	2017/03/24	<0.020		mg/L	
			Leachable Vinyl Chloride	2017/03/24	<0.020		mg/L	
4910657	JPN	RPD	Leachable Benzene	2017/03/24	3.9		%	30
			Leachable Carbon Tetrachloride	2017/03/24	NC		%	30
			Leachable Chlorobenzene	2017/03/24	NC		%	30
			Leachable Chloroform	2017/03/24	NC		%	30
			Leachable 1,2-Dichlorobenzene	2017/03/24	NC		%	30
			Leachable 1,4-Dichlorobenzene	2017/03/24	NC		%	30
			Leachable 1,2-Dichloroethane	2017/03/24	NC		%	30
			Leachable 1,1-Dichloroethylene	2017/03/24	NC		%	30
			Leachable Methylene Chloride(Dichloromethane)	2017/03/24	NC		%	30
			Leachable Methyl Ethyl Ketone (2-Butanone)	2017/03/24	NC		%	30
			Leachable Tetrachloroethylene	2017/03/24	NC		%	30
			Leachable Trichloroethylene	2017/03/24	NC		%	30
			Leachable Vinyl Chloride	2017/03/24	NC		%	30
4910670	SAC	Matrix Spike	Chromium (VI)	2017/03/24		83	%	75 - 125
4910670	SAC	Spiked Blank	Chromium (VI)	2017/03/24		84	%	80 - 120
4910670	SAC	Method Blank	Chromium (VI)	2017/03/24	<0.2		ug/g	
4910670	SAC	RPD	Chromium (VI)	2017/03/24	20		%	35
4910699	RAJ	Matrix Spike	D10-Anthracene	2017/03/23		90	%	50 - 130
			D14-Terphenyl (FS)	2017/03/23		87	%	50 - 130
			D8-Acenaphthylene	2017/03/23		90	%	50 - 130
			Acenaphthene	2017/03/23		84	%	50 - 130
			Acenaphthylene	2017/03/23		95	%	50 - 130
			Anthracene	2017/03/23		85	%	50 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Benzo(a)anthracene	2017/03/23		86	%	50 - 130
			Benzo(a)pyrene	2017/03/23		85	%	50 - 130
			Benzo(b/j)fluoranthene	2017/03/23		85	%	50 - 130
			Benzo(g,h,i)perylene	2017/03/23		83	%	50 - 130
			Benzo(k)fluoranthene	2017/03/23		86	%	50 - 130
			Chrysene	2017/03/23		90	%	50 - 130
			Dibenz(a,h)anthracene	2017/03/23		85	%	50 - 130
			Fluoranthene	2017/03/23		89	%	50 - 130
			Fluorene	2017/03/23		90	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2017/03/23		87	%	50 - 130
			1-Methylnaphthalene	2017/03/23		83	%	50 - 130
			2-Methylnaphthalene	2017/03/23		80	%	50 - 130
			Naphthalene	2017/03/23		75	%	50 - 130
			Phenanthrene	2017/03/23		84	%	50 - 130
			Pyrene	2017/03/23		91	%	50 - 130
4910699	RAJ	Spiked Blank	D10-Anthracene	2017/03/23		86	%	50 - 130
			D14-Terphenyl (FS)	2017/03/23		86	%	50 - 130
			D8-Acenaphthylene	2017/03/23		84	%	50 - 130
			Acenaphthene	2017/03/23		87	%	50 - 130
			Acenaphthylene	2017/03/23		87	%	50 - 130
			Anthracene	2017/03/23		81	%	50 - 130
			Benzo(a)anthracene	2017/03/23		81	%	50 - 130
			Benzo(a)pyrene	2017/03/23		90	%	50 - 130
			Benzo(b/j)fluoranthene	2017/03/23		94	%	50 - 130
			Benzo(g,h,i)perylene	2017/03/23		96	%	50 - 130
			Benzo(k)fluoranthene	2017/03/23		94	%	50 - 130
			Chrysene	2017/03/23		90	%	50 - 130
			Dibenz(a,h)anthracene	2017/03/23		94	%	50 - 130
			Fluoranthene	2017/03/23		86	%	50 - 130
			Fluorene	2017/03/23		90	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2017/03/23		96	%	50 - 130
			1-Methylnaphthalene	2017/03/23		87	%	50 - 130
			2-Methylnaphthalene	2017/03/23		84	%	50 - 130
			Naphthalene	2017/03/23		81	%	50 - 130
			Phenanthrene	2017/03/23		85	%	50 - 130
			Pyrene	2017/03/23		88	%	50 - 130
4910699	RAJ	Method Blank	D10-Anthracene	2017/03/23		85	%	50 - 130
			D14-Terphenyl (FS)	2017/03/23		84	%	50 - 130
			D8-Acenaphthylene	2017/03/23		84	%	50 - 130
			Acenaphthene	2017/03/23	<0.0050		ug/g	
			Acenaphthylene	2017/03/23	<0.0050		ug/g	
			Anthracene	2017/03/23	<0.0050		ug/g	
			Benzo(a)anthracene	2017/03/23	<0.0050		ug/g	
			Benzo(a)pyrene	2017/03/23	<0.0050		ug/g	
			Benzo(b/j)fluoranthene	2017/03/23	<0.0050		ug/g	
			Benzo(g,h,i)perylene	2017/03/23	<0.0050		ug/g	
			Benzo(k)fluoranthene	2017/03/23	<0.0050		ug/g	
			Chrysene	2017/03/23	<0.0050		ug/g	
			Dibenz(a,h)anthracene	2017/03/23	<0.0050		ug/g	
			Fluoranthene	2017/03/23	<0.0050		ug/g	
			Fluorene	2017/03/23	<0.0050		ug/g	
			Indeno(1,2,3-cd)pyrene	2017/03/23	<0.0050		ug/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
				1-Methylnaphthalene	2017/03/23	<0.0050		ug/g	
				2-Methylnaphthalene	2017/03/23	<0.0050		ug/g	
				Naphthalene	2017/03/23	<0.0050		ug/g	
				Phenanthrene	2017/03/23	<0.0050		ug/g	
				Pyrene	2017/03/23	<0.0050		ug/g	
4910699	RAJ	RPD		Acenaphthene	2017/03/23	NC		%	40
				Acenaphthylene	2017/03/23	NC		%	40
				Anthracene	2017/03/23	NC		%	40
				Benzo(a)anthracene	2017/03/23	NC		%	40
				Benzo(a)pyrene	2017/03/23	NC		%	40
				Benzo(b/j)fluoranthene	2017/03/23	NC		%	40
				Benzo(g,h,i)perylene	2017/03/23	NC		%	40
				Benzo(k)fluoranthene	2017/03/23	NC		%	40
				Chrysene	2017/03/23	NC		%	40
				Dibenz(a,h)anthracene	2017/03/23	NC		%	40
				Fluoranthene	2017/03/23	NC		%	40
				Fluorene	2017/03/23	NC		%	40
				Indeno(1,2,3-cd)pyrene	2017/03/23	NC		%	40
				1-Methylnaphthalene	2017/03/23	NC		%	40
				2-Methylnaphthalene	2017/03/23	NC		%	40
				Naphthalene	2017/03/23	NC		%	40
				Phenanthrene	2017/03/23	NC		%	40
				Pyrene	2017/03/23	NC		%	40
4910858	DT1	Matrix Spike		Acid Extractable Antimony (Sb)	2017/03/23		92	%	75 - 125
				Acid Extractable Arsenic (As)	2017/03/23		102	%	75 - 125
				Acid Extractable Barium (Ba)	2017/03/23		NC	%	75 - 125
				Acid Extractable Beryllium (Be)	2017/03/23		99	%	75 - 125
				Acid Extractable Boron (B)	2017/03/23		94	%	75 - 125
				Acid Extractable Cadmium (Cd)	2017/03/23		99	%	75 - 125
				Acid Extractable Chromium (Cr)	2017/03/23		100	%	75 - 125
				Acid Extractable Cobalt (Co)	2017/03/23		99	%	75 - 125
				Acid Extractable Copper (Cu)	2017/03/23		95	%	75 - 125
				Acid Extractable Lead (Pb)	2017/03/23		95	%	75 - 125
				Acid Extractable Molybdenum (Mo)	2017/03/23		100	%	75 - 125
				Acid Extractable Nickel (Ni)	2017/03/23		95	%	75 - 125
				Acid Extractable Selenium (Se)	2017/03/23		99	%	75 - 125
				Acid Extractable Silver (Ag)	2017/03/23		101	%	75 - 125
				Acid Extractable Thallium (Tl)	2017/03/23		96	%	75 - 125
				Acid Extractable Uranium (U)	2017/03/23		93	%	75 - 125
				Acid Extractable Vanadium (V)	2017/03/23		102	%	75 - 125
				Acid Extractable Zinc (Zn)	2017/03/23		NC	%	75 - 125
				Acid Extractable Mercury (Hg)	2017/03/23		102	%	75 - 125
4910858	DT1	Spiked Blank		Acid Extractable Antimony (Sb)	2017/03/23		99	%	80 - 120
				Acid Extractable Arsenic (As)	2017/03/23		104	%	80 - 120
				Acid Extractable Barium (Ba)	2017/03/23		100	%	80 - 120
				Acid Extractable Beryllium (Be)	2017/03/23		97	%	80 - 120
				Acid Extractable Boron (B)	2017/03/23		95	%	80 - 120
				Acid Extractable Cadmium (Cd)	2017/03/23		98	%	80 - 120
				Acid Extractable Chromium (Cr)	2017/03/23		99	%	80 - 120
				Acid Extractable Cobalt (Co)	2017/03/23		100	%	80 - 120
				Acid Extractable Copper (Cu)	2017/03/23		99	%	80 - 120
				Acid Extractable Lead (Pb)	2017/03/23		96	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Molybdenum (Mo)	2017/03/23		100	%	80 - 120
			Acid Extractable Nickel (Ni)	2017/03/23		101	%	80 - 120
			Acid Extractable Selenium (Se)	2017/03/23		101	%	80 - 120
			Acid Extractable Silver (Ag)	2017/03/23		100	%	80 - 120
			Acid Extractable Thallium (Tl)	2017/03/23		96	%	80 - 120
			Acid Extractable Uranium (U)	2017/03/23		91	%	80 - 120
			Acid Extractable Vanadium (V)	2017/03/23		97	%	80 - 120
			Acid Extractable Zinc (Zn)	2017/03/23		99	%	80 - 120
			Acid Extractable Mercury (Hg)	2017/03/23		91	%	80 - 120
4910858	DT1	Method Blank	Acid Extractable Antimony (Sb)	2017/03/23	<0.20		ug/g	
			Acid Extractable Arsenic (As)	2017/03/23	<1.0		ug/g	
			Acid Extractable Barium (Ba)	2017/03/23	<0.50		ug/g	
			Acid Extractable Beryllium (Be)	2017/03/23	<0.20		ug/g	
			Acid Extractable Boron (B)	2017/03/23	<5.0		ug/g	
			Acid Extractable Cadmium (Cd)	2017/03/23	<0.10		ug/g	
			Acid Extractable Chromium (Cr)	2017/03/23	<1.0		ug/g	
			Acid Extractable Cobalt (Co)	2017/03/23	<0.10		ug/g	
			Acid Extractable Copper (Cu)	2017/03/23	<0.50		ug/g	
			Acid Extractable Lead (Pb)	2017/03/23	<1.0		ug/g	
			Acid Extractable Molybdenum (Mo)	2017/03/23	<0.50		ug/g	
			Acid Extractable Nickel (Ni)	2017/03/23	<0.50		ug/g	
			Acid Extractable Selenium (Se)	2017/03/23	<0.50		ug/g	
			Acid Extractable Silver (Ag)	2017/03/23	<0.20		ug/g	
			Acid Extractable Thallium (Tl)	2017/03/23	<0.050		ug/g	
			Acid Extractable Uranium (U)	2017/03/23	<0.050		ug/g	
			Acid Extractable Vanadium (V)	2017/03/23	<5.0		ug/g	
			Acid Extractable Zinc (Zn)	2017/03/23	<5.0		ug/g	
			Acid Extractable Mercury (Hg)	2017/03/23	<0.050		ug/g	
4910858	DT1	RPD	Acid Extractable Antimony (Sb)	2017/03/23	NC		%	30
			Acid Extractable Arsenic (As)	2017/03/23	3.3		%	30
			Acid Extractable Barium (Ba)	2017/03/23	0.52		%	30
			Acid Extractable Beryllium (Be)	2017/03/23	1.2		%	30
			Acid Extractable Boron (B)	2017/03/23	1.6		%	30
			Acid Extractable Cadmium (Cd)	2017/03/23	27		%	30
			Acid Extractable Chromium (Cr)	2017/03/23	5.4		%	30
			Acid Extractable Cobalt (Co)	2017/03/23	0.13		%	30
			Acid Extractable Copper (Cu)	2017/03/23	0.96		%	30
			Acid Extractable Lead (Pb)	2017/03/23	4.7		%	30
			Acid Extractable Molybdenum (Mo)	2017/03/23	NC		%	30
			Acid Extractable Nickel (Ni)	2017/03/23	0.23		%	30
			Acid Extractable Selenium (Se)	2017/03/23	NC		%	30
			Acid Extractable Silver (Ag)	2017/03/23	NC		%	30
			Acid Extractable Thallium (Tl)	2017/03/23	4.6		%	30
			Acid Extractable Uranium (U)	2017/03/23	1.5		%	30
			Acid Extractable Vanadium (V)	2017/03/23	3.1		%	30
			Acid Extractable Zinc (Zn)	2017/03/23	1.7		%	30
4910863	LPG	Matrix Spike	Decachlorobiphenyl	2017/03/23		94	%	60 - 130
			Aroclor 1260	2017/03/23		102	%	60 - 130
			Total PCB	2017/03/23		102	%	60 - 130
4910863	LPG	Spiked Blank	Decachlorobiphenyl	2017/03/23		89	%	60 - 130
			Aroclor 1260	2017/03/23		95	%	60 - 130
			Total PCB	2017/03/23		95	%	60 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4910863	LPG	Method Blank	Decachlorobiphenyl	2017/03/23		88	%	60 - 130
			Aroclor 1242	2017/03/23	<0.010		ug/g	
			Aroclor 1248	2017/03/23	<0.010		ug/g	
			Aroclor 1254	2017/03/23	<0.010		ug/g	
			Aroclor 1260	2017/03/23	<0.010		ug/g	
			Total PCB	2017/03/23	<0.010		ug/g	
4910863	LPG	RPD	Aroclor 1242	2017/03/23	NC		%	50
			Aroclor 1248	2017/03/23	NC		%	50
			Aroclor 1254	2017/03/23	NC		%	50
			Aroclor 1260	2017/03/23	NC		%	50
			Total PCB	2017/03/23	NC		%	50
4910943	GYA	RPD	Moisture	2017/03/23	11		%	20
4910949	TA1	Spiked Blank	Available (CaCl2) pH	2017/03/24		98	%	97 - 103
4910949	TA1	RPD	Available (CaCl2) pH	2017/03/24	0.33		%	N/A
4911262	SAC	Matrix Spike	Chromium (VI)	2017/03/24		81	%	75 - 125
4911262	SAC	Spiked Blank	Chromium (VI)	2017/03/24		87	%	80 - 120
4911262	SAC	Method Blank	Chromium (VI)	2017/03/24	<0.2		ug/g	
4911262	SAC	RPD	Chromium (VI)	2017/03/24	NC		%	35
4911314	JBW	Matrix Spike	Leachable Arsenic (As)	2017/03/23		100	%	80 - 120
			Leachable Barium (Ba)	2017/03/23		NC	%	80 - 120
			Leachable Boron (B)	2017/03/23		100	%	80 - 120
			Leachable Cadmium (Cd)	2017/03/23		98	%	80 - 120
			Leachable Chromium (Cr)	2017/03/23		98	%	80 - 120
			Leachable Lead (Pb)	2017/03/23		95	%	80 - 120
			Leachable Selenium (Se)	2017/03/23		101	%	80 - 120
			Leachable Silver (Ag)	2017/03/23		97	%	80 - 120
			Leachable Uranium (U)	2017/03/23		94	%	80 - 120
4911314	JBW	Leachate Blank	Leachable Arsenic (As)	2017/03/23	<0.2		mg/L	
			Leachable Barium (Ba)	2017/03/23	<0.2		mg/L	
			Leachable Boron (B)	2017/03/23	<0.1		mg/L	
			Leachable Cadmium (Cd)	2017/03/23	<0.05		mg/L	
			Leachable Chromium (Cr)	2017/03/23	<0.1		mg/L	
			Leachable Lead (Pb)	2017/03/23	<0.1		mg/L	
			Leachable Selenium (Se)	2017/03/23	<0.1		mg/L	
			Leachable Silver (Ag)	2017/03/23	<0.01		mg/L	
			Leachable Uranium (U)	2017/03/23	<0.01		mg/L	
4911314	JBW	Spiked Blank	Leachable Arsenic (As)	2017/03/23		102	%	80 - 120
			Leachable Barium (Ba)	2017/03/23		99	%	80 - 120
			Leachable Boron (B)	2017/03/23		107	%	80 - 120
			Leachable Cadmium (Cd)	2017/03/23		102	%	80 - 120
			Leachable Chromium (Cr)	2017/03/23		101	%	80 - 120
			Leachable Lead (Pb)	2017/03/23		99	%	80 - 120
			Leachable Selenium (Se)	2017/03/23		103	%	80 - 120
			Leachable Silver (Ag)	2017/03/23		100	%	80 - 120
			Leachable Uranium (U)	2017/03/23		97	%	80 - 120
4911314	JBW	Method Blank	Leachable Arsenic (As)	2017/03/23	<0.2		mg/L	
			Leachable Barium (Ba)	2017/03/23	<0.2		mg/L	
			Leachable Boron (B)	2017/03/23	<0.1		mg/L	
			Leachable Cadmium (Cd)	2017/03/23	<0.05		mg/L	
			Leachable Chromium (Cr)	2017/03/23	<0.1		mg/L	
			Leachable Lead (Pb)	2017/03/23	<0.1		mg/L	
			Leachable Selenium (Se)	2017/03/23	<0.1		mg/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4911314	JBW	RPD	Leachable Silver (Ag)	2017/03/23	<0.01		mg/L	
			Leachable Uranium (U)	2017/03/23	<0.01		mg/L	
			Leachable Arsenic (As)	2017/03/23	NC		%	35
			Leachable Barium (Ba)	2017/03/23	0.090		%	35
			Leachable Boron (B)	2017/03/23	NC		%	35
			Leachable Cadmium (Cd)	2017/03/23	NC		%	35
			Leachable Chromium (Cr)	2017/03/23	NC		%	35
			Leachable Lead (Pb)	2017/03/23	NC		%	35
			Leachable Selenium (Se)	2017/03/23	NC		%	35
			Leachable Silver (Ag)	2017/03/23	NC		%	35
4911427	SUK	Spiked Blank	Leachable Uranium (U)	2017/03/23	NC		%	35
			Soluble Calcium (Ca)	2017/03/24		99	%	80 - 120
			Soluble Magnesium (Mg)	2017/03/24		98	%	80 - 120
4911427	SUK	Method Blank	Soluble Sodium (Na)	2017/03/24		101	%	80 - 120
			Soluble Calcium (Ca)	2017/03/24	<0.5		mg/L	
			Soluble Magnesium (Mg)	2017/03/24	<0.5		mg/L	
4911427	SUK	RPD	Soluble Sodium (Na)	2017/03/24	<5		mg/L	
			Soluble Calcium (Ca)	2017/03/24	19		%	30
			Soluble Magnesium (Mg)	2017/03/24	14		%	30
4911428	NYS	Spiked Blank	Soluble Sodium (Na)	2017/03/24	2.8		%	30
			Conductivity	2017/03/24		100	%	90 - 110
			Conductivity	2017/03/24	<0.002		mS/cm	
4911428	NYS	Method Blank	Conductivity	2017/03/24	2.6		%	10
4911428	NYS	RPD	Conductivity	2017/03/24			%	
4911432	XQI	Matrix Spike	Leachable Free Cyanide	2017/03/25		107	%	80 - 120
4911432	XQI	Leachate Blank	Leachable Free Cyanide	2017/03/25	<0.010		mg/L	
4911432	XQI	Spiked Blank	Leachable Free Cyanide	2017/03/25		106	%	80 - 120
4911432	XQI	Method Blank	Leachable Free Cyanide	2017/03/25	<0.0020		mg/L	
4911432	XQI	RPD	Leachable Free Cyanide	2017/03/25	NC		%	20
4911460	SAU	Matrix Spike	Leachable Fluoride (F-)	2017/03/24		102	%	80 - 120
4911460	SAU	Leachate Blank	Leachable Fluoride (F-)	2017/03/24	<0.10		mg/L	
4911460	SAU	Spiked Blank	Leachable Fluoride (F-)	2017/03/24		104	%	80 - 120
4911460	SAU	Method Blank	Leachable Fluoride (F-)	2017/03/24	<0.10		mg/L	
4911460	SAU	RPD	Leachable Fluoride (F-)	2017/03/24	0.96		%	25
4911461	C_N	Matrix Spike	Leachable Nitrite (N)	2017/03/24		100	%	80 - 120
			Leachable Nitrate (N)	2017/03/24		103	%	80 - 120
			Leachable Nitrate + Nitrite (N)	2017/03/24		102	%	80 - 120
4911461	C_N	Leachate Blank	Leachable Nitrite (N)	2017/03/24	<0.10		mg/L	
			Leachable Nitrate (N)	2017/03/24	<1.0		mg/L	
			Leachable Nitrate + Nitrite (N)	2017/03/24	<1.0		mg/L	
4911461	C_N	Spiked Blank	Leachable Nitrite (N)	2017/03/24		100	%	80 - 120
			Leachable Nitrate (N)	2017/03/24		104	%	80 - 120
			Leachable Nitrate + Nitrite (N)	2017/03/24		104	%	80 - 120
4911461	C_N	Method Blank	Leachable Nitrite (N)	2017/03/24	<0.10		mg/L	
			Leachable Nitrate (N)	2017/03/24	<1.0		mg/L	
			Leachable Nitrate + Nitrite (N)	2017/03/24	<1.0		mg/L	
4911461	C_N	RPD	Leachable Nitrite (N)	2017/03/24	NC		%	25
			Leachable Nitrate (N)	2017/03/24	NC		%	25
			Leachable Nitrate + Nitrite (N)	2017/03/24	NC		%	25
4911503	RON	Matrix Spike	Leachable Mercury (Hg)	2017/03/24		110	%	75 - 125
4911503	RON	Leachate Blank	Leachable Mercury (Hg)	2017/03/24	<0.0010		mg/L	
4911503	RON	Spiked Blank	Leachable Mercury (Hg)	2017/03/24		108	%	80 - 120
4911503	RON	Method Blank	Leachable Mercury (Hg)	2017/03/24	<0.0010		mg/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4911503	RON	RPD	Leachable Mercury (Hg)	2017/03/24	NC		%	25
4911514	ZZ	Matrix Spike	o-Terphenyl	2017/03/24		106	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/03/24		103	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2017/03/24		103	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2017/03/24		106	%	50 - 130
4911514	ZZ	Spiked Blank	o-Terphenyl	2017/03/24		104	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/03/24		102	%	80 - 120
			F3 (C16-C34 Hydrocarbons)	2017/03/24		100	%	80 - 120
			F4 (C34-C50 Hydrocarbons)	2017/03/24		103	%	80 - 120
4911514	ZZ	Method Blank	o-Terphenyl	2017/03/24		99	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/03/24	<10		ug/g	
			F3 (C16-C34 Hydrocarbons)	2017/03/24	<50		ug/g	
			F4 (C34-C50 Hydrocarbons)	2017/03/24	<50		ug/g	
4911514	ZZ	RPD	F2 (C10-C16 Hydrocarbons)	2017/03/24	NC		%	30
			F3 (C16-C34 Hydrocarbons)	2017/03/24	NC		%	30
			F4 (C34-C50 Hydrocarbons)	2017/03/24	NC		%	30
4912250	SUK	Matrix Spike	Hot Water Ext. Boron (B)	2017/03/27		106	%	75 - 125
4912250	SUK	Spiked Blank	Hot Water Ext. Boron (B)	2017/03/24		99	%	75 - 125
4912250	SUK	Method Blank	Hot Water Ext. Boron (B)	2017/03/24	<0.050		ug/g	
4912250	SUK	RPD	Hot Water Ext. Boron (B)	2017/03/25	5.8		%	40
4912434	GYA	RPD	Moisture	2017/03/24	2.1		%	20
4912450	DT1	Matrix Spike	Acid Extractable Antimony (Sb)	2017/03/24		93	%	75 - 125
			Acid Extractable Arsenic (As)	2017/03/24		97	%	75 - 125
			Acid Extractable Barium (Ba)	2017/03/24		NC	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/03/24		97	%	75 - 125
			Acid Extractable Boron (B)	2017/03/24		92	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/03/24		101	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/03/24		NC	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/03/24		96	%	75 - 125
			Acid Extractable Copper (Cu)	2017/03/24		102	%	75 - 125
			Acid Extractable Lead (Pb)	2017/03/24		80	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/03/24		100	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/03/24		97	%	75 - 125
			Acid Extractable Selenium (Se)	2017/03/24		95	%	75 - 125
			Acid Extractable Silver (Ag)	2017/03/24		99	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/03/24		96	%	75 - 125
			Acid Extractable Uranium (U)	2017/03/24		96	%	75 - 125
			Acid Extractable Vanadium (V)	2017/03/24		100	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/03/24		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/03/24		98	%	75 - 125
4912450	DT1	Spiked Blank	Acid Extractable Antimony (Sb)	2017/03/24		103	%	80 - 120
			Acid Extractable Arsenic (As)	2017/03/24		99	%	80 - 120
			Acid Extractable Barium (Ba)	2017/03/24		100	%	80 - 120
			Acid Extractable Beryllium (Be)	2017/03/24		98	%	80 - 120
			Acid Extractable Boron (B)	2017/03/24		96	%	80 - 120
			Acid Extractable Cadmium (Cd)	2017/03/24		102	%	80 - 120
			Acid Extractable Chromium (Cr)	2017/03/24		99	%	80 - 120
			Acid Extractable Cobalt (Co)	2017/03/24		98	%	80 - 120
			Acid Extractable Copper (Cu)	2017/03/24		107	%	80 - 120
			Acid Extractable Lead (Pb)	2017/03/24		103	%	80 - 120
			Acid Extractable Molybdenum (Mo)	2017/03/24		102	%	80 - 120
			Acid Extractable Nickel (Ni)	2017/03/24		97	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Selenium (Se)	2017/03/24		99	%	80 - 120
			Acid Extractable Silver (Ag)	2017/03/24		101	%	80 - 120
			Acid Extractable Thallium (Tl)	2017/03/24		103	%	80 - 120
			Acid Extractable Uranium (U)	2017/03/24		101	%	80 - 120
			Acid Extractable Vanadium (V)	2017/03/24		98	%	80 - 120
			Acid Extractable Zinc (Zn)	2017/03/24		95	%	80 - 120
			Acid Extractable Mercury (Hg)	2017/03/24		105	%	80 - 120
4912450	DT1	Method Blank	Acid Extractable Antimony (Sb)	2017/03/24	<0.20		ug/g	
			Acid Extractable Arsenic (As)	2017/03/24	<1.0		ug/g	
			Acid Extractable Barium (Ba)	2017/03/24	<0.50		ug/g	
			Acid Extractable Beryllium (Be)	2017/03/24	<0.20		ug/g	
			Acid Extractable Boron (B)	2017/03/24	<5.0		ug/g	
			Acid Extractable Cadmium (Cd)	2017/03/24	<0.10		ug/g	
			Acid Extractable Chromium (Cr)	2017/03/24	<1.0		ug/g	
			Acid Extractable Cobalt (Co)	2017/03/24	<0.10		ug/g	
			Acid Extractable Copper (Cu)	2017/03/24	<0.50		ug/g	
			Acid Extractable Lead (Pb)	2017/03/24	<1.0		ug/g	
			Acid Extractable Molybdenum (Mo)	2017/03/24	<0.50		ug/g	
			Acid Extractable Nickel (Ni)	2017/03/24	<0.50		ug/g	
			Acid Extractable Selenium (Se)	2017/03/24	<0.50		ug/g	
			Acid Extractable Silver (Ag)	2017/03/24	<0.20		ug/g	
			Acid Extractable Thallium (Tl)	2017/03/24	<0.050		ug/g	
			Acid Extractable Uranium (U)	2017/03/24	<0.050		ug/g	
			Acid Extractable Vanadium (V)	2017/03/24	<5.0		ug/g	
			Acid Extractable Zinc (Zn)	2017/03/24	<5.0		ug/g	
			Acid Extractable Mercury (Hg)	2017/03/24	<0.050		ug/g	
4912450	DT1	RPD	Acid Extractable Antimony (Sb)	2017/03/24	16		%	30
			Acid Extractable Arsenic (As)	2017/03/24	2.3		%	30
			Acid Extractable Barium (Ba)	2017/03/24	12		%	30
			Acid Extractable Beryllium (Be)	2017/03/24	8.6		%	30
			Acid Extractable Boron (B)	2017/03/24	6.4		%	30
			Acid Extractable Cadmium (Cd)	2017/03/24	30		%	30
			Acid Extractable Chromium (Cr)	2017/03/24	5.1		%	30
			Acid Extractable Cobalt (Co)	2017/03/24	3.0		%	30
			Acid Extractable Copper (Cu)	2017/03/24	4.9		%	30
			Acid Extractable Lead (Pb)	2017/03/24	10		%	30
			Acid Extractable Molybdenum (Mo)	2017/03/24	5.5		%	30
			Acid Extractable Nickel (Ni)	2017/03/24	7.6		%	30
			Acid Extractable Selenium (Se)	2017/03/24	NC		%	30
			Acid Extractable Silver (Ag)	2017/03/24	NC		%	30
			Acid Extractable Thallium (Tl)	2017/03/24	16		%	30
			Acid Extractable Uranium (U)	2017/03/24	19		%	30
			Acid Extractable Vanadium (V)	2017/03/24	7.0		%	30
			Acid Extractable Zinc (Zn)	2017/03/24	3.0		%	30
			Acid Extractable Mercury (Hg)	2017/03/24	10		%	30
4912617	TA1	Spiked Blank	Available (CaCl2) pH	2017/03/24		98	%	97 - 103
4912617	TA1	RPD	Available (CaCl2) pH	2017/03/24	0.22		%	N/A
4912718	LPG	Matrix Spike	Leachable Decachlorobiphenyl	2017/03/24		100	%	30 - 130
			Leachable Total PCB	2017/03/24		97	%	30 - 130
4912718	LPG	Spiked Blank	Leachable Decachlorobiphenyl	2017/03/24		93	%	30 - 130
			Leachable Total PCB	2017/03/24		95	%	30 - 130
4912718	LPG	Method Blank	Leachable Decachlorobiphenyl	2017/03/24		92	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Leachable D5-Nitrobenzene	2017/03/25		69	%	30 - 130
			Leachable D5-Phenol	2017/03/25		25	%	10 - 130
			Leachable Benzo(a)pyrene	2017/03/25	<0.10		ug/L	
			Leachable m/p-Cresol	2017/03/25	<2.5		ug/L	
			Leachable o-Cresol	2017/03/25	<2.5		ug/L	
			Leachable Cresol Total	2017/03/25	<2.5		ug/L	
			Leachable 2,4-Dichlorophenol	2017/03/25	<2.5		ug/L	
			Leachable 2,4-Dinitrotoluene	2017/03/25	<10		ug/L	
			Leachable Hexachlorobenzene	2017/03/25	<10		ug/L	
			Leachable Hexachlorobutadiene	2017/03/25	<10		ug/L	
			Leachable Hexachloroethane	2017/03/25	<10		ug/L	
			Leachable Nitrobenzene	2017/03/25	<10		ug/L	
			Leachable Pentachlorophenol	2017/03/25	<2.5		ug/L	
			Leachable Pyridine	2017/03/25	<10		ug/L	
			Leachable 2,3,4,6-Tetrachlorophenol	2017/03/25	<2.5		ug/L	
			Leachable 2,4,5-Trichlorophenol	2017/03/25	<0.50		ug/L	
			Leachable 2,4,6-Trichlorophenol	2017/03/25	<2.5		ug/L	
4913309	WZ	RPD	Leachable Benzo(a)pyrene	2017/03/25	NC		%	40
			Leachable m/p-Cresol	2017/03/25	NC		%	40
			Leachable o-Cresol	2017/03/25	NC		%	40
			Leachable Cresol Total	2017/03/25	NC		%	40
			Leachable 2,4-Dichlorophenol	2017/03/25	NC		%	40
			Leachable 2,4-Dinitrotoluene	2017/03/25	NC		%	40
			Leachable Hexachlorobenzene	2017/03/25	NC		%	40
			Leachable Hexachlorobutadiene	2017/03/25	NC		%	40
			Leachable Hexachloroethane	2017/03/25	NC		%	40
			Leachable Nitrobenzene	2017/03/25	NC		%	40
			Leachable Pentachlorophenol	2017/03/25	NC		%	40
			Leachable Pyridine	2017/03/25	NC		%	40
			Leachable 2,3,4,6-Tetrachlorophenol	2017/03/25	NC		%	40
			Leachable 2,4,5-Trichlorophenol	2017/03/25	NC		%	40
			Leachable 2,4,6-Trichlorophenol	2017/03/25	NC		%	40
4914509	JOH	Spiked Blank	Soluble Calcium (Ca)	2017/03/27		94	%	80 - 120
			Soluble Magnesium (Mg)	2017/03/27		94	%	80 - 120
			Soluble Sodium (Na)	2017/03/27		98	%	80 - 120
4914509	JOH	Method Blank	Soluble Calcium (Ca)	2017/03/27	<0.5		mg/L	
			Soluble Magnesium (Mg)	2017/03/27	<0.5		mg/L	
			Soluble Sodium (Na)	2017/03/27	<5		mg/L	
4914509	JOH	RPD	Soluble Calcium (Ca)	2017/03/27	1.3		%	30
			Soluble Magnesium (Mg)	2017/03/27	4.2		%	30
			Soluble Sodium (Na)	2017/03/27	8.4		%	30
4914513	NYS	Spiked Blank	Conductivity	2017/03/27		99	%	90 - 110
4914513	NYS	Method Blank	Conductivity	2017/03/27	<0.002		mS/cm	
4914513	NYS	RPD	Conductivity	2017/03/27	1.7		%	10
4916051	SK1	Matrix Spike [EBW870-01]	F4G-sg (Grav. Heavy Hydrocarbons)	2017/03/28		94	%	65 - 135
4916051	SK1	Spiked Blank	F4G-sg (Grav. Heavy Hydrocarbons)	2017/03/28		102	%	65 - 135
4916051	SK1	Method Blank	F4G-sg (Grav. Heavy Hydrocarbons)	2017/03/28	<100		ug/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4916051	SK1	RPD [EBW871-03]	F4G-sg (Grav. Heavy Hydrocarbons)	2017/03/28	NC		%	50
<p>N/A = Not Applicable</p> <p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>Leachate Blank: A blank matrix containing all reagents used in the leaching procedure. Used to determine any process contamination.</p> <p>Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.</p> <p>NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)</p> <p>NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).</p>								

VALIDATION SIGNATURE PAGE

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




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

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

Your Project #: 161-17781-00
 Site Location: HSR FACILITY
 Your C.O.C. #: 601902-32-01

Attention: Rachel Bryan

WSP Canada Inc
 4 Hughson Street South
 Suite 300
 Hamilton, ON
 CANADA L8N 3Z1

Report Date: 2017/04/20
 Report #: R4432271
 Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B755837

Received: 2017/03/21, 09:45

Sample Matrix: Soil
 # Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Semivolatile Organic Compounds (TCLP)	1	2017/03/24	2017/03/25	CAM SOP-00301	EPA 8270D m
Cyanide (WAD) in Leachates	1	N/A	2017/03/25	CAM SOP-00457	OMOE 3015 m
Fluoride by ISE in Leachates	1	2017/03/23	2017/03/24	CAM SOP-00449	SM 22 4500-F- C m
Mercury (TCLP Leachable) (mg/L)	1	N/A	2017/03/24	CAM SOP-00453	EPA 7470A m
Total Metals in TCLP Leachate by ICPMS	1	2017/03/23	2017/03/23	CAM SOP-00447	EPA 6020B m
Nitrate(NO3) + Nitrite(NO2) in Leachate	1	N/A	2017/03/24	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Polychlorinated Biphenyl in Leachate	1	2017/03/24	2017/03/24	CAM SOP-00309	EPA 8082A m
TCLP - % Solids	1	2017/03/22	2017/03/23	CAM SOP-00401	EPA 1311 Update I m
TCLP - Extraction Fluid	1	N/A	2017/03/23	CAM SOP-00401	EPA 1311 Update I m
TCLP - Initial and final pH	1	N/A	2017/03/23	CAM SOP-00401	EPA 1311 Update I m
TCLP Zero Headspace Extraction	1	2017/03/22	2017/03/23	CAM SOP-00430	EPA 1311 m
VOCs in ZHE Leachates	1	2017/03/23	2017/03/24	CAM SOP-00226	EPA 8260C m

Remarks:

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.

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

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



Your Project #: 161-17781-00
Site Location: HSR FACILITY
Your C.O.C. #: 601902-32-01

Attention:Rachel Bryan

WSP Canada Inc
4 Hughson Street South
Suite 300
Hamilton, ON
CANADA L8N 3Z1

Report Date: 2017/04/20
Report #: R4432271
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CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B755837

Received: 2017/03/21, 09:45

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

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ashton Gibson, Project Manager

Email: AGibson@maxxam.ca

Phone# (905) 817-5700

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

RESULTS OF ANALYSES OF SOIL

Maxxam ID			EBW879		
Sampling Date			2017/03/17		
COC Number			601902-32-01		
	UNITS	Criteria	TCLP	RDL	QC Batch
Charge/Prep Analysis					
Amount Extracted (Wet Weight) (g)	N/A	-	25	N/A	4909231
Inorganics					
Final pH	pH	-	6.27		4909388
Leachable Fluoride (F-)	mg/L	150	0.48	0.10	4911460
Leachable Free Cyanide	mg/L	20	<0.010	0.010	4911432
Initial pH	pH	-	9.37		4909388
TCLP - % Solids	%	-	100	0.2	4909384
TCLP Extraction Fluid	N/A	-	FLUID 1		4909387
Leachable Nitrite (N)	mg/L	-	<0.10	0.10	4911461
Leachable Nitrate (N)	mg/L	-	<1.0	1.0	4911461
Leachable Nitrate + Nitrite (N)	mg/L	1000	<1.0	1.0	4911461
Metals					
Leachable Mercury (Hg)	mg/L	0.1	<0.0010	0.0010	4911503
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 347/90 Schedule 4 Leachate Quality Criteria (as amended by Reg 558/00) N/A = Not Applicable					

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			EBW879		
Sampling Date			2017/03/17		
COC Number			601902-32-01		
	UNITS	Criteria	TCLP	RDL	QC Batch
Metals					
Leachable Arsenic (As)	mg/L	2.5	<0.2	0.2	4911314
Leachable Barium (Ba)	mg/L	100	1.1	0.2	4911314
Leachable Boron (B)	mg/L	500	0.2	0.1	4911314
Leachable Cadmium (Cd)	mg/L	0.5	<0.05	0.05	4911314
Leachable Chromium (Cr)	mg/L	5	<0.1	0.1	4911314
Leachable Lead (Pb)	mg/L	5	<0.1	0.1	4911314
Leachable Selenium (Se)	mg/L	1	<0.1	0.1	4911314
Leachable Silver (Ag)	mg/L	5	<0.01	0.01	4911314
Leachable Uranium (U)	mg/L	10	<0.01	0.01	4911314
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 347/90 Schedule 4 Leachate Quality Criteria (as amended by Reg 558/00)					

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID			EBW879		
Sampling Date			2017/03/17		
COC Number			601902-32-01		
	UNITS	Criteria	TCLP	RDL	QC Batch
Semivolatile Organics					
Leachable Benzo(a)pyrene	ug/L	1	<0.10	0.10	4913309
Leachable m/p-Cresol	ug/L	200000	<2.5	2.5	4913309
Leachable o-Cresol	ug/L	200000	<2.5	2.5	4913309
Leachable Cresol Total	ug/L	200000	<2.5	2.5	4913309
Leachable 2,4-Dichlorophenol	ug/L	90000	<2.5	2.5	4913309
Leachable 2,4-Dinitrotoluene	ug/L	130	<10	10	4913309
Leachable Hexachlorobenzene	ug/L	130	<10	10	4913309
Leachable Hexachlorobutadiene	ug/L	500	<10	10	4913309
Leachable Hexachloroethane	ug/L	3000	<10	10	4913309
Leachable Nitrobenzene	ug/L	2000	<10	10	4913309
Leachable Pentachlorophenol	ug/L	6000	<2.5	2.5	4913309
Leachable Pyridine	ug/L	5000	<10	10	4913309
Leachable 2,3,4,6-Tetrachlorophenol	ug/L	10000	<2.5	2.5	4913309
Leachable 2,4,5-Trichlorophenol	ug/L	400000	<0.50	0.50	4913309
Leachable 2,4,6-Trichlorophenol	ug/L	500	<2.5	2.5	4913309
Surrogate Recovery (%)					
Leachable 2,4,6-Tribromophenol	%	-	82		4913309
Leachable 2-Fluorobiphenyl	%	-	78		4913309
Leachable 2-Fluorophenol	%	-	39		4913309
Leachable D14-Terphenyl (FS)	%	-	92		4913309
Leachable D5-Nitrobenzene	%	-	85		4913309
Leachable D5-Phenol	%	-	32		4913309
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 347/90 Schedule 4 Leachate Quality Criteria (as amended by Reg 558/00)					

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			EBW879		
Sampling Date			2017/03/17		
COC Number			601902-32-01		
	UNITS	Criteria	TCLP	RDL	QC Batch
Volatile Organics					
Leachable Benzene	mg/L	0.5	<0.020	0.020	4910657
Leachable Carbon Tetrachloride	mg/L	0.5	<0.020	0.020	4910657
Leachable Chlorobenzene	mg/L	8	<0.020	0.020	4910657
Leachable Chloroform	mg/L	10	<0.020	0.020	4910657
Leachable 1,2-Dichlorobenzene	mg/L	20	<0.050	0.050	4910657
Leachable 1,4-Dichlorobenzene	mg/L	0.5	<0.050	0.050	4910657
Leachable 1,2-Dichloroethane	mg/L	0.5	<0.050	0.050	4910657
Leachable 1,1-Dichloroethylene	mg/L	1.4	<0.020	0.020	4910657
Leachable Methylene Chloride(Dichloromethane)	mg/L	5	<0.20	0.20	4910657
Leachable Methyl Ethyl Ketone (2-Butanone)	mg/L	200	<1.0	1.0	4910657
Leachable Tetrachloroethylene	mg/L	3	<0.020	0.020	4910657
Leachable Trichloroethylene	mg/L	5	<0.020	0.020	4910657
Leachable Vinyl Chloride	mg/L	0.2	<0.020	0.020	4910657
Surrogate Recovery (%)					
Leachable 4-Bromofluorobenzene	%	-	99		4910657
Leachable D4-1,2-Dichloroethane	%	-	104		4910657
Leachable D8-Toluene	%	-	99		4910657
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 347/90 Schedule 4 Leachate Quality Criteria (as amended by Reg 558/00)					

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID			EBW879		
Sampling Date			2017/03/17		
COC Number			601902-32-01		
	UNITS	Criteria	TCLP	RDL	QC Batch
PCBs					
Leachable Total PCB	ug/L	300	<3.0	3.0	4912718
Surrogate Recovery (%)					
Leachable Decachlorobiphenyl	%	-	100		4912718
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
Criteria: Ontario Reg. 347/90 Schedule 4 Leachate Quality Criteria (as amended by Reg 558/00)					

GENERAL COMMENTS

Revised Report[2017/04/20]: TCLP C of A report created per client request.

Revised Report[2017/4/13]: O.Reg 153/04 Table 3 med/fine criteria added to report.

Cooler custody seal was present and intact.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4910657	JPN	Matrix Spike	Leachable 4-Bromofluorobenzene	2017/03/24		104	%	70 - 130
			Leachable D4-1,2-Dichloroethane	2017/03/24		104	%	70 - 130
			Leachable D8-Toluene	2017/03/24		99	%	70 - 130
			Leachable Benzene	2017/03/24		100	%	70 - 130
			Leachable Carbon Tetrachloride	2017/03/24		104	%	70 - 130
			Leachable Chlorobenzene	2017/03/24		99	%	70 - 130
			Leachable Chloroform	2017/03/24		101	%	70 - 130
			Leachable 1,2-Dichlorobenzene	2017/03/24		97	%	70 - 130
			Leachable 1,4-Dichlorobenzene	2017/03/24		101	%	70 - 130
			Leachable 1,2-Dichloroethane	2017/03/24		98	%	70 - 130
			Leachable 1,1-Dichloroethylene	2017/03/24		103	%	70 - 130
			Leachable Methylene Chloride(Dichloromethane)	2017/03/24		98	%	70 - 130
			Leachable Methyl Ethyl Ketone (2-Butanone)	2017/03/24		103	%	60 - 140
			Leachable Tetrachloroethylene	2017/03/24		98	%	70 - 130
			Leachable Trichloroethylene	2017/03/24		100	%	70 - 130
4910657	JPN	Spiked Blank	Leachable Vinyl Chloride	2017/03/24		103	%	70 - 130
			Leachable 4-Bromofluorobenzene	2017/03/24		102	%	70 - 130
			Leachable D4-1,2-Dichloroethane	2017/03/24		96	%	70 - 130
			Leachable D8-Toluene	2017/03/24		102	%	70 - 130
			Leachable Benzene	2017/03/24		96	%	70 - 130
			Leachable Carbon Tetrachloride	2017/03/24		98	%	70 - 130
			Leachable Chlorobenzene	2017/03/24		99	%	70 - 130
			Leachable Chloroform	2017/03/24		95	%	70 - 130
			Leachable 1,2-Dichlorobenzene	2017/03/24		95	%	70 - 130
			Leachable 1,4-Dichlorobenzene	2017/03/24		96	%	70 - 130
			Leachable 1,2-Dichloroethane	2017/03/24		96	%	70 - 130
			Leachable 1,1-Dichloroethylene	2017/03/24		100	%	70 - 130
			Leachable Methylene Chloride(Dichloromethane)	2017/03/24		93	%	70 - 130
			Leachable Methyl Ethyl Ketone (2-Butanone)	2017/03/24		100	%	60 - 140
			Leachable Tetrachloroethylene	2017/03/24		94	%	70 - 130
4910657	JPN	Method Blank	Leachable Trichloroethylene	2017/03/24		93	%	70 - 130
			Leachable Vinyl Chloride	2017/03/24		94	%	70 - 130
			Leachable 4-Bromofluorobenzene	2017/03/24		99	%	70 - 130
			Leachable D4-1,2-Dichloroethane	2017/03/24		102	%	70 - 130
			Leachable D8-Toluene	2017/03/24		99	%	70 - 130
			Leachable Benzene	2017/03/24	<0.020		mg/L	
			Leachable Carbon Tetrachloride	2017/03/24	<0.020		mg/L	
			Leachable Chlorobenzene	2017/03/24	<0.020		mg/L	
			Leachable Chloroform	2017/03/24	<0.020		mg/L	
			Leachable 1,2-Dichlorobenzene	2017/03/24	<0.050		mg/L	
			Leachable 1,4-Dichlorobenzene	2017/03/24	<0.050		mg/L	
			Leachable 1,2-Dichloroethane	2017/03/24	<0.050		mg/L	
			Leachable 1,1-Dichloroethylene	2017/03/24	<0.020		mg/L	
			Leachable Methylene Chloride(Dichloromethane)	2017/03/24	<0.20		mg/L	
			Leachable Methyl Ethyl Ketone (2-Butanone)	2017/03/24	<1.0		mg/L	
Leachable Tetrachloroethylene	2017/03/24	<0.020		mg/L				
4910657	JPN	RPD	Leachable Trichloroethylene	2017/03/24	<0.020		mg/L	
			Leachable Vinyl Chloride	2017/03/24	<0.020		mg/L	
			Leachable Benzene	2017/03/24	3.9		%	30
			Leachable Carbon Tetrachloride	2017/03/24	NC		%	30
			Leachable Chlorobenzene	2017/03/24	NC		%	30
			Leachable Chloroform	2017/03/24	NC		%	30

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Leachable 1,2-Dichlorobenzene	2017/03/24	NC		%	30
			Leachable 1,4-Dichlorobenzene	2017/03/24	NC		%	30
			Leachable 1,2-Dichloroethane	2017/03/24	NC		%	30
			Leachable 1,1-Dichloroethylene	2017/03/24	NC		%	30
			Leachable Methylene Chloride(Dichlorometh	2017/03/24	NC		%	30
			Leachable Methyl Ethyl Ketone (2-Butanone)	2017/03/24	NC		%	30
			Leachable Tetrachloroethylene	2017/03/24	NC		%	30
			Leachable Trichloroethylene	2017/03/24	NC		%	30
			Leachable Vinyl Chloride	2017/03/24	NC		%	30
4911314	JBW	Matrix Spike	Leachable Arsenic (As)	2017/03/23		100	%	80 - 120
			Leachable Barium (Ba)	2017/03/23		NC	%	80 - 120
			Leachable Boron (B)	2017/03/23		100	%	80 - 120
			Leachable Cadmium (Cd)	2017/03/23		98	%	80 - 120
			Leachable Chromium (Cr)	2017/03/23		98	%	80 - 120
			Leachable Lead (Pb)	2017/03/23		95	%	80 - 120
			Leachable Selenium (Se)	2017/03/23		101	%	80 - 120
			Leachable Silver (Ag)	2017/03/23		97	%	80 - 120
			Leachable Uranium (U)	2017/03/23		94	%	80 - 120
4911314	JBW	Leachate Blank	Leachable Arsenic (As)	2017/03/23	<0.2		mg/L	
			Leachable Barium (Ba)	2017/03/23	<0.2		mg/L	
			Leachable Boron (B)	2017/03/23	<0.1		mg/L	
			Leachable Cadmium (Cd)	2017/03/23	<0.05		mg/L	
			Leachable Chromium (Cr)	2017/03/23	<0.1		mg/L	
			Leachable Lead (Pb)	2017/03/23	<0.1		mg/L	
			Leachable Selenium (Se)	2017/03/23	<0.1		mg/L	
			Leachable Silver (Ag)	2017/03/23	<0.01		mg/L	
			Leachable Uranium (U)	2017/03/23	<0.01		mg/L	
4911314	JBW	Spiked Blank	Leachable Arsenic (As)	2017/03/23		102	%	80 - 120
			Leachable Barium (Ba)	2017/03/23		99	%	80 - 120
			Leachable Boron (B)	2017/03/23		107	%	80 - 120
			Leachable Cadmium (Cd)	2017/03/23		102	%	80 - 120
			Leachable Chromium (Cr)	2017/03/23		101	%	80 - 120
			Leachable Lead (Pb)	2017/03/23		99	%	80 - 120
			Leachable Selenium (Se)	2017/03/23		103	%	80 - 120
			Leachable Silver (Ag)	2017/03/23		100	%	80 - 120
			Leachable Uranium (U)	2017/03/23		97	%	80 - 120
4911314	JBW	Method Blank	Leachable Arsenic (As)	2017/03/23	<0.2		mg/L	
			Leachable Barium (Ba)	2017/03/23	<0.2		mg/L	
			Leachable Boron (B)	2017/03/23	<0.1		mg/L	
			Leachable Cadmium (Cd)	2017/03/23	<0.05		mg/L	
			Leachable Chromium (Cr)	2017/03/23	<0.1		mg/L	
			Leachable Lead (Pb)	2017/03/23	<0.1		mg/L	
			Leachable Selenium (Se)	2017/03/23	<0.1		mg/L	
			Leachable Silver (Ag)	2017/03/23	<0.01		mg/L	
			Leachable Uranium (U)	2017/03/23	<0.01		mg/L	
4911314	JBW	RPD	Leachable Arsenic (As)	2017/03/23	NC		%	35
			Leachable Barium (Ba)	2017/03/23	0.090		%	35
			Leachable Boron (B)	2017/03/23	NC		%	35
			Leachable Cadmium (Cd)	2017/03/23	NC		%	35
			Leachable Chromium (Cr)	2017/03/23	NC		%	35
			Leachable Lead (Pb)	2017/03/23	NC		%	35
			Leachable Selenium (Se)	2017/03/23	NC		%	35

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Leachable Silver (Ag)	2017/03/23	NC		%	35
			Leachable Uranium (U)	2017/03/23	NC		%	35
4911432	XQI	Matrix Spike	Leachable Free Cyanide	2017/03/25		107	%	80 - 120
4911432	XQI	Leachate Blank	Leachable Free Cyanide	2017/03/25	<0.010		mg/L	
4911432	XQI	Spiked Blank	Leachable Free Cyanide	2017/03/25		106	%	80 - 120
4911432	XQI	Method Blank	Leachable Free Cyanide	2017/03/25	<0.0020		mg/L	
4911432	XQI	RPD	Leachable Free Cyanide	2017/03/25	NC		%	20
4911460	SAU	Matrix Spike	Leachable Fluoride (F-)	2017/03/24		102	%	80 - 120
4911460	SAU	Leachate Blank	Leachable Fluoride (F-)	2017/03/24	<0.10		mg/L	
4911460	SAU	Spiked Blank	Leachable Fluoride (F-)	2017/03/24		104	%	80 - 120
4911460	SAU	Method Blank	Leachable Fluoride (F-)	2017/03/24	<0.10		mg/L	
4911460	SAU	RPD	Leachable Fluoride (F-)	2017/03/24	0.96		%	25
4911461	C_N	Matrix Spike	Leachable Nitrite (N)	2017/03/24		100	%	80 - 120
			Leachable Nitrate (N)	2017/03/24		103	%	80 - 120
			Leachable Nitrate + Nitrite (N)	2017/03/24		102	%	80 - 120
4911461	C_N	Leachate Blank	Leachable Nitrite (N)	2017/03/24	<0.10		mg/L	
			Leachable Nitrate (N)	2017/03/24	<1.0		mg/L	
			Leachable Nitrate + Nitrite (N)	2017/03/24	<1.0		mg/L	
4911461	C_N	Spiked Blank	Leachable Nitrite (N)	2017/03/24		100	%	80 - 120
			Leachable Nitrate (N)	2017/03/24		104	%	80 - 120
			Leachable Nitrate + Nitrite (N)	2017/03/24		104	%	80 - 120
4911461	C_N	Method Blank	Leachable Nitrite (N)	2017/03/24	<0.10		mg/L	
			Leachable Nitrate (N)	2017/03/24	<1.0		mg/L	
			Leachable Nitrate + Nitrite (N)	2017/03/24	<1.0		mg/L	
4911461	C_N	RPD	Leachable Nitrite (N)	2017/03/24	NC		%	25
			Leachable Nitrate (N)	2017/03/24	NC		%	25
			Leachable Nitrate + Nitrite (N)	2017/03/24	NC		%	25
4911503	RON	Matrix Spike	Leachable Mercury (Hg)	2017/03/24		110	%	75 - 125
4911503	RON	Leachate Blank	Leachable Mercury (Hg)	2017/03/24	<0.0010		mg/L	
4911503	RON	Spiked Blank	Leachable Mercury (Hg)	2017/03/24		108	%	80 - 120
4911503	RON	Method Blank	Leachable Mercury (Hg)	2017/03/24	<0.0010		mg/L	
4911503	RON	RPD	Leachable Mercury (Hg)	2017/03/24	NC		%	25
4912718	LPG	Matrix Spike	Leachable Decachlorobiphenyl	2017/03/24		100	%	30 - 130
			Leachable Total PCB	2017/03/24		97	%	30 - 130
4912718	LPG	Spiked Blank	Leachable Decachlorobiphenyl	2017/03/24		93	%	30 - 130
			Leachable Total PCB	2017/03/24		95	%	30 - 130
4912718	LPG	Method Blank	Leachable Decachlorobiphenyl	2017/03/24		92	%	30 - 130
			Leachable Total PCB	2017/03/24	<3.0		ug/L	
4912718	LPG	RPD	Leachable Total PCB	2017/03/24	NC		%	40
4913309	WZ	Matrix Spike	Leachable 2,4,6-Tribromophenol	2017/03/25		83	%	10 - 130
			Leachable 2-Fluorobiphenyl	2017/03/25		64	%	30 - 130
			Leachable 2-Fluorophenol	2017/03/25		34	%	10 - 130
			Leachable D14-Terphenyl (FS)	2017/03/25		95	%	30 - 130
			Leachable D5-Nitrobenzene	2017/03/25		74	%	30 - 130
			Leachable D5-Phenol	2017/03/25		28	%	10 - 130
			Leachable Benzo(a)pyrene	2017/03/25		102	%	30 - 130
			Leachable m/p-Cresol	2017/03/25		58	%	10 - 130
			Leachable o-Cresol	2017/03/25		73	%	10 - 130
			Leachable Cresol Total	2017/03/25		65	%	10 - 130
			Leachable 2,4-Dichlorophenol	2017/03/25		70	%	10 - 130
			Leachable 2,4-Dinitrotoluene	2017/03/25		104	%	30 - 130
			Leachable Hexachlorobenzene	2017/03/25		106	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits			
4913309	WZ	Spiked Blank	Leachable Hexachlorobutadiene	2017/03/25		81	%	30 - 130			
			Leachable Hexachloroethane	2017/03/25		83	%	30 - 130			
			Leachable Nitrobenzene	2017/03/25		91	%	30 - 130			
			Leachable Pentachlorophenol	2017/03/25		89	%	30 - 130			
			Leachable Pyridine	2017/03/25		22	%	10 - 130			
			Leachable 2,3,4,6-Tetrachlorophenol	2017/03/25		89	%	10 - 130			
			Leachable 2,4,5-Trichlorophenol	2017/03/25		76	%	10 - 130			
			Leachable 2,4,6-Trichlorophenol	2017/03/25		72	%	10 - 130			
			Leachable 2,4,6-Tribromophenol	2017/03/25		87	%	10 - 130			
			Leachable 2-Fluorobiphenyl	2017/03/25		71	%	30 - 130			
			Leachable 2-Fluorophenol	2017/03/25		36	%	10 - 130			
			Leachable D14-Terphenyl (FS)	2017/03/25		97	%	30 - 130			
			Leachable D5-Nitrobenzene	2017/03/25		85	%	30 - 130			
			Leachable D5-Phenol	2017/03/25		33	%	10 - 130			
			Leachable Benzo(a)pyrene	2017/03/25		103	%	30 - 130			
			Leachable m/p-Cresol	2017/03/25		68	%	10 - 130			
			Leachable o-Cresol	2017/03/25		83	%	10 - 130			
			Leachable Cresol Total	2017/03/25		75	%	10 - 130			
			Leachable 2,4-Dichlorophenol	2017/03/25		78	%	10 - 130			
			Leachable 2,4-Dinitrotoluene	2017/03/25		109	%	30 - 130			
			Leachable Hexachlorobenzene	2017/03/25		113	%	30 - 130			
			Leachable Hexachlorobutadiene	2017/03/25		90	%	30 - 130			
			Leachable Hexachloroethane	2017/03/25		92	%	30 - 130			
			Leachable Nitrobenzene	2017/03/25		105	%	30 - 130			
			Leachable Pentachlorophenol	2017/03/25		90	%	30 - 130			
			Leachable Pyridine	2017/03/25		31	%	10 - 130			
			Leachable 2,3,4,6-Tetrachlorophenol	2017/03/25		93	%	10 - 130			
Leachable 2,4,5-Trichlorophenol	2017/03/25		77	%	10 - 130						
Leachable 2,4,6-Trichlorophenol	2017/03/25		83	%	10 - 130						
4913309	WZ	Method Blank	Leachable 2,4,6-Tribromophenol	2017/03/25		70	%	10 - 130			
			Leachable 2-Fluorobiphenyl	2017/03/25		62	%	30 - 130			
			Leachable 2-Fluorophenol	2017/03/25		32	%	10 - 130			
			Leachable D14-Terphenyl (FS)	2017/03/25		92	%	30 - 130			
			Leachable D5-Nitrobenzene	2017/03/25		69	%	30 - 130			
			Leachable D5-Phenol	2017/03/25		25	%	10 - 130			
			Leachable Benzo(a)pyrene	2017/03/25	<0.10		ug/L				
			Leachable m/p-Cresol	2017/03/25	<2.5		ug/L				
			Leachable o-Cresol	2017/03/25	<2.5		ug/L				
			Leachable Cresol Total	2017/03/25	<2.5		ug/L				
			Leachable 2,4-Dichlorophenol	2017/03/25	<2.5		ug/L				
			Leachable 2,4-Dinitrotoluene	2017/03/25	<10		ug/L				
			Leachable Hexachlorobenzene	2017/03/25	<10		ug/L				
			Leachable Hexachlorobutadiene	2017/03/25	<10		ug/L				
			Leachable Hexachloroethane	2017/03/25	<10		ug/L				
			Leachable Nitrobenzene	2017/03/25	<10		ug/L				
			Leachable Pentachlorophenol	2017/03/25	<2.5		ug/L				
			Leachable Pyridine	2017/03/25	<10		ug/L				
			Leachable 2,3,4,6-Tetrachlorophenol	2017/03/25	<2.5		ug/L				
			Leachable 2,4,5-Trichlorophenol	2017/03/25	<0.50		ug/L				
			Leachable 2,4,6-Trichlorophenol	2017/03/25	<2.5		ug/L				
			4913309	WZ	RPD	Leachable Benzo(a)pyrene	2017/03/25	NC		%	40
						Leachable m/p-Cresol	2017/03/25	NC		%	40

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Leachable o-Cresol	2017/03/25	NC		%	40
			Leachable Cresol Total	2017/03/25	NC		%	40
			Leachable 2,4-Dichlorophenol	2017/03/25	NC		%	40
			Leachable 2,4-Dinitrotoluene	2017/03/25	NC		%	40
			Leachable Hexachlorobenzene	2017/03/25	NC		%	40
			Leachable Hexachlorobutadiene	2017/03/25	NC		%	40
			Leachable Hexachloroethane	2017/03/25	NC		%	40
			Leachable Nitrobenzene	2017/03/25	NC		%	40
			Leachable Pentachlorophenol	2017/03/25	NC		%	40
			Leachable Pyridine	2017/03/25	NC		%	40
			Leachable 2,3,4,6-Tetrachlorophenol	2017/03/25	NC		%	40
			Leachable 2,4,5-Trichlorophenol	2017/03/25	NC		%	40
			Leachable 2,4,6-Trichlorophenol	2017/03/25	NC		%	40

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.

Leachate Blank: A blank matrix containing all reagents used in the leaching procedure. Used to determine any process contamination.

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

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

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

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

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

VALIDATION SIGNATURE PAGE

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




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

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

Your Project #: 161-17781-00
 Site Location: HSR FACILITY
 Your C.O.C. #: 601902-31-01

Attention: Rachel Bryan

WSP Canada Inc
 4 Hughson Street South
 Suite 300
 Hamilton, ON
 CANADA L8N 3Z1

Report Date: 2017/04/13
 Report #: R4426320
 Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B757809

Received: 2017/03/23, 09:00

Sample Matrix: Soil
 # Samples Received: 6

Analyses	Quantity	Date		Laboratory Method	Reference
		Extracted	Analyzed		
Methylnaphthalene Sum	6	N/A	2017/03/29	CAM SOP-00301	EPA 8270D m
Hot Water Extractable Boron	6	2017/03/27	2017/03/28	CAM SOP-00408	R153 Ana. Prot. 2011
1,3-Dichloropropene Sum	6	N/A	2017/03/28		EPA 8260C m
Free (WAD) Cyanide	4	2017/03/24	2017/03/27	CAM SOP-00457	OMOE E3015 m
Free (WAD) Cyanide	2	2017/03/25	2017/03/28	CAM SOP-00457	OMOE E3015 m
Conductivity	6	2017/03/28	2017/03/28	CAM SOP-00414	OMOE E3530 v1 m
Hexavalent Chromium in Soil by IC (1)	6	2017/03/27	2017/03/28	CAM SOP-00436	EPA 3060/7199 m
Petroleum Hydrocarbons F2-F4 in Soil (2)	6	2017/03/28	2017/03/29	CAM SOP-00316	CCME CWS m
F4G (CCME Hydrocarbons Gravimetric)	4	2017/03/30	2017/03/30	CAM SOP-00316	CCME PHC-CWS m
Strong Acid Leachable Metals by ICPMS	6	2017/03/27	2017/03/27	CAM SOP-00447	EPA 6020B m
Moisture	4	N/A	2017/03/25	CAM SOP-00445	Carter 2nd ed 51.2 m
Moisture	2	N/A	2017/03/27	CAM SOP-00445	Carter 2nd ed 51.2 m
PAH Compounds in Soil by GC/MS (SIM)	6	2017/03/27	2017/03/28	CAM SOP-00318	EPA 8270D m
pH CaCl2 EXTRACT	6	2017/03/27	2017/03/27	CAM SOP-00413	EPA 9045 D m
Sodium Adsorption Ratio (SAR)	6	N/A	2017/03/29	CAM SOP-00102	EPA 6010C
SAR - ICP Metals	6	2017/03/28	2017/03/28	CAM SOP-00408	EPA 6010C m
Volatile Organic Compounds and F1 PHCs	6	N/A	2017/03/27	CAM SOP-00230	EPA 8260C m

Remarks:

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.



Your Project #: 161-17781-00
Site Location: HSR FACILITY
Your C.O.C. #: 601902-31-01

Attention: Rachel Bryan

WSP Canada Inc
4 Hughson Street South
Suite 300
Hamilton, ON
CANADA L8N 3Z1

Report Date: 2017/04/13
Report #: R4426320
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B757809

Received: 2017/03/23, 09:00

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.

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

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

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

(1) Soils are reported on a dry weight basis unless otherwise specified.

(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ashton Gibson, Project Manager

Email: AGibson@maxxam.ca

Phone# (905) 817-5700

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

RESULTS OF ANALYSES OF SOIL

Maxxam ID			ECG054	ECG055	ECG056	ECG057		ECG058		
Sampling Date			2017/03/20	2017/03/20	2017/03/20	2017/03/20		2017/03/20		
COC Number			601902-31-01	601902-31-01	601902-31-01	601902-31-01		601902-31-01		
	UNITS	Criteria	17-15 SS2	17-15 SS4	17-16 SS4	17-16 SS8	QC Batch	17-17 SS1	RDL	QC Batch
Calculated Parameters										
Sodium Adsorption Ratio	N/A	12	10	2.9	1.9	5.5	4910791	110		4910791
Inorganics										
Conductivity	mS/cm	1.4	0.98	0.61	0.95	2.7	4914977	8.5	0.002	4915166
Free Cyanide	ug/g	0.051	<0.01	<0.01	<0.01	<0.01	4913764	<0.01	0.01	4914242
Moisture	%	-	12	19	5.3	30	4914127	7.2	1.0	4914629
Available (CaCl2) pH	pH	-	10.6	7.70	11.6	7.29	4914795	9.47		4914796
Metals										
Soluble Calcium (Ca)	mg/L	-	26.2	39.6	111	174	4914976	19.3	0.5	4915165
Soluble Magnesium (Mg)	mg/L	-	<0.5	7.3	<0.5	43.4	4914976	0.6	0.5	4915165
Soluble Sodium (Na)	mg/L	-	187	76	72	313	4914976	1860	5	4915165
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture										

RESULTS OF ANALYSES OF SOIL

Maxxam ID			ECG059		
Sampling Date			2017/03/20		
COC Number			601902-31-01		
	UNITS	Criteria	17-17 SS4	RDL	QC Batch
Calculated Parameters					
Sodium Adsorption Ratio	N/A	12	2.8		4910791
Inorganics					
Conductivity	mS/cm	1.4	1.3	0.002	4915166
Free Cyanide	ug/g	0.051	<0.01	0.01	4914242
Moisture	%	-	9.9	1.0	4914629
Available (CaCl2) pH	pH	-	10.6		4914796
Metals					
Soluble Calcium (Ca)	mg/L	-	140	0.5	4915165
Soluble Magnesium (Mg)	mg/L	-	1.6	0.5	4915165
Soluble Sodium (Na)	mg/L	-	122	5	4915165
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)					
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water					
Condition					
Soil - Industrial/Commercial/Community- Medium and Fine Texture					

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			ECG054	ECG055	ECG056	ECG057		
Sampling Date			2017/03/20	2017/03/20	2017/03/20	2017/03/20		
COC Number			601902-31-01	601902-31-01	601902-31-01	601902-31-01		
	UNITS	Criteria	17-15 SS2	17-15 SS4	17-16 SS4	17-16 SS8	RDL	QC Batch
Inorganics								
Chromium (VI)	ug/g	10	0.7	<0.2	<0.2	<0.2	0.2	4915043
Metals								
Hot Water Ext. Boron (B)	ug/g	2	0.96	0.34	0.29	0.31	0.050	4914938
Acid Extractable Antimony (Sb)	ug/g	50	4.6	<0.20	0.62	<0.20	0.20	4914873
Acid Extractable Arsenic (As)	ug/g	18	7.2	2.8	6.2	2.6	1.0	4914873
Acid Extractable Barium (Ba)	ug/g	670	82	140	96	81	0.50	4914873
Acid Extractable Beryllium (Be)	ug/g	10	0.56	0.80	0.86	0.56	0.20	4914873
Acid Extractable Boron (B)	ug/g	120	16	11	20	5.4	5.0	4914873
Acid Extractable Cadmium (Cd)	ug/g	1.9	1.1	<0.10	0.75	<0.10	0.10	4914873
Acid Extractable Chromium (Cr)	ug/g	160	89	28	23	19	1.0	4914873
Acid Extractable Cobalt (Co)	ug/g	100	4.9	13	4.2	7.9	0.10	4914873
Acid Extractable Copper (Cu)	ug/g	300	28	23	28	17	0.50	4914873
Acid Extractable Lead (Pb)	ug/g	120	120	14	70	11	1.0	4914873
Acid Extractable Molybdenum (Mo)	ug/g	40	1.9	<0.50	1.2	<0.50	0.50	4914873
Acid Extractable Nickel (Ni)	ug/g	340	16	31	12	16	0.50	4914873
Acid Extractable Selenium (Se)	ug/g	5.5	0.67	<0.50	<0.50	<0.50	0.50	4914873
Acid Extractable Silver (Ag)	ug/g	50	<0.20	<0.20	<0.20	<0.20	0.20	4914873
Acid Extractable Thallium (Tl)	ug/g	3.3	0.15	0.14	0.071	0.14	0.050	4914873
Acid Extractable Uranium (U)	ug/g	33	0.81	0.70	0.76	0.57	0.050	4914873
Acid Extractable Vanadium (V)	ug/g	86	69	35	21	30	5.0	4914873
Acid Extractable Zinc (Zn)	ug/g	340	460	64	400	54	5.0	4914873
Acid Extractable Mercury (Hg)	ug/g	20	0.080	<0.050	<0.050	<0.050	0.050	4914873
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture								

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			ECG058		ECG059		
Sampling Date			2017/03/20		2017/03/20		
COC Number			601902-31-01		601902-31-01		
	UNITS	Criteria	17-17 SS1	RDL	17-17 SS4	RDL	QC Batch
Inorganics							
Chromium (VI)	ug/g	10	0.5	0.2	<0.2	0.2	4915040
Metals							
Hot Water Ext. Boron (B)	ug/g	2	0.76	0.050	0.55	0.050	4915015
Acid Extractable Antimony (Sb)	ug/g	50	0.45	0.20	1.2	0.20	4914914
Acid Extractable Arsenic (As)	ug/g	18	5.3	1.0	6.8	1.0	4914914
Acid Extractable Barium (Ba)	ug/g	670	70	0.50	91	0.50	4914914
Acid Extractable Beryllium (Be)	ug/g	10	0.48	0.20	0.46	0.20	4914914
Acid Extractable Boron (B)	ug/g	120	12	5.0	17	5.0	4914914
Acid Extractable Cadmium (Cd)	ug/g	1.9	0.37	0.10	1.3	0.10	4914914
Acid Extractable Chromium (Cr)	ug/g	160	23	1.0	34	1.0	4914914
Acid Extractable Cobalt (Co)	ug/g	100	5.7	0.10	5.7	0.10	4914914
Acid Extractable Copper (Cu)	ug/g	300	27	0.50	41	0.50	4914914
Acid Extractable Lead (Pb)	ug/g	120	36	1.0	170	1.0	4914914
Acid Extractable Molybdenum (Mo)	ug/g	40	1.2	0.50	1.8	0.50	4914914
Acid Extractable Nickel (Ni)	ug/g	340	13	0.50	16	0.50	4914914
Acid Extractable Selenium (Se)	ug/g	5.5	<0.50	0.50	<0.50	0.50	4914914
Acid Extractable Silver (Ag)	ug/g	50	<0.20	0.20	<0.20	0.20	4914914
Acid Extractable Thallium (Tl)	ug/g	3.3	0.092	0.050	0.16	0.050	4914914
Acid Extractable Uranium (U)	ug/g	33	0.78	0.050	0.84	0.050	4914914
Acid Extractable Vanadium (V)	ug/g	86	21	5.0	23	5.0	4914914
Acid Extractable Zinc (Zn)	ug/g	340	220	5.0	4200	25	4914914
Acid Extractable Mercury (Hg)	ug/g	20	0.054	0.050	0.20	0.050	4914914
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture							

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID			ECG054		ECG055		ECG056		ECG057		
Sampling Date			2017/03/20		2017/03/20		2017/03/20		2017/03/20		
COC Number			601902-31-01		601902-31-01		601902-31-01		601902-31-01		
	UNITS	Criteria	17-15 SS2	RDL	17-15 SS4	RDL	17-16 SS4	RDL	17-16 SS8	RDL	QC Batch
Calculated Parameters											
Methylnaphthalene, 2-(1-)	ug/g	85	0.15	0.071	<0.0071	0.0071	<0.071	0.071	1.0	0.0071	4910945
Polyaromatic Hydrocarbons											
Acenaphthene	ug/g	96	<0.050	0.050	<0.0050	0.0050	<0.050	0.050	0.0070	0.0050	4915417
Acenaphthylene	ug/g	0.17	<0.050	0.050	<0.0050	0.0050	<0.050	0.050	<0.0050	0.0050	4915417
Anthracene	ug/g	0.74	<0.050	0.050	<0.0050	0.0050	<0.050	0.050	0.014	0.0050	4915417
Benzo(a)anthracene	ug/g	0.96	0.31	0.050	<0.0050	0.0050	0.10	0.050	<0.0070 (1)	0.0070	4915417
Benzo(a)pyrene	ug/g	0.3	0.35	0.050	<0.0050	0.0050	0.12	0.050	0.0060	0.0050	4915417
Benzo(b/j)fluoranthene	ug/g	0.96	0.52	0.050	<0.0050	0.0050	0.16	0.050	<0.0050	0.0050	4915417
Benzo(g,h,i)perylene	ug/g	9.6	0.31	0.050	<0.0050	0.0050	0.17	0.050	0.016	0.0050	4915417
Benzo(k)fluoranthene	ug/g	0.96	0.16	0.050	<0.0050	0.0050	<0.050	0.050	<0.0050	0.0050	4915417
Chrysene	ug/g	9.6	0.33	0.050	<0.0050	0.0050	0.090	0.050	<0.0050	0.0050	4915417
Dibenz(a,h)anthracene	ug/g	0.1	0.059	0.050	<0.0050	0.0050	<0.050	0.050	<0.0050	0.0050	4915417
Fluoranthene	ug/g	9.6	0.40	0.050	<0.0050	0.0050	0.22	0.050	0.0058	0.0050	4915417
Fluorene	ug/g	69	<0.050	0.050	<0.0050	0.0050	<0.050	0.050	0.016	0.0050	4915417
Indeno(1,2,3-cd)pyrene	ug/g	0.95	0.22	0.050	<0.0050	0.0050	0.099	0.050	0.0098	0.0050	4915417
1-Methylnaphthalene	ug/g	85	0.075	0.050	<0.0050	0.0050	<0.050	0.050	0.46	0.0050	4915417
2-Methylnaphthalene	ug/g	85	0.073	0.050	<0.0050	0.0050	<0.050	0.050	0.58	0.0050	4915417
Naphthalene	ug/g	28	<0.050	0.050	<0.0050	0.0050	<0.050	0.050	0.35	0.0050	4915417
Phenanthrene	ug/g	16	0.21	0.050	<0.0050	0.0050	0.16	0.050	0.037	0.0050	4915417
Pyrene	ug/g	96	0.41	0.050	<0.0050	0.0050	0.18	0.050	0.030	0.0050	4915417
Surrogate Recovery (%)											
D10-Anthracene	%	-	97		94		98		91		4915417
D14-Terphenyl (FS)	%	-	89		92		89		89		4915417
D8-Acenaphthylene	%	-	89		91		89		89		4915417
RDL = Reportable Detection Limit											
QC Batch = Quality Control Batch											
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)											
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition											
Soil - Industrial/Commercial/Community- Medium and Fine Texture											
(1) Detection Limit was raised due to matrix interferences.											

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID			ECG058	ECG059		
Sampling Date			2017/03/20	2017/03/20		
COC Number			601902-31-01	601902-31-01		
	UNITS	Criteria	17-17 SS1	17-17 SS4	RDL	QC Batch
Calculated Parameters						
Methylnaphthalene, 2-(1-)	ug/g	85	0.23	2.2	0.071	4910945
Polyaromatic Hydrocarbons						
Acenaphthene	ug/g	96	0.72	6.9	0.050	4915417
Acenaphthylene	ug/g	0.17	0.070	0.19	0.050	4915417
Anthracene	ug/g	0.74	1.3	10	0.050	4915417
Benzo(a)anthracene	ug/g	0.96	4.1	24	0.050	4915417
Benzo(a)pyrene	ug/g	0.3	4.1	22	0.050	4915417
Benzo(b/j)fluoranthene	ug/g	0.96	5.4	28	0.050	4915417
Benzo(g,h,i)perylene	ug/g	9.6	2.5	13	0.050	4915417
Benzo(k)fluoranthene	ug/g	0.96	1.9	11	0.050	4915417
Chrysene	ug/g	9.6	3.6	20	0.050	4915417
Dibenz(a,h)anthracene	ug/g	0.1	0.65	3.5	0.050	4915417
Fluoranthene	ug/g	9.6	9.6	60	0.050	4915417
Fluorene	ug/g	69	0.60	5.7	0.050	4915417
Indeno(1,2,3-cd)pyrene	ug/g	0.95	2.8	14	0.050	4915417
1-Methylnaphthalene	ug/g	85	0.11	1.1	0.050	4915417
2-Methylnaphthalene	ug/g	85	0.12	1.1	0.050	4915417
Naphthalene	ug/g	28	0.21	2.2	0.050	4915417
Phenanthrene	ug/g	16	6.4	50	0.050	4915417
Pyrene	ug/g	96	7.5	46	0.050	4915417
Surrogate Recovery (%)						
D10-Anthracene	%	-	99	97		4915417
D14-Terphenyl (FS)	%	-	94	109		4915417
D8-Acenaphthylene	%	-	93	92		4915417
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture						

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			ECG054	ECG055	ECG056	ECG057	ECG058		
Sampling Date			2017/03/20	2017/03/20	2017/03/20	2017/03/20	2017/03/20		
COC Number			601902-31-01	601902-31-01	601902-31-01	601902-31-01	601902-31-01		
	UNITS	Criteria	17-15 SS2	17-15 SS4	17-16 SS4	17-16 SS8	17-17 SS1	RDL	QC Batch

Calculated Parameters

1,3-Dichloropropene (cis+trans)	ug/g	0.21	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4911016
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Volatile Organics

Acetone (2-Propanone)	ug/g	28	<0.50	<0.50	<0.50	1.1	<0.50	0.50	4912420
Benzene	ug/g	0.4	0.044	<0.020	<0.020	<0.020	<0.020	0.020	4912420
Bromodichloromethane	ug/g	18	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
Bromoform	ug/g	1.7	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
Bromomethane	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
Carbon Tetrachloride	ug/g	1.5	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
Chlorobenzene	ug/g	2.7	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
Chloroform	ug/g	0.18	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
Dibromochloromethane	ug/g	13	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
1,2-Dichlorobenzene	ug/g	8.5	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
1,3-Dichlorobenzene	ug/g	12	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
1,4-Dichlorobenzene	ug/g	0.84	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
Dichlorodifluoromethane (FREON 12)	ug/g	25	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
1,1-Dichloroethane	ug/g	21	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
1,2-Dichloroethane	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
1,1-Dichloroethylene	ug/g	0.48	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
cis-1,2-Dichloroethylene	ug/g	37	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
trans-1,2-Dichloroethylene	ug/g	9.3	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
1,2-Dichloropropane	ug/g	0.68	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
cis-1,3-Dichloropropene	ug/g	0.21	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	4912420
trans-1,3-Dichloropropene	ug/g	0.21	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	4912420
Ethylbenzene	ug/g	19	0.21	<0.020	<0.020	0.079	<0.020	0.020	4912420
Ethylene Dibromide	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
Hexane	ug/g	88	0.19	<0.050	<0.050	0.59	<0.050	0.050	4912420
Methylene Chloride(Dichloromethane)	ug/g	2	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
Methyl Ethyl Ketone (2-Butanone)	ug/g	88	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4912420
Methyl Isobutyl Ketone	ug/g	210	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4912420
Methyl t-butyl ether (MTBE)	ug/g	3.2	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
Styrene	ug/g	43	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
1,1,1,2-Tetrachloroethane	ug/g	0.11	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)

Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

Soil - Industrial/Commercial/Community- Medium and Fine Texture

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			ECG054	ECG055	ECG056	ECG057	ECG058		
Sampling Date			2017/03/20	2017/03/20	2017/03/20	2017/03/20	2017/03/20		
COC Number			601902-31-01	601902-31-01	601902-31-01	601902-31-01	601902-31-01		
	UNITS	Criteria	17-15 SS2	17-15 SS4	17-16 SS4	17-16 SS8	17-17 SS1	RDL	QC Batch
1,1,2,2-Tetrachloroethane	ug/g	0.094	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
Tetrachloroethylene	ug/g	21	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
Toluene	ug/g	78	0.88	<0.020	<0.020	0.090	<0.020	0.020	4912420
1,1,1-Trichloroethane	ug/g	12	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
1,1,2-Trichloroethane	ug/g	0.11	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
Trichloroethylene	ug/g	0.61	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
Trichlorofluoromethane (FREON 11)	ug/g	5.8	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4912420
Vinyl Chloride	ug/g	0.25	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4912420
p+m-Xylene	ug/g	-	0.84	<0.020	<0.020	1.3	<0.020	0.020	4912420
o-Xylene	ug/g	-	0.61	<0.020	<0.020	0.56	<0.020	0.020	4912420
Total Xylenes	ug/g	30	1.5	<0.020	<0.020	1.8	<0.020	0.020	4912420
F1 (C6-C10)	ug/g	65	12	<10	<10	80	<10	10	4912420
F1 (C6-C10) - BTEX	ug/g	65	<10	<10	<10	78	<10	10	4912420
Surrogate Recovery (%)									
4-Bromofluorobenzene	%	-	98	97	95	97	97		4912420
D10-o-Xylene	%	-	87	89	82	82	89		4912420
D4-1,2-Dichloroethane	%	-	107	106	107	108	105		4912420
D8-Toluene	%	-	101	99	101	103	100		4912420
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)									
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition									
Soil - Industrial/Commercial/Community- Medium and Fine Texture									

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			ECG059		
Sampling Date			2017/03/20		
COC Number			601902-31-01		
	UNITS	Criteria	17-17 SS4	RDL	QC Batch
Calculated Parameters					
1,3-Dichloropropene (cis+trans)	ug/g	0.21	<0.050	0.050	4911016
Volatile Organics					
Acetone (2-Propanone)	ug/g	28	<0.50	0.50	4912420
Benzene	ug/g	0.4	<0.020	0.020	4912420
Bromodichloromethane	ug/g	18	<0.050	0.050	4912420
Bromoform	ug/g	1.7	<0.050	0.050	4912420
Bromomethane	ug/g	0.05	<0.050	0.050	4912420
Carbon Tetrachloride	ug/g	1.5	<0.050	0.050	4912420
Chlorobenzene	ug/g	2.7	<0.050	0.050	4912420
Chloroform	ug/g	0.18	<0.050	0.050	4912420
Dibromochloromethane	ug/g	13	<0.050	0.050	4912420
1,2-Dichlorobenzene	ug/g	8.5	<0.050	0.050	4912420
1,3-Dichlorobenzene	ug/g	12	<0.050	0.050	4912420
1,4-Dichlorobenzene	ug/g	0.84	<0.050	0.050	4912420
Dichlorodifluoromethane (FREON 12)	ug/g	25	<0.050	0.050	4912420
1,1-Dichloroethane	ug/g	21	<0.050	0.050	4912420
1,2-Dichloroethane	ug/g	0.05	<0.050	0.050	4912420
1,1-Dichloroethylene	ug/g	0.48	<0.050	0.050	4912420
cis-1,2-Dichloroethylene	ug/g	37	<0.050	0.050	4912420
trans-1,2-Dichloroethylene	ug/g	9.3	<0.050	0.050	4912420
1,2-Dichloropropane	ug/g	0.68	<0.050	0.050	4912420
cis-1,3-Dichloropropene	ug/g	0.21	<0.030	0.030	4912420
trans-1,3-Dichloropropene	ug/g	0.21	<0.040	0.040	4912420
Ethylbenzene	ug/g	19	<0.020	0.020	4912420
Ethylene Dibromide	ug/g	0.05	<0.050	0.050	4912420
Hexane	ug/g	88	<0.050	0.050	4912420
Methylene Chloride(Dichloromethane)	ug/g	2	<0.050	0.050	4912420
Methyl Ethyl Ketone (2-Butanone)	ug/g	88	<0.50	0.50	4912420
Methyl Isobutyl Ketone	ug/g	210	<0.50	0.50	4912420
Methyl t-butyl ether (MTBE)	ug/g	3.2	<0.050	0.050	4912420
Styrene	ug/g	43	<0.050	0.050	4912420
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)					
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition					
Soil - Industrial/Commercial/Community- Medium and Fine Texture					

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			ECG059		
Sampling Date			2017/03/20		
COC Number			601902-31-01		
	UNITS	Criteria	17-17 SS4	RDL	QC Batch
1,1,1,2-Tetrachloroethane	ug/g	0.11	<0.050	0.050	4912420
1,1,2,2-Tetrachloroethane	ug/g	0.094	<0.050	0.050	4912420
Tetrachloroethylene	ug/g	21	<0.050	0.050	4912420
Toluene	ug/g	78	0.029	0.020	4912420
1,1,1-Trichloroethane	ug/g	12	<0.050	0.050	4912420
1,1,2-Trichloroethane	ug/g	0.11	<0.050	0.050	4912420
Trichloroethylene	ug/g	0.61	0.12	0.050	4912420
Trichlorofluoromethane (FREON 11)	ug/g	5.8	<0.050	0.050	4912420
Vinyl Chloride	ug/g	0.25	<0.020	0.020	4912420
p+m-Xylene	ug/g	-	0.034	0.020	4912420
o-Xylene	ug/g	-	0.021	0.020	4912420
Total Xylenes	ug/g	30	0.055	0.020	4912420
F1 (C6-C10)	ug/g	65	<10	10	4912420
F1 (C6-C10) - BTEX	ug/g	65	<10	10	4912420
Surrogate Recovery (%)					
4-Bromofluorobenzene	%	-	96		4912420
D10-o-Xylene	%	-	92		4912420
D4-1,2-Dichloroethane	%	-	107		4912420
D8-Toluene	%	-	100		4912420
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture					

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			ECG054	ECG055	ECG056	ECG057	ECG058		
Sampling Date			2017/03/20	2017/03/20	2017/03/20	2017/03/20	2017/03/20		
COC Number			601902-31-01	601902-31-01	601902-31-01	601902-31-01	601902-31-01		
	UNITS	Criteria	17-15 SS2	17-15 SS4	17-16 SS4	17-16 SS8	17-17 SS1	RDL	QC Batch
F2-F4 Hydrocarbons									
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	6600	10000		13000		1100	100	4919627
F2 (C10-C16 Hydrocarbons)	ug/g	250	29	<10	<10	31	11	10	4916107
F3 (C16-C34 Hydrocarbons)	ug/g	2500	1100	<50	1000	130	290	50	4916107
F4 (C34-C50 Hydrocarbons)	ug/g	6600	3200	<50	4000	<50	300	50	4916107
Reached Baseline at C50	ug/g	-	No	Yes	No	Yes	No		4916107
Surrogate Recovery (%)									
o-Terphenyl	%	-	86	88	88	91	86		4916107
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture									

Maxxam ID			ECG059		
Sampling Date			2017/03/20		
COC Number			601902-31-01		
	UNITS	Criteria	17-17 SS4	RDL	QC Batch
F2-F4 Hydrocarbons					
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	6600	2500	100	4919627
F2 (C10-C16 Hydrocarbons)	ug/g	250	40	10	4916107
F3 (C16-C34 Hydrocarbons)	ug/g	2500	1100	50	4916107
F4 (C34-C50 Hydrocarbons)	ug/g	6600	720	50	4916107
Reached Baseline at C50	ug/g	-	No		4916107
Surrogate Recovery (%)					
o-Terphenyl	%	-	92		4916107
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture					

GENERAL COMMENTS

Revised Report[2017/4/13]: O.Reg 153/04 Table 3 med/fine criteria added to report.

Sample ECG054 [17-15 SS2] : PAH analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample ECG056 [17-16 SS4] : PAH analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample ECG058 [17-17 SS1] : PAH analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample ECG059 [17-17 SS4] : PAH analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4912420	KH2	Matrix Spike	4-Bromofluorobenzene	2017/03/27		99	%	60 - 140
			D10-o-Xylene	2017/03/27		91	%	60 - 130
			D4-1,2-Dichloroethane	2017/03/27		107	%	60 - 140
			D8-Toluene	2017/03/27		99	%	60 - 140
			Acetone (2-Propanone)	2017/03/27		100	%	60 - 140
			Benzene	2017/03/27		94	%	60 - 140
			Bromodichloromethane	2017/03/27		98	%	60 - 140
			Bromoform	2017/03/27		90	%	60 - 140
			Bromomethane	2017/03/27		99	%	60 - 140
			Carbon Tetrachloride	2017/03/27		94	%	60 - 140
			Chlorobenzene	2017/03/27		95	%	60 - 140
			Chloroform	2017/03/27		97	%	60 - 140
			Dibromochloromethane	2017/03/27		94	%	60 - 140
			1,2-Dichlorobenzene	2017/03/27		92	%	60 - 140
			1,3-Dichlorobenzene	2017/03/27		92	%	60 - 140
			1,4-Dichlorobenzene	2017/03/27		93	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2017/03/27		90	%	60 - 140
			1,1-Dichloroethane	2017/03/27		98	%	60 - 140
			1,2-Dichloroethane	2017/03/27		99	%	60 - 140
			1,1-Dichloroethylene	2017/03/27		102	%	60 - 140
			cis-1,2-Dichloroethylene	2017/03/27		100	%	60 - 140
			trans-1,2-Dichloroethylene	2017/03/27		95	%	60 - 140
			1,2-Dichloropropane	2017/03/27		96	%	60 - 140
			cis-1,3-Dichloropropene	2017/03/27		101	%	60 - 140
			trans-1,3-Dichloropropene	2017/03/27		103	%	60 - 140
			Ethylbenzene	2017/03/27		93	%	60 - 140
			Ethylene Dibromide	2017/03/27		95	%	60 - 140
			Hexane	2017/03/27		99	%	60 - 140
			Methylene Chloride(Dichloromethane)	2017/03/27		101	%	60 - 140
			Methyl Ethyl Ketone (2-Butanone)	2017/03/27		103	%	60 - 140
			Methyl Isobutyl Ketone	2017/03/27		101	%	60 - 140
			Methyl t-butyl ether (MTBE)	2017/03/27		98	%	60 - 140
			Styrene	2017/03/27		90	%	60 - 140
			1,1,1,2-Tetrachloroethane	2017/03/27		92	%	60 - 140
			1,1,2,2-Tetrachloroethane	2017/03/27		95	%	60 - 140
			Tetrachloroethylene	2017/03/27		91	%	60 - 140
			Toluene	2017/03/27		90	%	60 - 140
			1,1,1-Trichloroethane	2017/03/27		93	%	60 - 140
			1,1,2-Trichloroethane	2017/03/27		97	%	60 - 140
			Trichloroethylene	2017/03/27		94	%	60 - 140
Trichlorofluoromethane (FREON 11)	2017/03/27		97	%	60 - 140			
Vinyl Chloride	2017/03/27		97	%	60 - 140			
p+m-Xylene	2017/03/27		90	%	60 - 140			
o-Xylene	2017/03/27		88	%	60 - 140			
F1 (C6-C10)	2017/03/27		97	%	60 - 140			
4912420	KH2	Spiked Blank	4-Bromofluorobenzene	2017/03/27		99	%	60 - 140
			D10-o-Xylene	2017/03/27		89	%	60 - 130
			D4-1,2-Dichloroethane	2017/03/27		106	%	60 - 140
			D8-Toluene	2017/03/27		98	%	60 - 140
			Acetone (2-Propanone)	2017/03/27		101	%	60 - 140
			Benzene	2017/03/27		92	%	60 - 130
			Bromodichloromethane	2017/03/27		97	%	60 - 130
			Bromoform	2017/03/27		90	%	60 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC			Parameter	Date	Value	Recovery	UNITS	QC Limits
Batch	Init	QC Type		Analyzed				
			Bromomethane	2017/03/27		96	%	60 - 140
			Carbon Tetrachloride	2017/03/27		94	%	60 - 130
			Chlorobenzene	2017/03/27		95	%	60 - 130
			Chloroform	2017/03/27		96	%	60 - 130
			Dibromochloromethane	2017/03/27		94	%	60 - 130
			1,2-Dichlorobenzene	2017/03/27		93	%	60 - 130
			1,3-Dichlorobenzene	2017/03/27		92	%	60 - 130
			1,4-Dichlorobenzene	2017/03/27		93	%	60 - 130
			Dichlorodifluoromethane (FREON 12)	2017/03/27		89	%	60 - 140
			1,1-Dichloroethane	2017/03/27		97	%	60 - 130
			1,2-Dichloroethane	2017/03/27		98	%	60 - 130
			1,1-Dichloroethylene	2017/03/27		102	%	60 - 130
			cis-1,2-Dichloroethylene	2017/03/27		99	%	60 - 130
			trans-1,2-Dichloroethylene	2017/03/27		94	%	60 - 130
			1,2-Dichloropropane	2017/03/27		95	%	60 - 130
			cis-1,3-Dichloropropene	2017/03/27		98	%	60 - 130
			trans-1,3-Dichloropropene	2017/03/27		98	%	60 - 130
			Ethylbenzene	2017/03/27		92	%	60 - 130
			Ethylene Dibromide	2017/03/27		95	%	60 - 130
			Hexane	2017/03/27		98	%	60 - 130
			Methylene Chloride(Dichloromethane)	2017/03/27		100	%	60 - 130
			Methyl Ethyl Ketone (2-Butanone)	2017/03/27		103	%	60 - 140
			Methyl Isobutyl Ketone	2017/03/27		101	%	60 - 130
			Methyl t-butyl ether (MTBE)	2017/03/27		97	%	60 - 130
			Styrene	2017/03/27		89	%	60 - 130
			1,1,1,2-Tetrachloroethane	2017/03/27		92	%	60 - 130
			1,1,2,2-Tetrachloroethane	2017/03/27		95	%	60 - 130
			Tetrachloroethylene	2017/03/27		91	%	60 - 130
			Toluene	2017/03/27		89	%	60 - 130
			1,1,1-Trichloroethane	2017/03/27		92	%	60 - 130
			1,1,2-Trichloroethane	2017/03/27		96	%	60 - 130
			Trichloroethylene	2017/03/27		94	%	60 - 130
			Trichlorofluoromethane (FREON 11)	2017/03/27		96	%	60 - 130
			Vinyl Chloride	2017/03/27		96	%	60 - 130
			p+m-Xylene	2017/03/27		90	%	60 - 130
			o-Xylene	2017/03/27		87	%	60 - 130
			F1 (C6-C10)	2017/03/27		96	%	80 - 120
4912420	KH2	Method Blank	4-Bromofluorobenzene	2017/03/27		97	%	60 - 140
			D10-o-Xylene	2017/03/27		88	%	60 - 130
			D4-1,2-Dichloroethane	2017/03/27		104	%	60 - 140
			D8-Toluene	2017/03/27		100	%	60 - 140
			Acetone (2-Propanone)	2017/03/27	<0.50		ug/g	
			Benzene	2017/03/27	<0.020		ug/g	
			Bromodichloromethane	2017/03/27	<0.050		ug/g	
			Bromoform	2017/03/27	<0.050		ug/g	
			Bromomethane	2017/03/27	<0.050		ug/g	
			Carbon Tetrachloride	2017/03/27	<0.050		ug/g	
			Chlorobenzene	2017/03/27	<0.050		ug/g	
			Chloroform	2017/03/27	<0.050		ug/g	
			Dibromochloromethane	2017/03/27	<0.050		ug/g	
			1,2-Dichlorobenzene	2017/03/27	<0.050		ug/g	
			1,3-Dichlorobenzene	2017/03/27	<0.050		ug/g	
			1,4-Dichlorobenzene	2017/03/27	<0.050		ug/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dichlorodifluoromethane (FREON 12)	2017/03/27	<0.050		ug/g	
			1,1-Dichloroethane	2017/03/27	<0.050		ug/g	
			1,2-Dichloroethane	2017/03/27	<0.050		ug/g	
			1,1-Dichloroethylene	2017/03/27	<0.050		ug/g	
			cis-1,2-Dichloroethylene	2017/03/27	<0.050		ug/g	
			trans-1,2-Dichloroethylene	2017/03/27	<0.050		ug/g	
			1,2-Dichloropropane	2017/03/27	<0.050		ug/g	
			cis-1,3-Dichloropropene	2017/03/27	<0.030		ug/g	
			trans-1,3-Dichloropropene	2017/03/27	<0.040		ug/g	
			Ethylbenzene	2017/03/27	<0.020		ug/g	
			Ethylene Dibromide	2017/03/27	<0.050		ug/g	
			Hexane	2017/03/27	<0.050		ug/g	
			Methylene Chloride(Dichloromethane)	2017/03/27	<0.050		ug/g	
			Methyl Ethyl Ketone (2-Butanone)	2017/03/27	<0.50		ug/g	
			Methyl Isobutyl Ketone	2017/03/27	<0.50		ug/g	
			Methyl t-butyl ether (MTBE)	2017/03/27	<0.050		ug/g	
			Styrene	2017/03/27	<0.050		ug/g	
			1,1,1,2-Tetrachloroethane	2017/03/27	<0.050		ug/g	
			1,1,1,2,2-Tetrachloroethane	2017/03/27	<0.050		ug/g	
			Tetrachloroethylene	2017/03/27	<0.050		ug/g	
			Toluene	2017/03/27	<0.020		ug/g	
			1,1,1-Trichloroethane	2017/03/27	<0.050		ug/g	
			1,1,2-Trichloroethane	2017/03/27	<0.050		ug/g	
			Trichloroethylene	2017/03/27	<0.050		ug/g	
			Trichlorofluoromethane (FREON 11)	2017/03/27	<0.050		ug/g	
			Vinyl Chloride	2017/03/27	<0.020		ug/g	
			p+m-Xylene	2017/03/27	<0.020		ug/g	
			o-Xylene	2017/03/27	<0.020		ug/g	
			Total Xylenes	2017/03/27	<0.020		ug/g	
			F1 (C6-C10)	2017/03/27	<10		ug/g	
			F1 (C6-C10) - BTEX	2017/03/27	<10		ug/g	
4912420	KH2	RPD	Acetone (2-Propanone)	2017/03/27	NC		%	50
			Benzene	2017/03/27	NC		%	50
			Bromodichloromethane	2017/03/27	NC		%	50
			Bromoform	2017/03/27	NC		%	50
			Bromomethane	2017/03/27	NC		%	50
			Carbon Tetrachloride	2017/03/27	NC		%	50
			Chlorobenzene	2017/03/27	NC		%	50
			Chloroform	2017/03/27	NC		%	50
			Dibromochloromethane	2017/03/27	NC		%	50
			1,2-Dichlorobenzene	2017/03/27	NC		%	50
			1,3-Dichlorobenzene	2017/03/27	NC		%	50
			1,4-Dichlorobenzene	2017/03/27	NC		%	50
			Dichlorodifluoromethane (FREON 12)	2017/03/27	NC		%	50
			1,1-Dichloroethane	2017/03/27	NC		%	50
			1,2-Dichloroethane	2017/03/27	NC		%	50
			1,1-Dichloroethylene	2017/03/27	NC		%	50
			cis-1,2-Dichloroethylene	2017/03/27	NC		%	50
			trans-1,2-Dichloroethylene	2017/03/27	NC		%	50
			1,2-Dichloropropane	2017/03/27	NC		%	50
			cis-1,3-Dichloropropene	2017/03/27	NC		%	50
			trans-1,3-Dichloropropene	2017/03/27	NC		%	50
			Ethylbenzene	2017/03/27	NC		%	50

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
			Ethylene Dibromide	2017/03/27	NC		%	50
			Hexane	2017/03/27	NC		%	50
			Methylene Chloride(Dichloromethane)	2017/03/27	NC		%	50
			Methyl Ethyl Ketone (2-Butanone)	2017/03/27	NC		%	50
			Methyl Isobutyl Ketone	2017/03/27	NC		%	50
			Methyl t-butyl ether (MTBE)	2017/03/27	NC		%	50
			Styrene	2017/03/27	NC		%	50
			1,1,1,2-Tetrachloroethane	2017/03/27	NC		%	50
			1,1,2,2-Tetrachloroethane	2017/03/27	NC		%	50
			Tetrachloroethylene	2017/03/27	NC		%	50
			Toluene	2017/03/27	NC		%	50
			1,1,1-Trichloroethane	2017/03/27	NC		%	50
			1,1,2-Trichloroethane	2017/03/27	NC		%	50
			Trichloroethylene	2017/03/27	NC		%	50
			Trichlorofluoromethane (FREON 11)	2017/03/27	NC		%	50
			Vinyl Chloride	2017/03/27	NC		%	50
			p+m-Xylene	2017/03/27	NC		%	50
			o-Xylene	2017/03/27	NC		%	50
			Total Xylenes	2017/03/27	NC		%	50
			F1 (C6-C10)	2017/03/27	NC		%	30
			F1 (C6-C10) - BTEX	2017/03/27	NC		%	30
4913764	XQI	Matrix Spike	Free Cyanide	2017/03/27		106	%	75 - 125
4913764	XQI	Spiked Blank	Free Cyanide	2017/03/27		102	%	80 - 120
4913764	XQI	Method Blank	Free Cyanide	2017/03/27	<0.01		ug/g	
4913764	XQI	RPD	Free Cyanide	2017/03/27	NC		%	35
4914127	NS3	RPD	Moisture	2017/03/25	4.4		%	20
4914242	XQI	Matrix Spike	Free Cyanide	2017/03/28		102	%	75 - 125
4914242	XQI	Spiked Blank	Free Cyanide	2017/03/28		100	%	80 - 120
4914242	XQI	Method Blank	Free Cyanide	2017/03/28	<0.01		ug/g	
4914242	XQI	RPD	Free Cyanide	2017/03/28	11		%	35
4914629	GVA	RPD	Moisture	2017/03/27	4.6		%	20
4914795	TA1	Spiked Blank	Available (CaCl2) pH	2017/03/27		98	%	97 - 103
4914795	TA1	RPD	Available (CaCl2) pH	2017/03/27	0.022		%	N/A
4914796	TA1	Spiked Blank	Available (CaCl2) pH	2017/03/27		97	%	97 - 103
4914796	TA1	RPD	Available (CaCl2) pH	2017/03/27	0.16		%	N/A
4914873	DT1	Matrix Spike	Acid Extractable Antimony (Sb)	2017/03/27		93	%	75 - 125
			Acid Extractable Arsenic (As)	2017/03/27		103	%	75 - 125
			Acid Extractable Barium (Ba)	2017/03/27		NC	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/03/27		105	%	75 - 125
			Acid Extractable Boron (B)	2017/03/27		102	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/03/27		106	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/03/27		104	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/03/27		102	%	75 - 125
			Acid Extractable Copper (Cu)	2017/03/27		98	%	75 - 125
			Acid Extractable Lead (Pb)	2017/03/27		101	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/03/27		102	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/03/27		104	%	75 - 125
			Acid Extractable Selenium (Se)	2017/03/27		105	%	75 - 125
			Acid Extractable Silver (Ag)	2017/03/27		102	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/03/27		100	%	75 - 125
			Acid Extractable Uranium (U)	2017/03/27		99	%	75 - 125
			Acid Extractable Vanadium (V)	2017/03/27		NC	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/03/27		NC	%	75 - 125

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4914873	DT1	Spiked Blank	Acid Extractable Mercury (Hg)	2017/03/27		103	%	75 - 125
			Acid Extractable Antimony (Sb)	2017/03/27		100	%	80 - 120
			Acid Extractable Arsenic (As)	2017/03/27		100	%	80 - 120
			Acid Extractable Barium (Ba)	2017/03/27		95	%	80 - 120
			Acid Extractable Beryllium (Be)	2017/03/27		100	%	80 - 120
			Acid Extractable Boron (B)	2017/03/27		100	%	80 - 120
			Acid Extractable Cadmium (Cd)	2017/03/27		102	%	80 - 120
			Acid Extractable Chromium (Cr)	2017/03/27		100	%	80 - 120
			Acid Extractable Cobalt (Co)	2017/03/27		101	%	80 - 120
			Acid Extractable Copper (Cu)	2017/03/27		101	%	80 - 120
			Acid Extractable Lead (Pb)	2017/03/27		102	%	80 - 120
			Acid Extractable Molybdenum (Mo)	2017/03/27		101	%	80 - 120
			Acid Extractable Nickel (Ni)	2017/03/27		101	%	80 - 120
			Acid Extractable Selenium (Se)	2017/03/27		102	%	80 - 120
			Acid Extractable Silver (Ag)	2017/03/27		101	%	80 - 120
			Acid Extractable Thallium (Tl)	2017/03/27		101	%	80 - 120
			Acid Extractable Uranium (U)	2017/03/27		99	%	80 - 120
			Acid Extractable Vanadium (V)	2017/03/27		100	%	80 - 120
			Acid Extractable Zinc (Zn)	2017/03/27		101	%	80 - 120
			4914873	DT1	Method Blank	Acid Extractable Mercury (Hg)	2017/03/27	
Acid Extractable Antimony (Sb)	2017/03/27	<0.20					ug/g	
Acid Extractable Arsenic (As)	2017/03/27	<1.0					ug/g	
Acid Extractable Barium (Ba)	2017/03/27	<0.50					ug/g	
Acid Extractable Beryllium (Be)	2017/03/27	<0.20					ug/g	
Acid Extractable Boron (B)	2017/03/27	<5.0					ug/g	
Acid Extractable Cadmium (Cd)	2017/03/27	<0.10					ug/g	
Acid Extractable Chromium (Cr)	2017/03/27	<1.0					ug/g	
Acid Extractable Cobalt (Co)	2017/03/27	<0.10					ug/g	
Acid Extractable Copper (Cu)	2017/03/27	<0.50					ug/g	
Acid Extractable Lead (Pb)	2017/03/27	<1.0					ug/g	
Acid Extractable Molybdenum (Mo)	2017/03/27	<0.50					ug/g	
Acid Extractable Nickel (Ni)	2017/03/27	<0.50					ug/g	
Acid Extractable Selenium (Se)	2017/03/27	<0.50					ug/g	
Acid Extractable Silver (Ag)	2017/03/27	<0.20					ug/g	
Acid Extractable Thallium (Tl)	2017/03/27	<0.050					ug/g	
Acid Extractable Uranium (U)	2017/03/27	<0.050					ug/g	
Acid Extractable Vanadium (V)	2017/03/27	<5.0					ug/g	
Acid Extractable Zinc (Zn)	2017/03/27	<5.0					ug/g	
4914873	DT1	RPD				Acid Extractable Mercury (Hg)	2017/03/27	<0.050
			Acid Extractable Antimony (Sb)	2017/03/27	NC		%	30
			Acid Extractable Arsenic (As)	2017/03/27	6.3		%	30
			Acid Extractable Barium (Ba)	2017/03/27	3.1		%	30
			Acid Extractable Beryllium (Be)	2017/03/27	0.065		%	30
			Acid Extractable Boron (B)	2017/03/27	6.6		%	30
			Acid Extractable Cadmium (Cd)	2017/03/27	3.3		%	30
			Acid Extractable Chromium (Cr)	2017/03/27	0.66		%	30
			Acid Extractable Cobalt (Co)	2017/03/27	0.35		%	30
			Acid Extractable Copper (Cu)	2017/03/27	1.8		%	30
			Acid Extractable Lead (Pb)	2017/03/27	1.4		%	30
			Acid Extractable Molybdenum (Mo)	2017/03/27	NC		%	30
			Acid Extractable Nickel (Ni)	2017/03/27	3.5		%	30
Acid Extractable Selenium (Se)	2017/03/27	NC		%	30			
Acid Extractable Silver (Ag)	2017/03/27	NC		%	30			

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC			Parameter	Date	Value	Recovery	UNITS	QC Limits			
Batch	Init	QC Type		Analyzed							
4914914	DT1	Matrix Spike	Acid Extractable Thallium (Tl)	2017/03/27	17		%	30			
			Acid Extractable Uranium (U)	2017/03/27	3.5		%	30			
			Acid Extractable Vanadium (V)	2017/03/27	0.017		%	30			
			Acid Extractable Zinc (Zn)	2017/03/27	0.96		%	30			
			Acid Extractable Mercury (Hg)	2017/03/27	NC		%	30			
			Acid Extractable Antimony (Sb)	2017/03/27		95	%	75 - 125			
			Acid Extractable Arsenic (As)	2017/03/27		98	%	75 - 125			
			Acid Extractable Barium (Ba)	2017/03/27		NC	%	75 - 125			
			Acid Extractable Beryllium (Be)	2017/03/27		102	%	75 - 125			
			Acid Extractable Boron (B)	2017/03/27		98	%	75 - 125			
			Acid Extractable Cadmium (Cd)	2017/03/27		104	%	75 - 125			
			Acid Extractable Chromium (Cr)	2017/03/27		NC	%	75 - 125			
			Acid Extractable Cobalt (Co)	2017/03/27		99	%	75 - 125			
			Acid Extractable Copper (Cu)	2017/03/27		104	%	75 - 125			
			Acid Extractable Lead (Pb)	2017/03/27		101	%	75 - 125			
			Acid Extractable Molybdenum (Mo)	2017/03/27		102	%	75 - 125			
			Acid Extractable Nickel (Ni)	2017/03/27		NC	%	75 - 125			
			Acid Extractable Selenium (Se)	2017/03/27		99	%	75 - 125			
			4914914	DT1	Spiked Blank	Acid Extractable Silver (Ag)	2017/03/27		103	%	75 - 125
						Acid Extractable Thallium (Tl)	2017/03/27		100	%	75 - 125
Acid Extractable Uranium (U)	2017/03/27					100	%	75 - 125			
Acid Extractable Vanadium (V)	2017/03/27					NC	%	75 - 125			
Acid Extractable Zinc (Zn)	2017/03/27					NC	%	75 - 125			
Acid Extractable Mercury (Hg)	2017/03/27					98	%	75 - 125			
Acid Extractable Antimony (Sb)	2017/03/27					100	%	80 - 120			
Acid Extractable Arsenic (As)	2017/03/27					100	%	80 - 120			
Acid Extractable Barium (Ba)	2017/03/27					99	%	80 - 120			
Acid Extractable Beryllium (Be)	2017/03/27					99	%	80 - 120			
Acid Extractable Boron (B)	2017/03/27					97	%	80 - 120			
Acid Extractable Cadmium (Cd)	2017/03/27					101	%	80 - 120			
Acid Extractable Chromium (Cr)	2017/03/27					100	%	80 - 120			
Acid Extractable Cobalt (Co)	2017/03/27					100	%	80 - 120			
Acid Extractable Copper (Cu)	2017/03/27					101	%	80 - 120			
Acid Extractable Lead (Pb)	2017/03/27					100	%	80 - 120			
Acid Extractable Molybdenum (Mo)	2017/03/27					100	%	80 - 120			
Acid Extractable Nickel (Ni)	2017/03/27					100	%	80 - 120			
Acid Extractable Selenium (Se)	2017/03/27					104	%	80 - 120			
4914914	DT1	Method Blank				Acid Extractable Silver (Ag)	2017/03/27		101	%	80 - 120
			Acid Extractable Thallium (Tl)	2017/03/27		98	%	80 - 120			
			Acid Extractable Uranium (U)	2017/03/27		97	%	80 - 120			
			Acid Extractable Vanadium (V)	2017/03/27		101	%	80 - 120			
			Acid Extractable Zinc (Zn)	2017/03/27		105	%	80 - 120			
			Acid Extractable Mercury (Hg)	2017/03/27		100	%	80 - 120			
			Acid Extractable Antimony (Sb)	2017/03/27	<0.20		ug/g				
			Acid Extractable Arsenic (As)	2017/03/27	<1.0		ug/g				
			Acid Extractable Barium (Ba)	2017/03/27	<0.50		ug/g				
			Acid Extractable Beryllium (Be)	2017/03/27	<0.20		ug/g				
			Acid Extractable Boron (B)	2017/03/27	<5.0		ug/g				
			Acid Extractable Cadmium (Cd)	2017/03/27	<0.10		ug/g				
Acid Extractable Chromium (Cr)	2017/03/27	<1.0		ug/g							
Acid Extractable Cobalt (Co)	2017/03/27	<0.10		ug/g							
Acid Extractable Copper (Cu)	2017/03/27	<0.50		ug/g							
Acid Extractable Lead (Pb)	2017/03/27	<1.0		ug/g							

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Molybdenum (Mo)	2017/03/27	<0.50		ug/g	
			Acid Extractable Nickel (Ni)	2017/03/27	<0.50		ug/g	
			Acid Extractable Selenium (Se)	2017/03/27	<0.50		ug/g	
			Acid Extractable Silver (Ag)	2017/03/27	<0.20		ug/g	
			Acid Extractable Thallium (Tl)	2017/03/27	<0.050		ug/g	
			Acid Extractable Uranium (U)	2017/03/27	<0.050		ug/g	
			Acid Extractable Vanadium (V)	2017/03/27	<5.0		ug/g	
			Acid Extractable Zinc (Zn)	2017/03/27	<5.0		ug/g	
4914914	DT1	RPD	Acid Extractable Mercury (Hg)	2017/03/27	<0.050		ug/g	
			Acid Extractable Antimony (Sb)	2017/03/27	NC		%	30
			Acid Extractable Arsenic (As)	2017/03/27	1.6		%	30
			Acid Extractable Barium (Ba)	2017/03/27	1.6		%	30
			Acid Extractable Beryllium (Be)	2017/03/27	6.9		%	30
			Acid Extractable Boron (B)	2017/03/27	4.1		%	30
			Acid Extractable Cadmium (Cd)	2017/03/27	NC		%	30
			Acid Extractable Chromium (Cr)	2017/03/27	1.8		%	30
			Acid Extractable Cobalt (Co)	2017/03/27	0.44		%	30
			Acid Extractable Copper (Cu)	2017/03/27	1.5		%	30
			Acid Extractable Lead (Pb)	2017/03/27	3.2		%	30
			Acid Extractable Molybdenum (Mo)	2017/03/27	NC		%	30
			Acid Extractable Nickel (Ni)	2017/03/27	4.0		%	30
			Acid Extractable Selenium (Se)	2017/03/27	NC		%	30
			Acid Extractable Silver (Ag)	2017/03/27	NC		%	30
			Acid Extractable Thallium (Tl)	2017/03/27	2.3		%	30
			Acid Extractable Uranium (U)	2017/03/27	0.80		%	30
			Acid Extractable Vanadium (V)	2017/03/27	4.4		%	30
			Acid Extractable Zinc (Zn)	2017/03/27	0.20		%	30
			Acid Extractable Mercury (Hg)	2017/03/27	NC		%	30
4914938	SUK	Matrix Spike	Hot Water Ext. Boron (B)	2017/03/28		100	%	75 - 125
4914938	SUK	Spiked Blank	Hot Water Ext. Boron (B)	2017/03/28		96	%	75 - 125
4914938	SUK	Method Blank	Hot Water Ext. Boron (B)	2017/03/28	<0.050		ug/g	
4914938	SUK	RPD	Hot Water Ext. Boron (B)	2017/03/28	13		%	40
4914976	AFZ	Spiked Blank	Soluble Calcium (Ca)	2017/03/28		106	%	80 - 120
			Soluble Magnesium (Mg)	2017/03/28		109	%	80 - 120
			Soluble Sodium (Na)	2017/03/28		107	%	80 - 120
4914976	AFZ	Method Blank	Soluble Calcium (Ca)	2017/03/28	<0.5		mg/L	
			Soluble Magnesium (Mg)	2017/03/28	<0.5		mg/L	
			Soluble Sodium (Na)	2017/03/28	<5		mg/L	
4914976	AFZ	RPD	Soluble Calcium (Ca)	2017/03/28	4.7		%	30
			Soluble Magnesium (Mg)	2017/03/28	12		%	30
			Soluble Sodium (Na)	2017/03/28	5.5		%	30
4914977	NYS	Spiked Blank	Conductivity	2017/03/28		99	%	90 - 110
4914977	NYS	Method Blank	Conductivity	2017/03/28	<0.002		mS/cm	
4914977	NYS	RPD	Conductivity	2017/03/28	5.5		%	10
4915015	AFZ	Matrix Spike	Hot Water Ext. Boron (B)	2017/03/28		111	%	75 - 125
4915015	AFZ	Spiked Blank	Hot Water Ext. Boron (B)	2017/03/28		109	%	75 - 125
4915015	AFZ	Method Blank	Hot Water Ext. Boron (B)	2017/03/28	<0.050		ug/g	
4915015	AFZ	RPD	Hot Water Ext. Boron (B)	2017/03/28	4.6		%	40
4915040	SAC	Matrix Spike	Chromium (VI)	2017/03/28		0.12 (1)	%	75 - 125
4915040	SAC	Spiked Blank	Chromium (VI)	2017/03/28		89	%	80 - 120
4915040	SAC	Method Blank	Chromium (VI)	2017/03/28	<0.2		ug/g	
4915040	SAC	RPD	Chromium (VI)	2017/03/28	NC		%	35
4915043	SAC	Matrix Spike	Chromium (VI)	2017/03/28		72 (2)	%	75 - 125

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4915043	SAC	Spiked Blank	Chromium (VI)	2017/03/28		86	%	80 - 120
4915043	SAC	Method Blank	Chromium (VI)	2017/03/28	<0.2		ug/g	
4915043	SAC	RPD	Chromium (VI)	2017/03/28	31		%	35
4915165	AFZ	Spiked Blank	Soluble Calcium (Ca)	2017/03/28		105	%	80 - 120
			Soluble Magnesium (Mg)	2017/03/28		103	%	80 - 120
			Soluble Sodium (Na)	2017/03/28		107	%	80 - 120
4915165	AFZ	Method Blank	Soluble Calcium (Ca)	2017/03/28	<0.5		mg/L	
			Soluble Magnesium (Mg)	2017/03/28	<0.5		mg/L	
			Soluble Sodium (Na)	2017/03/28	<5		mg/L	
4915165	AFZ	RPD	Soluble Calcium (Ca)	2017/03/28	0.86		%	30
			Soluble Magnesium (Mg)	2017/03/28	12		%	30
			Soluble Sodium (Na)	2017/03/28	0.43		%	30
4915166	NYS	Spiked Blank	Conductivity	2017/03/28		99	%	90 - 110
4915166	NYS	Method Blank	Conductivity	2017/03/28	<0.002		mS/cm	
4915166	NYS	RPD	Conductivity	2017/03/28	0.097		%	10
4915417	RAJ	Matrix Spike	D10-Anthracene	2017/03/27		92	%	50 - 130
			D14-Terphenyl (FS)	2017/03/27		92	%	50 - 130
			D8-Acenaphthylene	2017/03/27		89	%	50 - 130
			Acenaphthene	2017/03/27		89	%	50 - 130
			Acenaphthylene	2017/03/27		88	%	50 - 130
			Anthracene	2017/03/27		81	%	50 - 130
			Benzo(a)anthracene	2017/03/27		87	%	50 - 130
			Benzo(a)pyrene	2017/03/27		84	%	50 - 130
			Benzo(b/j)fluoranthene	2017/03/27		81	%	50 - 130
			Benzo(g,h,i)perylene	2017/03/27		72	%	50 - 130
			Benzo(k)fluoranthene	2017/03/27		84	%	50 - 130
			Chrysene	2017/03/27		89	%	50 - 130
			Dibenz(a,h)anthracene	2017/03/27		81	%	50 - 130
			Fluoranthene	2017/03/27		89	%	50 - 130
			Fluorene	2017/03/27		88	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2017/03/27		79	%	50 - 130
			1-Methylnaphthalene	2017/03/27		101	%	50 - 130
			2-Methylnaphthalene	2017/03/27		97	%	50 - 130
			Naphthalene	2017/03/27		85	%	50 - 130
			Phenanthrene	2017/03/27		85	%	50 - 130
			Pyrene	2017/03/27		90	%	50 - 130
4915417	RAJ	Spiked Blank	D10-Anthracene	2017/03/27		90	%	50 - 130
			D14-Terphenyl (FS)	2017/03/27		90	%	50 - 130
			D8-Acenaphthylene	2017/03/27		86	%	50 - 130
			Acenaphthene	2017/03/27		91	%	50 - 130
			Acenaphthylene	2017/03/27		89	%	50 - 130
			Anthracene	2017/03/27		83	%	50 - 130
			Benzo(a)anthracene	2017/03/27		86	%	50 - 130
			Benzo(a)pyrene	2017/03/27		91	%	50 - 130
			Benzo(b/j)fluoranthene	2017/03/27		91	%	50 - 130
			Benzo(g,h,i)perylene	2017/03/27		87	%	50 - 130
			Benzo(k)fluoranthene	2017/03/27		89	%	50 - 130
			Chrysene	2017/03/27		91	%	50 - 130
			Dibenz(a,h)anthracene	2017/03/27		89	%	50 - 130
			Fluoranthene	2017/03/27		91	%	50 - 130
			Fluorene	2017/03/27		89	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2017/03/27		94	%	50 - 130
			1-Methylnaphthalene	2017/03/27		100	%	50 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4915417	RAJ	Method Blank	2-Methylnaphthalene	2017/03/27		96	%	50 - 130
			Naphthalene	2017/03/27		88	%	50 - 130
			Phenanthrene	2017/03/27		89	%	50 - 130
			Pyrene	2017/03/27		92	%	50 - 130
			D10-Anthracene	2017/03/27		92	%	50 - 130
			D14-Terphenyl (FS)	2017/03/27		91	%	50 - 130
			D8-Acenaphthylene	2017/03/27		88	%	50 - 130
			Acenaphthene	2017/03/27	<0.0050		ug/g	
			Acenaphthylene	2017/03/27	<0.0050		ug/g	
			Anthracene	2017/03/27	<0.0050		ug/g	
			Benzo(a)anthracene	2017/03/27	<0.0050		ug/g	
			Benzo(a)pyrene	2017/03/27	<0.0050		ug/g	
			Benzo(b/j)fluoranthene	2017/03/27	<0.0050		ug/g	
			Benzo(g,h,i)perylene	2017/03/27	<0.0050		ug/g	
			Benzo(k)fluoranthene	2017/03/27	<0.0050		ug/g	
			Chrysene	2017/03/27	<0.0050		ug/g	
			Dibenz(a,h)anthracene	2017/03/27	<0.0050		ug/g	
			Fluoranthene	2017/03/27	<0.0050		ug/g	
			Fluorene	2017/03/27	<0.0050		ug/g	
			Indeno(1,2,3-cd)pyrene	2017/03/27	<0.0050		ug/g	
1-Methylnaphthalene	2017/03/27	<0.0050		ug/g				
2-Methylnaphthalene	2017/03/27	<0.0050		ug/g				
Naphthalene	2017/03/27	<0.0050		ug/g				
Phenanthrene	2017/03/27	<0.0050		ug/g				
Pyrene	2017/03/27	<0.0050		ug/g				
4915417	RAJ	RPD	Acenaphthene	2017/03/27	NC		%	40
			Acenaphthylene	2017/03/27	NC		%	40
			Anthracene	2017/03/27	NC		%	40
			Benzo(a)anthracene	2017/03/27	NC		%	40
			Benzo(a)pyrene	2017/03/27	NC		%	40
			Benzo(b/j)fluoranthene	2017/03/27	NC		%	40
			Benzo(g,h,i)perylene	2017/03/27	NC		%	40
			Benzo(k)fluoranthene	2017/03/27	NC		%	40
			Chrysene	2017/03/27	NC		%	40
			Dibenz(a,h)anthracene	2017/03/27	NC		%	40
			Fluoranthene	2017/03/27	NC		%	40
			Fluorene	2017/03/27	NC		%	40
			Indeno(1,2,3-cd)pyrene	2017/03/27	NC		%	40
			1-Methylnaphthalene	2017/03/27	NC		%	40
			2-Methylnaphthalene	2017/03/27	NC		%	40
			Naphthalene	2017/03/27	NC		%	40
Phenanthrene	2017/03/27	NC		%	40			
Pyrene	2017/03/27	NC		%	40			
4916107	KLI	Matrix Spike	o-Terphenyl	2017/03/29		85	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/03/29		87	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2017/03/29		86	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2017/03/29		85	%	50 - 130
4916107	KLI	Spiked Blank	o-Terphenyl	2017/03/29		90	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/03/29		93	%	80 - 120
			F3 (C16-C34 Hydrocarbons)	2017/03/29		94	%	80 - 120
			F4 (C34-C50 Hydrocarbons)	2017/03/29		92	%	80 - 120
4916107	KLI	Method Blank	o-Terphenyl	2017/03/29		94	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/03/29	<10		ug/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4916107	KLI	RPD	F3 (C16-C34 Hydrocarbons)	2017/03/29	<50		ug/g	
			F4 (C34-C50 Hydrocarbons)	2017/03/29	<50		ug/g	
			F2 (C10-C16 Hydrocarbons)	2017/03/29	NC		%	30
			F3 (C16-C34 Hydrocarbons)	2017/03/29	NC		%	30
			F4 (C34-C50 Hydrocarbons)	2017/03/29	NC		%	30
4919627	DDS	Matrix Spike [ECG054-02]	F4G-sg (Grav. Heavy Hydrocarbons)	2017/03/30		NC	%	65 - 135
4919627	DDS	Spiked Blank	F4G-sg (Grav. Heavy Hydrocarbons)	2017/03/30		99	%	65 - 135
4919627	DDS	Method Blank	F4G-sg (Grav. Heavy Hydrocarbons)	2017/03/30	<100		ug/g	
4919627	DDS	RPD [ECG056-02]	F4G-sg (Grav. Heavy Hydrocarbons)	2017/03/30	0.55		%	50

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.

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

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

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

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

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

(1) The matrix spike recovery was below the lower control limit. This may be due in part to the reducing environment of the sample. The matrix spike was reanalyzed to confirm result.

(2) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

VALIDATION SIGNATURE PAGE

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




Ewa Pranjić, M.Sc., C.Chem, Scientific Specialist

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

Your Project #: 161-17781-00
 Site Location: HSR FACILITY
 Your C.O.C. #: 601902-30-01

Attention: Rachel Bryan

WSP Canada Inc
 4 Hughson Street South
 Suite 300
 Hamilton, ON
 CANADA L8N 3Z1

Report Date: 2017/04/13
 Report #: R4426321
 Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B759687

Received: 2017/03/25, 09:16

Sample Matrix: Soil
 # Samples Received: 16

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum	14	N/A	2017/03/31	CAM SOP-00301	EPA 8270D m
Hot Water Extractable Boron	10	2017/03/29	2017/03/29	CAM SOP-00408	R153 Ana. Prot. 2011
1,3-Dichloropropene Sum	13	N/A	2017/03/31		EPA 8260C m
1,3-Dichloropropene Sum	3	N/A	2017/04/03		EPA 8260C m
Free (WAD) Cyanide	10	2017/03/28	2017/03/29	CAM SOP-00457	OMOE E3015 m
Conductivity	6	2017/03/29	2017/03/29	CAM SOP-00414	OMOE E3530 v1 m
Conductivity	4	2017/03/31	2017/03/31	CAM SOP-00414	OMOE E3530 v1 m
Hexavalent Chromium in Soil by IC (1)	10	2017/03/29	2017/03/31	CAM SOP-00436	EPA 3060/7199 m
Petroleum Hydrocarbons F2-F4 in Soil (2)	7	2017/03/30	2017/03/30	CAM SOP-00316	CCME CWS m
Petroleum Hydrocarbons F2-F4 in Soil (2)	9	2017/03/30	2017/03/31	CAM SOP-00316	CCME CWS m
F4G (CCME Hydrocarbons Gravimetric)	6	2017/04/01	2017/04/01	CAM SOP-00316	CCME PHC-CWS m
Strong Acid Leachable Metals by ICPMS	10	2017/03/29	2017/03/29	CAM SOP-00447	EPA 6020B m
Moisture	12	N/A	2017/03/28	CAM SOP-00445	Carter 2nd ed 51.2 m
Moisture	4	N/A	2017/03/29	CAM SOP-00445	Carter 2nd ed 51.2 m
PAH Compounds in Soil by GC/MS (SIM)	14	2017/03/28	2017/03/29	CAM SOP-00318	EPA 8270D m
pH CaCl2 EXTRACT	10	2017/03/29	2017/03/29	CAM SOP-00413	EPA 9045 D m
Sodium Adsorption Ratio (SAR)	6	N/A	2017/03/30	CAM SOP-00102	EPA 6010C
Sodium Adsorption Ratio (SAR)	4	N/A	2017/04/03	CAM SOP-00102	EPA 6010C
SAR - ICP Metals	6	2017/03/29	2017/03/29	CAM SOP-00408	EPA 6010C m
SAR - ICP Metals	3	2017/03/31	2017/03/31	CAM SOP-00408	EPA 6010C m
SAR - ICP Metals	1	2017/03/31	2017/04/03	CAM SOP-00408	EPA 6010C m
Volatile Organic Compounds and F1 PHCs	13	N/A	2017/03/30	CAM SOP-00230	EPA 8260C m
Volatile Organic Compounds and F1 PHCs	3	N/A	2017/03/31	CAM SOP-00230	EPA 8260C m

Remarks:

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

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

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CANADA L8N 3Z1

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CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B759687

Received: 2017/03/25, 09:16

data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.

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

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

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

(1) Soils are reported on a dry weight basis unless otherwise specified.

(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ashton Gibson, Project Manager

Email: AGibson@maxxam.ca

Phone# (905) 817-5700

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

RESULTS OF ANALYSES OF SOIL

Maxxam ID			ECO808			ECO809		ECO810		
Sampling Date			2017/03/21			2017/03/21		2017/03/21		
COC Number			601902-30-01			601902-30-01		601902-30-01		
	UNITS	Criteria	17-19 SS1	RDL	QC Batch	17-19 SS8	QC Batch	17-14 SS1	RDL	QC Batch
Calculated Parameters										
Sodium Adsorption Ratio	N/A	12	40		4914692	7.1	4914692	2.2		4914692
Inorganics										
Conductivity	mS/cm	1.4	5.9	0.002	4920447	1.8	4917981	0.48	0.002	4920447
Free Cyanide	ug/g	0.051	<0.01	0.01	4916686	0.03	4916686	<0.01	0.01	4916686
Moisture	%	-	6.2	1.0	4916312	25	4916312	5.1	1.0	4916312
Available (CaCl2) pH	pH	-	10.1		4916420	7.25	4916420	8.34		4916420
Metals										
Soluble Calcium (Ca)	mg/L	-	60.1	0.5	4920420	73.3	4917979	17.4	0.5	4920420
Soluble Magnesium (Mg)	mg/L	-	2.3	0.5	4920420	19.1	4917979	12.1	0.5	4920420
Soluble Sodium (Na)	mg/L	-	1160	50	4920420	262	4917979	49	5	4920420
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture										

RESULTS OF ANALYSES OF SOIL

Maxxam ID			ECO811	ECO812	ECO813		ECO814	ECO815		
Sampling Date			2017/03/21	2017/03/21	2017/03/21		2017/03/21	2017/03/21		
COC Number			601902-30-01	601902-30-01	601902-30-01		601902-30-01	601902-30-01		
	UNITS	Criteria	17-14 SS10	17-13 SS2	17-13 SS5	QC Batch	17-20 SS7	17-20 SS9	RDL	QC Batch

Calculated Parameters										
Sodium Adsorption Ratio	N/A	12	6.1	1.5	1.9	4914692				4914692

Inorganics										
Conductivity	mS/cm	1.4	1.5	0.78	0.66	4917981			0.002	4917981
Free Cyanide	ug/g	0.051	<0.01	<0.01	<0.01	4916686			0.01	4916686
Moisture	%	-	18	11	18	4916312	24	21	1.0	4916131
Available (CaCl2) pH	pH	-	7.58	9.73	7.66	4916420				

Metals										
Soluble Calcium (Ca)	mg/L	-	57.9	95.2	55.3	4917979			0.5	
Soluble Magnesium (Mg)	mg/L	-	18.5	7.4	9.9	4917979			0.5	
Soluble Sodium (Na)	mg/L	-	209	56	57	4917979			5	

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
 Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
 Soil - Industrial/Commercial/Community- Medium and Fine Texture

RESULTS OF ANALYSES OF SOIL

Maxxam ID			ECO816	ECO817	ECO818	ECO819		ECO820		
Sampling Date			2017/03/21	2017/03/21	2017/03/21	2017/03/21		2017/03/22		
COC Number			601902-30-01	601902-30-01	601902-30-01	601902-30-01		601902-30-01		
	UNITS	Criteria	QA/QC 5	QA/QC 6	QA/QC 7	QA/QC 8	QC Batch	17-06 SS3	RDL	QC Batch
Calculated Parameters										
Sodium Adsorption Ratio	N/A	12					4914692	0.34		4914692
Inorganics										
Conductivity	mS/cm	1.4					4917981	0.60	0.002	4920447
Free Cyanide	ug/g	0.051					4916686	<0.01	0.01	4916686
Moisture	%	-	6.3	23	21	18	4918403	19	1.0	4916312
Available (CaCl2) pH	pH	-						11.4		4916420
Metals										
Soluble Calcium (Ca)	mg/L	-						81.5	0.5	4920420
Soluble Magnesium (Mg)	mg/L	-						<0.5	0.5	4920420
Soluble Sodium (Na)	mg/L	-						11	5	4920420
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture										

RESULTS OF ANALYSES OF SOIL

Maxxam ID			ECO821			ECO822	ECO823		
Sampling Date			2017/03/22			2017/03/22	2017/03/22		
COC Number			601902-30-01			601902-30-01	601902-30-01		
	UNITS	Criteria	17-06 SS13	RDL	QC Batch	17-11 SS1	17-11 SS4	RDL	QC Batch
Calculated Parameters									
Sodium Adsorption Ratio	N/A	12	6.2		4914692	0.25	0.55		4914692
Inorganics									
Conductivity	mS/cm	1.4	3.1	0.002	4920447	0.21	0.34	0.002	4917981
Free Cyanide	ug/g	0.051	0.31	0.04	4916686	<0.01	<0.01	0.01	4916686
Moisture	%	-	69	1.0	4916312	5.2	19	1.0	4916312
Available (CaCl2) pH	pH	-	7.17		4916420	8.33	7.69		4916420
Metals									
Soluble Calcium (Ca)	mg/L	-	141	0.5	4920420	20.1	39.7	0.5	4917979
Soluble Magnesium (Mg)	mg/L	-	39.1	0.5	4920420	8.0	7.1	0.5	4917979
Soluble Sodium (Na)	mg/L	-	324	5	4920420	5	14	5	4917979
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)									
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition									
Soil - Industrial/Commercial/Community- Medium and Fine Texture									

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			ECO808	ECO809	ECO810	ECO811	ECO812		
Sampling Date			2017/03/21	2017/03/21	2017/03/21	2017/03/21	2017/03/21		
COC Number			601902-30-01	601902-30-01	601902-30-01	601902-30-01	601902-30-01		
	UNITS	Criteria	17-19 SS1	17-19 SS8	17-14 SS1	17-14 SS10	17-13 SS2	RDL	QC Batch

Inorganics									
Chromium (VI)	ug/g	10	0.8	<0.2	0.2	<0.2	1.2	0.2	4918041
Metals									
Hot Water Ext. Boron (B)	ug/g	2	1.2	1.5	0.48	0.24	2.9	0.050	4918133
Acid Extractable Antimony (Sb)	ug/g	50	0.34	0.93	0.20	<0.20	1.5	0.20	4918028
Acid Extractable Arsenic (As)	ug/g	18	4.4	4.2	3.7	4.5	5.6	1.0	4918028
Acid Extractable Barium (Ba)	ug/g	670	150	84	110	97	170	0.50	4918028
Acid Extractable Beryllium (Be)	ug/g	10	0.43	0.65	0.30	0.68	0.94	0.20	4918028
Acid Extractable Boron (B)	ug/g	120	20	8.0	12	9.0	22	5.0	4918028
Acid Extractable Cadmium (Cd)	ug/g	1.9	0.33	0.24	0.45	<0.10	0.64	0.10	4918028
Acid Extractable Chromium (Cr)	ug/g	160	65	23	33	23	120	1.0	4918028
Acid Extractable Cobalt (Co)	ug/g	100	3.1	8.2	2.9	11	7.4	0.10	4918028
Acid Extractable Copper (Cu)	ug/g	300	17	29	12	28	60	0.50	4918028
Acid Extractable Lead (Pb)	ug/g	120	55	1500	53	18	100	1.0	4918028
Acid Extractable Molybdenum (Mo)	ug/g	40	2.8	0.71	2.5	1.0	2.3	0.50	4918028
Acid Extractable Nickel (Ni)	ug/g	340	11	17	9.5	25	25	0.50	4918028
Acid Extractable Selenium (Se)	ug/g	5.5	<0.50	<0.50	<0.50	<0.50	0.56	0.50	4918028
Acid Extractable Silver (Ag)	ug/g	50	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4918028
Acid Extractable Thallium (Tl)	ug/g	3.3	0.17	0.35	0.12	0.19	0.14	0.050	4918028
Acid Extractable Uranium (U)	ug/g	33	1.1	0.64	0.87	0.58	0.85	0.050	4918028
Acid Extractable Vanadium (V)	ug/g	86	37	27	28	30	34	5.0	4918028
Acid Extractable Zinc (Zn)	ug/g	340	150	100	200	60	320	5.0	4918028
Acid Extractable Mercury (Hg)	ug/g	20	<0.050	0.051	<0.050	<0.050	0.062	0.050	4918028

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
 Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
 Soil - Industrial/Commercial/Community- Medium and Fine Texture

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			ECO813		ECO820		ECO821	ECO822		
Sampling Date			2017/03/21		2017/03/22		2017/03/22	2017/03/22		
COC Number			601902-30-01		601902-30-01		601902-30-01	601902-30-01		
	UNITS	Criteria	17-13 SS5	RDL	17-06 SS3	RDL	17-06 SS13	17-11 SS1	RDL	QC Batch

Inorganics										
Chromium (VI)	ug/g	10	<0.2	0.2	3.9	0.2	<0.2	0.6	0.2	4918041
Metals										
Hot Water Ext. Boron (B)	ug/g	2	0.26	0.050	6.1	0.050	0.58	0.42	0.050	4918133
Acid Extractable Antimony (Sb)	ug/g	50	<0.20	0.20	8.5	0.20	1.0	3.4	0.20	4918028
Acid Extractable Arsenic (As)	ug/g	18	2.9	1.0	15	1.0	5.7	2.7	1.0	4918028
Acid Extractable Barium (Ba)	ug/g	670	170	0.50	440	0.50	110	220	0.50	4918028
Acid Extractable Beryllium (Be)	ug/g	10	0.75	0.20	0.98	0.20	0.46	2.3	0.20	4918028
Acid Extractable Boron (B)	ug/g	120	9.4	5.0	98	5.0	11	21	5.0	4918028
Acid Extractable Cadmium (Cd)	ug/g	1.9	<0.10	0.10	8.1	0.10	0.56	2.2	0.10	4918028
Acid Extractable Chromium (Cr)	ug/g	160	26	1.0	910	5.0	14	73	1.0	4918028
Acid Extractable Cobalt (Co)	ug/g	100	11	0.10	12	0.10	6.2	4.0	0.10	4918028
Acid Extractable Copper (Cu)	ug/g	300	25	0.50	330	0.50	110	100	0.50	4918028
Acid Extractable Lead (Pb)	ug/g	120	20	1.0	620	1.0	290	150	1.0	4918028
Acid Extractable Molybdenum (Mo)	ug/g	40	0.72	0.50	26	0.50	1.2	5.6	0.50	4918028
Acid Extractable Nickel (Ni)	ug/g	340	26	0.50	120	0.50	17	33	0.50	4918028
Acid Extractable Selenium (Se)	ug/g	5.5	<0.50	0.50	1.1	0.50	0.86	0.99	0.50	4918028
Acid Extractable Silver (Ag)	ug/g	50	<0.20	0.20	1.5	0.20	0.43	<0.20	0.20	4918028
Acid Extractable Thallium (Tl)	ug/g	3.3	0.16	0.050	0.19	0.050	0.18	0.20	0.050	4918028
Acid Extractable Uranium (U)	ug/g	33	0.63	0.050	1.2	0.050	0.93	1.5	0.050	4918028
Acid Extractable Vanadium (V)	ug/g	86	29	5.0	110	5.0	19	19	5.0	4918028
Acid Extractable Zinc (Zn)	ug/g	340	89	5.0	3200	5.0	280	880	5.0	4918028
Acid Extractable Mercury (Hg)	ug/g	20	<0.050	0.050	0.37	0.050	0.61	0.20	0.050	4918028

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)

Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

Soil - Industrial/Commercial/Community- Medium and Fine Texture

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			ECO823		
Sampling Date			2017/03/22		
COC Number			601902-30-01		
	UNITS	Criteria	17-11 SS4	RDL	QC Batch
Inorganics					
Chromium (VI)	ug/g	10	<0.2	0.2	4918041
Metals					
Hot Water Ext. Boron (B)	ug/g	2	0.17	0.050	4918133
Acid Extractable Antimony (Sb)	ug/g	50	<0.20	0.20	4918028
Acid Extractable Arsenic (As)	ug/g	18	2.7	1.0	4918028
Acid Extractable Barium (Ba)	ug/g	670	150	0.50	4918028
Acid Extractable Beryllium (Be)	ug/g	10	0.85	0.20	4918028
Acid Extractable Boron (B)	ug/g	120	11	5.0	4918028
Acid Extractable Cadmium (Cd)	ug/g	1.9	0.10	0.10	4918028
Acid Extractable Chromium (Cr)	ug/g	160	28	1.0	4918028
Acid Extractable Cobalt (Co)	ug/g	100	14	0.10	4918028
Acid Extractable Copper (Cu)	ug/g	300	24	0.50	4918028
Acid Extractable Lead (Pb)	ug/g	120	15	1.0	4918028
Acid Extractable Molybdenum (Mo)	ug/g	40	<0.50	0.50	4918028
Acid Extractable Nickel (Ni)	ug/g	340	31	0.50	4918028
Acid Extractable Selenium (Se)	ug/g	5.5	<0.50	0.50	4918028
Acid Extractable Silver (Ag)	ug/g	50	<0.20	0.20	4918028
Acid Extractable Thallium (Tl)	ug/g	3.3	0.13	0.050	4918028
Acid Extractable Uranium (U)	ug/g	33	0.63	0.050	4918028
Acid Extractable Vanadium (V)	ug/g	86	34	5.0	4918028
Acid Extractable Zinc (Zn)	ug/g	340	62	5.0	4918028
Acid Extractable Mercury (Hg)	ug/g	20	<0.050	0.050	4918028
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)					
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition					
Soil - Industrial/Commercial/Community- Medium and Fine Texture					

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID			ECO808		ECO809		ECO810		ECO811		
Sampling Date			2017/03/21		2017/03/21		2017/03/21		2017/03/21		
COC Number			601902-30-01		601902-30-01		601902-30-01		601902-30-01		
	UNITS	Criteria	17-19 SS1	RDL	17-19 SS8	RDL	17-14 SS1	RDL	17-14 SS10	RDL	QC Batch
Calculated Parameters											
Methylnaphthalene, 2-(1-)	ug/g	85	0.12	0.071	0.58	0.0071	<0.14	0.14	<0.0071	0.0071	4914713
Polyaromatic Hydrocarbons											
Acenaphthene	ug/g	96	<0.050	0.050	0.057	0.0050	<0.10	0.10	<0.0050	0.0050	4917178
Acenaphthylene	ug/g	0.17	<0.050	0.050	<0.020 (1)	0.020	<0.10	0.10	<0.0050	0.0050	4917178
Anthracene	ug/g	0.74	<0.050	0.050	0.13	0.0050	<0.10	0.10	<0.0050	0.0050	4917178
Benzo(a)anthracene	ug/g	0.96	0.052	0.050	0.058	0.0050	<0.10	0.10	<0.0050	0.0050	4917178
Benzo(a)pyrene	ug/g	0.3	0.057	0.050	0.028	0.0050	<0.10	0.10	<0.0050	0.0050	4917178
Benzo(b/j)fluoranthene	ug/g	0.96	0.097	0.050	0.034	0.0050	0.10	0.10	<0.0050	0.0050	4917178
Benzo(g,h,i)perylene	ug/g	9.6	0.11	0.050	0.021	0.0050	0.23	0.10	<0.0050	0.0050	4917178
Benzo(k)fluoranthene	ug/g	0.96	<0.050	0.050	0.0090	0.0050	<0.10	0.10	<0.0050	0.0050	4917178
Chrysene	ug/g	9.6	0.079	0.050	0.10	0.0050	<0.10	0.10	<0.0050	0.0050	4917178
Dibenz(a,h)anthracene	ug/g	0.1	<0.050	0.050	0.0066	0.0050	<0.10	0.10	<0.0050	0.0050	4917178
Fluoranthene	ug/g	9.6	0.13	0.050	0.070	0.0050	<0.10	0.10	<0.0050	0.0050	4917178
Fluorene	ug/g	69	<0.050	0.050	<0.060 (1)	0.060	<0.10	0.10	<0.0050	0.0050	4917178
Indeno(1,2,3-cd)pyrene	ug/g	0.95	0.054	0.050	0.014	0.0050	0.11	0.10	<0.0050	0.0050	4917178
1-Methylnaphthalene	ug/g	85	0.051	0.050	0.29	0.0050	<0.10	0.10	<0.0050	0.0050	4917178
2-Methylnaphthalene	ug/g	85	0.064	0.050	0.29	0.0050	<0.10	0.10	<0.0050	0.0050	4917178
Naphthalene	ug/g	28	<0.050	0.050	<0.050 (1)	0.050	<0.10	0.10	<0.0050	0.0050	4917178
Phenanthrene	ug/g	16	0.10	0.050	0.38	0.0050	<0.10	0.10	<0.0050	0.0050	4917178
Pyrene	ug/g	96	0.15	0.050	0.20	0.0050	<0.10	0.10	<0.0050	0.0050	4917178
Surrogate Recovery (%)											
D10-Anthracene	%	-	128		105		125		111		4917178
D14-Terphenyl (FS)	%	-	107		112		106		108		4917178
D8-Acenaphthylene	%	-	108		107		113		102		4917178
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture (1) DL was raised due to matrix interference.											

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID			ECO812		ECO813		ECO816		ECO817		
Sampling Date			2017/03/21		2017/03/21		2017/03/21		2017/03/21		
COC Number			601902-30-01		601902-30-01		601902-30-01		601902-30-01		
	UNITS	Criteria	17-13 SS2	RDL	17-13 SS5	RDL	QA/QC 5	RDL	QA/QC 6	RDL	QC Batch

Calculated Parameters

Methylnaphthalene, 2-(1-)	ug/g	85	0.32	0.071	0.012	0.0071	0.15	0.071	0.49	0.0071	4914713
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Polyaromatic Hydrocarbons

Acenaphthene	ug/g	96	0.080	0.050	<0.0050	0.0050	<0.050	0.050	0.19	0.0050	4917178
Acenaphthylene	ug/g	0.17	<0.050	0.050	<0.0050	0.0050	<0.050	0.050	0.030	0.0050	4917178
Anthracene	ug/g	0.74	0.17	0.050	0.012	0.0050	<0.050	0.050	0.31	0.0050	4917178
Benzo(a)anthracene	ug/g	0.96	0.68	0.050	0.055	0.0050	0.078	0.050	0.70	0.0050	4917178
Benzo(a)pyrene	ug/g	0.3	0.71	0.050	0.055	0.0050	0.092	0.050	0.64	0.0050	4917178
Benzo(b/j)fluoranthene	ug/g	0.96	0.97	0.050	0.067	0.0050	0.15	0.050	0.85	0.0050	4917178
Benzo(g,h,i)perylene	ug/g	9.6	0.53	0.050	0.039	0.0050	0.18	0.050	0.43	0.0050	4917178
Benzo(k)fluoranthene	ug/g	0.96	0.32	0.050	0.025	0.0050	<0.050	0.050	0.33	0.0050	4917178
Chrysene	ug/g	9.6	0.66	0.050	0.049	0.0050	0.10	0.050	0.71	0.0050	4917178
Dibenz(a,h)anthracene	ug/g	0.1	0.12	0.050	0.0088	0.0050	<0.050	0.050	0.11	0.0050	4917178
Fluoranthene	ug/g	9.6	1.6	0.050	0.10	0.0050	0.18	0.050	1.7	0.0050	4917178
Fluorene	ug/g	69	0.082	0.050	<0.0050	0.0050	<0.050	0.050	0.17	0.0050	4917178
Indeno(1,2,3-cd)pyrene	ug/g	0.95	0.52	0.050	0.036	0.0050	0.091	0.050	0.47	0.0050	4917178
1-Methylnaphthalene	ug/g	85	0.17	0.050	0.0060	0.0050	0.065	0.050	0.31	0.0050	4917178
2-Methylnaphthalene	ug/g	85	0.15	0.050	0.0058	0.0050	0.085	0.050	0.18	0.0050	4917178
Naphthalene	ug/g	28	0.096	0.050	<0.0050	0.0050	<0.050	0.050	0.12	0.0050	4917178
Phenanthrene	ug/g	16	1.1	0.050	0.037	0.0050	0.15	0.050	1.4	0.0050	4917178
Pyrene	ug/g	96	1.4	0.050	0.10	0.0050	0.21	0.050	1.5	0.0050	4917178

Surrogate Recovery (%)

D10-Anthracene	%	-	120		108		124		99		4917178
D14-Terphenyl (FS)	%	-	111		102		114		103		4917178
D8-Acenaphthylene	%	-	113		103		117		103		4917178

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)

Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

Soil - Industrial/Commercial/Community- Medium and Fine Texture

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID			ECO818	ECO819		ECO820		ECO821		
Sampling Date			2017/03/21	2017/03/21		2017/03/22		2017/03/22		
COC Number			601902-30-01	601902-30-01		601902-30-01		601902-30-01		
	UNITS	Criteria	QA/QC 7	QA/QC 8	RDL	17-06 SS3	RDL	17-06 SS13	RDL	QC Batch
Calculated Parameters										
Methylnaphthalene, 2-(1-)	ug/g	85	<0.0071	<0.0071	0.0071	0.17	0.071	1.7	0.021	4914713
Polyaromatic Hydrocarbons										
Acenaphthene	ug/g	96	<0.0050	<0.0050	0.0050	0.062	0.050	0.045	0.015	4917178
Acenaphthylene	ug/g	0.17	<0.0050	<0.0050	0.0050	<0.050	0.050	<0.015	0.015	4917178
Anthracene	ug/g	0.74	<0.0050	<0.0050	0.0050	0.14	0.050	0.060	0.015	4917178
Benzo(a)anthracene	ug/g	0.96	<0.0050	<0.0050	0.0050	0.17	0.050	0.028	0.015	4917178
Benzo(a)pyrene	ug/g	0.3	<0.0050	<0.0050	0.0050	0.10	0.050	0.031	0.015	4917178
Benzo(b/j)fluoranthene	ug/g	0.96	<0.0050	<0.0050	0.0050	0.21	0.050	0.041	0.015	4917178
Benzo(g,h,i)perylene	ug/g	9.6	<0.0050	<0.0050	0.0050	0.11	0.050	0.027	0.015	4917178
Benzo(k)fluoranthene	ug/g	0.96	<0.0050	<0.0050	0.0050	0.051	0.050	<0.015	0.015	4917178
Chrysene	ug/g	9.6	<0.0050	<0.0050	0.0050	0.32	0.050	0.026	0.015	4917178
Dibenz(a,h)anthracene	ug/g	0.1	<0.0050	<0.0050	0.0050	<0.050	0.050	<0.015	0.015	4917178
Fluoranthene	ug/g	9.6	<0.0050	<0.0050	0.0050	0.71	0.050	0.062	0.015	4917178
Fluorene	ug/g	69	<0.0050	<0.0050	0.0050	0.21	0.050	0.048	0.015	4917178
Indeno(1,2,3-cd)pyrene	ug/g	0.95	<0.0050	<0.0050	0.0050	0.12	0.050	0.027	0.015	4917178
1-Methylnaphthalene	ug/g	85	<0.0050	<0.0050	0.0050	0.078	0.050	0.80	0.015	4917178
2-Methylnaphthalene	ug/g	85	<0.0050	<0.0050	0.0050	0.091	0.050	0.87	0.015	4917178
Naphthalene	ug/g	28	<0.0050	<0.0050	0.0050	<0.070 (1)	0.070	0.16	0.015	4917178
Phenanthrene	ug/g	16	0.0051	<0.0050	0.0050	0.42	0.050	0.28	0.015	4917178
Pyrene	ug/g	96	0.0056	<0.0050	0.0050	0.61	0.050	0.072	0.015	4917178
Surrogate Recovery (%)										
D10-Anthracene	%	-	109	110		111		101		4917178
D14-Terphenyl (FS)	%	-	109	109		112		97		4917178
D8-Acenaphthylene	%	-	99	103		107		101		4917178
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture (1) DL was raised due to matrix interference.										

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID			ECO822		ECO823		
Sampling Date			2017/03/22		2017/03/22		
COC Number			601902-30-01		601902-30-01		
	UNITS	Criteria	17-11 SS1	RDL	17-11 SS4	RDL	QC Batch
Calculated Parameters							
Methylnaphthalene, 2-(1-)	ug/g	85	0.13	0.0071	<0.0071	0.0071	4914713
Polyaromatic Hydrocarbons							
Acenaphthene	ug/g	96	0.023	0.0050	<0.0050	0.0050	4917178
Acenaphthylene	ug/g	0.17	0.0095	0.0050	<0.0050	0.0050	4917178
Anthracene	ug/g	0.74	0.042	0.0050	<0.0050	0.0050	4917178
Benzo(a)anthracene	ug/g	0.96	0.026	0.0050	<0.0050	0.0050	4917178
Benzo(a)pyrene	ug/g	0.3	0.027	0.0050	<0.0050	0.0050	4917178
Benzo(b/j)fluoranthene	ug/g	0.96	0.053	0.0050	<0.0050	0.0050	4917178
Benzo(g,h,i)perylene	ug/g	9.6	0.038	0.0050	<0.0050	0.0050	4917178
Benzo(k)fluoranthene	ug/g	0.96	0.018	0.0050	<0.0050	0.0050	4917178
Chrysene	ug/g	9.6	0.032	0.0050	0.010	0.0050	4917178
Dibenz(a,h)anthracene	ug/g	0.1	0.0070	0.0050	<0.0050	0.0050	4917178
Fluoranthene	ug/g	9.6	0.062	0.0050	<0.0050	0.0050	4917178
Fluorene	ug/g	69	0.027	0.0050	<0.0050	0.0050	4917178
Indeno(1,2,3-cd)pyrene	ug/g	0.95	0.038	0.0050	<0.0050	0.0050	4917178
1-Methylnaphthalene	ug/g	85	0.059	0.0050	<0.0050	0.0050	4917178
2-Methylnaphthalene	ug/g	85	0.070	0.0050	<0.0050	0.0050	4917178
Naphthalene	ug/g	28	<0.020 (1)	0.020	<0.0050	0.0050	4917178
Phenanthrene	ug/g	16	0.11	0.0050	<0.0050	0.0050	4917178
Pyrene	ug/g	96	0.084	0.0050	<0.0050	0.0050	4917178
Surrogate Recovery (%)							
D10-Anthracene	%	-	104		108		4917178
D14-Terphenyl (FS)	%	-	102		109		4917178
D8-Acenaphthylene	%	-	102		103		4917178
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture (1) DL was raised due to matrix interference.							

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			ECO808	ECO809	ECO810	ECO811	ECO812		
Sampling Date			2017/03/21	2017/03/21	2017/03/21	2017/03/21	2017/03/21		
COC Number			601902-30-01	601902-30-01	601902-30-01	601902-30-01	601902-30-01		
	UNITS	Criteria	17-19 SS1	17-19 SS8	17-14 SS1	17-14 SS10	17-13 SS2	RDL	QC Batch

Calculated Parameters									
1,3-Dichloropropene (cis+trans)	ug/g	0.21	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4914746
Volatile Organics									
Acetone (2-Propanone)	ug/g	28	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4916219
Benzene	ug/g	0.4	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4916219
Bromodichloromethane	ug/g	18	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
Bromoform	ug/g	1.7	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
Bromomethane	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
Carbon Tetrachloride	ug/g	1.5	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
Chlorobenzene	ug/g	2.7	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
Chloroform	ug/g	0.18	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
Dibromochloromethane	ug/g	13	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
1,2-Dichlorobenzene	ug/g	8.5	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
1,3-Dichlorobenzene	ug/g	12	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
1,4-Dichlorobenzene	ug/g	0.84	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
Dichlorodifluoromethane (FREON 12)	ug/g	25	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
1,1-Dichloroethane	ug/g	21	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
1,2-Dichloroethane	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
1,1-Dichloroethylene	ug/g	0.48	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
cis-1,2-Dichloroethylene	ug/g	37	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
trans-1,2-Dichloroethylene	ug/g	9.3	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
1,2-Dichloropropane	ug/g	0.68	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
cis-1,3-Dichloropropene	ug/g	0.21	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	4916219
trans-1,3-Dichloropropene	ug/g	0.21	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	4916219
Ethylbenzene	ug/g	19	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4916219
Ethylene Dibromide	ug/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
Hexane	ug/g	88	<0.050	0.11	<0.050	<0.050	<0.050	0.050	4916219
Methylene Chloride(Dichloromethane)	ug/g	2	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
Methyl Ethyl Ketone (2-Butanone)	ug/g	88	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4916219
Methyl Isobutyl Ketone	ug/g	210	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4916219
Methyl t-butyl ether (MTBE)	ug/g	3.2	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
Styrene	ug/g	43	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
 Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
 Soil - Industrial/Commercial/Community- Medium and Fine Texture

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			ECO808	ECO809	ECO810	ECO811	ECO812		
Sampling Date			2017/03/21	2017/03/21	2017/03/21	2017/03/21	2017/03/21		
COC Number			601902-30-01	601902-30-01	601902-30-01	601902-30-01	601902-30-01		
	UNITS	Criteria	17-19 SS1	17-19 SS8	17-14 SS1	17-14 SS10	17-13 SS2	RDL	QC Batch
1,1,1,2-Tetrachloroethane	ug/g	0.11	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
1,1,2,2-Tetrachloroethane	ug/g	0.094	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
Tetrachloroethylene	ug/g	21	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
Toluene	ug/g	78	<0.020	0.027	<0.020	<0.020	<0.020	0.020	4916219
1,1,1-Trichloroethane	ug/g	12	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
1,1,2-Trichloroethane	ug/g	0.11	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
Trichloroethylene	ug/g	0.61	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
Trichlorofluoromethane (FREON 11)	ug/g	5.8	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4916219
Vinyl Chloride	ug/g	0.25	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4916219
p+m-Xylene	ug/g	-	<0.020	0.16	<0.020	<0.020	<0.020	0.020	4916219
o-Xylene	ug/g	-	<0.020	0.091	<0.020	<0.020	<0.020	0.020	4916219
Total Xylenes	ug/g	30	<0.020	0.25	<0.020	<0.020	<0.020	0.020	4916219
F1 (C6-C10)	ug/g	65	<10	19	<10	<10	<10	10	4916219
F1 (C6-C10) - BTEX	ug/g	65	<10	18	<10	<10	<10	10	4916219
Surrogate Recovery (%)									
4-Bromofluorobenzene	%	-	95	96	94	95	94		4916219
D10-o-Xylene	%	-	103	101	101	105	106		4916219
D4-1,2-Dichloroethane	%	-	102	89	102	99	101		4916219
D8-Toluene	%	-	102	101	102	102	101		4916219
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)									
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition									
Soil - Industrial/Commercial/Community- Medium and Fine Texture									

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			ECO813		ECO814		ECO815	ECO816		
Sampling Date			2017/03/21		2017/03/21		2017/03/21	2017/03/21		
COC Number			601902-30-01		601902-30-01		601902-30-01	601902-30-01		
	UNITS	Criteria	17-13 SS5	RDL	17-20 SS7	RDL	17-20 SS9	QA/QC 5	RDL	QC Batch

Calculated Parameters										
1,3-Dichloropropene (cis+trans)	ug/g	0.21	<0.050	0.050	<0.050	0.050	<0.050	<0.050	0.050	4914746
Volatile Organics										
Acetone (2-Propanone)	ug/g	28	<0.50	0.50	<13	13	<0.50	<0.50	0.50	4916219
Benzene	ug/g	0.4	<0.020	0.020	0.14	0.020	<0.020	<0.020	0.020	4916219
Bromodichloromethane	ug/g	18	<0.050	0.050	<1.3	1.3	<0.050	<0.050	0.050	4916219
Bromoform	ug/g	1.7	<0.050	0.050	<0.050	0.050	<0.050	<0.050	0.050	4916219
Bromomethane	ug/g	0.05	<0.050	0.050	<0.050	0.050	<0.050	<0.050	0.050	4916219
Carbon Tetrachloride	ug/g	1.5	<0.050	0.050	<0.050	0.050	<0.050	<0.050	0.050	4916219
Chlorobenzene	ug/g	2.7	<0.050	0.050	<1.3	1.3	<0.050	<0.050	0.050	4916219
Chloroform	ug/g	0.18	<0.050	0.050	<0.050	0.050	<0.050	<0.050	0.050	4916219
Dibromochloromethane	ug/g	13	<0.050	0.050	<1.3	1.3	<0.050	<0.050	0.050	4916219
1,2-Dichlorobenzene	ug/g	8.5	<0.050	0.050	<1.3	1.3	<0.050	<0.050	0.050	4916219
1,3-Dichlorobenzene	ug/g	12	<0.050	0.050	<1.3	1.3	<0.050	<0.050	0.050	4916219
1,4-Dichlorobenzene	ug/g	0.84	<0.050	0.050	<0.14 (1)	0.14	<0.050	<0.050	0.050	4916219
Dichlorodifluoromethane (FREON 12)	ug/g	25	<0.050	0.050	<1.3	1.3	<0.050	<0.050	0.050	4916219
1,1-Dichloroethane	ug/g	21	<0.050	0.050	<1.3	1.3	<0.050	<0.050	0.050	4916219
1,2-Dichloroethane	ug/g	0.05	<0.050	0.050	<0.050	0.050	<0.050	<0.050	0.050	4916219
1,1-Dichloroethylene	ug/g	0.48	<0.050	0.050	<0.050	0.050	<0.050	<0.050	0.050	4916219
cis-1,2-Dichloroethylene	ug/g	37	<0.050	0.050	<1.3	1.3	<0.050	<0.050	0.050	4916219
trans-1,2-Dichloroethylene	ug/g	9.3	<0.050	0.050	<1.3	1.3	<0.050	<0.050	0.050	4916219
1,2-Dichloropropane	ug/g	0.68	<0.050	0.050	<0.090 (1)	0.090	<0.050	<0.050	0.050	4916219
cis-1,3-Dichloropropene	ug/g	0.21	<0.030	0.030	<0.030	0.030	<0.030	<0.030	0.030	4916219
trans-1,3-Dichloropropene	ug/g	0.21	<0.040	0.040	<0.040	0.040	<0.040	<0.040	0.040	4916219
Ethylbenzene	ug/g	19	<0.020	0.020	2.8	0.50	<0.020	<0.020	0.020	4916219
Ethylene Dibromide	ug/g	0.05	<0.050	0.050	<0.050	0.050	<0.050	<0.050	0.050	4916219
Hexane	ug/g	88	<0.050	0.050	3.3	1.3	<0.050	<0.050	0.050	4916219
Methylene Chloride(Dichloromethane)	ug/g	2	<0.050	0.050	<1.3	1.3	<0.050	<0.050	0.050	4916219
Methyl Ethyl Ketone (2-Butanone)	ug/g	88	<0.50	0.50	<13	13	<0.50	<0.50	0.50	4916219
Methyl Isobutyl Ketone	ug/g	210	<0.50	0.50	<13	13	<0.50	<0.50	0.50	4916219
Methyl t-butyl ether (MTBE)	ug/g	3.2	<0.050	0.050	<1.3	1.3	<0.050	<0.050	0.050	4916219

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
 Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
 Soil - Industrial/Commercial/Community- Medium and Fine Texture
 (1) VOCF1 Analysis: Detection limit was raised due to matrix interferences.

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			ECO813		ECO814		ECO815	ECO816		
Sampling Date			2017/03/21		2017/03/21		2017/03/21	2017/03/21		
COC Number			601902-30-01		601902-30-01		601902-30-01	601902-30-01		
	UNITS	Criteria	17-13 SS5	RDL	17-20 SS7	RDL	17-20 SS9	QA/QC 5	RDL	QC Batch
Styrene	ug/g	43	<0.050	0.050	<1.3	1.3	<0.050	<0.050	0.050	4916219
1,1,1,2-Tetrachloroethane	ug/g	0.11	<0.050	0.050	<0.050	0.050	<0.050	<0.050	0.050	4916219
1,1,2,2-Tetrachloroethane	ug/g	0.094	<0.050	0.050	<0.050	0.050	<0.050	<0.050	0.050	4916219
Tetrachloroethylene	ug/g	21	<0.050	0.050	<1.3	1.3	<0.050	<0.050	0.050	4916219
Toluene	ug/g	78	<0.020	0.020	2.3	0.50	<0.020	<0.020	0.020	4916219
1,1,1-Trichloroethane	ug/g	12	<0.050	0.050	<1.3	1.3	<0.050	<0.050	0.050	4916219
1,1,2-Trichloroethane	ug/g	0.11	<0.050	0.050	<0.050	0.050	<0.050	<0.050	0.050	4916219
Trichloroethylene	ug/g	0.61	<0.050	0.050	<0.050	0.050	<0.050	<0.050	0.050	4916219
Trichlorofluoromethane (FREON 11)	ug/g	5.8	<0.050	0.050	<1.3	1.3	<0.050	0.33	0.050	4916219
Vinyl Chloride	ug/g	0.25	<0.020	0.020	<0.020	0.020	<0.020	<0.020	0.020	4916219
p+m-Xylene	ug/g	-	<0.020	0.020	19	0.50	<0.020	0.021	0.020	4916219
o-Xylene	ug/g	-	<0.020	0.020	10	0.50	<0.020	<0.020	0.020	4916219
Total Xylenes	ug/g	30	<0.020	0.020	29	0.50	<0.020	0.021	0.020	4916219
F1 (C6-C10)	ug/g	65	<10	10	1200	250	<10	<10	10	4916219
F1 (C6-C10) - BTEX	ug/g	65	<10	10	1100	250	<10	<10	10	4916219
Surrogate Recovery (%)										
4-Bromofluorobenzene	%	-	95		99		94	99		4916219
D10-o-Xylene	%	-	105		89		104	96		4916219
D4-1,2-Dichloroethane	%	-	101		101		100	97		4916219
D8-Toluene	%	-	102		101		102	100		4916219
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture										

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			ECO817		ECO818	ECO819	ECO820		
Sampling Date			2017/03/21		2017/03/21	2017/03/21	2017/03/22		
COC Number			601902-30-01		601902-30-01	601902-30-01	601902-30-01		
	UNITS	Criteria	QA/QC 6	RDL	QA/QC 7	QA/QC 8	17-06 SS3	RDL	QC Batch

Calculated Parameters									
1,3-Dichloropropene (cis+trans)	ug/g	0.21	<0.16	0.16	<0.050	<0.050	<0.050	0.050	4914746
Volatile Organics									
Acetone (2-Propanone)	ug/g	28	<2.5	2.5	<0.50	<0.50	<0.50	0.50	4916219
Benzene	ug/g	0.4	<0.10	0.10	<0.020	<0.020	0.031	0.020	4916219
Bromodichloromethane	ug/g	18	<0.25	0.25	<0.050	<0.050	<0.050	0.050	4916219
Bromoform	ug/g	1.7	<0.25	0.25	<0.050	<0.050	<0.050	0.050	4916219
Bromomethane	ug/g	0.05	<0.050	0.050	<0.050	<0.050	<0.050	0.050	4916219
Carbon Tetrachloride	ug/g	1.5	<0.050	0.050	<0.050	<0.050	<0.050	0.050	4916219
Chlorobenzene	ug/g	2.7	<0.25	0.25	<0.050	<0.050	<0.050	0.050	4916219
Chloroform	ug/g	0.18	<0.050	0.050	<0.050	<0.050	<0.050	0.050	4916219
Dibromochloromethane	ug/g	13	<0.25	0.25	<0.050	<0.050	<0.050	0.050	4916219
1,2-Dichlorobenzene	ug/g	8.5	<0.25	0.25	<0.050	<0.050	<0.050	0.050	4916219
1,3-Dichlorobenzene	ug/g	12	<0.25	0.25	<0.050	<0.050	<0.050	0.050	4916219
1,4-Dichlorobenzene	ug/g	0.84	<0.050	0.050	<0.050	<0.050	<0.050	0.050	4916219
Dichlorodifluoromethane (FREON 12)	ug/g	25	<0.25	0.25	<0.050	<0.050	<0.050	0.050	4916219
1,1-Dichloroethane	ug/g	21	<0.25	0.25	<0.050	<0.050	<0.050	0.050	4916219
1,2-Dichloroethane	ug/g	0.05	<0.050	0.050	<0.050	<0.050	<0.050	0.050	4916219
1,1-Dichloroethylene	ug/g	0.48	<0.050	0.050	<0.050	<0.050	<0.050	0.050	4916219
cis-1,2-Dichloroethylene	ug/g	37	<0.25	0.25	<0.050	<0.050	<0.050	0.050	4916219
trans-1,2-Dichloroethylene	ug/g	9.3	<0.25	0.25	<0.050	<0.050	<0.050	0.050	4916219
1,2-Dichloropropane	ug/g	0.68	<0.050	0.050	<0.050	<0.050	<0.050	0.050	4916219
cis-1,3-Dichloropropene	ug/g	0.21	<0.15	0.15	<0.030	<0.030	<0.030	0.030	4916219
trans-1,3-Dichloropropene	ug/g	0.21	<0.040	0.040	<0.040	<0.040	<0.040	0.040	4916219
Ethylbenzene	ug/g	19	0.11	0.10	<0.020	<0.020	0.16	0.020	4916219
Ethylene Dibromide	ug/g	0.05	<0.050	0.050	<0.050	<0.050	<0.050	0.050	4916219
Hexane	ug/g	88	0.80	0.25	<0.050	<0.050	0.065	0.050	4916219
Methylene Chloride(Dichloromethane)	ug/g	2	<0.25	0.25	<0.050	<0.050	<0.050	0.050	4916219
Methyl Ethyl Ketone (2-Butanone)	ug/g	88	<2.5	2.5	<0.50	<0.50	<0.50	0.50	4916219
Methyl Isobutyl Ketone	ug/g	210	<2.5	2.5	<0.50	<0.50	<0.50	0.50	4916219
Methyl t-butyl ether (MTBE)	ug/g	3.2	<0.25	0.25	<0.050	<0.050	<0.050	0.050	4916219
Styrene	ug/g	43	<0.25	0.25	<0.050	<0.050	<0.050	0.050	4916219

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
 Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
 Soil - Industrial/Commercial/Community- Medium and Fine Texture

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			ECO817		ECO818	ECO819	ECO820		
Sampling Date			2017/03/21		2017/03/21	2017/03/21	2017/03/22		
COC Number			601902-30-01		601902-30-01	601902-30-01	601902-30-01		
	UNITS	Criteria	QA/QC 6	RDL	QA/QC 7	QA/QC 8	17-06 SS3	RDL	QC Batch
1,1,1,2-Tetrachloroethane	ug/g	0.11	<0.050	0.050	<0.050	<0.050	<0.050	0.050	4916219
1,1,2,2-Tetrachloroethane	ug/g	0.094	<0.050	0.050	<0.050	<0.050	<0.050	0.050	4916219
Tetrachloroethylene	ug/g	21	<0.25	0.25	<0.050	<0.050	<0.050	0.050	4916219
Toluene	ug/g	78	0.12	0.10	<0.020	<0.020	0.41	0.020	4916219
1,1,1-Trichloroethane	ug/g	12	<0.25	0.25	<0.050	<0.050	<0.050	0.050	4916219
1,1,2-Trichloroethane	ug/g	0.11	<0.050	0.050	<0.050	<0.050	<0.050	0.050	4916219
Trichloroethylene	ug/g	0.61	<0.25	0.25	<0.050	<0.050	0.079	0.050	4916219
Trichlorofluoromethane (FREON 11)	ug/g	5.8	<0.25	0.25	<0.050	<0.050	<0.050	0.050	4916219
Vinyl Chloride	ug/g	0.25	<0.020	0.020	<0.020	<0.020	<0.020	0.020	4916219
p+m-Xylene	ug/g	-	0.93	0.10	<0.020	<0.020	0.58	0.020	4916219
o-Xylene	ug/g	-	0.45	0.10	<0.020	<0.020	0.25	0.020	4916219
Total Xylenes	ug/g	30	1.4	0.10	<0.020	<0.020	0.83	0.020	4916219
F1 (C6-C10)	ug/g	65	150	50	<10	<10	<10	10	4916219
F1 (C6-C10) - BTEX	ug/g	65	140	50	<10	<10	<10	10	4916219
Surrogate Recovery (%)									
4-Bromofluorobenzene	%	-	100		95	95	96		4916219
D10-o-Xylene	%	-	90		108	108	103		4916219
D4-1,2-Dichloroethane	%	-	103		101	102	101		4916219
D8-Toluene	%	-	103		103	102	102		4916219
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture									

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			ECO821		ECO822	ECO823		
Sampling Date			2017/03/22		2017/03/22	2017/03/22		
COC Number			601902-30-01		601902-30-01	601902-30-01		
	UNITS	Criteria	17-06 SS13	RDL	17-11 SS1	17-11 SS4	RDL	QC Batch
Calculated Parameters								
1,3-Dichloropropene (cis+trans)	ug/g	0.21	<0.10	0.10	<0.050	<0.050	0.050	4914746
Volatile Organics								
Acetone (2-Propanone)	ug/g	28	1.0	1.0	<0.50	<0.50	0.50	4916219
Benzene	ug/g	0.4	<0.040	0.040	<0.020	<0.020	0.020	4916219
Bromodichloromethane	ug/g	18	<0.10	0.10	<0.050	<0.050	0.050	4916219
Bromoform	ug/g	1.7	<0.10	0.10	<0.050	<0.050	0.050	4916219
Bromomethane	ug/g	0.05	<0.10 (1)	0.10	<0.050	<0.050	0.050	4916219
Carbon Tetrachloride	ug/g	1.5	<0.10	0.10	<0.050	<0.050	0.050	4916219
Chlorobenzene	ug/g	2.7	<0.10	0.10	<0.050	<0.050	0.050	4916219
Chloroform	ug/g	0.18	<0.10	0.10	<0.050	<0.050	0.050	4916219
Dibromochloromethane	ug/g	13	<0.10	0.10	<0.050	<0.050	0.050	4916219
1,2-Dichlorobenzene	ug/g	8.5	<0.10	0.10	<0.050	<0.050	0.050	4916219
1,3-Dichlorobenzene	ug/g	12	<0.10	0.10	<0.050	<0.050	0.050	4916219
1,4-Dichlorobenzene	ug/g	0.84	<0.10	0.10	<0.050	<0.050	0.050	4916219
Dichlorodifluoromethane (FREON 12)	ug/g	25	<0.10	0.10	<0.050	<0.050	0.050	4916219
1,1-Dichloroethane	ug/g	21	<0.10	0.10	<0.050	<0.050	0.050	4916219
1,2-Dichloroethane	ug/g	0.05	<0.10 (1)	0.10	<0.050	<0.050	0.050	4916219
1,1-Dichloroethylene	ug/g	0.48	<0.10	0.10	<0.050	<0.050	0.050	4916219
cis-1,2-Dichloroethylene	ug/g	37	<0.10	0.10	<0.050	0.11	0.050	4916219
trans-1,2-Dichloroethylene	ug/g	9.3	<0.10	0.10	<0.050	<0.050	0.050	4916219
1,2-Dichloropropane	ug/g	0.68	<0.10	0.10	<0.050	<0.050	0.050	4916219
cis-1,3-Dichloropropene	ug/g	0.21	<0.060	0.060	<0.030	<0.030	0.030	4916219
trans-1,3-Dichloropropene	ug/g	0.21	<0.080	0.080	<0.040	<0.040	0.040	4916219
Ethylbenzene	ug/g	19	<0.040	0.040	<0.020	<0.020	0.020	4916219
Ethylene Dibromide	ug/g	0.05	<0.10 (1)	0.10	<0.050	<0.050	0.050	4916219
Hexane	ug/g	88	<0.10	0.10	0.24	<0.050	0.050	4916219
Methylene Chloride(Dichloromethane)	ug/g	2	<0.10	0.10	<0.050	<0.050	0.050	4916219
Methyl Ethyl Ketone (2-Butanone)	ug/g	88	<1.0	1.0	<0.50	<0.50	0.50	4916219
Methyl Isobutyl Ketone	ug/g	210	<1.0	1.0	<0.50	<0.50	0.50	4916219
Methyl t-butyl ether (MTBE)	ug/g	3.2	<0.10	0.10	<0.050	<0.050	0.050	4916219
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture (1) RDL exceeds criteria								

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID			ECO821		ECO822	ECO823		
Sampling Date			2017/03/22		2017/03/22	2017/03/22		
COC Number			601902-30-01		601902-30-01	601902-30-01		
	UNITS	Criteria	17-06 SS13	RDL	17-11 SS1	17-11 SS4	RDL	QC Batch
Styrene	ug/g	43	<0.10	0.10	<0.050	<0.050	0.050	4916219
1,1,1,2-Tetrachloroethane	ug/g	0.11	<0.10	0.10	<0.050	<0.050	0.050	4916219
1,1,2,2-Tetrachloroethane	ug/g	0.094	<0.10 (1)	0.10	<0.050	<0.050	0.050	4916219
Tetrachloroethylene	ug/g	21	<0.10	0.10	<0.050	<0.050	0.050	4916219
Toluene	ug/g	78	0.062	0.040	<0.020	<0.020	0.020	4916219
1,1,1-Trichloroethane	ug/g	12	<0.10	0.10	<0.050	<0.050	0.050	4916219
1,1,2-Trichloroethane	ug/g	0.11	<0.10	0.10	<0.050	<0.050	0.050	4916219
Trichloroethylene	ug/g	0.61	<0.10	0.10	<0.050	<0.050	0.050	4916219
Trichlorofluoromethane (FREON 11)	ug/g	5.8	<0.10	0.10	<0.050	<0.050	0.050	4916219
Vinyl Chloride	ug/g	0.25	<0.040	0.040	<0.020	0.041	0.020	4916219
p+m-Xylene	ug/g	-	0.23	0.040	<0.020	<0.020	0.020	4916219
o-Xylene	ug/g	-	0.18	0.040	<0.020	<0.020	0.020	4916219
Total Xylenes	ug/g	30	0.41	0.040	<0.020	<0.020	0.020	4916219
F1 (C6-C10)	ug/g	65	<20	20	15	<10	10	4916219
F1 (C6-C10) - BTEX	ug/g	65	<20	20	15	<10	10	4916219
Surrogate Recovery (%)								
4-Bromofluorobenzene	%	-	95		95	95		4916219
D10-o-Xylene	%	-	101		109	107		4916219
D4-1,2-Dichloroethane	%	-	99		103	100		4916219
D8-Toluene	%	-	102		101	102		4916219
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture (1) RDL exceeds criteria								

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			ECO808	ECO809	ECO810	ECO811	ECO812		
Sampling Date			2017/03/21	2017/03/21	2017/03/21	2017/03/21	2017/03/21		
COC Number			601902-30-01	601902-30-01	601902-30-01	601902-30-01	601902-30-01		
	UNITS	Criteria	17-19 SS1	17-19 SS8	17-14 SS1	17-14 SS10	17-13 SS2	RDL	QC Batch

F2-F4 Hydrocarbons									
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	6600	6700		16000		7700	100	4923135
F2 (C10-C16 Hydrocarbons)	ug/g	250	29	330	20	<10	21	10	4919580
F3 (C16-C34 Hydrocarbons)	ug/g	2500	610	510	1100	<50	750	50	4919580
F4 (C34-C50 Hydrocarbons)	ug/g	6600	2000	52	3400	<50	2200	50	4919580
Reached Baseline at C50	ug/g	-	No	Yes	No	Yes	No		4919580

Surrogate Recovery (%)									
o-Terphenyl	%	-	88	93	85	92	89		4919580

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
Soil - Industrial/Commercial/Community- Medium and Fine Texture

Maxxam ID			ECO813	ECO814	ECO815	ECO816	ECO817		
Sampling Date			2017/03/21	2017/03/21	2017/03/21	2017/03/21	2017/03/21		
COC Number			601902-30-01	601902-30-01	601902-30-01	601902-30-01	601902-30-01		
	UNITS	Criteria	17-13 SS5	17-20 SS7	17-20 SS9	QA/QC 5	QA/QC 6	RDL	QC Batch

F2-F4 Hydrocarbons									
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	6600	910			7000	160	100	4923135
F2 (C10-C16 Hydrocarbons)	ug/g	250	<10	4300	<10	23	160	10	4919580
F3 (C16-C34 Hydrocarbons)	ug/g	2500	120	8000	<50	580	310	50	4919580
F4 (C34-C50 Hydrocarbons)	ug/g	6600	150	1200	<50	1800	78	50	4919580
Reached Baseline at C50	ug/g	-	No	Yes	Yes	No	No		4919580

Surrogate Recovery (%)									
o-Terphenyl	%	-	84	128	87	88	88		4919580

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
Soil - Industrial/Commercial/Community- Medium and Fine Texture

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			ECO818	ECO819	ECO820		ECO821		
Sampling Date			2017/03/21	2017/03/21	2017/03/22		2017/03/22		
COC Number			601902-30-01	601902-30-01	601902-30-01		601902-30-01		
	UNITS	Criteria	QA/QC 7	QA/QC 8	17-06 SS3	RDL	17-06 SS13	RDL	QC Batch
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g	250	<10	<10	540	10	1500	30	4919580
F3 (C16-C34 Hydrocarbons)	ug/g	2500	<50	<50	17000	50	2100	150	4919580
F4 (C34-C50 Hydrocarbons)	ug/g	6600	<50	<50	3800	50	190	150	4919580
Reached Baseline at C50	ug/g	-	Yes	Yes	Yes		Yes		4919580
Surrogate Recovery (%)									
o-Terphenyl	%	-	86	89	124		100		4919580
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture									

Maxxam ID			ECO822	ECO823		
Sampling Date			2017/03/22	2017/03/22		
COC Number			601902-30-01	601902-30-01		
	UNITS	Criteria	17-11 SS1	17-11 SS4	RDL	QC Batch
F2-F4 Hydrocarbons						
F2 (C10-C16 Hydrocarbons)	ug/g	250	64	<10	10	4919580
F3 (C16-C34 Hydrocarbons)	ug/g	2500	300	<50	50	4919580
F4 (C34-C50 Hydrocarbons)	ug/g	6600	65	<50	50	4919580
Reached Baseline at C50	ug/g	-	Yes	Yes		4919580
Surrogate Recovery (%)						
o-Terphenyl	%	-	92	89		4919580
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Soil - Industrial/Commercial/Community- Medium and Fine Texture						

GENERAL COMMENTS

Revised Report[2017/4/13]: O.Reg 153/04 Table 3 med/fine criteria added to report.

Sample ECO808 [17-19 SS1] : PAH analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample ECO810 [17-14 SS1] : PAH analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample ECO812 [17-13 SS2] : PAH analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample ECO814 [17-20 SS7] : VOCF1 Analysis: Due to high concentrations of hydrocarbon compounds, sample required dilution. Detection limits were adjusted accordingly. In order to meet required regulatory criteria, results for selected compounds (obtained by a separate analysis using an appropriate low dilution) are included in the report.

Sample ECO816 [QA/QC 5] : PAH analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample ECO817 [QA/QC 6] : VOCF1 Analysis: Due to high concentrations of hydrocarbon compounds, sample required dilution. Detection limits were adjusted accordingly. In order to meet required regulatory criteria, results for selected compounds (obtained by a separate analysis using an appropriate low dilution) are included in the report.

Sample ECO820 [17-06 SS3] : PAH analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample ECO821 [17-06 SS13] : VOCF1 Analysis: Detection limits were raised due to high moisture content of soil provided.

PAH analysis: Detection limits were adjusted for high moisture content.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4916131	GYA	RPD	Moisture	2017/03/28	0.51		%	20
4916219	DR1	Matrix Spike [ECO813-03]	4-Bromofluorobenzene	2017/03/30		97	%	60 - 140
			D10-o-Xylene	2017/03/30		110	%	60 - 130
			D4-1,2-Dichloroethane	2017/03/30		102	%	60 - 140
			D8-Toluene	2017/03/30		102	%	60 - 140
			Acetone (2-Propanone)	2017/03/30		103	%	60 - 140
			Benzene	2017/03/30		104	%	60 - 140
			Bromodichloromethane	2017/03/30		102	%	60 - 140
			Bromoform	2017/03/30		96	%	60 - 140
			Bromomethane	2017/03/30		110	%	60 - 140
			Carbon Tetrachloride	2017/03/30		104	%	60 - 140
			Chlorobenzene	2017/03/30		110	%	60 - 140
			Chloroform	2017/03/30		102	%	60 - 140
			Dibromochloromethane	2017/03/30		101	%	60 - 140
			1,2-Dichlorobenzene	2017/03/30		106	%	60 - 140
			1,3-Dichlorobenzene	2017/03/30		110	%	60 - 140
			1,4-Dichlorobenzene	2017/03/30		112	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2017/03/30		104	%	60 - 140
			1,1-Dichloroethane	2017/03/30		106	%	60 - 140
			1,2-Dichloroethane	2017/03/30		101	%	60 - 140
			1,1-Dichloroethylene	2017/03/30		112	%	60 - 140
			cis-1,2-Dichloroethylene	2017/03/30		109	%	60 - 140
			trans-1,2-Dichloroethylene	2017/03/30		107	%	60 - 140
			1,2-Dichloropropane	2017/03/30		105	%	60 - 140
			cis-1,3-Dichloropropene	2017/03/30		104	%	60 - 140
			trans-1,3-Dichloropropene	2017/03/30		106	%	60 - 140
			Ethylbenzene	2017/03/30		109	%	60 - 140
			Ethylene Dibromide	2017/03/30		104	%	60 - 140
			Hexane	2017/03/30		116	%	60 - 140
			Methylene Chloride(Dichloromethane)	2017/03/30		106	%	60 - 140
			Methyl Ethyl Ketone (2-Butanone)	2017/03/30		107	%	60 - 140
			Methyl Isobutyl Ketone	2017/03/30		95	%	60 - 140
			Methyl t-butyl ether (MTBE)	2017/03/30		105	%	60 - 140
			Styrene	2017/03/30		102	%	60 - 140
			1,1,1,2-Tetrachloroethane	2017/03/30		104	%	60 - 140
			1,1,2,2-Tetrachloroethane	2017/03/30		103	%	60 - 140
			Tetrachloroethylene	2017/03/30		105	%	60 - 140
			Toluene	2017/03/30		103	%	60 - 140
			1,1,1-Trichloroethane	2017/03/30		101	%	60 - 140
			1,1,2-Trichloroethane	2017/03/30		104	%	60 - 140
			Trichloroethylene	2017/03/30		105	%	60 - 140
			Trichlorofluoromethane (FREON 11)	2017/03/30		107	%	60 - 140
			Vinyl Chloride	2017/03/30		118	%	60 - 140
			p+m-Xylene	2017/03/30		102	%	60 - 140
			o-Xylene	2017/03/30		100	%	60 - 140
			F1 (C6-C10)	2017/03/30		95	%	60 - 140
4916219	DR1	Spiked Blank	4-Bromofluorobenzene	2017/03/30		98	%	60 - 140
			D10-o-Xylene	2017/03/30		101	%	60 - 130
			D4-1,2-Dichloroethane	2017/03/30		102	%	60 - 140
			D8-Toluene	2017/03/30		101	%	60 - 140
			Acetone (2-Propanone)	2017/03/30		104	%	60 - 140
			Benzene	2017/03/30		102	%	60 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
				Bromodichloromethane	2017/03/30		99	%	60 - 130
				Bromoform	2017/03/30		92	%	60 - 130
				Bromomethane	2017/03/30		104	%	60 - 140
				Carbon Tetrachloride	2017/03/30		101	%	60 - 130
				Chlorobenzene	2017/03/30		106	%	60 - 130
				Chloroform	2017/03/30		100	%	60 - 130
				Dibromochloromethane	2017/03/30		97	%	60 - 130
				1,2-Dichlorobenzene	2017/03/30		102	%	60 - 130
				1,3-Dichlorobenzene	2017/03/30		106	%	60 - 130
				1,4-Dichlorobenzene	2017/03/30		108	%	60 - 130
				Dichlorodifluoromethane (FREON 12)	2017/03/30		101	%	60 - 140
				1,1-Dichloroethane	2017/03/30		103	%	60 - 130
				1,2-Dichloroethane	2017/03/30		99	%	60 - 130
				1,1-Dichloroethylene	2017/03/30		110	%	60 - 130
				cis-1,2-Dichloroethylene	2017/03/30		106	%	60 - 130
				trans-1,2-Dichloroethylene	2017/03/30		105	%	60 - 130
				1,2-Dichloropropane	2017/03/30		103	%	60 - 130
				cis-1,3-Dichloropropene	2017/03/30		98	%	60 - 130
				trans-1,3-Dichloropropene	2017/03/30		98	%	60 - 130
				Ethylbenzene	2017/03/30		105	%	60 - 130
				Ethylene Dibromide	2017/03/30		101	%	60 - 130
				Hexane	2017/03/30		114	%	60 - 130
				Methylene Chloride(Dichloromethane)	2017/03/30		104	%	60 - 130
				Methyl Ethyl Ketone (2-Butanone)	2017/03/30		107	%	60 - 140
				Methyl Isobutyl Ketone	2017/03/30		93	%	60 - 130
				Methyl t-butyl ether (MTBE)	2017/03/30		103	%	60 - 130
				Styrene	2017/03/30		98	%	60 - 130
				1,1,1,2-Tetrachloroethane	2017/03/30		100	%	60 - 130
				1,1,2,2-Tetrachloroethane	2017/03/30		99	%	60 - 130
				Tetrachloroethylene	2017/03/30		103	%	60 - 130
				Toluene	2017/03/30		100	%	60 - 130
				1,1,1-Trichloroethane	2017/03/30		99	%	60 - 130
				1,1,2-Trichloroethane	2017/03/30		101	%	60 - 130
				Trichloroethylene	2017/03/30		102	%	60 - 130
				Trichlorofluoromethane (FREON 11)	2017/03/30		104	%	60 - 130
				Vinyl Chloride	2017/03/30		125	%	60 - 130
				p+m-Xylene	2017/03/30		99	%	60 - 130
				o-Xylene	2017/03/30		97	%	60 - 130
				F1 (C6-C10)	2017/03/30		92	%	80 - 120
4916219	DR1		Method Blank	4-Bromofluorobenzene	2017/03/30		94	%	60 - 140
				D10-o-Xylene	2017/03/30		98	%	60 - 130
				D4-1,2-Dichloroethane	2017/03/30		100	%	60 - 140
				D8-Toluene	2017/03/30		101	%	60 - 140
				Acetone (2-Propanone)	2017/03/30	<0.50		ug/g	
				Benzene	2017/03/30	<0.020		ug/g	
				Bromodichloromethane	2017/03/30	<0.050		ug/g	
				Bromoform	2017/03/30	<0.050		ug/g	
				Bromomethane	2017/03/30	<0.050		ug/g	
				Carbon Tetrachloride	2017/03/30	<0.050		ug/g	
				Chlorobenzene	2017/03/30	<0.050		ug/g	
				Chloroform	2017/03/30	<0.050		ug/g	
				Dibromochloromethane	2017/03/30	<0.050		ug/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,2-Dichlorobenzene	2017/03/30	<0.050		ug/g	
			1,3-Dichlorobenzene	2017/03/30	<0.050		ug/g	
			1,4-Dichlorobenzene	2017/03/30	<0.050		ug/g	
			Dichlorodifluoromethane (FREON 12)	2017/03/30	<0.050		ug/g	
			1,1-Dichloroethane	2017/03/30	<0.050		ug/g	
			1,2-Dichloroethane	2017/03/30	<0.050		ug/g	
			1,1-Dichloroethylene	2017/03/30	<0.050		ug/g	
			cis-1,2-Dichloroethylene	2017/03/30	<0.050		ug/g	
			trans-1,2-Dichloroethylene	2017/03/30	<0.050		ug/g	
			1,2-Dichloropropane	2017/03/30	<0.050		ug/g	
			cis-1,3-Dichloropropene	2017/03/30	<0.030		ug/g	
			trans-1,3-Dichloropropene	2017/03/30	<0.040		ug/g	
			Ethylbenzene	2017/03/30	<0.020		ug/g	
			Ethylene Dibromide	2017/03/30	<0.050		ug/g	
			Hexane	2017/03/30	<0.050		ug/g	
			Methylene Chloride(Dichloromethane)	2017/03/30	<0.050		ug/g	
			Methyl Ethyl Ketone (2-Butanone)	2017/03/30	<0.50		ug/g	
			Methyl Isobutyl Ketone	2017/03/30	<0.50		ug/g	
			Methyl t-butyl ether (MTBE)	2017/03/30	<0.050		ug/g	
			Styrene	2017/03/30	<0.050		ug/g	
			1,1,1,2-Tetrachloroethane	2017/03/30	<0.050		ug/g	
			1,1,2,2-Tetrachloroethane	2017/03/30	<0.050		ug/g	
			Tetrachloroethylene	2017/03/30	<0.050		ug/g	
			Toluene	2017/03/30	<0.020		ug/g	
			1,1,1-Trichloroethane	2017/03/30	<0.050		ug/g	
			1,1,2-Trichloroethane	2017/03/30	<0.050		ug/g	
			Trichloroethylene	2017/03/30	<0.050		ug/g	
			Trichlorofluoromethane (FREON 11)	2017/03/30	<0.050		ug/g	
			Vinyl Chloride	2017/03/30	<0.020		ug/g	
			p+m-Xylene	2017/03/30	<0.020		ug/g	
			o-Xylene	2017/03/30	<0.020		ug/g	
			Total Xylenes	2017/03/30	<0.020		ug/g	
			F1 (C6-C10)	2017/03/30	<10		ug/g	
			F1 (C6-C10) - BTEX	2017/03/30	<10		ug/g	
4916219	DR1	RPD [ECO813-03]	Acetone (2-Propanone)	2017/03/30	NC		%	50
			Benzene	2017/03/30	NC		%	50
			Bromodichloromethane	2017/03/30	NC		%	50
			Bromoform	2017/03/30	NC		%	50
			Bromomethane	2017/03/30	NC		%	50
			Carbon Tetrachloride	2017/03/30	NC		%	50
			Chlorobenzene	2017/03/30	NC		%	50
			Chloroform	2017/03/30	NC		%	50
			Dibromochloromethane	2017/03/30	NC		%	50
			1,2-Dichlorobenzene	2017/03/30	NC		%	50
			1,3-Dichlorobenzene	2017/03/30	NC		%	50
			1,4-Dichlorobenzene	2017/03/30	NC		%	50
			Dichlorodifluoromethane (FREON 12)	2017/03/30	NC		%	50
			1,1-Dichloroethane	2017/03/30	NC		%	50
			1,2-Dichloroethane	2017/03/30	NC		%	50
			1,1-Dichloroethylene	2017/03/30	NC		%	50
			cis-1,2-Dichloroethylene	2017/03/30	NC		%	50
			trans-1,2-Dichloroethylene	2017/03/30	NC		%	50

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,2-Dichloropropane	2017/03/30	NC		%	50
			cis-1,3-Dichloropropene	2017/03/30	NC		%	50
			trans-1,3-Dichloropropene	2017/03/30	NC		%	50
			Ethylbenzene	2017/03/30	NC		%	50
			Ethylene Dibromide	2017/03/30	NC		%	50
			Hexane	2017/03/30	NC		%	50
			Methylene Chloride(Dichloromethane)	2017/03/30	NC		%	50
			Methyl Ethyl Ketone (2-Butanone)	2017/03/30	NC		%	50
			Methyl Isobutyl Ketone	2017/03/30	NC		%	50
			Methyl t-butyl ether (MTBE)	2017/03/30	NC		%	50
			Styrene	2017/03/30	NC		%	50
			1,1,1,2-Tetrachloroethane	2017/03/30	NC		%	50
			1,1,2,2-Tetrachloroethane	2017/03/30	NC		%	50
			Tetrachloroethylene	2017/03/30	NC		%	50
			Toluene	2017/03/30	NC		%	50
			1,1,1-Trichloroethane	2017/03/30	NC		%	50
			1,1,2-Trichloroethane	2017/03/30	NC		%	50
			Trichloroethylene	2017/03/30	NC		%	50
			Trichlorofluoromethane (FREON 11)	2017/03/30	NC		%	50
			Vinyl Chloride	2017/03/30	NC		%	50
			p+m-Xylene	2017/03/30	NC		%	50
			o-Xylene	2017/03/30	NC		%	50
			Total Xylenes	2017/03/30	NC		%	50
			F1 (C6-C10)	2017/03/30	NC		%	30
			F1 (C6-C10) - BTEX	2017/03/30	NC		%	30
4916312	GYA	RPD	Moisture	2017/03/28	5.6		%	20
4916420	TA1	Spiked Blank	Available (CaCl2) pH	2017/03/29		98	%	97 - 103
4916420	TA1	RPD	Available (CaCl2) pH	2017/03/29	0.65		%	N/A
4916686	XQI	Matrix Spike	Free Cyanide	2017/03/29		108	%	75 - 125
4916686	XQI	Spiked Blank	Free Cyanide	2017/03/29		106	%	80 - 120
4916686	XQI	Method Blank	Free Cyanide	2017/03/29	<0.01		ug/g	
4916686	XQI	RPD	Free Cyanide	2017/03/29	NC		%	35
4917178	RAJ	Matrix Spike	D10-Anthracene	2017/03/29		108	%	50 - 130
			D14-Terphenyl (FS)	2017/03/29		107	%	50 - 130
			D8-Acenaphthylene	2017/03/29		101	%	50 - 130
			Acenaphthene	2017/03/29		110	%	50 - 130
			Acenaphthylene	2017/03/29		107	%	50 - 130
			Anthracene	2017/03/29		99	%	50 - 130
			Benzo(a)anthracene	2017/03/29		112	%	50 - 130
			Benzo(a)pyrene	2017/03/29		110	%	50 - 130
			Benzo(b/j)fluoranthene	2017/03/29		109	%	50 - 130
			Benzo(g,h,i)perylene	2017/03/29		104	%	50 - 130
			Benzo(k)fluoranthene	2017/03/29		109	%	50 - 130
			Chrysene	2017/03/29		110	%	50 - 130
			Dibenz(a,h)anthracene	2017/03/29		110	%	50 - 130
			Fluoranthene	2017/03/29		112	%	50 - 130
			Fluorene	2017/03/29		110	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2017/03/29		110	%	50 - 130
			1-Methylnaphthalene	2017/03/29		111	%	50 - 130
			2-Methylnaphthalene	2017/03/29		105	%	50 - 130
			Naphthalene	2017/03/29		99	%	50 - 130
			Phenanthrene	2017/03/29		106	%	50 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4917178	RAJ	Spiked Blank	Pyrene	2017/03/29		115	%	50 - 130
			D10-Anthracene	2017/03/29		107	%	50 - 130
			D14-Terphenyl (FS)	2017/03/29		105	%	50 - 130
			D8-Acenaphthylene	2017/03/29		99	%	50 - 130
			Acenaphthene	2017/03/29		109	%	50 - 130
			Acenaphthylene	2017/03/29		105	%	50 - 130
			Anthracene	2017/03/29		100	%	50 - 130
			Benzo(a)anthracene	2017/03/29		103	%	50 - 130
			Benzo(a)pyrene	2017/03/29		105	%	50 - 130
			Benzo(b/j)fluoranthene	2017/03/29		107	%	50 - 130
			Benzo(g,h,i)perylene	2017/03/29		104	%	50 - 130
			Benzo(k)fluoranthene	2017/03/29		106	%	50 - 130
			Chrysene	2017/03/29		109	%	50 - 130
			Dibenz(a,h)anthracene	2017/03/29		104	%	50 - 130
			Fluoranthene	2017/03/29		109	%	50 - 130
			Fluorene	2017/03/29		108	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2017/03/29		109	%	50 - 130
			1-Methylnaphthalene	2017/03/29		111	%	50 - 130
			2-Methylnaphthalene	2017/03/29		107	%	50 - 130
			Naphthalene	2017/03/29		104	%	50 - 130
Phenanthrene	2017/03/29		105	%	50 - 130			
4917178	RAJ	Method Blank	Pyrene	2017/03/29		112	%	50 - 130
			D10-Anthracene	2017/03/29		109	%	50 - 130
			D14-Terphenyl (FS)	2017/03/29		105	%	50 - 130
			D8-Acenaphthylene	2017/03/29		97	%	50 - 130
			Acenaphthene	2017/03/29	<0.0050		ug/g	
			Acenaphthylene	2017/03/29	<0.0050		ug/g	
			Anthracene	2017/03/29	<0.0050		ug/g	
			Benzo(a)anthracene	2017/03/29	<0.0050		ug/g	
			Benzo(a)pyrene	2017/03/29	<0.0050		ug/g	
			Benzo(b/j)fluoranthene	2017/03/29	<0.0050		ug/g	
			Benzo(g,h,i)perylene	2017/03/29	<0.0050		ug/g	
			Benzo(k)fluoranthene	2017/03/29	<0.0050		ug/g	
			Chrysene	2017/03/29	<0.0050		ug/g	
			Dibenz(a,h)anthracene	2017/03/29	<0.0050		ug/g	
			Fluoranthene	2017/03/29	<0.0050		ug/g	
			Fluorene	2017/03/29	<0.0050		ug/g	
			Indeno(1,2,3-cd)pyrene	2017/03/29	<0.0050		ug/g	
			1-Methylnaphthalene	2017/03/29	<0.0050		ug/g	
			2-Methylnaphthalene	2017/03/29	<0.0050		ug/g	
			Naphthalene	2017/03/29	<0.0050		ug/g	
Phenanthrene	2017/03/29	<0.0050		ug/g				
4917178	RAJ	RPD	Pyrene	2017/03/29	<0.0050		ug/g	
			Acenaphthene	2017/03/29	NC		%	40
			Acenaphthylene	2017/03/29	NC		%	40
			Anthracene	2017/03/29	NC		%	40
			Benzo(a)anthracene	2017/03/29	NC		%	40
			Benzo(a)pyrene	2017/03/29	NC		%	40
			Benzo(b/j)fluoranthene	2017/03/29	NC		%	40
			Benzo(g,h,i)perylene	2017/03/29	NC		%	40
			Benzo(k)fluoranthene	2017/03/29	NC		%	40
			Chrysene	2017/03/29	NC		%	40

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Parameter	Date	Value	Recovery	UNITS	QC Limits
Batch	Init	QC Type	Analyzed						
				Dibenz(a,h)anthracene	2017/03/29	NC		%	40
				Fluoranthene	2017/03/29	NC		%	40
				Fluorene	2017/03/29	NC		%	40
				Indeno(1,2,3-cd)pyrene	2017/03/29	NC		%	40
				1-Methylnaphthalene	2017/03/29	NC		%	40
				2-Methylnaphthalene	2017/03/29	NC		%	40
				Naphthalene	2017/03/29	NC		%	40
				Phenanthrene	2017/03/29	NC		%	40
				Pyrene	2017/03/29	NC		%	40
4917979	SUK	Spiked Blank		Soluble Calcium (Ca)	2017/03/29		102	%	80 - 120
				Soluble Magnesium (Mg)	2017/03/29		101	%	80 - 120
				Soluble Sodium (Na)	2017/03/29		104	%	80 - 120
4917979	SUK	Method Blank		Soluble Calcium (Ca)	2017/03/29	<0.5		mg/L	
				Soluble Magnesium (Mg)	2017/03/29	<0.5		mg/L	
				Soluble Sodium (Na)	2017/03/29	<5		mg/L	
4917979	SUK	RPD		Soluble Calcium (Ca)	2017/03/29	1.4		%	30
				Soluble Magnesium (Mg)	2017/03/29	8.3		%	30
				Soluble Sodium (Na)	2017/03/29	1.6		%	30
4917981	NYS	Spiked Blank		Conductivity	2017/03/29		99	%	90 - 110
4917981	NYS	Method Blank		Conductivity	2017/03/29	<0.002		mS/cm	
4917981	NYS	RPD		Conductivity	2017/03/29	3.6		%	10
4918028	DT1	Matrix Spike [ECO810-01]		Acid Extractable Antimony (Sb)	2017/03/29		98	%	75 - 125
				Acid Extractable Arsenic (As)	2017/03/29		100	%	75 - 125
				Acid Extractable Barium (Ba)	2017/03/29	NC		%	75 - 125
				Acid Extractable Beryllium (Be)	2017/03/29		99	%	75 - 125
				Acid Extractable Boron (B)	2017/03/29		100	%	75 - 125
				Acid Extractable Cadmium (Cd)	2017/03/29		102	%	75 - 125
				Acid Extractable Chromium (Cr)	2017/03/29	NC		%	75 - 125
				Acid Extractable Cobalt (Co)	2017/03/29		97	%	75 - 125
				Acid Extractable Copper (Cu)	2017/03/29		100	%	75 - 125
				Acid Extractable Lead (Pb)	2017/03/29	NC		%	75 - 125
				Acid Extractable Molybdenum (Mo)	2017/03/29		104	%	75 - 125
				Acid Extractable Nickel (Ni)	2017/03/29		95	%	75 - 125
				Acid Extractable Selenium (Se)	2017/03/29		98	%	75 - 125
				Acid Extractable Silver (Ag)	2017/03/29		100	%	75 - 125
				Acid Extractable Thallium (Tl)	2017/03/29		93	%	75 - 125
				Acid Extractable Uranium (U)	2017/03/29		96	%	75 - 125
				Acid Extractable Vanadium (V)	2017/03/29	NC		%	75 - 125
				Acid Extractable Zinc (Zn)	2017/03/29	NC		%	75 - 125
				Acid Extractable Mercury (Hg)	2017/03/29		95	%	75 - 125
4918028	DT1	Spiked Blank		Acid Extractable Antimony (Sb)	2017/03/29		99	%	80 - 120
				Acid Extractable Arsenic (As)	2017/03/29		101	%	80 - 120
				Acid Extractable Barium (Ba)	2017/03/29		98	%	80 - 120
				Acid Extractable Beryllium (Be)	2017/03/29		99	%	80 - 120
				Acid Extractable Boron (B)	2017/03/29		97	%	80 - 120
				Acid Extractable Cadmium (Cd)	2017/03/29		100	%	80 - 120
				Acid Extractable Chromium (Cr)	2017/03/29		100	%	80 - 120
				Acid Extractable Cobalt (Co)	2017/03/29		101	%	80 - 120
				Acid Extractable Copper (Cu)	2017/03/29		100	%	80 - 120
				Acid Extractable Lead (Pb)	2017/03/29		101	%	80 - 120
				Acid Extractable Molybdenum (Mo)	2017/03/29		99	%	80 - 120
				Acid Extractable Nickel (Ni)	2017/03/29		102	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Selenium (Se)	2017/03/29		102	%	80 - 120
			Acid Extractable Silver (Ag)	2017/03/29		100	%	80 - 120
			Acid Extractable Thallium (Tl)	2017/03/29		102	%	80 - 120
			Acid Extractable Uranium (U)	2017/03/29		98	%	80 - 120
			Acid Extractable Vanadium (V)	2017/03/29		101	%	80 - 120
			Acid Extractable Zinc (Zn)	2017/03/29		99	%	80 - 120
			Acid Extractable Mercury (Hg)	2017/03/29		95	%	80 - 120
4918028	DT1	Method Blank	Acid Extractable Antimony (Sb)	2017/03/29	<0.20		ug/g	
			Acid Extractable Arsenic (As)	2017/03/29	<1.0		ug/g	
			Acid Extractable Barium (Ba)	2017/03/29	<0.50		ug/g	
			Acid Extractable Beryllium (Be)	2017/03/29	<0.20		ug/g	
			Acid Extractable Boron (B)	2017/03/29	<5.0		ug/g	
			Acid Extractable Cadmium (Cd)	2017/03/29	<0.10		ug/g	
			Acid Extractable Chromium (Cr)	2017/03/29	<1.0		ug/g	
			Acid Extractable Cobalt (Co)	2017/03/29	<0.10		ug/g	
			Acid Extractable Copper (Cu)	2017/03/29	<0.50		ug/g	
			Acid Extractable Lead (Pb)	2017/03/29	<1.0		ug/g	
			Acid Extractable Molybdenum (Mo)	2017/03/29	<0.50		ug/g	
			Acid Extractable Nickel (Ni)	2017/03/29	<0.50		ug/g	
			Acid Extractable Selenium (Se)	2017/03/29	<0.50		ug/g	
			Acid Extractable Silver (Ag)	2017/03/29	<0.20		ug/g	
			Acid Extractable Thallium (Tl)	2017/03/29	<0.050		ug/g	
			Acid Extractable Uranium (U)	2017/03/29	<0.050		ug/g	
			Acid Extractable Vanadium (V)	2017/03/29	<5.0		ug/g	
			Acid Extractable Zinc (Zn)	2017/03/29	<5.0		ug/g	
4918028	DT1	RPD [ECO810-01]	Acid Extractable Mercury (Hg)	2017/03/29	<0.050		ug/g	
			Acid Extractable Antimony (Sb)	2017/03/29	0.89		%	30
			Acid Extractable Arsenic (As)	2017/03/29	3.4		%	30
			Acid Extractable Barium (Ba)	2017/03/29	7.6		%	30
			Acid Extractable Beryllium (Be)	2017/03/29	4.0		%	30
			Acid Extractable Boron (B)	2017/03/29	0.93		%	30
			Acid Extractable Cadmium (Cd)	2017/03/29	13		%	30
			Acid Extractable Chromium (Cr)	2017/03/29	4.4		%	30
			Acid Extractable Cobalt (Co)	2017/03/29	0.044		%	30
			Acid Extractable Copper (Cu)	2017/03/29	5.8		%	30
			Acid Extractable Lead (Pb)	2017/03/29	8.5		%	30
			Acid Extractable Molybdenum (Mo)	2017/03/29	1.7		%	30
			Acid Extractable Nickel (Ni)	2017/03/29	1.1		%	30
			Acid Extractable Selenium (Se)	2017/03/29	NC		%	30
			Acid Extractable Silver (Ag)	2017/03/29	NC		%	30
			Acid Extractable Thallium (Tl)	2017/03/29	12		%	30
			Acid Extractable Uranium (U)	2017/03/29	5.3		%	30
			Acid Extractable Vanadium (V)	2017/03/29	0.97		%	30
			Acid Extractable Zinc (Zn)	2017/03/29	14		%	30
			Acid Extractable Mercury (Hg)	2017/03/29	NC		%	30
4918041	SAC	Matrix Spike	Chromium (VI)	2017/03/31		73 (1)	%	75 - 125
4918041	SAC	Spiked Blank	Chromium (VI)	2017/03/31		87	%	80 - 120
4918041	SAC	Method Blank	Chromium (VI)	2017/03/31	<0.2		ug/g	
4918041	SAC	RPD	Chromium (VI)	2017/03/31	NC		%	35
4918133	SUK	Matrix Spike [ECO820-01]	Hot Water Ext. Boron (B)	2017/03/29		NC	%	75 - 125
4918133	SUK	Spiked Blank	Hot Water Ext. Boron (B)	2017/03/29		101	%	75 - 125
4918133	SUK	Method Blank	Hot Water Ext. Boron (B)	2017/03/29	<0.050		ug/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4918133	SUK	RPD [ECO820-01]	Hot Water Ext. Boron (B)	2017/03/29	6.3		%	40
4918403	NS3	RPD	Moisture	2017/03/29	1.5		%	20
4919580	AKS	Matrix Spike [ECO810-02]	o-Terphenyl	2017/03/30		86	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/03/30		93	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2017/03/30		NC	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2017/03/30		NC	%	50 - 130
4919580	AKS	Spiked Blank	o-Terphenyl	2017/03/30		90	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/03/30		97	%	80 - 120
			F3 (C16-C34 Hydrocarbons)	2017/03/30		96	%	80 - 120
			F4 (C34-C50 Hydrocarbons)	2017/03/30		94	%	80 - 120
4919580	AKS	Method Blank	o-Terphenyl	2017/03/30		90	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/03/30	<10		ug/g	
			F3 (C16-C34 Hydrocarbons)	2017/03/30	<50		ug/g	
			F4 (C34-C50 Hydrocarbons)	2017/03/30	<50		ug/g	
4919580	AKS	RPD [ECO810-02]	F2 (C10-C16 Hydrocarbons)	2017/03/30	13		%	30
			F3 (C16-C34 Hydrocarbons)	2017/03/30	3.0		%	30
			F4 (C34-C50 Hydrocarbons)	2017/03/30	6.5		%	30
4920420	SUK	Spiked Blank	Soluble Calcium (Ca)	2017/03/31		97	%	80 - 120
			Soluble Magnesium (Mg)	2017/03/31		97	%	80 - 120
			Soluble Sodium (Na)	2017/03/31		97	%	80 - 120
4920420	SUK	Method Blank	Soluble Calcium (Ca)	2017/03/31	<0.5		mg/L	
			Soluble Magnesium (Mg)	2017/03/31	<0.5		mg/L	
			Soluble Sodium (Na)	2017/03/31	<5		mg/L	
4920420	SUK	RPD	Soluble Calcium (Ca)	2017/03/31	1.0		%	30
			Soluble Magnesium (Mg)	2017/03/31	1.1		%	30
			Soluble Sodium (Na)	2017/03/31	0.50		%	30
4920447	NYS	Spiked Blank	Conductivity	2017/03/31		99	%	90 - 110
4920447	NYS	Method Blank	Conductivity	2017/03/31	<0.002		mS/cm	
4920447	NYS	RPD	Conductivity	2017/03/31	0.15		%	10
4923135	SK1	Matrix Spike [ECO808-02]	F4G-sg (Grav. Heavy Hydrocarbons)	2017/04/01		NC	%	65 - 135
4923135	SK1	Spiked Blank	F4G-sg (Grav. Heavy Hydrocarbons)	2017/04/01		100	%	65 - 135
4923135	SK1	Method Blank	F4G-sg (Grav. Heavy Hydrocarbons)	2017/04/01	<100		ug/g	
4923135	SK1	RPD [ECO810-02]	F4G-sg (Grav. Heavy Hydrocarbons)	2017/04/01	4.1		%	50

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.

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

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

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

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

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

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

VALIDATION SIGNATURE PAGE

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




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

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

Your Project #: 161-17781-00
 Site Location: FUTURE HSR
 Your C.O.C. #: 601902-03-01

Attention: Rachel Bryan

WSP Canada Inc
 4 Hughson Street South
 Suite 300
 Hamilton, ON
 CANADA L8N 3Z1

Report Date: 2017/04/19
 Report #: R4431398
 Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B773375

Received: 2017/04/12, 09:22

Sample Matrix: Water
 # Samples Received: 4

Analyses	Date		Laboratory Method	Reference
	Quantity	Extracted		
Methylnaphthalene Sum	4	N/A	2017/04/18 CAM SOP-00301	EPA 8270D m
1,3-Dichloropropene Sum	4	N/A	2017/04/18	EPA 8260C m
Chloride by Automated Colourimetry	4	N/A	2017/04/17 CAM SOP-00463	EPA 325.2 m
Chromium (VI) in Water	3	N/A	2017/04/13 CAM SOP-00436	EPA 7199 m
Free (WAD) Cyanide	4	N/A	2017/04/18 CAM SOP-00457	OMOE E3015 m
Petroleum Hydrocarbons F2-F4 in Water (1)	4	2017/04/17	2017/04/18 CAM SOP-00316	CCME PHC-CWS m
Mercury	3	2017/04/18	2017/04/18 CAM SOP-00453	EPA 7470A m
Dissolved Metals by ICPMS	4	N/A	2017/04/18 CAM SOP-00447	EPA 6020B m
PAH Compounds in Water by GC/MS (SIM)	4	2017/04/15	2017/04/15 CAM SOP-00318	EPA 8270D m
Polychlorinated Biphenyl in Water	3	2017/04/13	2017/04/16 CAM SOP-00309	EPA 8082A m
Volatile Organic Compounds and F1 PHCs	4	N/A	2017/04/17 CAM SOP-00230	EPA 8260C m

Remarks:

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.

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

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

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



Your Project #: 161-17781-00
Site Location: FUTURE HSR
Your C.O.C. #: 601902-03-01

Attention: Rachel Bryan

WSP Canada Inc
4 Hughson Street South
Suite 300
Hamilton, ON
CANADA L8N 3Z1

Report Date: 2017/04/19
Report #: R4431398
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B773375

Received: 2017/04/12, 09:22

(1) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ashton Gibson, Project Manager
Email: AGibson@maxxam.ca
Phone# (905) 817-5700
=====

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

RESULTS OF ANALYSES OF WATER

Maxxam ID			EEZ205		EEZ206		EEZ207	EEZ208		
Sampling Date			2017/04/11 09:00		2017/04/11 11:00		2017/04/11 12:00	2017/04/11 01:00		
COC Number			601902-03-01		601902-03-01		601902-03-01	601902-03-01		
	UNITS	Criteria	17-15	RDL	17-21	RDL	17-22	QA/QC2	RDL	QC Batch
Inorganics										
Free Cyanide	ug/L	66	<1	1	<1	1	<1	<1	1	4943400
Dissolved Chloride (Cl)	mg/L	2300	410	4.0	290	3.0	110	110	1.0	4938073
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil										

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID			EEZ205	EEZ206	EEZ207	EEZ208		
Sampling Date			2017/04/11 09:00	2017/04/11 11:00	2017/04/11 12:00	2017/04/11 01:00		
COC Number			601902-03-01	601902-03-01	601902-03-01	601902-03-01		
	UNITS	Criteria	17-15	17-21	17-22	QA/QC2	RDL	QC Batch
Metals								
Chromium (VI)	ug/L	140		<0.50	<0.50	<0.50	0.50	4939499
Mercury (Hg)	ug/L	2.8		<0.1	<0.1	<0.1	0.1	4942691
Dissolved Antimony (Sb)	ug/L	20000	<0.50	<0.50	0.63	0.64	0.50	4941788
Dissolved Arsenic (As)	ug/L	1900	2.1	1.5	2.1	2.1	1.0	4941788
Dissolved Barium (Ba)	ug/L	29000	68	140	150	170	2.0	4941788
Dissolved Beryllium (Be)	ug/L	67	<0.50	<0.50	<0.50	<0.50	0.50	4941788
Dissolved Boron (B)	ug/L	45000	48	77	42	39	10	4941788
Dissolved Cadmium (Cd)	ug/L	2.7	<0.10	<0.10	<0.10	<0.10	0.10	4941788
Dissolved Chromium (Cr)	ug/L	810	<5.0	<5.0	<5.0	<5.0	5.0	4941788
Dissolved Cobalt (Co)	ug/L	66	<0.50	0.55	<0.50	<0.50	0.50	4941788
Dissolved Copper (Cu)	ug/L	87	5.2	2.2	1.1	<1.0	1.0	4941788
Dissolved Lead (Pb)	ug/L	25	<0.50	<0.50	<0.50	<0.50	0.50	4941788
Dissolved Molybdenum (Mo)	ug/L	9200	3.6	6.4	8.5	7.7	0.50	4941788
Dissolved Nickel (Ni)	ug/L	490	<1.0	<1.0	<1.0	<1.0	1.0	4941788
Dissolved Selenium (Se)	ug/L	63	<2.0	<2.0	<2.0	<2.0	2.0	4941788
Dissolved Silver (Ag)	ug/L	1.5	<0.10	<0.10	<0.10	<0.10	0.10	4941788
Dissolved Sodium (Na)	ug/L	2300000	160000	66000	46000	40000	100	4941788
Dissolved Thallium (Tl)	ug/L	510	<0.050	0.053	<0.050	<0.050	0.050	4941788
Dissolved Uranium (U)	ug/L	420	7.5	5.1	2.5	2.5	0.10	4941788
Dissolved Vanadium (V)	ug/L	250	0.75	0.52	0.85	0.97	0.50	4941788
Dissolved Zinc (Zn)	ug/L	1100	5.0	9.4	71	8.5	5.0	4941788
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)								
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition								
Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil								

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID			EEZ205	EEZ206	EEZ207	EEZ208		
Sampling Date			2017/04/11 09:00	2017/04/11 11:00	2017/04/11 12:00	2017/04/11 01:00		
COC Number			601902-03-01	601902-03-01	601902-03-01	601902-03-01		
	UNITS	Criteria	17-15	17-21	17-22	QA/QC2	RDL	QC Batch
Calculated Parameters								
Methylnaphthalene, 2-(1-)	ug/L	1800	<0.071	<0.071	<0.071	<0.071	0.071	4936826
Polyaromatic Hydrocarbons								
Acenaphthene	ug/L	1700	<0.050	<0.050	<0.050	<0.050	0.050	4940699
Acenaphthylene	ug/L	1.8	<0.050	<0.050	<0.050	<0.050	0.050	4940699
Anthracene	ug/L	2.4	<0.050	<0.050	<0.050	<0.050	0.050	4940699
Benzo(a)anthracene	ug/L	4.7	<0.050	<0.050	<0.050	<0.050	0.050	4940699
Benzo(a)pyrene	ug/L	0.81	<0.010	<0.010	<0.010	<0.010	0.010	4940699
Benzo(b,j)fluoranthene	ug/L	0.75	<0.050	<0.050	<0.050	<0.050	0.050	4940699
Benzo(g,h,i)perylene	ug/L	0.2	<0.050	<0.050	<0.050	<0.050	0.050	4940699
Benzo(k)fluoranthene	ug/L	0.4	<0.050	<0.050	<0.050	<0.050	0.050	4940699
Chrysene	ug/L	1	<0.050	<0.050	<0.050	<0.050	0.050	4940699
Dibenz(a,h)anthracene	ug/L	0.52	<0.050	<0.050	<0.050	<0.050	0.050	4940699
Fluoranthene	ug/L	130	<0.050	<0.050	<0.050	<0.050	0.050	4940699
Fluorene	ug/L	400	<0.050	<0.050	<0.050	<0.050	0.050	4940699
Indeno(1,2,3-cd)pyrene	ug/L	0.2	<0.050	<0.050	<0.050	<0.050	0.050	4940699
1-Methylnaphthalene	ug/L	1800	<0.050	<0.050	<0.050	<0.050	0.050	4940699
2-Methylnaphthalene	ug/L	1800	<0.050	<0.050	<0.050	<0.050	0.050	4940699
Naphthalene	ug/L	6400	<0.050	<0.050	<0.050	<0.050	0.050	4940699
Phenanthrene	ug/L	580	<0.030	<0.030	<0.030	<0.030	0.030	4940699
Pyrene	ug/L	68	<0.050	<0.050	<0.050	<0.050	0.050	4940699
Surrogate Recovery (%)								
D10-Anthracene	%	-	98	102	98	100		4940699
D14-Terphenyl (FS)	%	-	82	86	82	83		4940699
D8-Acenaphthylene	%	-	115	116	116	116		4940699
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Non-Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil								

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID			EEZ205	EEZ206	EEZ207	EEZ208		
Sampling Date			2017/04/11 09:00	2017/04/11 11:00	2017/04/11 12:00	2017/04/11 01:00		
COC Number			601902-03-01	601902-03-01	601902-03-01	601902-03-01		
	UNITS	Criteria	17-15	17-21	17-22	QA/QC2	RDL	QC Batch

Calculated Parameters								
1,3-Dichloropropene (cis+trans)	ug/L	45	<0.50	<0.50	<0.50	<0.50	0.50	4937003
Volatile Organics								
Acetone (2-Propanone)	ug/L	130000	<10	<10	<10	<10	10	4939340
Benzene	ug/L	430	<0.20	<0.20	<0.20	<0.20	0.20	4939340
Bromodichloromethane	ug/L	85000	<0.50	<0.50	<0.50	<0.50	0.50	4939340
Bromoform	ug/L	770	<1.0	<1.0	<1.0	<1.0	1.0	4939340
Bromomethane	ug/L	56	<0.50	<0.50	<0.50	<0.50	0.50	4939340
Carbon Tetrachloride	ug/L	8.4	<0.20	<0.20	<0.20	<0.20	0.20	4939340
Chlorobenzene	ug/L	630	<0.20	<0.20	<0.20	<0.20	0.20	4939340
Chloroform	ug/L	22	<0.20	<0.20	<0.20	<0.20	0.20	4939340
Dibromochloromethane	ug/L	82000	<0.50	<0.50	<0.50	<0.50	0.50	4939340
1,2-Dichlorobenzene	ug/L	9600	<0.50	<0.50	<0.50	<0.50	0.50	4939340
1,3-Dichlorobenzene	ug/L	9600	<0.50	<0.50	<0.50	<0.50	0.50	4939340
1,4-Dichlorobenzene	ug/L	67	<0.50	<0.50	<0.50	<0.50	0.50	4939340
Dichlorodifluoromethane (FREON 12)	ug/L	4400	<1.0	<1.0	<1.0	<1.0	1.0	4939340
1,1-Dichloroethane	ug/L	3100	<0.20	<0.20	<0.20	<0.20	0.20	4939340
1,2-Dichloroethane	ug/L	12	<0.50	<0.50	<0.50	<0.50	0.50	4939340
1,1-Dichloroethylene	ug/L	17	<0.20	<0.20	<0.20	<0.20	0.20	4939340
cis-1,2-Dichloroethylene	ug/L	17	<0.50	<0.50	<0.50	<0.50	0.50	4939340
trans-1,2-Dichloroethylene	ug/L	17	<0.50	<0.50	<0.50	<0.50	0.50	4939340
1,2-Dichloropropane	ug/L	140	<0.20	<0.20	<0.20	<0.20	0.20	4939340
cis-1,3-Dichloropropene	ug/L	45	<0.30	<0.30	<0.30	<0.30	0.30	4939340
trans-1,3-Dichloropropene	ug/L	45	<0.40	<0.40	<0.40	<0.40	0.40	4939340
Ethylbenzene	ug/L	2300	<0.20	<0.20	<0.20	<0.20	0.20	4939340
Ethylene Dibromide	ug/L	0.83	<0.20	<0.20	<0.20	<0.20	0.20	4939340
Hexane	ug/L	520	<1.0	<1.0	<1.0	<1.0	1.0	4939340
Methylene Chloride(Dichloromethane)	ug/L	5500	<2.0	<2.0	<2.0	<2.0	2.0	4939340
Methyl Ethyl Ketone (2-Butanone)	ug/L	1500000	<10	<10	<10	<10	10	4939340
Methyl Isobutyl Ketone	ug/L	580000	<5.0	<5.0	<5.0	<5.0	5.0	4939340
Methyl t-butyl ether (MTBE)	ug/L	1400	<0.50	<0.50	<0.50	<0.50	0.50	4939340

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
 Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water
 Condition
 Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID			EEZ205	EEZ206	EEZ207	EEZ208		
Sampling Date			2017/04/11 09:00	2017/04/11 11:00	2017/04/11 12:00	2017/04/11 01:00		
COC Number			601902-03-01	601902-03-01	601902-03-01	601902-03-01		
	UNITS	Criteria	17-15	17-21	17-22	QA/QC2	RDL	QC Batch
Styrene	ug/L	9100	<0.50	<0.50	<0.50	<0.50	0.50	4939340
1,1,1,2-Tetrachloroethane	ug/L	28	<0.50	<0.50	<0.50	<0.50	0.50	4939340
1,1,2,2-Tetrachloroethane	ug/L	15	<0.50	<0.50	<0.50	<0.50	0.50	4939340
Tetrachloroethylene	ug/L	17	<0.20	<0.20	<0.20	<0.20	0.20	4939340
Toluene	ug/L	18000	0.40	<0.20	<0.20	<0.20	0.20	4939340
1,1,1-Trichloroethane	ug/L	6700	<0.20	<0.20	<0.20	<0.20	0.20	4939340
1,1,2-Trichloroethane	ug/L	30	<0.50	<0.50	<0.50	<0.50	0.50	4939340
Trichloroethylene	ug/L	17	<0.20	<0.20	<0.20	<0.20	0.20	4939340
Trichlorofluoromethane (FREON 11)	ug/L	2500	<0.50	<0.50	<0.50	<0.50	0.50	4939340
Vinyl Chloride	ug/L	1.7	<0.20	<0.20	<0.20	<0.20	0.20	4939340
p+m-Xylene	ug/L	-	<0.20	<0.20	<0.20	<0.20	0.20	4939340
o-Xylene	ug/L	-	<0.20	<0.20	<0.20	<0.20	0.20	4939340
Total Xylenes	ug/L	4200	<0.20	<0.20	<0.20	<0.20	0.20	4939340
F1 (C6-C10)	ug/L	750	<25	<25	<25	<25	25	4939340
F1 (C6-C10) - BTEX	ug/L	750	<25	<25	<25	<25	25	4939340
Surrogate Recovery (%)								
4-Bromofluorobenzene	%	-	99	99	99	99		4939340
D4-1,2-Dichloroethane	%	-	95	95	97	94		4939340
D8-Toluene	%	-	96	96	95	96		4939340
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil								

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			EEZ205	EEZ206	EEZ207	EEZ208		
Sampling Date			2017/04/11 09:00	2017/04/11 11:00	2017/04/11 12:00	2017/04/11 01:00		
COC Number			601902-03-01	601902-03-01	601902-03-01	601902-03-01		
	UNITS	Criteria	17-15	17-21	17-22	QA/QC2	RDL	QC Batch
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/L	150	<100	<100	<100	<100	100	4942127
F3 (C16-C34 Hydrocarbons)	ug/L	500	<200	<200	<200	<200	200	4942127
F4 (C34-C50 Hydrocarbons)	ug/L	500	<200	<200	<200	<200	200	4942127
Reached Baseline at C50	ug/L	-	Yes	Yes	Yes	Yes		4942127
Surrogate Recovery (%)								
o-Terphenyl	%	-	99	98	98	99		4942127
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil								

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID			EEZ206	EEZ207	EEZ208		
Sampling Date			2017/04/11 11:00	2017/04/11 12:00	2017/04/11 01:00		
COC Number			601902-03-01	601902-03-01	601902-03-01		
	UNITS	Criteria	17-21	17-22	QA/QC2	RDL	QC Batch
PCBs							
Aroclor 1242	ug/L	-	<0.05	<0.05	<0.05	0.05	4938755
Aroclor 1248	ug/L	-	<0.05	<0.05	<0.05	0.05	4938755
Aroclor 1254	ug/L	-	<0.05	<0.05	<0.05	0.05	4938755
Aroclor 1260	ug/L	-	<0.05	<0.05	<0.05	0.05	4938755
Total PCB	ug/L	15	<0.05	<0.05	<0.05	0.05	4938755
Surrogate Recovery (%)							
Decachlorobiphenyl	%	-	86	91	81		4938755
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil							

GENERAL COMMENTS

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4938073	ADB	Matrix Spike	Dissolved Chloride (Cl)	2017/04/17		NC	%	80 - 120
4938073	ADB	Spiked Blank	Dissolved Chloride (Cl)	2017/04/17		102	%	80 - 120
4938073	ADB	Method Blank	Dissolved Chloride (Cl)	2017/04/17	<1.0		mg/L	
4938073	ADB	RPD	Dissolved Chloride (Cl)	2017/04/17	0.32		%	20
4938755	FSO	Matrix Spike	Decachlorobiphenyl	2017/04/16		89	%	60 - 130
			Aroclor 1260	2017/04/16		82	%	60 - 130
			Total PCB	2017/04/16		82	%	60 - 130
4938755	FSO	Spiked Blank	Decachlorobiphenyl	2017/04/16		94	%	60 - 130
			Aroclor 1260	2017/04/16		92	%	60 - 130
			Total PCB	2017/04/16		92	%	60 - 130
4938755	FSO	Method Blank	Decachlorobiphenyl	2017/04/16		98	%	60 - 130
			Aroclor 1242	2017/04/16	<0.05		ug/L	
			Aroclor 1248	2017/04/16	<0.05		ug/L	
			Aroclor 1254	2017/04/16	<0.05		ug/L	
			Aroclor 1260	2017/04/16	<0.05		ug/L	
			Total PCB	2017/04/16	<0.05		ug/L	
4938755	FSO	RPD	Total PCB	2017/04/16	NC		%	40
4939340	DR1	Matrix Spike [EEZ205-06]	4-Bromofluorobenzene	2017/04/17		102	%	70 - 130
			D4-1,2-Dichloroethane	2017/04/17		96	%	70 - 130
			D8-Toluene	2017/04/17		97	%	70 - 130
			Acetone (2-Propanone)	2017/04/17		92	%	60 - 140
			Benzene	2017/04/17		99	%	70 - 130
			Bromodichloromethane	2017/04/17		121	%	70 - 130
			Bromoform	2017/04/17		92	%	70 - 130
			Bromomethane	2017/04/17		102	%	60 - 140
			Carbon Tetrachloride	2017/04/17		100	%	70 - 130
			Chlorobenzene	2017/04/17		97	%	70 - 130
			Chloroform	2017/04/17		96	%	70 - 130
			Dibromochloromethane	2017/04/17		94	%	70 - 130
			1,2-Dichlorobenzene	2017/04/17		92	%	70 - 130
			1,3-Dichlorobenzene	2017/04/17		93	%	70 - 130
			1,4-Dichlorobenzene	2017/04/17		93	%	70 - 130
			Dichlorodifluoromethane (FREON 12)	2017/04/17		100	%	60 - 140
			1,1-Dichloroethane	2017/04/17		99	%	70 - 130
			1,2-Dichloroethane	2017/04/17		93	%	70 - 130
			1,1-Dichloroethylene	2017/04/17		104	%	70 - 130
			cis-1,2-Dichloroethylene	2017/04/17		103	%	70 - 130
			trans-1,2-Dichloroethylene	2017/04/17		101	%	70 - 130
			1,2-Dichloropropane	2017/04/17		98	%	70 - 130
			cis-1,3-Dichloropropene	2017/04/17		99	%	70 - 130
			trans-1,3-Dichloropropene	2017/04/17		94	%	70 - 130
			Ethylbenzene	2017/04/17		96	%	70 - 130
			Ethylene Dibromide	2017/04/17		94	%	70 - 130
			Hexane	2017/04/17		104	%	70 - 130
			Methylene Chloride(Dichloromethane)	2017/04/17		102	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2017/04/17		99	%	60 - 140
			Methyl Isobutyl Ketone	2017/04/17		97	%	70 - 130
			Methyl t-butyl ether (MTBE)	2017/04/17		98	%	70 - 130
			Styrene	2017/04/17		94	%	70 - 130
			1,1,1,2-Tetrachloroethane	2017/04/17		96	%	70 - 130
			1,1,2,2-Tetrachloroethane	2017/04/17		95	%	70 - 130
			Tetrachloroethylene	2017/04/17		94	%	70 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Toluene	2017/04/17		92	%	70 - 130
			1,1,1-Trichloroethane	2017/04/17		96	%	70 - 130
			1,1,2-Trichloroethane	2017/04/17		90	%	70 - 130
			Trichloroethylene	2017/04/17		99	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2017/04/17		102	%	70 - 130
			Vinyl Chloride	2017/04/17		103	%	70 - 130
			p+m-Xylene	2017/04/17		92	%	70 - 130
			o-Xylene	2017/04/17		92	%	70 - 130
4939340	DR1	Spiked Blank	F1 (C6-C10)	2017/04/17		94	%	60 - 140
			4-Bromofluorobenzene	2017/04/17		100	%	70 - 130
			D4-1,2-Dichloroethane	2017/04/17		91	%	70 - 130
			D8-Toluene	2017/04/17		99	%	70 - 130
			Acetone (2-Propanone)	2017/04/17		80	%	60 - 140
			Benzene	2017/04/17		100	%	70 - 130
			Bromodichloromethane	2017/04/17		95	%	70 - 130
			Bromoform	2017/04/17		88	%	70 - 130
			Bromomethane	2017/04/17		96	%	60 - 140
			Carbon Tetrachloride	2017/04/17		103	%	70 - 130
			Chlorobenzene	2017/04/17		97	%	70 - 130
			Chloroform	2017/04/17		96	%	70 - 130
			Dibromochloromethane	2017/04/17		91	%	70 - 130
			1,2-Dichlorobenzene	2017/04/17		93	%	70 - 130
			1,3-Dichlorobenzene	2017/04/17		97	%	70 - 130
			1,4-Dichlorobenzene	2017/04/17		97	%	70 - 130
			Dichlorodifluoromethane (FREON 12)	2017/04/17		104	%	60 - 140
			1,1-Dichloroethane	2017/04/17		99	%	70 - 130
			1,2-Dichloroethane	2017/04/17		88	%	70 - 130
			1,1-Dichloroethylene	2017/04/17		107	%	70 - 130
			cis-1,2-Dichloroethylene	2017/04/17		102	%	70 - 130
			trans-1,2-Dichloroethylene	2017/04/17		103	%	70 - 130
			1,2-Dichloropropane	2017/04/17		97	%	70 - 130
			cis-1,3-Dichloropropene	2017/04/17		89	%	70 - 130
			trans-1,3-Dichloropropene	2017/04/17		81	%	70 - 130
			Ethylbenzene	2017/04/17		99	%	70 - 130
			Ethylene Dibromide	2017/04/17		89	%	70 - 130
			Hexane	2017/04/17		109	%	70 - 130
			Methylene Chloride(Dichloromethane)	2017/04/17		99	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2017/04/17		87	%	60 - 140
			Methyl Isobutyl Ketone	2017/04/17		88	%	70 - 130
			Methyl t-butyl ether (MTBE)	2017/04/17		97	%	70 - 130
			Styrene	2017/04/17		95	%	70 - 130
			1,1,1,2-Tetrachloroethane	2017/04/17		96	%	70 - 130
			1,1,2,2-Tetrachloroethane	2017/04/17		89	%	70 - 130
			Tetrachloroethylene	2017/04/17		98	%	70 - 130
			Toluene	2017/04/17		94	%	70 - 130
			1,1,1-Trichloroethane	2017/04/17		98	%	70 - 130
			1,1,2-Trichloroethane	2017/04/17		87	%	70 - 130
			Trichloroethylene	2017/04/17		101	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2017/04/17		105	%	70 - 130
			Vinyl Chloride	2017/04/17		106	%	70 - 130
			p+m-Xylene	2017/04/17		94	%	70 - 130
			o-Xylene	2017/04/17		94	%	70 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits	
4939340	DR1	Method Blank	F1 (C6-C10)	2017/04/17		94	%	60 - 140	
			4-Bromofluorobenzene	2017/04/17		99	%	70 - 130	
			D4-1,2-Dichloroethane	2017/04/17		92	%	70 - 130	
			D8-Toluene	2017/04/17		98	%	70 - 130	
			Acetone (2-Propanone)	2017/04/17	<10			ug/L	
			Benzene	2017/04/17	<0.20			ug/L	
			Bromodichloromethane	2017/04/17	<0.50			ug/L	
			Bromoform	2017/04/17	<1.0			ug/L	
			Bromomethane	2017/04/17	<0.50			ug/L	
			Carbon Tetrachloride	2017/04/17	<0.20			ug/L	
			Chlorobenzene	2017/04/17	<0.20			ug/L	
			Chloroform	2017/04/17	<0.20			ug/L	
			Dibromochloromethane	2017/04/17	<0.50			ug/L	
			1,2-Dichlorobenzene	2017/04/17	<0.50			ug/L	
			1,3-Dichlorobenzene	2017/04/17	<0.50			ug/L	
			1,4-Dichlorobenzene	2017/04/17	<0.50			ug/L	
			Dichlorodifluoromethane (FREON 12)	2017/04/17	<1.0			ug/L	
			1,1-Dichloroethane	2017/04/17	<0.20			ug/L	
			1,2-Dichloroethane	2017/04/17	<0.50			ug/L	
			1,1-Dichloroethylene	2017/04/17	<0.20			ug/L	
			cis-1,2-Dichloroethylene	2017/04/17	<0.50			ug/L	
			trans-1,2-Dichloroethylene	2017/04/17	<0.50			ug/L	
			1,2-Dichloropropane	2017/04/17	<0.20			ug/L	
			cis-1,3-Dichloropropene	2017/04/17	<0.30			ug/L	
			trans-1,3-Dichloropropene	2017/04/17	<0.40			ug/L	
			Ethylbenzene	2017/04/17	<0.20			ug/L	
			Ethylene Dibromide	2017/04/17	<0.20			ug/L	
			Hexane	2017/04/17	<1.0			ug/L	
			Methylene Chloride(Dichloromethane)	2017/04/17	<2.0			ug/L	
			Methyl Ethyl Ketone (2-Butanone)	2017/04/17	<10			ug/L	
			Methyl Isobutyl Ketone	2017/04/17	<5.0			ug/L	
			Methyl t-butyl ether (MTBE)	2017/04/17	<0.50			ug/L	
			Styrene	2017/04/17	<0.50			ug/L	
			1,1,1,2-Tetrachloroethane	2017/04/17	<0.50			ug/L	
			1,1,2,2-Tetrachloroethane	2017/04/17	<0.50			ug/L	
			Tetrachloroethylene	2017/04/17	<0.20			ug/L	
			Toluene	2017/04/17	<0.20			ug/L	
			1,1,1-Trichloroethane	2017/04/17	<0.20			ug/L	
			1,1,2-Trichloroethane	2017/04/17	<0.50			ug/L	
			Trichloroethylene	2017/04/17	<0.20			ug/L	
Trichlorofluoromethane (FREON 11)	2017/04/17	<0.50			ug/L				
Vinyl Chloride	2017/04/17	<0.20			ug/L				
p+m-Xylene	2017/04/17	<0.20			ug/L				
o-Xylene	2017/04/17	<0.20			ug/L				
Total Xylenes	2017/04/17	<0.20			ug/L				
F1 (C6-C10)	2017/04/17	<25			ug/L				
F1 (C6-C10) - BTEX	2017/04/17	<25			ug/L				
4939340	DR1	RPD [EEZ205-06]	Acetone (2-Propanone)	2017/04/17	NC		%	30	
			Benzene	2017/04/17	NC		%	30	
			Bromodichloromethane	2017/04/17	NC		%	30	
			Bromoform	2017/04/17	NC		%	30	
			Bromomethane	2017/04/17	NC		%	30	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Carbon Tetrachloride	2017/04/17	NC		%	30
			Chlorobenzene	2017/04/17	NC		%	30
			Chloroform	2017/04/17	NC		%	30
			Dibromochloromethane	2017/04/17	NC		%	30
			1,2-Dichlorobenzene	2017/04/17	NC		%	30
			1,3-Dichlorobenzene	2017/04/17	NC		%	30
			1,4-Dichlorobenzene	2017/04/17	NC		%	30
			Dichlorodifluoromethane (FREON 12)	2017/04/17	NC		%	30
			1,1-Dichloroethane	2017/04/17	NC		%	30
			1,2-Dichloroethane	2017/04/17	NC		%	30
			1,1-Dichloroethylene	2017/04/17	NC		%	30
			cis-1,2-Dichloroethylene	2017/04/17	NC		%	30
			trans-1,2-Dichloroethylene	2017/04/17	NC		%	30
			1,2-Dichloropropane	2017/04/17	NC		%	30
			cis-1,3-Dichloropropene	2017/04/17	NC		%	30
			trans-1,3-Dichloropropene	2017/04/17	NC		%	30
			Ethylbenzene	2017/04/17	NC		%	30
			Ethylene Dibromide	2017/04/17	NC		%	30
			Hexane	2017/04/17	NC		%	30
			Methylene Chloride(Dichloromethane)	2017/04/17	NC		%	30
			Methyl Ethyl Ketone (2-Butanone)	2017/04/17	NC		%	30
			Methyl Isobutyl Ketone	2017/04/17	NC		%	30
			Methyl t-butyl ether (MTBE)	2017/04/17	NC		%	30
			Styrene	2017/04/17	NC		%	30
			1,1,1,2-Tetrachloroethane	2017/04/17	NC		%	30
			1,1,2,2-Tetrachloroethane	2017/04/17	NC		%	30
			Tetrachloroethylene	2017/04/17	NC		%	30
			Toluene	2017/04/17	0.75		%	30
			1,1,1-Trichloroethane	2017/04/17	NC		%	30
			1,1,2-Trichloroethane	2017/04/17	NC		%	30
			Trichloroethylene	2017/04/17	NC		%	30
			Trichlorofluoromethane (FREON 11)	2017/04/17	NC		%	30
			Vinyl Chloride	2017/04/17	NC		%	30
			p+m-Xylene	2017/04/17	NC		%	30
			o-Xylene	2017/04/17	NC		%	30
			Total Xylenes	2017/04/17	NC		%	30
			F1 (C6-C10)	2017/04/17	NC		%	30
			F1 (C6-C10) - BTEX	2017/04/17	NC		%	30
4939499	SAC	Matrix Spike	Chromium (VI)	2017/04/13		108	%	80 - 120
4939499	SAC	Spiked Blank	Chromium (VI)	2017/04/13		110	%	80 - 120
4939499	SAC	Method Blank	Chromium (VI)	2017/04/13	<0.50		ug/L	
4939499	SAC	RPD	Chromium (VI)	2017/04/13	NC		%	20
4940699	RAJ	Matrix Spike	D10-Anthracene	2017/04/15		91	%	50 - 130
			D14-Terphenyl (FS)	2017/04/15		81	%	50 - 130
			D8-Acenaphthylene	2017/04/15		106	%	50 - 130
			Acenaphthene	2017/04/15		97	%	50 - 130
			Acenaphthylene	2017/04/15		111	%	50 - 130
			Anthracene	2017/04/15		88	%	50 - 130
			Benzo(a)anthracene	2017/04/15		89	%	50 - 130
			Benzo(a)pyrene	2017/04/15		90	%	50 - 130
			Benzo(b/j)fluoranthene	2017/04/15		92	%	50 - 130
			Benzo(g,h,i)perylene	2017/04/15		84	%	50 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Date							
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
			Benzo(k)fluoranthene	2017/04/15		92	%	50 - 130
			Chrysene	2017/04/15		91	%	50 - 130
			Dibenz(a,h)anthracene	2017/04/15		84	%	50 - 130
			Fluoranthene	2017/04/15		100	%	50 - 130
			Fluorene	2017/04/15		99	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2017/04/15		85	%	50 - 130
			1-Methylnaphthalene	2017/04/15		98	%	50 - 130
			2-Methylnaphthalene	2017/04/15		91	%	50 - 130
			Naphthalene	2017/04/15		89	%	50 - 130
			Phenanthrene	2017/04/15		100	%	50 - 130
			Pyrene	2017/04/15		100	%	50 - 130
4940699	RAJ	Spiked Blank	D10-Anthracene	2017/04/15		89	%	50 - 130
			D14-Terphenyl (FS)	2017/04/15		85	%	50 - 130
			D8-Acenaphthylene	2017/04/15		96	%	50 - 130
			Acenaphthene	2017/04/15		97	%	50 - 130
			Acenaphthylene	2017/04/15		97	%	50 - 130
			Anthracene	2017/04/15		84	%	50 - 130
			Benzo(a)anthracene	2017/04/15		87	%	50 - 130
			Benzo(a)pyrene	2017/04/15		96	%	50 - 130
			Benzo(b/j)fluoranthene	2017/04/15		107	%	50 - 130
			Benzo(g,h,i)perylene	2017/04/15		97	%	50 - 130
			Benzo(k)fluoranthene	2017/04/15		95	%	50 - 130
			Chrysene	2017/04/15		98	%	50 - 130
			Dibenz(a,h)anthracene	2017/04/15		97	%	50 - 130
			Fluoranthene	2017/04/15		95	%	50 - 130
			Fluorene	2017/04/15		99	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2017/04/15		95	%	50 - 130
			1-Methylnaphthalene	2017/04/15		94	%	50 - 130
			2-Methylnaphthalene	2017/04/15		86	%	50 - 130
			Naphthalene	2017/04/15		88	%	50 - 130
			Phenanthrene	2017/04/15		100	%	50 - 130
			Pyrene	2017/04/15		96	%	50 - 130
4940699	RAJ	Method Blank	D10-Anthracene	2017/04/15		92	%	50 - 130
			D14-Terphenyl (FS)	2017/04/15		85	%	50 - 130
			D8-Acenaphthylene	2017/04/15		101	%	50 - 130
			Acenaphthene	2017/04/15	<0.050		ug/L	
			Acenaphthylene	2017/04/15	<0.050		ug/L	
			Anthracene	2017/04/15	<0.050		ug/L	
			Benzo(a)anthracene	2017/04/15	<0.050		ug/L	
			Benzo(a)pyrene	2017/04/15	<0.010		ug/L	
			Benzo(b/j)fluoranthene	2017/04/15	<0.050		ug/L	
			Benzo(g,h,i)perylene	2017/04/15	<0.050		ug/L	
			Benzo(k)fluoranthene	2017/04/15	<0.050		ug/L	
			Chrysene	2017/04/15	<0.050		ug/L	
			Dibenz(a,h)anthracene	2017/04/15	<0.050		ug/L	
			Fluoranthene	2017/04/15	<0.050		ug/L	
			Fluorene	2017/04/15	<0.050		ug/L	
			Indeno(1,2,3-cd)pyrene	2017/04/15	<0.050		ug/L	
			1-Methylnaphthalene	2017/04/15	<0.050		ug/L	
			2-Methylnaphthalene	2017/04/15	<0.050		ug/L	
			Naphthalene	2017/04/15	<0.050		ug/L	
			Phenanthrene	2017/04/15	<0.030		ug/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4940699	RAJ	RPD	Pyrene	2017/04/15	<0.050		ug/L	
			Acenaphthene	2017/04/15	NC		%	30
			Acenaphthylene	2017/04/15	NC		%	30
			Anthracene	2017/04/15	NC		%	30
			Benzo(a)anthracene	2017/04/15	NC		%	30
			Benzo(a)pyrene	2017/04/15	NC		%	30
			Benzo(b,j)fluoranthene	2017/04/15	NC		%	30
			Benzo(g,h,i)perylene	2017/04/15	NC		%	30
			Benzo(k)fluoranthene	2017/04/15	NC		%	30
			Chrysene	2017/04/15	NC		%	30
			Dibenz(a,h)anthracene	2017/04/15	NC		%	30
			Fluoranthene	2017/04/15	NC		%	30
			Fluorene	2017/04/15	NC		%	30
			Indeno(1,2,3-cd)pyrene	2017/04/15	NC		%	30
			1-Methylnaphthalene	2017/04/15	NC		%	30
			2-Methylnaphthalene	2017/04/15	NC		%	30
			Naphthalene	2017/04/15	NC		%	30
			Phenanthrene	2017/04/15	NC		%	30
			Pyrene	2017/04/15	NC		%	30
			4941788	CPE	Matrix Spike	Dissolved Antimony (Sb)	2017/04/18	
Dissolved Arsenic (As)	2017/04/18					98	%	80 - 120
Dissolved Barium (Ba)	2017/04/18					96	%	80 - 120
Dissolved Beryllium (Be)	2017/04/18					92	%	80 - 120
Dissolved Boron (B)	2017/04/18					NC	%	80 - 120
Dissolved Cadmium (Cd)	2017/04/18					98	%	80 - 120
Dissolved Chromium (Cr)	2017/04/18					100	%	80 - 120
Dissolved Cobalt (Co)	2017/04/18					97	%	80 - 120
Dissolved Copper (Cu)	2017/04/18					98	%	80 - 120
Dissolved Lead (Pb)	2017/04/18					90	%	80 - 120
Dissolved Molybdenum (Mo)	2017/04/18					106	%	80 - 120
Dissolved Nickel (Ni)	2017/04/18					96	%	80 - 120
Dissolved Selenium (Se)	2017/04/18					99	%	80 - 120
Dissolved Silver (Ag)	2017/04/18					93	%	80 - 120
Dissolved Sodium (Na)	2017/04/18					NC	%	80 - 120
Dissolved Thallium (Tl)	2017/04/18					89	%	80 - 120
Dissolved Uranium (U)	2017/04/18					100	%	80 - 120
Dissolved Vanadium (V)	2017/04/18					102	%	80 - 120
Dissolved Zinc (Zn)	2017/04/18					91	%	80 - 120
4941788	CPE	Spiked Blank				Dissolved Antimony (Sb)	2017/04/18	
			Dissolved Arsenic (As)	2017/04/18		97	%	80 - 120
			Dissolved Barium (Ba)	2017/04/18		98	%	80 - 120
			Dissolved Beryllium (Be)	2017/04/18		96	%	80 - 120
			Dissolved Boron (B)	2017/04/18		98	%	80 - 120
			Dissolved Cadmium (Cd)	2017/04/18		99	%	80 - 120
			Dissolved Chromium (Cr)	2017/04/18		97	%	80 - 120
			Dissolved Cobalt (Co)	2017/04/18		95	%	80 - 120
			Dissolved Copper (Cu)	2017/04/18		97	%	80 - 120
			Dissolved Lead (Pb)	2017/04/18		93	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/04/18		100	%	80 - 120
			Dissolved Nickel (Ni)	2017/04/18		95	%	80 - 120
			Dissolved Selenium (Se)	2017/04/18		96	%	80 - 120
Dissolved Silver (Ag)	2017/04/18		98	%	80 - 120			

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits	
4941788	CPE	Method Blank	Dissolved Sodium (Na)	2017/04/18		98	%	80 - 120	
			Dissolved Thallium (Tl)	2017/04/18		93	%	80 - 120	
			Dissolved Uranium (U)	2017/04/18		99	%	80 - 120	
			Dissolved Vanadium (V)	2017/04/18		95	%	80 - 120	
			Dissolved Zinc (Zn)	2017/04/18		94	%	80 - 120	
			Dissolved Antimony (Sb)	2017/04/18	<0.50		ug/L		
			Dissolved Arsenic (As)	2017/04/18	<1.0		ug/L		
			Dissolved Barium (Ba)	2017/04/18	<2.0		ug/L		
			Dissolved Beryllium (Be)	2017/04/18	<0.50		ug/L		
			Dissolved Boron (B)	2017/04/18	<10		ug/L		
			Dissolved Cadmium (Cd)	2017/04/18	<0.10		ug/L		
			Dissolved Chromium (Cr)	2017/04/18	<5.0		ug/L		
			Dissolved Cobalt (Co)	2017/04/18	<0.50		ug/L		
			Dissolved Copper (Cu)	2017/04/18	<1.0		ug/L		
			Dissolved Lead (Pb)	2017/04/18	<0.50		ug/L		
			Dissolved Molybdenum (Mo)	2017/04/18	<0.50		ug/L		
			Dissolved Nickel (Ni)	2017/04/18	<1.0		ug/L		
			Dissolved Selenium (Se)	2017/04/18	<2.0		ug/L		
			Dissolved Silver (Ag)	2017/04/18	<0.10		ug/L		
			4941788	CPE	RPD	Dissolved Sodium (Na)	2017/04/18	<100	
Dissolved Thallium (Tl)	2017/04/18	<0.050					ug/L		
Dissolved Uranium (U)	2017/04/18	<0.10					ug/L		
Dissolved Vanadium (V)	2017/04/18	<0.50					ug/L		
Dissolved Zinc (Zn)	2017/04/18	<5.0					ug/L		
Dissolved Antimony (Sb)	2017/04/18	NC					%	20	
Dissolved Arsenic (As)	2017/04/18	NC					%	20	
Dissolved Barium (Ba)	2017/04/18	0.28					%	20	
Dissolved Beryllium (Be)	2017/04/18	NC					%	20	
Dissolved Boron (B)	2017/04/18	2.9					%	20	
Dissolved Cadmium (Cd)	2017/04/18	NC					%	20	
Dissolved Chromium (Cr)	2017/04/18	NC					%	20	
Dissolved Cobalt (Co)	2017/04/18	2.7					%	20	
Dissolved Copper (Cu)	2017/04/18	5.0					%	20	
Dissolved Lead (Pb)	2017/04/18	NC					%	20	
Dissolved Molybdenum (Mo)	2017/04/18	0.44					%	20	
Dissolved Nickel (Ni)	2017/04/18	0.0076					%	20	
Dissolved Selenium (Se)	2017/04/18	NC					%	20	
Dissolved Silver (Ag)	2017/04/18	NC					%	20	
Dissolved Thallium (Tl)	2017/04/18	16					%	20	
Dissolved Uranium (U)	2017/04/18	0.13		%	20				
Dissolved Vanadium (V)	2017/04/18	NC		%	20				
Dissolved Zinc (Zn)	2017/04/18	1.9		%	20				
4942127	AKS	Matrix Spike	o-Terphenyl	2017/04/18		101	%	60 - 130	
			F2 (C10-C16 Hydrocarbons)	2017/04/18		100	%	50 - 130	
			F3 (C16-C34 Hydrocarbons)	2017/04/18		99	%	50 - 130	
			F4 (C34-C50 Hydrocarbons)	2017/04/18		101	%	50 - 130	
4942127	AKS	Spiked Blank	o-Terphenyl	2017/04/18		101	%	60 - 130	
			F2 (C10-C16 Hydrocarbons)	2017/04/18		102	%	60 - 130	
			F3 (C16-C34 Hydrocarbons)	2017/04/18		106	%	60 - 130	
			F4 (C34-C50 Hydrocarbons)	2017/04/18		101	%	60 - 130	
4942127	AKS	Method Blank	o-Terphenyl	2017/04/17		99	%	60 - 130	
			F2 (C10-C16 Hydrocarbons)	2017/04/17	<100		ug/L		

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4942127	AKS	RPD	F3 (C16-C34 Hydrocarbons)	2017/04/17	<200		ug/L	
			F4 (C34-C50 Hydrocarbons)	2017/04/17	<200		ug/L	
			F2 (C10-C16 Hydrocarbons)	2017/04/18	0.72		%	30
			F3 (C16-C34 Hydrocarbons)	2017/04/18	NC		%	30
			F4 (C34-C50 Hydrocarbons)	2017/04/18	NC		%	30
4942691	RON	Matrix Spike [EEZ206-08]	Mercury (Hg)	2017/04/18		113	%	75 - 125
4942691	RON	Spiked Blank	Mercury (Hg)	2017/04/18		106	%	80 - 120
4942691	RON	Method Blank	Mercury (Hg)	2017/04/18	<0.1		ug/L	
4942691	RON	RPD [EEZ206-08]	Mercury (Hg)	2017/04/18	NC		%	20
4943400	LHA	Matrix Spike	Free Cyanide	2017/04/18		102	%	80 - 120
4943400	LHA	Spiked Blank	Free Cyanide	2017/04/18		101	%	80 - 120
4943400	LHA	Method Blank	Free Cyanide	2017/04/18	<1		ug/L	
4943400	LHA	RPD	Free Cyanide	2017/04/18	NC		%	20

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.

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

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

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

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

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

VALIDATION SIGNATURE PAGE

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




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

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

Your Project #: 161-17781-00
 Site Location: FUTURE HSR FACILITY
 Your C.O.C. #: 603044-01-01

Attention: Rachel Bryan

WSP Canada Inc
 4 Hughson Street South
 Suite 300
 Hamilton, ON
 CANADA L8N 3Z1

Report Date: 2017/04/13
 Report #: R4426322
 Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B764582

Received: 2017/03/31, 09:57

Sample Matrix: Water
 # Samples Received: 10

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
1,3-Dichloropropene Sum	1	N/A	2017/04/05		EPA 8260C m
Chloride by Automated Colourimetry	9	N/A	2017/04/05	CAM SOP-00463	EPA 325.2 m
Chromium (VI) in Water	9	N/A	2017/04/04	CAM SOP-00436	EPA 7199 m
Free (WAD) Cyanide	9	N/A	2017/04/05	CAM SOP-00457	OMOE E3015 m
Petroleum Hydro. CCME F1 & BTEX in Water	9	N/A	2017/04/05	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (1)	9	2017/04/05	2017/04/06	CAM SOP-00316	CCME PHC-CWS m
Mercury	9	2017/04/05	2017/04/06	CAM SOP-00453	EPA 7470A m
Dissolved Metals by ICPMS	8	N/A	2017/04/05	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	1	N/A	2017/04/06	CAM SOP-00447	EPA 6020B m
PAH Compounds in Water by GC/MS (SIM)	9	2017/04/05	2017/04/06	CAM SOP-00318	EPA 8270D m
Polychlorinated Biphenyl in Water	1	2017/04/03	2017/04/03	CAM SOP-00309	EPA 8082A m
Polychlorinated Biphenyl in Water	8	2017/04/03	2017/04/04	CAM SOP-00309	EPA 8082A m
Volatile Organic Compounds in Water	6	N/A	2017/04/04	CAM SOP-00228	EPA 8260C m
Volatile Organic Compounds in Water	4	N/A	2017/04/05	CAM SOP-00228	EPA 8260C m

Remarks:

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.



Your Project #: 161-17781-00
Site Location: FUTURE HSR FACILITY
Your C.O.C. #: 603044-01-01

Attention: Rachel Bryan

WSP Canada Inc
4 Hughson Street South
Suite 300
Hamilton, ON
CANADA L8N 3Z1

Report Date: 2017/04/13
Report #: R4426322
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B764582

Received: 2017/03/31, 09:57

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

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

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

(1) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ashton Gibson, Project Manager
Email: AGibson@maxxam.ca
Phone# (905) 817-5700

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

RESULTS OF ANALYSES OF WATER

Maxxam ID			EDL784		EDL785		EDL786		EDL787		
Sampling Date			2017/03/30 08:00		2017/03/30 13:00		2017/03/30 12:00		2017/03/29 08:00		
COC Number			603044-01-01		603044-01-01		603044-01-01		603044-01-01		
	UNITS	Criteria	17-11	RDL	17-13	RDL	17-19	RDL	MW101	RDL	QC Batch

Inorganics											
Free Cyanide	ug/L	66	<1	1	<1	1	<4	4	<1	1	4927873
Dissolved Chloride (Cl)	mg/L	2300	140	2.0	740	10	710	10	64	1.0	4926962

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
 Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
 Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil

Maxxam ID			EDL788		EDL789		EDL790		EDL791		
Sampling Date			2017/03/29 09:00		2017/03/29 10:00		2017/03/29 11:00		2017/03/30 11:00		
COC Number			603044-01-01		603044-01-01		603044-01-01		603044-01-01		
	UNITS	Criteria	MW104	RDL	MW105	RDL	MW106	RDL	MW107	RDL	QC Batch

Inorganics											
Free Cyanide	ug/L	66	<1	1	<1	1	<1	1	<1	1	4927873
Dissolved Chloride (Cl)	mg/L	2300	140	2.0	620	8.0	78	1.0	1900	25	4926962

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
 Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
 Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil

RESULTS OF ANALYSES OF WATER

Maxxam ID			EDL792		
Sampling Date			2017/03/29 12:00		
COC Number			603044-01-01		
	UNITS	Criteria	QA/QC1	RDL	QC Batch
Inorganics					
Free Cyanide	ug/L	66	<1	1	4927873
Dissolved Chloride (Cl)	mg/L	2300	610	8.0	4926962
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil					

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID			EDL784	EDL785	EDL786	EDL787	EDL788		
Sampling Date			2017/03/30 08:00	2017/03/30 13:00	2017/03/30 12:00	2017/03/29 08:00	2017/03/29 09:00		
COC Number			603044-01-01	603044-01-01	603044-01-01	603044-01-01	603044-01-01		
	UNITS	Criteria	17-11	17-13	17-19	MW101	MW104	RDL	QC Batch

Metals									
Chromium (VI)	ug/L	140	1.3	<0.50	<0.50	<0.50	<0.50	0.50	4925597
Mercury (Hg)	ug/L	2.8	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	4927376
Dissolved Antimony (Sb)	ug/L	20000	0.52	<0.50	0.57	<0.50	<0.50	0.50	4924609
Dissolved Arsenic (As)	ug/L	1900	3.7	1.3	4.2	<1.0	<1.0	1.0	4924609
Dissolved Barium (Ba)	ug/L	29000	100	73	730	120	390	2.0	4924609
Dissolved Beryllium (Be)	ug/L	67	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4924609
Dissolved Boron (B)	ug/L	45000	230	76	230	620	830	10	4924609
Dissolved Cadmium (Cd)	ug/L	2.7	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	4924609
Dissolved Chromium (Cr)	ug/L	810	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	4924609
Dissolved Cobalt (Co)	ug/L	66	<0.50	0.81	4.1	<0.50	0.61	0.50	4924609
Dissolved Copper (Cu)	ug/L	87	1.7	3.0	3.2	<1.0	<1.0	1.0	4924609
Dissolved Lead (Pb)	ug/L	25	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4924609
Dissolved Molybdenum (Mo)	ug/L	9200	10	4.8	3.2	<0.50	<0.50	0.50	4924609
Dissolved Nickel (Ni)	ug/L	490	1.7	2.1	5.1	1.4	1.8	1.0	4924609
Dissolved Selenium (Se)	ug/L	63	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	4924609
Dissolved Silver (Ag)	ug/L	1.5	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	4924609
Dissolved Sodium (Na)	ug/L	2300000	66000	280000	180000	100000	94000	100	4924609
Dissolved Thallium (Tl)	ug/L	510	<0.050	0.067	0.11	<0.050	<0.050	0.050	4924609
Dissolved Uranium (U)	ug/L	420	7.2	13	6.5	<0.10	0.14	0.10	4924609
Dissolved Vanadium (V)	ug/L	250	1.3	0.75	2.2	2.4	1.2	0.50	4924609
Dissolved Zinc (Zn)	ug/L	1100	<5.0	7.1	16	<5.0	<5.0	5.0	4924609

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)

Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID			EDL789	EDL790		EDL791		EDL792		
Sampling Date			2017/03/29 10:00	2017/03/29 11:00		2017/03/30 11:00		2017/03/29 12:00		
COC Number			603044-01-01	603044-01-01		603044-01-01		603044-01-01		
	UNITS	Criteria	MW105	MW106	RDL	MW107	RDL	QA/QC1	RDL	QC Batch
Metals										
Chromium (VI)	ug/L	140	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	4925597
Mercury (Hg)	ug/L	2.8	<0.1	<0.1	0.1	<0.1	0.1	<0.1	0.1	4927376
Dissolved Antimony (Sb)	ug/L	20000	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	4924609
Dissolved Arsenic (As)	ug/L	1900	8.6	2.4	1.0	<1.0	1.0	8.5	1.0	4924609
Dissolved Barium (Ba)	ug/L	29000	550	310	2.0	400	2.0	560	2.0	4924609
Dissolved Beryllium (Be)	ug/L	67	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	4924609
Dissolved Boron (B)	ug/L	45000	1100	260	10	370	10	1200	10	4924609
Dissolved Cadmium (Cd)	ug/L	2.7	<0.10	<0.10	0.10	<0.10	0.10	<0.10	0.10	4924609
Dissolved Chromium (Cr)	ug/L	810	<5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	4924609
Dissolved Cobalt (Co)	ug/L	66	3.2	18	0.50	0.71	0.50	3.2	0.50	4924609
Dissolved Copper (Cu)	ug/L	87	<1.0	1.3	1.0	<1.0	1.0	<1.0	1.0	4924609
Dissolved Lead (Pb)	ug/L	25	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	4924609
Dissolved Molybdenum (Mo)	ug/L	9200	<0.50	3.8	0.50	<0.50	0.50	<0.50	0.50	4924609
Dissolved Nickel (Ni)	ug/L	490	<1.0	7.0	1.0	<1.0	1.0	<1.0	1.0	4924609
Dissolved Selenium (Se)	ug/L	63	<2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	4924609
Dissolved Silver (Ag)	ug/L	1.5	<0.10	<0.10	0.10	<0.10	0.10	<0.10	0.10	4924609
Dissolved Sodium (Na)	ug/L	2300000	220000	38000	100	740000	500	220000	100	4924609
Dissolved Thallium (Tl)	ug/L	510	<0.050	<0.050	0.050	<0.050	0.050	<0.050	0.050	4924609
Dissolved Uranium (U)	ug/L	420	<0.10	6.3	0.10	<0.10	0.10	<0.10	0.10	4924609
Dissolved Vanadium (V)	ug/L	250	0.86	3.1	0.50	2.2	0.50	0.78	0.50	4924609
Dissolved Zinc (Zn)	ug/L	1100	<5.0	8.2	5.0	<5.0	5.0	<5.0	5.0	4924609

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)

Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

Non-Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID			EDL784	EDL785	EDL786	EDL787		EDL788		
Sampling Date			2017/03/30 08:00	2017/03/30 13:00	2017/03/30 12:00	2017/03/29 08:00		2017/03/29 09:00		
COC Number			603044-01-01	603044-01-01	603044-01-01	603044-01-01		603044-01-01		
	UNITS	Criteria	17-11	17-13	17-19	MW101	RDL	MW104	RDL	QC Batch

Polyaromatic Hydrocarbons										
Acenaphthene	ug/L	1700	<0.050	<0.050	0.25	0.62	0.050	0.063	0.050	4928192
Acenaphthylene	ug/L	1.8	<0.050	<0.050	<0.050	0.073	0.050	<0.050	0.050	4928192
Anthracene	ug/L	2.4	<0.050	<0.050	0.10	<0.050	0.050	<0.050	0.050	4928192
Benzo(a)anthracene	ug/L	4.7	<0.050	<0.050	<0.050	<0.050	0.050	<0.050	0.050	4928192
Benzo(a)pyrene	ug/L	0.81	0.032	<0.010	0.012	0.014	0.010	0.039	0.010	4928192
Benzo(b/j)fluoranthene	ug/L	0.75	<0.050	<0.050	<0.050	<0.050	0.050	0.061	0.050	4928192
Benzo(g,h,i)perylene	ug/L	0.2	<0.050	<0.050	<0.050	<0.050	0.050	<0.050	0.050	4928192
Benzo(k)fluoranthene	ug/L	0.4	<0.050	<0.050	<0.050	<0.050	0.050	<0.050	0.050	4928192
Chrysene	ug/L	1	<0.050	<0.050	<0.050	<0.050	0.050	0.053	0.050	4928192
Dibenz(a,h)anthracene	ug/L	0.52	<0.050	<0.050	<0.050	<0.050	0.050	<0.050	0.050	4928192
Fluoranthene	ug/L	130	<0.050	<0.050	<0.050	<0.050	0.050	0.13	0.050	4928192
Fluorene	ug/L	400	<0.050	<0.050	0.25	<0.050	0.050	<0.050	0.050	4928192
Indeno(1,2,3-cd)pyrene	ug/L	0.2	<0.050	<0.050	<0.050	<0.050	0.050	<0.050	0.050	4928192
1-Methylnaphthalene	ug/L	1800	<0.050	<0.050	4.9	<0.050	0.050	0.068	0.050	4928192
2-Methylnaphthalene	ug/L	1800	<0.050	<0.050	4.1	<0.050	0.050	<0.050	0.050	4928192
Naphthalene	ug/L	6400	<0.050	<0.050	2.8	<0.050	0.050	<0.070 (1)	0.070	4928192
Phenanthrene	ug/L	580	<0.030	0.060	0.50	0.038	0.030	0.056	0.030	4928192
Pyrene	ug/L	68	<0.050	<0.050	<0.050	<0.050	0.050	0.12	0.050	4928192

Surrogate Recovery (%)										
D10-Anthracene	%	-	102	100	102	100		102		4928192
D14-Terphenyl (FS)	%	-	97	95	96	90		95		4928192
D8-Acenaphthylene	%	-	101	100	107	102		103		4928192

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil
(1) DL was raised due to matrix interference.

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID			EDL789	EDL790	EDL791	EDL792		
Sampling Date			2017/03/29 10:00	2017/03/29 11:00	2017/03/30 11:00	2017/03/29 12:00		
COC Number			603044-01-01	603044-01-01	603044-01-01	603044-01-01		
	UNITS	Criteria	MW105	MW106	MW107	QA/QC1	RDL	QC Batch
Polyaromatic Hydrocarbons								
Acenaphthene	ug/L	1700	<0.050	0.065	<0.050	<0.050	0.050	4928192
Acenaphthylene	ug/L	1.8	<0.050	<0.050	<0.050	<0.050	0.050	4928192
Anthracene	ug/L	2.4	<0.050	0.051	<0.050	<0.050	0.050	4928192
Benzo(a)anthracene	ug/L	4.7	<0.050	<0.050	<0.050	<0.050	0.050	4928192
Benzo(a)pyrene	ug/L	0.81	0.034	<0.010	0.032	0.031	0.010	4928192
Benzo(b/j)fluoranthene	ug/L	0.75	0.052	<0.050	<0.050	<0.050	0.050	4928192
Benzo(g,h,i)perylene	ug/L	0.2	<0.050	<0.050	<0.050	<0.050	0.050	4928192
Benzo(k)fluoranthene	ug/L	0.4	<0.050	<0.050	<0.050	<0.050	0.050	4928192
Chrysene	ug/L	1	<0.050	<0.050	<0.050	<0.050	0.050	4928192
Dibenz(a,h)anthracene	ug/L	0.52	<0.050	<0.050	<0.050	<0.050	0.050	4928192
Fluoranthene	ug/L	130	0.076	0.063	<0.050	0.066	0.050	4928192
Fluorene	ug/L	400	<0.050	0.19	<0.050	<0.050	0.050	4928192
Indeno(1,2,3-cd)pyrene	ug/L	0.2	<0.050	<0.050	<0.050	<0.050	0.050	4928192
1-Methylnaphthalene	ug/L	1800	<0.050	0.20	<0.050	<0.050	0.050	4928192
2-Methylnaphthalene	ug/L	1800	<0.050	0.13	<0.050	<0.050	0.050	4928192
Naphthalene	ug/L	6400	<0.050	0.39	<0.050	<0.050	0.050	4928192
Phenanthrene	ug/L	580	0.047	1.3	<0.030	0.046	0.030	4928192
Pyrene	ug/L	68	0.072	0.45	0.055	0.062	0.050	4928192
Surrogate Recovery (%)								
D10-Anthracene	%	-	104	100	98	104		4928192
D14-Terphenyl (FS)	%	-	98	87	95	100		4928192
D8-Acenaphthylene	%	-	104	106	98	103		4928192
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil								

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID			EDL784	EDL785		EDL786		EDL787		
Sampling Date			2017/03/30 08:00	2017/03/30 13:00		2017/03/30 12:00		2017/03/29 08:00		
COC Number			603044-01-01	603044-01-01		603044-01-01		603044-01-01		
	UNITS	Criteria	17-11	17-13	RDL	17-19	RDL	MW101	RDL	QC Batch
Volatile Organics										
Acetone (2-Propanone)	ug/L	130000	<10	<10	10	120	10	14	10	4924389
Benzene	ug/L	430	<0.20	<0.20	0.20	0.44	0.20	<0.20	0.20	4924389
Bromodichloromethane	ug/L	85000	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	4924389
Bromoform	ug/L	770	<1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	4924389
Bromomethane	ug/L	56	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	4924389
Carbon Tetrachloride	ug/L	8.4	<0.20	<0.20	0.20	<0.20	0.20	<0.20	0.20	4924389
Chlorobenzene	ug/L	630	<0.20	<0.20	0.20	<0.20	0.20	<0.20	0.20	4924389
Chloroform	ug/L	22	<0.20	<0.20	0.20	<0.20	0.20	<0.20	0.20	4924389
Dibromochloromethane	ug/L	82000	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	4924389
1,2-Dichlorobenzene	ug/L	9600	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	4924389
1,3-Dichlorobenzene	ug/L	9600	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	4924389
1,4-Dichlorobenzene	ug/L	67	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	4924389
Dichlorodifluoromethane (FREON 12)	ug/L	4400	<1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	4924389
1,1-Dichloroethane	ug/L	3100	<0.20	<0.20	0.20	<0.20	0.20	<0.20	0.20	4924389
1,2-Dichloroethane	ug/L	12	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	4924389
1,1-Dichloroethylene	ug/L	17	<0.20	<0.20	0.20	<0.20	0.20	<0.20	0.20	4924389
cis-1,2-Dichloroethylene	ug/L	17	9.3	1.7	0.50	<0.50	0.50	<0.50	0.50	4924389
trans-1,2-Dichloroethylene	ug/L	17	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	4924389
1,2-Dichloropropane	ug/L	140	<0.20	<0.20	0.20	<0.20	0.20	<0.20	0.20	4924389
cis-1,3-Dichloropropene	ug/L	45	<0.30	<0.30	0.30	<0.30	0.30	<0.30	0.30	4924389
trans-1,3-Dichloropropene	ug/L	45	<0.40	<0.40	0.40	<0.40	0.40	<0.40	0.40	4924389
Ethylbenzene	ug/L	2300	<0.20	<0.20	0.20	2.0	0.20	<0.20	0.20	4924389
Ethylene Dibromide	ug/L	0.83	<0.20	<0.20	0.20	<0.20	0.20	<0.20	0.20	4924389
Hexane	ug/L	520	<1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	4924389
Methylene Chloride(Dichloromethane)	ug/L	5500	<2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	4924389
Methyl Ethyl Ketone (2-Butanone)	ug/L	1500000	<10	<10	10	33	10	<10	10	4924389
Methyl Isobutyl Ketone	ug/L	580000	<5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	4924389
Methyl t-butyl ether (MTBE)	ug/L	1400	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	4924389
Styrene	ug/L	9100	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	4924389

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)

Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID			EDL784	EDL785		EDL786		EDL787		
Sampling Date			2017/03/30 08:00	2017/03/30 13:00		2017/03/30 12:00		2017/03/29 08:00		
COC Number			603044-01-01	603044-01-01		603044-01-01		603044-01-01		
	UNITS	Criteria	17-11	17-13	RDL	17-19	RDL	MW101	RDL	QC Batch
1,1,1,2-Tetrachloroethane	ug/L	28	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	4924389
1,1,2,2-Tetrachloroethane	ug/L	15	<0.50	<0.50	0.50	<1.3 (1)	1.3	<0.50	0.50	4924389
Tetrachloroethylene	ug/L	17	<0.20	<0.20	0.20	<0.20	0.20	<0.20	0.20	4924389
Toluene	ug/L	18000	<0.20	<0.20	0.20	3.9	0.20	<0.20	0.20	4924389
1,1,1-Trichloroethane	ug/L	6700	<0.20	<0.20	0.20	<0.20	0.20	<0.20	0.20	4924389
1,1,2-Trichloroethane	ug/L	30	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	4924389
Trichloroethylene	ug/L	17	1.5	<0.20	0.20	<0.20	0.20	<0.20	0.20	4924389
Trichlorofluoromethane (FREON 11)	ug/L	2500	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	4924389
Vinyl Chloride	ug/L	1.7	4.2	0.20	0.20	<0.20	0.20	<0.20	0.20	4924389
p+m-Xylene	ug/L	-	<0.20	<0.20	0.20	12	0.20	<0.20	0.20	4924389
o-Xylene	ug/L	-	<0.20	<0.20	0.20	7.0	0.20	<0.20	0.20	4924389
Total Xylenes	ug/L	4200	<0.20	<0.20	0.20	19	0.20	<0.20	0.20	4924389
Surrogate Recovery (%)										
4-Bromofluorobenzene	%	-	92	91		99		93		4924389
D4-1,2-Dichloroethane	%	-	111	112		105		108		4924389
D8-Toluene	%	-	95	95		98		96		4924389
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil (1) VOC Analysis: Detection limit was raised due to matrix interferences.										

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID			EDL788	EDL789	EDL790	EDL791	EDL792		
Sampling Date			2017/03/29 09:00	2017/03/29 10:00	2017/03/29 11:00	2017/03/30 11:00	2017/03/29 12:00		
COC Number			603044-01-01	603044-01-01	603044-01-01	603044-01-01	603044-01-01		
	UNITS	Criteria	MW104	MW105	MW106	MW107	QA/QC1	RDL	QC Batch

Volatile Organics									
Acetone (2-Propanone)	ug/L	130000	<10	<10	130	<10	<10	10	4924389
Benzene	ug/L	430	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4924389
Bromodichloromethane	ug/L	85000	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4924389
Bromoform	ug/L	770	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	4924389
Bromomethane	ug/L	56	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4924389
Carbon Tetrachloride	ug/L	8.4	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4924389
Chlorobenzene	ug/L	630	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4924389
Chloroform	ug/L	22	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4924389
Dibromochloromethane	ug/L	82000	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4924389
1,2-Dichlorobenzene	ug/L	9600	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4924389
1,3-Dichlorobenzene	ug/L	9600	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4924389
1,4-Dichlorobenzene	ug/L	67	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4924389
Dichlorodifluoromethane (FREON 12)	ug/L	4400	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	4924389
1,1-Dichloroethane	ug/L	3100	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4924389
1,2-Dichloroethane	ug/L	12	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4924389
1,1-Dichloroethylene	ug/L	17	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4924389
cis-1,2-Dichloroethylene	ug/L	17	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4924389
trans-1,2-Dichloroethylene	ug/L	17	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4924389
1,2-Dichloropropane	ug/L	140	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4924389
cis-1,3-Dichloropropene	ug/L	45	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	4924389
trans-1,3-Dichloropropene	ug/L	45	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	4924389
Ethylbenzene	ug/L	2300	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4924389
Ethylene Dibromide	ug/L	0.83	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4924389
Hexane	ug/L	520	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	4924389
Methylene Chloride(Dichloromethane)	ug/L	5500	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	4924389
Methyl Ethyl Ketone (2-Butanone)	ug/L	1500000	<10	<10	<10	<10	<10	10	4924389
Methyl Isobutyl Ketone	ug/L	580000	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	4924389
Methyl t-butyl ether (MTBE)	ug/L	1400	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4924389
Styrene	ug/L	9100	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4924389

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
 Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
 Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID			EDL788	EDL789	EDL790	EDL791	EDL792		
Sampling Date			2017/03/29 09:00	2017/03/29 10:00	2017/03/29 11:00	2017/03/30 11:00	2017/03/29 12:00		
COC Number			603044-01-01	603044-01-01	603044-01-01	603044-01-01	603044-01-01		
	UNITS	Criteria	MW104	MW105	MW106	MW107	QA/QC1	RDL	QC Batch
1,1,1,2-Tetrachloroethane	ug/L	28	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4924389
1,1,2,2-Tetrachloroethane	ug/L	15	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4924389
Tetrachloroethylene	ug/L	17	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4924389
Toluene	ug/L	18000	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4924389
1,1,1-Trichloroethane	ug/L	6700	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4924389
1,1,2-Trichloroethane	ug/L	30	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4924389
Trichloroethylene	ug/L	17	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4924389
Trichlorofluoromethane (FREON 11)	ug/L	2500	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4924389
Vinyl Chloride	ug/L	1.7	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4924389
p+m-Xylene	ug/L	-	0.20	<0.20	<0.20	<0.20	<0.20	0.20	4924389
o-Xylene	ug/L	-	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4924389
Total Xylenes	ug/L	4200	0.20	<0.20	<0.20	<0.20	<0.20	0.20	4924389
Surrogate Recovery (%)									
4-Bromofluorobenzene	%	-	93	92	92	91	90		4924389
D4-1,2-Dichloroethane	%	-	105	109	112	111	112		4924389
D8-Toluene	%	-	97	95	95	95	95		4924389
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil									

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID			EDL793		
Sampling Date					
COC Number			603044-01-01		
	UNITS	Criteria	TRIP BLANK	RDL	QC Batch
Calculated Parameters					
1,3-Dichloropropene (cis+trans)	ug/L	45	<0.50	0.50	4924389
Volatile Organics					
Acetone (2-Propanone)	ug/L	130000	<10	10	4924389
Benzene	ug/L	430	<0.20	0.20	4924389
Bromodichloromethane	ug/L	85000	<0.50	0.50	4924389
Bromoform	ug/L	770	<1.0	1.0	4924389
Bromomethane	ug/L	56	<0.50	0.50	4924389
Carbon Tetrachloride	ug/L	8.4	<0.20	0.20	4924389
Chlorobenzene	ug/L	630	<0.20	0.20	4924389
Chloroform	ug/L	22	<0.20	0.20	4924389
Dibromochloromethane	ug/L	82000	<0.50	0.50	4924389
1,2-Dichlorobenzene	ug/L	9600	<0.50	0.50	4924389
1,3-Dichlorobenzene	ug/L	9600	<0.50	0.50	4924389
1,4-Dichlorobenzene	ug/L	67	<0.50	0.50	4924389
Dichlorodifluoromethane (FREON 12)	ug/L	4400	<1.0	1.0	4924389
1,1-Dichloroethane	ug/L	3100	<0.20	0.20	4924389
1,2-Dichloroethane	ug/L	12	<0.50	0.50	4924389
1,1-Dichloroethylene	ug/L	17	<0.20	0.20	4924389
cis-1,2-Dichloroethylene	ug/L	17	<0.50	0.50	4924389
trans-1,2-Dichloroethylene	ug/L	17	<0.50	0.50	4924389
1,2-Dichloropropane	ug/L	140	<0.20	0.20	4924389
cis-1,3-Dichloropropene	ug/L	45	<0.30	0.30	4924389
trans-1,3-Dichloropropene	ug/L	45	<0.40	0.40	4924389
Ethylbenzene	ug/L	2300	<0.20	0.20	4924389
Ethylene Dibromide	ug/L	0.83	<0.20	0.20	4924389
Hexane	ug/L	520	<1.0	1.0	4924389
Methylene Chloride(Dichloromethane)	ug/L	5500	<2.0	2.0	4924389
Methyl Ethyl Ketone (2-Butanone)	ug/L	1500000	<10	10	4924389
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)					
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition					
Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil					

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID			EDL793		
Sampling Date					
COC Number			603044-01-01		
	UNITS	Criteria	TRIP BLANK	RDL	QC Batch
Methyl Isobutyl Ketone	ug/L	580000	<5.0	5.0	4924389
Methyl t-butyl ether (MTBE)	ug/L	1400	<0.50	0.50	4924389
Styrene	ug/L	9100	<0.50	0.50	4924389
1,1,1,2-Tetrachloroethane	ug/L	28	<0.50	0.50	4924389
1,1,2,2-Tetrachloroethane	ug/L	15	<0.50	0.50	4924389
Tetrachloroethylene	ug/L	17	<0.20	0.20	4924389
Toluene	ug/L	18000	<0.20	0.20	4924389
1,1,1-Trichloroethane	ug/L	6700	<0.20	0.20	4924389
1,1,2-Trichloroethane	ug/L	30	<0.50	0.50	4924389
Trichloroethylene	ug/L	17	<0.20	0.20	4924389
Trichlorofluoromethane (FREON 11)	ug/L	2500	<0.50	0.50	4924389
Vinyl Chloride	ug/L	1.7	<0.20	0.20	4924389
p+m-Xylene	ug/L	-	<0.20	0.20	4924389
o-Xylene	ug/L	-	<0.20	0.20	4924389
Total Xylenes	ug/L	4200	<0.20	0.20	4924389
Surrogate Recovery (%)					
4-Bromofluorobenzene	%	-	92		4924389
D4-1,2-Dichloroethane	%	-	112		4924389
D8-Toluene	%	-	95		4924389
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil					

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			EDL784	EDL785	EDL786	EDL787	EDL788		
Sampling Date			2017/03/30 08:00	2017/03/30 13:00	2017/03/30 12:00	2017/03/29 08:00	2017/03/29 09:00		
COC Number			603044-01-01	603044-01-01	603044-01-01	603044-01-01	603044-01-01		
	UNITS	Criteria	17-11	17-13	17-19	MW101	MW104	RDL	QC Batch
BTEX & F1 Hydrocarbons									
F1 (C6-C10)	ug/L	750	<25	<25	940	<25	25	25	4926995
F1 (C6-C10) - BTEX	ug/L	750	<25	<25	910	<25	25	25	4926995
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/L	150	<100	<100	1100	<100	<100	100	4927925
F3 (C16-C34 Hydrocarbons)	ug/L	500	<200	<200	260	<200	<200	200	4927925
F4 (C34-C50 Hydrocarbons)	ug/L	500	<200	<200	<200	<200	<200	200	4927925
Reached Baseline at C50	ug/L	-	Yes	Yes	Yes	Yes	Yes		4927925
Surrogate Recovery (%)									
1,4-Difluorobenzene	%	-	101	102	98	100	100		4926995
4-Bromofluorobenzene	%	-	96	96	95	95	94		4926995
D10-Ethylbenzene	%	-	105	104	103	103	104		4926995
D4-1,2-Dichloroethane	%	-	102	103	103	102	101		4926995
o-Terphenyl	%	-	109	110	111	110	110		4927925
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil									

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			EDL789	EDL790	EDL791	EDL792		
Sampling Date			2017/03/29 10:00	2017/03/29 11:00	2017/03/30 11:00	2017/03/29 12:00		
COC Number			603044-01-01	603044-01-01	603044-01-01	603044-01-01		
	UNITS	Criteria	MW105	MW106	MW107	QA/QC1	RDL	QC Batch
BTEX & F1 Hydrocarbons								
F1 (C6-C10)	ug/L	750	<25	<25	<25	<25	25	4926995
F1 (C6-C10) - BTEX	ug/L	750	<25	<25	<25	<25	25	4926995
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/L	150	<100	120	<100	<100	100	4927925
F3 (C16-C34 Hydrocarbons)	ug/L	500	<200	<200	<200	<200	200	4927925
F4 (C34-C50 Hydrocarbons)	ug/L	500	<200	<200	<200	<200	200	4927925
Reached Baseline at C50	ug/L	-	Yes	Yes	Yes	Yes		4927925
Surrogate Recovery (%)								
1,4-Difluorobenzene	%	-	102	101	101	101		4926995
4-Bromofluorobenzene	%	-	96	95	96	96		4926995
D10-Ethylbenzene	%	-	105	104	103	103		4926995
D4-1,2-Dichloroethane	%	-	103	102	104	103		4926995
o-Terphenyl	%	-	111	111	111	110		4927925
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)								
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition								
Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil								

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID			EDL784	EDL785	EDL786	EDL787	EDL788		
Sampling Date			2017/03/30 08:00	2017/03/30 13:00	2017/03/30 12:00	2017/03/29 08:00	2017/03/29 09:00		
COC Number			603044-01-01	603044-01-01	603044-01-01	603044-01-01	603044-01-01		
	UNITS	Criteria	17-11	17-13	17-19	MW101	MW104	RDL	QC Batch
PCBs									
Aroclor 1242	ug/L	-	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	4924351
Aroclor 1248	ug/L	-	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	4924351
Aroclor 1254	ug/L	-	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	4924351
Aroclor 1260	ug/L	-	<0.05	<0.05	<0.05	0.06	<0.05	0.05	4924351
Total PCB	ug/L	15	<0.05	<0.05	<0.05	0.06	<0.05	0.05	4924351
Surrogate Recovery (%)									
Decachlorobiphenyl	%	-	64	68	67	53 (1)	68		4924351
<p>RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil (1) The Surrogate recovery was below the control limit as stipulated by Ontario Regulation 153, however, this recovery is still within Maxxam's performance based limits. Results reported with surrogate recoveries within this range are still valid but may have an associated low bias.</p>									

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID			EDL789	EDL790	EDL791	EDL792		
Sampling Date			2017/03/29 10:00	2017/03/29 11:00	2017/03/30 11:00	2017/03/29 12:00		
COC Number			603044-01-01	603044-01-01	603044-01-01	603044-01-01		
	UNITS	Criteria	MW105	MW106	MW107	QA/QC1	RDL	QC Batch
PCBs								
Aroclor 1242	ug/L	-	<0.05	<0.05	<0.05	<0.05	0.05	4924351
Aroclor 1248	ug/L	-	<0.05	<0.05	<0.05	<0.05	0.05	4924351
Aroclor 1254	ug/L	-	<0.05	<0.05	<0.05	<0.05	0.05	4924351
Aroclor 1260	ug/L	-	<0.05	<0.05	<0.05	<0.05	0.05	4924351
Total PCB	ug/L	15	<0.05	<0.05	<0.05	<0.05	0.05	4924351
Surrogate Recovery (%)								
Decachlorobiphenyl	%	-	58 (1)	70	63	56 (1)		4924351
<p>RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Reg. 153/04 (Amended April 15, 2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition Non- Potable Ground Water - All Types of Property Uses - Medium and Fine Texture Soil (1) The Surrogate recovery was below the control limit as stipulated by Ontario Regulation 153, however, this recovery is still within Maxxam's performance based limits. Results reported with surrogate recoveries within this range are still valid but may have an associated low bias.</p>								

GENERAL COMMENTS

Revised Report[2017/4/13]: O.Reg 153/04 Table 3 med/fine criteria added to report.

For all samples all 40mL vials for F1BTEX and VOC analyses contained visible sediment. Also all 250mL amber glass bottles for F2-F4 and PAH analyses contained visible sediment, which was included in the extraction, and the 500mL amber glass bottles for PCB analysis contained visible sediment. Additionally, the 500mL plastic bottle for chloride analysis contained visible sediment and the 125mL plastic bottles for cyanide analysis contained visible sediment. For sample MW105 also the 125mL plastic bottles for chromium VI analysis contained visible sediment.

Sample EDL784 [17-11] : Hexavalent Chromium > Total/Dissolved Chromium: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample EDL786 [17-19] : F1-BTEX Analysis: The BTEX results used for the F1-BTEX calculation were obtained from Headspace-GC analysis .

Sample EDL788 [MW104] : F1-BTEX Analysis: The BTEX results used for the F1-BTEX calculation were obtained from Headspace-GC analysis.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4924351	LPG	Matrix Spike	Decachlorobiphenyl	2017/04/03		76	%	60 - 130
			Aroclor 1260	2017/04/03		77	%	60 - 130
			Total PCB	2017/04/03		77	%	60 - 130
4924351	LPG	Spiked Blank	Decachlorobiphenyl	2017/04/03		87	%	60 - 130
			Aroclor 1260	2017/04/03		78	%	60 - 130
			Total PCB	2017/04/03		78	%	60 - 130
4924351	LPG	Method Blank	Decachlorobiphenyl	2017/04/03		80	%	60 - 130
			Aroclor 1242	2017/04/03	<0.05		ug/L	
			Aroclor 1248	2017/04/03	<0.05		ug/L	
			Aroclor 1254	2017/04/03	<0.05		ug/L	
			Aroclor 1260	2017/04/03	<0.05		ug/L	
			Total PCB	2017/04/03	<0.05		ug/L	
4924351	LPG	RPD [EDL785-01]	Aroclor 1242	2017/04/03	NC		%	30
			Aroclor 1248	2017/04/03	NC		%	30
			Aroclor 1254	2017/04/03	NC		%	30
			Aroclor 1260	2017/04/03	NC		%	30
			Total PCB	2017/04/03	NC		%	40
4924389	AYA	Matrix Spike [EDL784-09]	4-Bromofluorobenzene	2017/04/04		98	%	70 - 130
			D4-1,2-Dichloroethane	2017/04/04		108	%	70 - 130
			D8-Toluene	2017/04/04		102	%	70 - 130
			Acetone (2-Propanone)	2017/04/04		126	%	60 - 140
			Benzene	2017/04/04		99	%	70 - 130
			Bromodichloromethane	2017/04/04		105	%	70 - 130
			Bromoform	2017/04/04		110	%	70 - 130
			Bromomethane	2017/04/04		100	%	60 - 140
			Carbon Tetrachloride	2017/04/04		99	%	70 - 130
			Chlorobenzene	2017/04/04		103	%	70 - 130
			Chloroform	2017/04/04		99	%	70 - 130
			Dibromochloromethane	2017/04/04		108	%	70 - 130
			1,2-Dichlorobenzene	2017/04/04		101	%	70 - 130
			1,3-Dichlorobenzene	2017/04/04		98	%	70 - 130
			1,4-Dichlorobenzene	2017/04/04		100	%	70 - 130
			Dichlorodifluoromethane (FREON 12)	2017/04/04		80	%	60 - 140
			1,1-Dichloroethane	2017/04/04		100	%	70 - 130
			1,2-Dichloroethane	2017/04/04		101	%	70 - 130
			1,1-Dichloroethylene	2017/04/04		99	%	70 - 130
			cis-1,2-Dichloroethylene	2017/04/04		104	%	70 - 130
			trans-1,2-Dichloroethylene	2017/04/04		97	%	70 - 130
			1,2-Dichloropropane	2017/04/04		102	%	70 - 130
			cis-1,3-Dichloropropene	2017/04/04		102	%	70 - 130
			trans-1,3-Dichloropropene	2017/04/04		104	%	70 - 130
			Ethylbenzene	2017/04/04		99	%	70 - 130
			Ethylene Dibromide	2017/04/04		110	%	70 - 130
			Hexane	2017/04/04		101	%	70 - 130
			Methylene Chloride(Dichloromethane)	2017/04/04		106	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2017/04/04		122	%	60 - 140
			Methyl Isobutyl Ketone	2017/04/04		116	%	70 - 130
Methyl t-butyl ether (MTBE)	2017/04/04		98	%	70 - 130			
Styrene	2017/04/04		102	%	70 - 130			
1,1,1,2-Tetrachloroethane	2017/04/04		104	%	70 - 130			
1,1,2,2-Tetrachloroethane	2017/04/04		112	%	70 - 130			
Tetrachloroethylene	2017/04/04		97	%	70 - 130			

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Toluene	2017/04/04		98	%	70 - 130
			1,1,1-Trichloroethane	2017/04/04		96	%	70 - 130
			1,1,2-Trichloroethane	2017/04/04		108	%	70 - 130
			Trichloroethylene	2017/04/04		96	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2017/04/04		96	%	70 - 130
			Vinyl Chloride	2017/04/04		94	%	70 - 130
			p+m-Xylene	2017/04/04		99	%	70 - 130
			o-Xylene	2017/04/04		94	%	70 - 130
4924389	AYA	Spiked Blank	4-Bromofluorobenzene	2017/04/04		100	%	70 - 130
			D4-1,2-Dichloroethane	2017/04/04		104	%	70 - 130
			D8-Toluene	2017/04/04		102	%	70 - 130
			Acetone (2-Propanone)	2017/04/04		116	%	60 - 140
			Benzene	2017/04/04		93	%	70 - 130
			Bromodichloromethane	2017/04/04		98	%	70 - 130
			Bromoform	2017/04/04		104	%	70 - 130
			Bromomethane	2017/04/04		93	%	60 - 140
			Carbon Tetrachloride	2017/04/04		94	%	70 - 130
			Chlorobenzene	2017/04/04		97	%	70 - 130
			Chloroform	2017/04/04		93	%	70 - 130
			Dibromochloromethane	2017/04/04		102	%	70 - 130
			1,2-Dichlorobenzene	2017/04/04		97	%	70 - 130
			1,3-Dichlorobenzene	2017/04/04		95	%	70 - 130
			1,4-Dichlorobenzene	2017/04/04		97	%	70 - 130
			Dichlorodifluoromethane (FREON 12)	2017/04/04		80	%	60 - 140
			1,1-Dichloroethane	2017/04/04		93	%	70 - 130
			1,2-Dichloroethane	2017/04/04		94	%	70 - 130
			1,1-Dichloroethylene	2017/04/04		94	%	70 - 130
			cis-1,2-Dichloroethylene	2017/04/04		98	%	70 - 130
			trans-1,2-Dichloroethylene	2017/04/04		93	%	70 - 130
			1,2-Dichloropropane	2017/04/04		96	%	70 - 130
			cis-1,3-Dichloropropene	2017/04/04		99	%	70 - 130
			trans-1,3-Dichloropropene	2017/04/04		100	%	70 - 130
			Ethylbenzene	2017/04/04		95	%	70 - 130
			Ethylene Dibromide	2017/04/04		102	%	70 - 130
			Hexane	2017/04/04		97	%	70 - 130
			Methylene Chloride(Dichloromethane)	2017/04/04		99	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2017/04/04		114	%	60 - 140
			Methyl Isobutyl Ketone	2017/04/04		110	%	70 - 130
			Methyl t-butyl ether (MTBE)	2017/04/04		95	%	70 - 130
			Styrene	2017/04/04		100	%	70 - 130
			1,1,1,2-Tetrachloroethane	2017/04/04		98	%	70 - 130
			1,1,2,2-Tetrachloroethane	2017/04/04		105	%	70 - 130
			Tetrachloroethylene	2017/04/04		92	%	70 - 130
			Toluene	2017/04/04		92	%	70 - 130
			1,1,1-Trichloroethane	2017/04/04		92	%	70 - 130
			1,1,2-Trichloroethane	2017/04/04		100	%	70 - 130
			Trichloroethylene	2017/04/04		92	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2017/04/04		91	%	70 - 130
			Vinyl Chloride	2017/04/04		90	%	70 - 130
			p+m-Xylene	2017/04/04		95	%	70 - 130
			o-Xylene	2017/04/04		93	%	70 - 130
4924389	AYA	Method Blank	4-Bromofluorobenzene	2017/04/04		96	%	70 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			D4-1,2-Dichloroethane	2017/04/04		108	%	70 - 130
			D8-Toluene	2017/04/04		95	%	70 - 130
			Acetone (2-Propanone)	2017/04/04	<10		ug/L	
			Benzene	2017/04/04	<0.20		ug/L	
			Bromodichloromethane	2017/04/04	<0.50		ug/L	
			Bromoform	2017/04/04	<1.0		ug/L	
			Bromomethane	2017/04/04	<0.50		ug/L	
			Carbon Tetrachloride	2017/04/04	<0.20		ug/L	
			Chlorobenzene	2017/04/04	<0.20		ug/L	
			Chloroform	2017/04/04	<0.20		ug/L	
			Dibromochloromethane	2017/04/04	<0.50		ug/L	
			1,2-Dichlorobenzene	2017/04/04	<0.50		ug/L	
			1,3-Dichlorobenzene	2017/04/04	<0.50		ug/L	
			1,4-Dichlorobenzene	2017/04/04	<0.50		ug/L	
			Dichlorodifluoromethane (FREON 12)	2017/04/04	<1.0		ug/L	
			1,1-Dichloroethane	2017/04/04	<0.20		ug/L	
			1,2-Dichloroethane	2017/04/04	<0.50		ug/L	
			1,1-Dichloroethylene	2017/04/04	<0.20		ug/L	
			cis-1,2-Dichloroethylene	2017/04/04	<0.50		ug/L	
			trans-1,2-Dichloroethylene	2017/04/04	<0.50		ug/L	
			1,2-Dichloropropane	2017/04/04	<0.20		ug/L	
			cis-1,3-Dichloropropene	2017/04/04	<0.30		ug/L	
			trans-1,3-Dichloropropene	2017/04/04	<0.40		ug/L	
			Ethylbenzene	2017/04/04	<0.20		ug/L	
			Ethylene Dibromide	2017/04/04	<0.20		ug/L	
			Hexane	2017/04/04	<1.0		ug/L	
			Methylene Chloride(Dichloromethane)	2017/04/04	<2.0		ug/L	
			Methyl Ethyl Ketone (2-Butanone)	2017/04/04	<10		ug/L	
			Methyl Isobutyl Ketone	2017/04/04	<5.0		ug/L	
			Methyl t-butyl ether (MTBE)	2017/04/04	<0.50		ug/L	
			Styrene	2017/04/04	<0.50		ug/L	
			1,1,1,2-Tetrachloroethane	2017/04/04	<0.50		ug/L	
			1,1,2,2-Tetrachloroethane	2017/04/04	<0.50		ug/L	
			Tetrachloroethylene	2017/04/04	<0.20		ug/L	
			Toluene	2017/04/04	<0.20		ug/L	
			1,1,1-Trichloroethane	2017/04/04	<0.20		ug/L	
			1,1,2-Trichloroethane	2017/04/04	<0.50		ug/L	
			Trichloroethylene	2017/04/04	<0.20		ug/L	
			Trichlorofluoromethane (FREON 11)	2017/04/04	<0.50		ug/L	
			Vinyl Chloride	2017/04/04	<0.20		ug/L	
			p+m-Xylene	2017/04/04	<0.20		ug/L	
			o-Xylene	2017/04/04	<0.20		ug/L	
			Total Xylenes	2017/04/04	<0.20		ug/L	
4924389	AYA	RPD [EDL784-09]	Acetone (2-Propanone)	2017/04/04	NC		%	30
			Benzene	2017/04/04	NC		%	30
			Bromodichloromethane	2017/04/04	NC		%	30
			Bromoform	2017/04/04	NC		%	30
			Bromomethane	2017/04/04	NC		%	30
			Carbon Tetrachloride	2017/04/04	NC		%	30
			Chlorobenzene	2017/04/04	NC		%	30
			Chloroform	2017/04/04	NC		%	30
			Dibromochloromethane	2017/04/04	NC		%	30

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,2-Dichlorobenzene	2017/04/04	NC		%	30
			1,3-Dichlorobenzene	2017/04/04	NC		%	30
			1,4-Dichlorobenzene	2017/04/04	NC		%	30
			Dichlorodifluoromethane (FREON 12)	2017/04/04	NC		%	30
			1,1-Dichloroethane	2017/04/04	NC		%	30
			1,2-Dichloroethane	2017/04/04	NC		%	30
			1,1-Dichloroethylene	2017/04/04	NC		%	30
			cis-1,2-Dichloroethylene	2017/04/04	3.1		%	30
			trans-1,2-Dichloroethylene	2017/04/04	NC		%	30
			1,2-Dichloropropane	2017/04/04	NC		%	30
			cis-1,3-Dichloropropene	2017/04/04	NC		%	30
			trans-1,3-Dichloropropene	2017/04/04	NC		%	30
			Ethylbenzene	2017/04/04	NC		%	30
			Ethylene Dibromide	2017/04/04	NC		%	30
			Hexane	2017/04/04	NC		%	30
			Methylene Chloride(Dichloromethane)	2017/04/04	NC		%	30
			Methyl Ethyl Ketone (2-Butanone)	2017/04/04	NC		%	30
			Methyl Isobutyl Ketone	2017/04/04	NC		%	30
			Methyl t-butyl ether (MTBE)	2017/04/04	NC		%	30
			Styrene	2017/04/04	NC		%	30
			1,1,1,2-Tetrachloroethane	2017/04/04	NC		%	30
			1,1,2,2-Tetrachloroethane	2017/04/04	NC		%	30
			Tetrachloroethylene	2017/04/04	NC		%	30
			Toluene	2017/04/04	NC		%	30
			1,1,1-Trichloroethane	2017/04/04	NC		%	30
			1,1,2-Trichloroethane	2017/04/04	NC		%	30
			Trichloroethylene	2017/04/04	0.60		%	30
			Trichlorofluoromethane (FREON 11)	2017/04/04	NC		%	30
			Vinyl Chloride	2017/04/04	0.86		%	30
			p+m-Xylene	2017/04/04	NC		%	30
			o-Xylene	2017/04/04	NC		%	30
			Total Xylenes	2017/04/04	NC		%	30
4924609	ADA	Matrix Spike	Dissolved Antimony (Sb)	2017/04/05		110	%	80 - 120
			Dissolved Arsenic (As)	2017/04/05		107	%	80 - 120
			Dissolved Barium (Ba)	2017/04/05		103	%	80 - 120
			Dissolved Beryllium (Be)	2017/04/05		112	%	80 - 120
			Dissolved Boron (B)	2017/04/05		NC	%	80 - 120
			Dissolved Cadmium (Cd)	2017/04/05		106	%	80 - 120
			Dissolved Chromium (Cr)	2017/04/05		108	%	80 - 120
			Dissolved Cobalt (Co)	2017/04/05		106	%	80 - 120
			Dissolved Copper (Cu)	2017/04/05		104	%	80 - 120
			Dissolved Lead (Pb)	2017/04/05		109	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/04/05		109	%	80 - 120
			Dissolved Nickel (Ni)	2017/04/05		98	%	80 - 120
			Dissolved Selenium (Se)	2017/04/05		97	%	80 - 120
			Dissolved Silver (Ag)	2017/04/05		81	%	80 - 120
			Dissolved Sodium (Na)	2017/04/05		NC	%	80 - 120
			Dissolved Thallium (Tl)	2017/04/05		111	%	80 - 120
			Dissolved Uranium (U)	2017/04/05		112	%	80 - 120
			Dissolved Vanadium (V)	2017/04/05		109	%	80 - 120
			Dissolved Zinc (Zn)	2017/04/05		104	%	80 - 120
4924609	ADA	Spiked Blank	Dissolved Antimony (Sb)	2017/04/05		104	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Arsenic (As)	2017/04/05		102	%	80 - 120
			Dissolved Barium (Ba)	2017/04/05		102	%	80 - 120
			Dissolved Beryllium (Be)	2017/04/05		103	%	80 - 120
			Dissolved Boron (B)	2017/04/05		106	%	80 - 120
			Dissolved Cadmium (Cd)	2017/04/05		101	%	80 - 120
			Dissolved Chromium (Cr)	2017/04/05		103	%	80 - 120
			Dissolved Cobalt (Co)	2017/04/05		102	%	80 - 120
			Dissolved Copper (Cu)	2017/04/05		103	%	80 - 120
			Dissolved Lead (Pb)	2017/04/05		102	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/04/05		103	%	80 - 120
			Dissolved Nickel (Ni)	2017/04/05		97	%	80 - 120
			Dissolved Selenium (Se)	2017/04/05		103	%	80 - 120
			Dissolved Silver (Ag)	2017/04/05		100	%	80 - 120
			Dissolved Sodium (Na)	2017/04/05		102	%	80 - 120
			Dissolved Thallium (Tl)	2017/04/05		106	%	80 - 120
			Dissolved Uranium (U)	2017/04/05		109	%	80 - 120
			Dissolved Vanadium (V)	2017/04/05		100	%	80 - 120
			Dissolved Zinc (Zn)	2017/04/05		101	%	80 - 120
4924609	ADA	Method Blank	Dissolved Antimony (Sb)	2017/04/05	<0.50		ug/L	
			Dissolved Arsenic (As)	2017/04/05	<1.0		ug/L	
			Dissolved Barium (Ba)	2017/04/05	<2.0		ug/L	
			Dissolved Beryllium (Be)	2017/04/05	<0.50		ug/L	
			Dissolved Boron (B)	2017/04/05	<10		ug/L	
			Dissolved Cadmium (Cd)	2017/04/05	<0.10		ug/L	
			Dissolved Chromium (Cr)	2017/04/05	<5.0		ug/L	
			Dissolved Cobalt (Co)	2017/04/05	<0.50		ug/L	
			Dissolved Copper (Cu)	2017/04/05	<1.0		ug/L	
			Dissolved Lead (Pb)	2017/04/05	<0.50		ug/L	
			Dissolved Molybdenum (Mo)	2017/04/05	<0.50		ug/L	
			Dissolved Nickel (Ni)	2017/04/05	<1.0		ug/L	
			Dissolved Selenium (Se)	2017/04/05	<2.0		ug/L	
			Dissolved Silver (Ag)	2017/04/05	<0.10		ug/L	
			Dissolved Sodium (Na)	2017/04/05	<100		ug/L	
			Dissolved Thallium (Tl)	2017/04/05	<0.050		ug/L	
			Dissolved Uranium (U)	2017/04/05	<0.10		ug/L	
			Dissolved Vanadium (V)	2017/04/05	<0.50		ug/L	
			Dissolved Zinc (Zn)	2017/04/05	<5.0		ug/L	
4924609	ADA	RPD	Dissolved Barium (Ba)	2017/04/05	2.4		%	20
			Dissolved Boron (B)	2017/04/05	3.2		%	20
			Dissolved Sodium (Na)	2017/04/05	0.67		%	20
4925597	LLE	Matrix Spike [EDL784-06]	Chromium (VI)	2017/04/04		111	%	80 - 120
4925597	LLE	Spiked Blank	Chromium (VI)	2017/04/04		108	%	80 - 120
4925597	LLE	Method Blank	Chromium (VI)	2017/04/04	<0.50		ug/L	
4925597	LLE	RPD [EDL784-06]	Chromium (VI)	2017/04/04	3.1		%	20
4926962	DRM	Matrix Spike	Dissolved Chloride (Cl)	2017/04/05		NC	%	80 - 120
4926962	DRM	Spiked Blank	Dissolved Chloride (Cl)	2017/04/05		103	%	80 - 120
4926962	DRM	Method Blank	Dissolved Chloride (Cl)	2017/04/05	<1.0		mg/L	
4926962	DRM	RPD	Dissolved Chloride (Cl)	2017/04/05	0.68		%	20
4926995	RGA	Matrix Spike	1,4-Difluorobenzene	2017/04/05		100	%	70 - 130
			4-Bromofluorobenzene	2017/04/05		95	%	70 - 130
			D10-Ethylbenzene	2017/04/05		102	%	70 - 130
			D4-1,2-Dichloroethane	2017/04/05		101	%	70 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4926995	RGA	Spiked Blank	F1 (C6-C10)	2017/04/05		86	%	70 - 130
			1,4-Difluorobenzene	2017/04/05		99	%	70 - 130
			4-Bromofluorobenzene	2017/04/05		96	%	70 - 130
			D10-Ethylbenzene	2017/04/05		101	%	70 - 130
			D4-1,2-Dichloroethane	2017/04/05		105	%	70 - 130
4926995	RGA	Method Blank	F1 (C6-C10)	2017/04/05		93	%	70 - 130
			1,4-Difluorobenzene	2017/04/05		100	%	70 - 130
			4-Bromofluorobenzene	2017/04/05		96	%	70 - 130
			D10-Ethylbenzene	2017/04/05		102	%	70 - 130
			D4-1,2-Dichloroethane	2017/04/05		104	%	70 - 130
			F1 (C6-C10)	2017/04/05	<25		ug/L	
			F1 (C6-C10) - BTEX	2017/04/05	<25		ug/L	
4927376	RON	Matrix Spike [EDL788-05]	Mercury (Hg)	2017/04/06		109	%	75 - 125
4927376	RON	Spiked Blank	Mercury (Hg)	2017/04/06		100	%	80 - 120
4927376	RON	Method Blank	Mercury (Hg)	2017/04/06	<0.1		ug/L	
4927376	RON	RPD [EDL788-05]	Mercury (Hg)	2017/04/06	NC		%	20
4927873	LJN	Matrix Spike [EDL785-07]	Free Cyanide	2017/04/05		105	%	80 - 120
4927873	LJN	Spiked Blank	Free Cyanide	2017/04/05		104	%	80 - 120
4927873	LJN	Method Blank	Free Cyanide	2017/04/05	<1		ug/L	
4927873	LJN	RPD [EDL785-07]	Free Cyanide	2017/04/05	NC		%	20
4927925	ZZ	Matrix Spike	o-Terphenyl	2017/04/06		112	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/04/06		104	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2017/04/06		102	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2017/04/06		99	%	50 - 130
			o-Terphenyl	2017/04/06		112	%	60 - 130
4927925	ZZ	Spiked Blank	F2 (C10-C16 Hydrocarbons)	2017/04/06		105	%	60 - 130
			F3 (C16-C34 Hydrocarbons)	2017/04/06		102	%	60 - 130
			F4 (C34-C50 Hydrocarbons)	2017/04/06		99	%	60 - 130
			o-Terphenyl	2017/04/06		110	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/04/06	<100	ug/L		
4927925	ZZ	Method Blank	F3 (C16-C34 Hydrocarbons)	2017/04/06	<200		ug/L	
			F4 (C34-C50 Hydrocarbons)	2017/04/06	<200		ug/L	
			F2 (C10-C16 Hydrocarbons)	2017/04/06	NC	%	30	
			F3 (C16-C34 Hydrocarbons)	2017/04/06	NC	%	30	
			F4 (C34-C50 Hydrocarbons)	2017/04/06	NC	%	30	
4928192	RAJ	Matrix Spike	D10-Anthracene	2017/04/06		101	%	50 - 130
			D14-Terphenyl (FS)	2017/04/06		95	%	50 - 130
			D8-Acenaphthylene	2017/04/06		101	%	50 - 130
			Acenaphthene	2017/04/06		107	%	50 - 130
			Acenaphthylene	2017/04/06		108	%	50 - 130
			Anthracene	2017/04/06		100	%	50 - 130
			Benzo(a)anthracene	2017/04/06		102	%	50 - 130
			Benzo(a)pyrene	2017/04/06		104	%	50 - 130
			Benzo(b/j)fluoranthene	2017/04/06		101	%	50 - 130
			Benzo(g,h,i)perylene	2017/04/06		101	%	50 - 130
			Benzo(k)fluoranthene	2017/04/06		105	%	50 - 130
			Chrysene	2017/04/06		105	%	50 - 130
			Dibenz(a,h)anthracene	2017/04/06		98	%	50 - 130
			Fluoranthene	2017/04/06		108	%	50 - 130
			Fluorene	2017/04/06		106	%	50 - 130
Indeno(1,2,3-cd)pyrene	2017/04/06		105	%	50 - 130			
1-Methylnaphthalene	2017/04/06		93	%	50 - 130			

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4928192	RAJ	Spiked Blank	2-Methylnaphthalene	2017/04/06		88	%	50 - 130
			Naphthalene	2017/04/06		96	%	50 - 130
			Phenanthrene	2017/04/06		106	%	50 - 130
			Pyrene	2017/04/06		108	%	50 - 130
			D10-Anthracene	2017/04/06		103	%	50 - 130
			D14-Terphenyl (FS)	2017/04/06		99	%	50 - 130
			D8-Acenaphthylene	2017/04/06		101	%	50 - 130
			Acenaphthene	2017/04/06		105	%	50 - 130
			Acenaphthylene	2017/04/06		104	%	50 - 130
			Anthracene	2017/04/06		98	%	50 - 130
			Benzo(a)anthracene	2017/04/06		100	%	50 - 130
			Benzo(a)pyrene	2017/04/06		104	%	50 - 130
			Benzo(b/j)fluoranthene	2017/04/06		104	%	50 - 130
			Benzo(g,h,i)perylene	2017/04/06		101	%	50 - 130
			Benzo(k)fluoranthene	2017/04/06		100	%	50 - 130
			Chrysene	2017/04/06		105	%	50 - 130
			Dibenz(a,h)anthracene	2017/04/06		99	%	50 - 130
			Fluoranthene	2017/04/06		105	%	50 - 130
			Fluorene	2017/04/06		102	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2017/04/06		106	%	50 - 130
1-Methylnaphthalene	2017/04/06		90	%	50 - 130			
2-Methylnaphthalene	2017/04/06		85	%	50 - 130			
Naphthalene	2017/04/06		92	%	50 - 130			
Phenanthrene	2017/04/06		103	%	50 - 130			
Pyrene	2017/04/06		107	%	50 - 130			
4928192	RAJ	Method Blank	D10-Anthracene	2017/04/05		101	%	50 - 130
			D14-Terphenyl (FS)	2017/04/05		97	%	50 - 130
			D8-Acenaphthylene	2017/04/05		99	%	50 - 130
			Acenaphthene	2017/04/05	<0.050		ug/L	
			Acenaphthylene	2017/04/05	<0.050		ug/L	
			Anthracene	2017/04/05	<0.050		ug/L	
			Benzo(a)anthracene	2017/04/05	<0.050		ug/L	
			Benzo(a)pyrene	2017/04/05	<0.010		ug/L	
			Benzo(b/j)fluoranthene	2017/04/05	<0.050		ug/L	
			Benzo(g,h,i)perylene	2017/04/05	<0.050		ug/L	
			Benzo(k)fluoranthene	2017/04/05	<0.050		ug/L	
			Chrysene	2017/04/05	<0.050		ug/L	
			Dibenz(a,h)anthracene	2017/04/05	<0.050		ug/L	
			Fluoranthene	2017/04/05	<0.050		ug/L	
			Fluorene	2017/04/05	<0.050		ug/L	
			Indeno(1,2,3-cd)pyrene	2017/04/05	<0.050		ug/L	
			1-Methylnaphthalene	2017/04/05	<0.050		ug/L	
			2-Methylnaphthalene	2017/04/05	<0.050		ug/L	
			Naphthalene	2017/04/05	<0.050		ug/L	
			Phenanthrene	2017/04/05	<0.030		ug/L	
Pyrene	2017/04/05	<0.050		ug/L				
4928192	RAJ	RPD	Acenaphthene	2017/04/05	2.4		%	30
			Acenaphthylene	2017/04/05	5.4		%	30
			Anthracene	2017/04/05	4.1		%	30
			Benzo(a)anthracene	2017/04/05	NC		%	30
			Benzo(a)pyrene	2017/04/05	NC		%	30
			Benzo(b/j)fluoranthene	2017/04/05	NC		%	30

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Benzo(g,h,i)perylene	2017/04/05	NC		%	30
			Benzo(k)fluoranthene	2017/04/05	NC		%	30
			Chrysene	2017/04/05	NC		%	30
			Dibenz(a,h)anthracene	2017/04/05	NC		%	30
			Fluoranthene	2017/04/05	3.1		%	30
			Fluorene	2017/04/05	3.1		%	30
			Indeno(1,2,3-cd)pyrene	2017/04/05	NC		%	30
			1-Methylnaphthalene	2017/04/05	3.6		%	30
			2-Methylnaphthalene	2017/04/05	5.1		%	30
			Naphthalene	2017/04/05	5.5		%	30
			Phenanthrene	2017/04/05	3.0		%	30
			Pyrene	2017/04/05	4.2		%	30

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.

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

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

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

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

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

VALIDATION SIGNATURE PAGE

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

Cristina Carriere

Cristina Carriere, Scientific Services

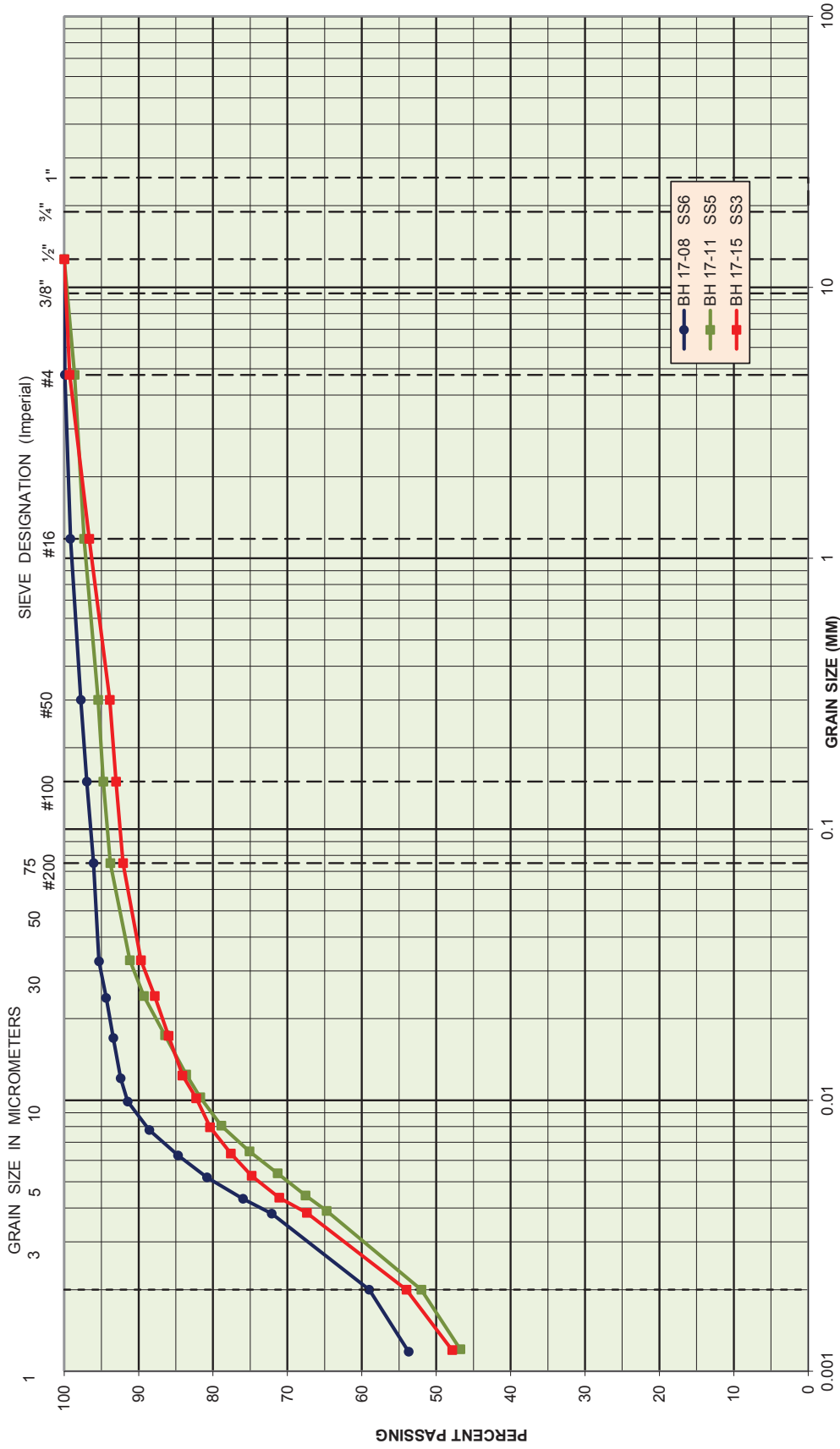
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Appendix C

GRAIN SIZE ANALYSES

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY AND SILT			SAND			GRAVEL		
			Fine	Medium	Coarse	Fine	Coarse	Coarse

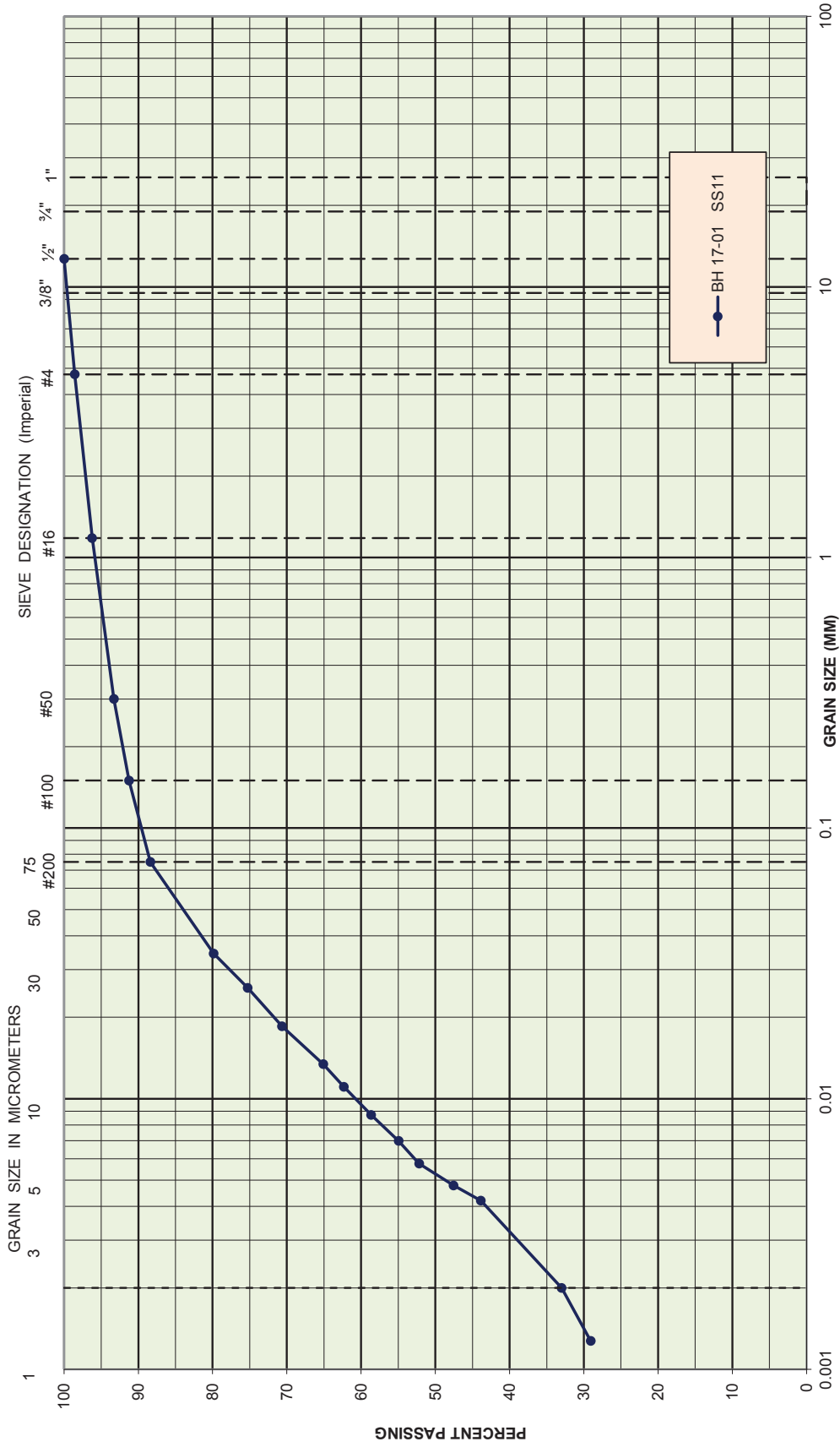


GRAIN SIZE DISTRIBUTION
Silty Clay

Project No:	161-17781-00	Figure No:	02/17
Project Name:	HSR-MSF building Hamilton	Client:	City of Hamilton
Sampling Date:		Lab Testing Date:	April 10, 2017

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY AND SILT			SAND			GRAVEL		
			Fine	Medium	Coarse	Fine	Coarse	



GRAIN SIZE DISTRIBUTION
Clayey Silt

Project No:	161-17781-00	Figure No:	01/17
Project Name:	HSR-MSF building Hamilton	Client:	City of Hamilton
Sampling Date:		Lab Testing Date:	April 10, 2017

Appendix 01

SOILS PROFILE AND DATA COLLECTION

REPORT NO.:161-17781-00

HSR - MSF HAMILTON SOILS PROFILE AND DATA COLLECTION

WSP CANADA INC

MAY 11, 2017

HSR - MSF HAMILTON SOILS PROFILE AND DATA COLLECTION

WSP CANADA INC

City of Hamilton

Final Report, Version 1

Project No.: 161-17781-00

Date: May 11, 2017

Distribution:

1 c Client

1 c File

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APPENDIX B	GRAIN SIZE DISTRIBUTION CURVES (FIGURES B-1) ATTERBERG LIMITS RESULTS (FIGURE B-2)

1

INTRODUCTION

WSP Canada Inc. (WSP) was retained by the City of Hamilton to undertake a Phase II Environmental Site Assessment (ESA) for the Future HSR Maintenance Storage Facility (MSF) located between Brant Street, Wentworth Street N., and Birch Avenue in the City of Hamilton. Factual soil profile data and recommendations are provided in this report based on the information collected as part of the ESA.

The site is situated within the former Sherman Inlet and after the inlet was backfilled, the land has been under industrial use since the early 1900s. The proposed development comprises of a 275,000 square foot single storey structure and associated driveways/parking areas.

The purpose of this soils profile and data collection report is to determine the subsurface conditions at the borehole locations and based on the boreholes results, make engineering recommendations for the following:

1. Foundations
2. Floor slabs and permanent drainage
3. Excavations and backfill

This report is provided on the basis of the terms of reference presented above and on the assumption that the design will be in accordance with applicable codes and standards. If there are any changes in the design features relevant to the geotechnical analyses, or if any questions arise concerning the geotechnical aspects of the codes and standards, this office should be contacted to review the design. It may then be necessary to carry out additional borings and reporting before the recommendations can be moderated to the changed design.

The site investigation and recommendations follow generally accepted practice for geotechnical consultants in Ontario. The format and contents are guided by client specific needs and economics and do not conform to generalized standards for services. Laboratory testing follows ASTM or CSA Standards or modifications of these standards that have become standard practice.

This report has been prepared for The City of Hamilton and their designers. Third party use of this report without WSP consent is prohibited.

2

PREVIOUS GEOTECHNICAL INVESTIGATIONS

Subsurface information of the site and the surrounding area is also available from the following previous investigations:

- Geotechnical Investigation HSR Garage Terra Cotta Avenue, Hamilton , Ontario by Trow Ontario Ltd., dated April 24, 1987 (Project: H860243-G). The report included compiled results and

recommendations from multiple investigations for a proposed HSR MSF development located on the site immediately adjacent to the south of the site discussed in this report. The compiled investigations included, 38 boreholes, 11 test pits, 9 auger probes, and 17 dynamic cone penetration tests (DCPTs). Limits of the buried former Sherman Inlet were delineated from this work and foundation recommendations were given. Pile foundations were recommended for areas of the building located within the Sherman Inlet with fill reaching depths up to 10 m. Shallow foundations were recommended for the remainder of the proposed structure.

3 METHOD OF INVESTIGATION

3.1 DRILLING INVESTIGATION WORK AND FIELD TESTING

Borehole locations and depths for this investigation were established by WSP personnel in accordance with the Phase II ESA project requirements.

Twenty-two (22) boreholes were drilled throughout the site between March 14, 2017 and March 31, 2017 and were advanced to depths ranging from 3.7 m to 10.5 m below existing grade. Approximate borehole locations are shown on Drawing 1. Drilling was conducted with hollow stem continuous flight auger equipment by a drilling sub-contractor under the supervision of WSP personnel. The soil stratigraphy was recorded by observing the quality and changes of augered materials which were withdrawn from the boreholes, and by sampling the soils at regular intervals of depth using a 50 mm O.D. split spoon sampler, in accordance with the Standard Penetration Test (ASTM D 1586) method. This sampling method recovers samples from the soil strata, and the number of blows required to drive the sampler 0.3 m depth into the undisturbed soil (SPT 'N'-values) gives an indication of the compactness condition or consistency of the sampled soil material. The SPT 'N'-values are indicated on the Borehole Logs in Appendix A.

Upon completion of the fieldwork, the ground surface geodetic elevations at the location of each borehole were surveyed by WSP personnel. The survey was completed using a differential GPS based on Benchmark Station 0011965U144; the tablet on the west face of the concrete foundation of the three storey school at the northeast corner of Wentworth Street North and Munro Street, in the City of Hamilton. Table 3-1 summarizes the borehole elevations and depths.

Table 3-1 Summary of Borehole Elevations and Depths

BOREHOLE	GROUND ELEVATION (M)	DEPTH (M)	BOREHOLE	GROUND ELEVATION (M)	DEPTH (M)
BH17-01	78.7	9.0	BH17-12	80.2	3.7
BH17-02	78.8	4.4	BH17-13	79.6	5.2
BH17-03	78.5	9.0	BH17-14	79.5	7.5
BH17-04	77.8	9.8	BH17-15	79.6	5.9
BH17-05	78.0	6.7	BH17-16	79.1	7.5
BH17-06	77.2	10.5	BH17-17	79.2	5.9
BH17-07	77.4	9.8	BH17-18	79.7	5.2
BH17-08	77.9	4.4	BH17-19	79.5	6.7
BH17-09	79.6	6.7	BH17-20	79.3	6.7
BH17-10	77.5	5.2	BH17-21	80.3	8.2
BH17-11	77.4	5.2	BH17-22	81.0	7.6

3.2 LABORATORY TESTING

The soil samples were taken to our laboratory where they were re-examined. Representative samples were selected for index testing. The testing program consisted of the measurement of the natural moisture content of all samples and grain size analyses/Atterberg Limits tests of four (4) selected samples. The test results are enclosed on the individual borehole logs and in Appendix B.

4 SUBSURFACE CONDITIONS

4.1 SUBSOIL CONDITIONS

The twenty-two boreholes revealed the presence of a deep buried gully, the former Sherman Inlet, backfilled with cohesive and cohesionless fill mixed with construction debris. The fill is underlain by compressible organic soils (peat) in some locations. The fill or peat is underlain by native silty clay. More specific details on the subsurface conditions at the individual boring locations are given in the borehole log sheets in Appendix A. The following notes are, therefore, intended only to summarize the data and to amplify some of the general characteristics of the deposits.

4.1.1 PAVEMENT STRUCTURE

A pavement structure was encountered at ground surface at various boreholes on the project site. The pavement structure consisted of an asphaltic concrete layer varying in thickness from 50 mm to 150 mm underlain by fill materials in BH17-12, BH17-14, BH17-15, and BH17-17 through BH17-22.

4.1.2 FILL

Heterogeneous fill materials were encountered in all twenty-two boreholes to depths ranging from 1.5 m to 9.4 m below grade. The fill was composed of sand and gravel, sand, silt, and clay mixed with building debris and organic material. The fill varied in colour from black to greyish brown to reddish brown. The SPT 'N'-values of 0 to in excess of 50 blows per 0.3 m indicated very loose to very dense compactness condition of the fill. The natural moisture measured in the test samples from these materials ranged from 4% to 89%.

4.1.3 PEAT AND ORGANIC SOILS

Compressible peat and organic soils were encountered beneath the heterogeneous fill at BH17-03, BH17-04, BH17-05, BH17-06, BH17-07, BH17-08, BH17-09, and BH17-10 at depths ranging from 2.1 m to 8.4 m below grade. Boreholes BH17-03, BH17-04, BH17-06, and BH17-07 were terminated in the peat. The SPT 'N'-values of 1 to 8 indicate the very soft to firm/stiff consistency of the peaty soils. The natural moisture content measured in the test samples from these materials ranged from 41% to 89%.

4.1.4 SILTY CLAY

Native silty clay was encountered beneath the fill or peaty soils in BH17-01, BH17-02, BH17-05, BH17-08, and BH17-10 through BH17-22. The silty clay was encountered at depths ranging from 1.5 m to 6.9 m depending on the borehole's proximity to the buried gully and it extended to the completion of all boreholes it was encountered in. This deposit contained trace to some sand, trace gravel, and in some samples trace organics/rootlets. The cohesive soil was greyish brown in colour and based on SPT 'N'-values of 6 to 23, its consistency is classified as firm to very stiff.

Four grain size distribution tests and Atterberg Limits tests were conducted on samples from this deposit. The results are shown in Table 4-1 and presented graphically in Appendix B.

Table 4-1 Summary of Grain Size Distribution and Atterberg Limits Tests in Silty Clay

SAMPLE ID	GRAIN SIZE DISTRIBUTION (%)				ATTERBERG LIMITS (%)		
	GRAVEL	SAND	SILT	CLAY	LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)
BH17-01/SS11	1	10	55	33	33	17	16
BH17-08/SS6	0	4	37	59	49	21	28
BH17-11/SS5	1	5	42	52	42	18	24
BH17-15/SS3	1	7	38	54	47	19	28

Under the modified Unified Soil Classification System, BH17-01/SS11 is classified as 'CL' low plasticity clay and the remainder of the samples are classified as 'CI' medium plasticity clay.

4.2 GROUNDWATER CONDITIONS

Groundwater conditions in the twenty-two boreholes were observed while drilling and at the completion of borehole drilling. Water levels noted in various boreholes at the completion of drilling ranged from 1.5 m to 4.6 m below ground surface.

Eight (8) monitoring wells were installed in boreholes as part of the investigation. Water levels taken from these wells in addition to wells previously installed by others are shown in Table 4-2.

Table 4-2 Groundwater Levels in Monitoring Wells

BOREHOLE	DATE OF MEASUREMENT	GROUNDWATER DEPTH	GROUNDWATER ELEVATION
BH17-11	April 11, 2017	0.9	76.4
BH17-12	April 11, 2017	DRY	DRY
BH17-13	April 11, 2017	2.5	77.1
BH17-15	April 11, 2017	4.9	74.7
BH17-19	April 11, 2017	4.1	75.4
BH17-20	April 11, 2017	3.3	76.0
BH17-21	April 11, 2017	7.0	73.2
BH17-22	April 11, 2017	6.7	74.3
MW101 (by others)	April 11, 2017	1.3	76.3
MW104 (by others)	April 11, 2017	2.8	75.4
MW105 (by others)	April 11, 2017	2.2	76.3
MW106 (by others)	April 11, 2017	2.8	75.9
MW107 (by others)	April 11, 2017	1.6	76.6
MW108 (by others)	April 11, 2017	1.9	76.4

BOREHOLE	DATE OF MEASUREMENT	GROUNDWATER DEPTH	GROUNDWATER ELEVATION
MW107B (by others)	April 11, 2017	1.3	75.8
BH32 (by others)	April 11, 2017	0.5	75.5
DC5 (by others)	April 11, 2017	1.2	75.4

It should be noted that the groundwater levels can vary and are subject to seasonal fluctuations and in response to major weather events.

5 SOIL PROFILE INTERPRETATION AND RECOMMENDATIONS

5.1 PROJECT OVERVIEW

We understand that the proposed HSR MSF building will be a single storey structure without a basement. The proposed finish floor elevation is not known at the time of this report.

The construction methods described in this report must not be misconstrued as being specifications or direct recommendations to contractors, or as being the only suitable methods. Prospective contractors should evaluate all of the factual information, obtain additional subsurface information as they might deem necessary and should select their construction methods, sequence and equipment based on their own experience in similar ground conditions. Readers of this report are also reminded that the conditions are known only at the borehole locations and in view of the generally wide spacing of the boreholes; conditions may vary significantly between boreholes.

5.2 FOUNDATION DESIGN

As discussed in Section 4.1 of this report, very soft/very loose to very stiff/very dense, heterogeneous fill material with various amounts of organic content is present within the majority of the proposed building footprint up to depths of 9.4 m. The fill is underlain by either compressible organic silts and peat soils or stiff to very stiff silty clay. Shallow foundations are not suitable for the proposed structure due to the existing fill conditions at this site, unless the fill is removed and replaced or it is improved by other methods.

Subexcavating the fill and backfilling with engineered fill is likely not a cost effective solution for the proposed structure's foundation design. Caisson or pile foundations extending to a competent bearing soil or bedrock can provide an alternative solution for the proposed structure's foundation design. Competent bearing soil was not encountered in BH17-03, BH17-04, BH17-06, BH17-07, and BH17-09, as part of the Phase II ESA investigation. Further geotechnical investigation work with additional borehole drilling is required for more specific foundation recommendations to be provided.

5.3 FLOOR SLABS AND PERMANENT DRAINAGE

The type of floor slab for the proposed structure will depend on the site preparation and foundation design. If soil improvement methods are used, such as removing the fill soil and replacing with engineered fill or using deep mixing methods with cement if the organic soil/peat can be kept at site, a slab on grade design can be used. If deep foundations are selected, a structural slab will be required.

Any backfill required to raise the grade can consist of inorganic soil, placed in shallow lifts and compacted to 98% of Standard Proctor Maximum Dry Density (SPMDD).

A moisture barrier consisting of at least 200 mm of 19 mm clear crushed stone should be installed under the floor slab.

A perimeter and underfloor drainage system will be required around the exterior basement walls. Typical drainage and backfill recommendations are illustrated on Drawing 2.

5.4 EXCAVATIONS AND BACKFILL

Excavations can be carried out with heavy hydraulic backhoes. Complications due to groundwater can be anticipated for excavations to various depths throughout the site. Refer to Table 4-2 for measured groundwater levels, which ranged from 0.5 m to 7.0 m below existing ground level (Elev. 73.2m to 77.1m). Positive dewatering will be required before any excavation below the groundwater table. The groundwater must be lowered to at least 1.0 m below the lowest level of the excavation.

It should be noted that the native soils may contain boulders. Large obstructions such as concrete blocks in the fill material are anticipated. Provisions must be made in the excavation contract for the removal of boulders in the native and large obstructions in the fill material.

All excavations must be carried out in accordance with the most recent Occupational Health and Safety Act (OHSA). In accordance with OHSA, the existing fill is classified as Type 4 soil and the firm to very stiff silty clay is classified as Type 3 Soil above the groundwater table and Type 4 Soil below the groundwater table.

Select inorganic fill and native soils free from topsoil and organics can be used as general construction backfill where it can be suitably compacted, provided its moisture content is within 2 percent of its optimum. Majority of the excavated soils will be too wet to compact and will require significant aeration prior to its use. Loose lifts of soil, which are to be compacted, should not exceed 200 mm.

The excavated native soils are not considered to be free draining. Where free draining backfill is required, imported granular fill such as OPSS Granular B should be used.

It should be noted that the excavated soils are subject to moisture content increase during wet weather which would make these materials too wet for adequate compaction. Stockpiles should be compacted at the surface or be covered with tarpaulins to minimize moisture uptake.

5.5 LATERAL EARTH PRESSURES

The lateral earth and water pressure acting at any depth on foundation and retaining walls can be calculated as follows:

In soils above the groundwater table ($z < d_w$):

$$p = K (\gamma.z + q)$$

In soils below the groundwater table ($z \geq d_w$):

$$p = K \{ \gamma d_w + \gamma_1 (z - d_w) + q \} + p_w$$

$$\text{In which, } p_w = \gamma_w (z - d_w)$$

where p = lateral earth and water pressure in kPa acting at a depth of z below ground surface

K = earth pressure coefficient at rest, $K = 0.56$

γ = unit weight of soil above groundwater table, assuming $\gamma = 20 \text{ kN/m}^3$

γ_1 = submerged unit weight of soil below groundwater table, assuming $\gamma_1 = 10 \text{ kN/m}^3$

γ_w = unit weight of water, assuming $\gamma_w = 9.8 \text{ kN/m}^3$

z = depth below ground surface to point of interest, in metres

d_w = depth of groundwater table below ground surface, in metres

q = value of surcharge in kPa

p_w = hydrostatic water pressure in kPa

6 GENERAL COMMENTS

WSP should be retained for a general review of the final design and specifications to verify that this report has been properly interpreted and implemented. If not accorded the privilege of making this review, WSP will assume no responsibility for interpretation of the recommendations in the report.

The comments given in this report are intended only for the guidance of design engineers. The number of boreholes and test pits required to determine the localized underground conditions between boreholes and test pits affecting construction costs, techniques, sequencing, equipment, scheduling, etc., would be much greater than has been carried out for design purposes. Contractors bidding on or undertaking the works should, in this light, decide on their own investigations, as well as their own

interpretations of the factual borehole and test pit results, so that they may draw their own conclusions as to how the subsurface conditions may affect them.

7

LIMITATIONS OF REPORT

This report is intended solely for the Client named. The material in it reflects our best judgment in light of the information available to WSP at the time of preparation. Unless otherwise agreed in writing by WSP, it shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. No portion of this report may be used as a separate entity, it is written to be read in its entirety.

The conclusions and recommendations given in this report are based on information determined at the test hole locations. The information contained herein in no way reflects on the environment aspects of the project, unless otherwise stated. Subsurface and groundwater conditions between and beyond the test holes may differ from those encountered at the test hole locations, and conditions may become apparent during construction, which could not be detected or anticipated at the time of the site investigation. The benchmark and elevations used in this report are primarily to establish relative elevation differences between the test hole locations and should not be used for other purposes, such as grading, excavating, planning, development, etc.

The design recommendations given in this report are applicable only to the project described in the text and then only if constructed substantially in accordance with the details stated in this report.

The comments made in this report on potential construction problems and possible methods are intended only for the guidance of the designer. The number of test holes may not be sufficient to determine all the factors that may affect construction methods and costs. For example, the thickness of surficial topsoil or fill layers may vary markedly and unpredictably. The contractors bidding on this project or undertaking the construction should, therefore, make their own interpretation of the factual information presented and draw their own conclusions as to how the subsurface conditions may affect their work. This work has been undertaken in accordance with normally accepted geotechnical engineering practices.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. WSP accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. We accept no responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will be as agreed to at that time.

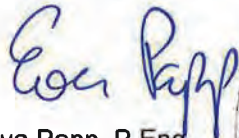
We trust that the information contained in this report is satisfactory. Should you have any questions, please do not hesitate to contact this office.

Yours very truly,

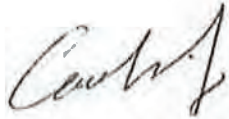
WSP CANADA INC.



Cameron Cluett, M.Eng., E.I.T.



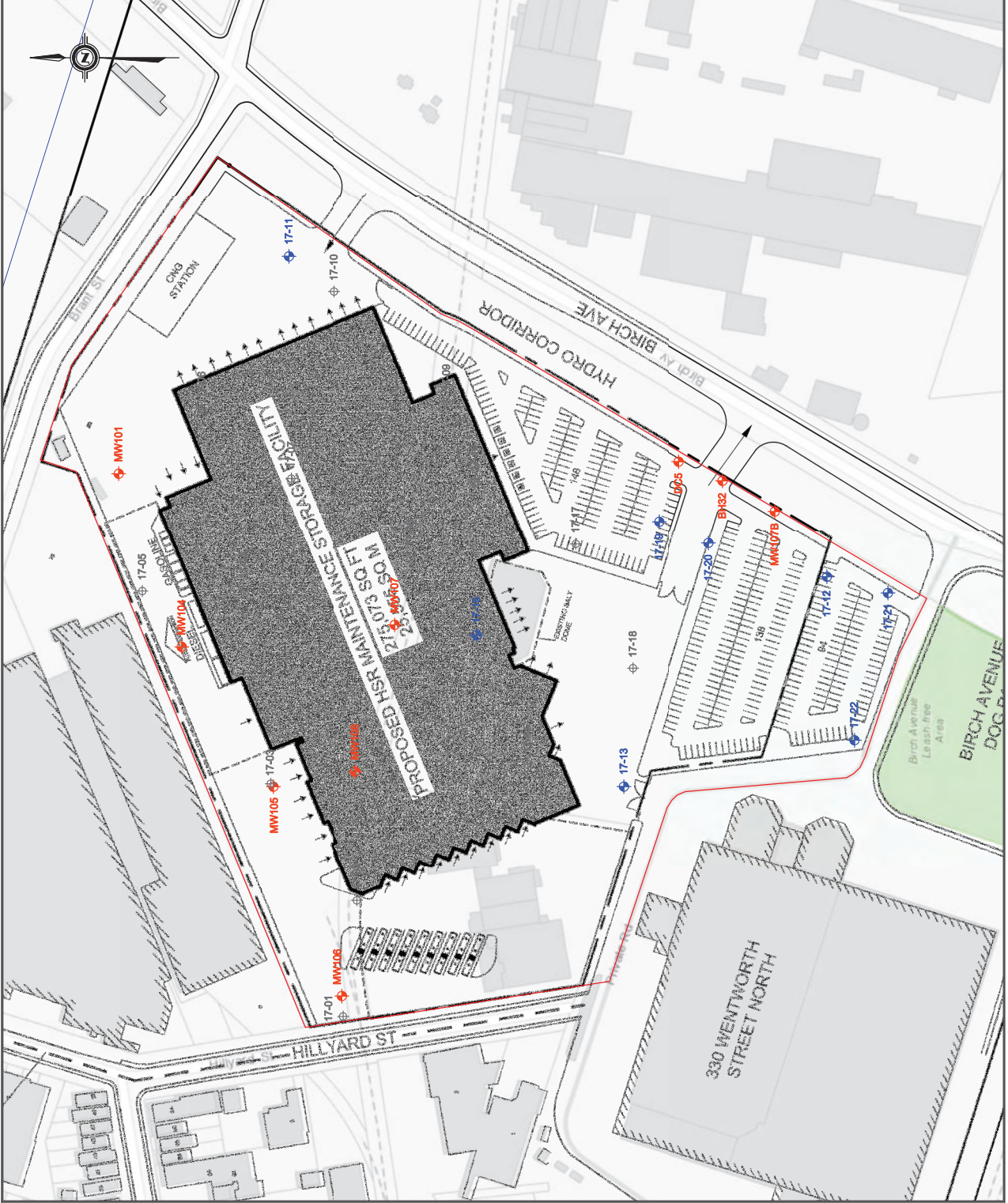
Eva Papp, P.Eng.



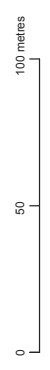
Laifa Cao, Ph.D, P.Eng.

Drawings

- 1 **BOREHOLE LOCATION PLAN**
- 2 **DRAINAGE AND BACKFILL RECOMMENDATIONS**



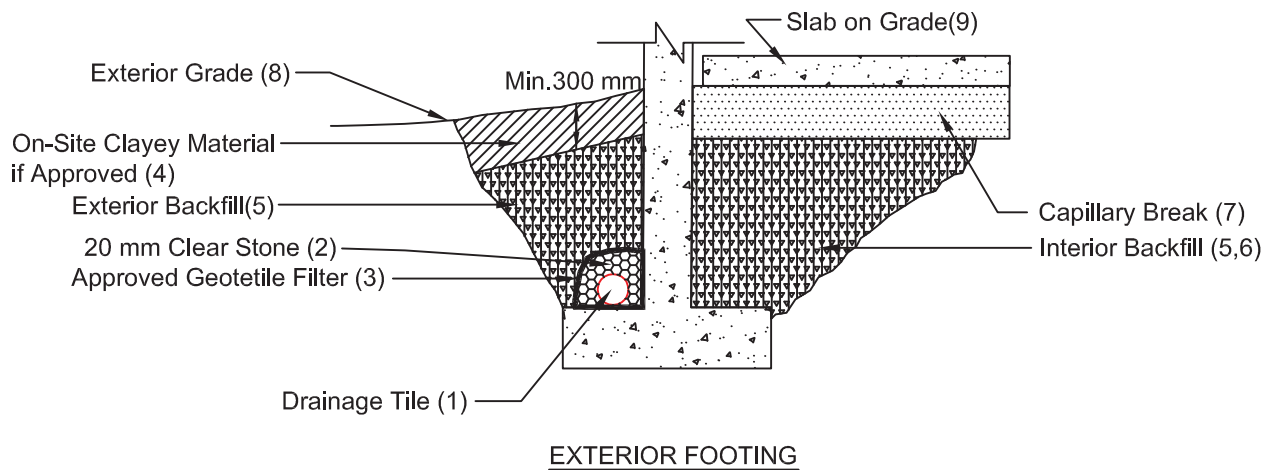
- LEGEND**
- SITE BOUNDARY (Approximate)
 - ⊕ 17-1 BOREHOLE LOCATION AND DESIGNATION (MARCH, 2017)
 - ⊕ 17-21 MONITORING WELL LOCATION AND DESIGNATION (MARCH, 2017)
 - ⊕ MW101 EXISTING MONITORING WELL LOCATION AND DESIGNATION



SITE PLAN

PHASE II ENVIRONMENTAL SITE ASSESSMENT
 FUTURE HSR STORAGE AND MAINTENANCE FACILITY
 For: City of Hamilton

DATE: APRIL 2017
 SCALE: AS SHOWN
 PROJECT: 161-17781-00 - 03
 REF. NO.: 161-17781-00 - 03 F2-SP



Notes

1. Drainage tile to consist of 100 mm (4") diameter weeping tile or equivalent perforated pipe leading to a positive sump or outlet.
2. 20 mm (3/4") clear stone - 150 mm (6") top and side of drain. If drain is not on footing, place 100 mm (4 inches) of stone below drain .
3. Wrap the clear stone with an approved geotextile filter (Terrafix 270R or equivalent).
4. The on-site clayey material, if approved, can be used as backfill in the upper 300 mm.
5. The interior and exterior fill adjacent to foundation walls should be OPSS Granular 'B' Type I. Compact to at least 98% SPMDD.
6. Do not use heavy compaction equipment within 450 mm (18") of the wall. Do not fill or compact within 1.8 m (6') of the wall. Place fill on both sides simultaneously.
7. Capillary break to be at least 200 mm (8") of compacted clear 20 mm (3/4") stone or equivalent free draining material. A vapour barrier may be required for specialty floors (consult with architect).
8. Exterior grade to slope away from building at min. 2%.
9. Slab on grade should not be structurally connected to the wall or footing.
10. Review the geotechnical report for specific details.

DRAINAGE AND BACKFILL RECOMMENDATIONS
Slab on Grade Construction Without Underfloor Drainage
(not to scale)

Appendix A

**EXPLANATION OF TERMS USED IN BOREHOLE LOGS
LOGS OF BOREHOLES (BH17-01 THROUGH BH17-22)**

Explanation of Terms Used in the Record of Borehole

Sample Type

AS	Auger sample
BS	Block sample
CS	Chunk sample
DO	Drive open
DS	Dimension type sample
FS	Foil sample
NR	No recovery
RC	Rock core
SC	Soil core
SS	Spoon sample
SH	Shelby tube sample
ST	Slotted tube
TO	Thin-walled, open
TP	Thin-walled, piston
WS	Wash sample

Penetration Resistance

Standard Penetration Resistance (SPT), N:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in) required to drive a 50 mm (2 in) drive open sampler for a distance of 300 mm (12 in).

WH – Samples sinks under “weight of hammer”

Dynamic Cone Penetration Resistance, N_d:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in) to drive uncased a 50 mm (2 in) diameter, 60° cone attached to “A” size drill rods for a distance of 300 mm (12 in).

Textural Classification of Soils (ASTM D2487-10)

Classification	Particle Size
Boulders	> 300 mm
Cobbles	75 mm - 300 mm
Gravel	4.75 mm - 75 mm
Sand	0.075 mm - 4.75 mm
Silt	0.002 mm - 0.075 mm
Clay	<0.002 mm(*)

(*) Canadian Foundation Engineering Manual (4th Edition)

Coarse Grain Soil Description (50% greater than 0.075 mm)

Terminology	Proportion
Trace	0-10%
Some	10-20%
Adjective (e.g. silty or sandy)	20-35%
And (e.g. sand and gravel)	> 35%

Soil Description

a) Cohesive Soils(*)

Consistency	Undrained Shear Strength (kPa)	SPT “N” Value
Very soft	<12	0-2
Soft	12-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very stiff	100-200	15-30
Hard	>200	>30

(*) Hierarchy of Shear Strength prediction

1. Lab triaxial test
2. Field vane shear test
3. Lab. vane shear test
4. SPT “N” value
5. Pocket penetrometer

b) Cohesionless Soils

Density Index (Relative Density)	SPT “N” Value
Very loose	<4
Loose	4-10
Compact	10-30
Dense	30-50
Very dense	>50

Soil Tests

w	Water content
w _p	Plastic limit
w _l	Liquid limit
C	Consolidation (oedometer) test
CID	Consolidated isotropically drained triaxial test
CIU	consolidated isotropically undrained triaxial test with porewater pressure measurement
D _R	Relative density (specific gravity, G _s)
DS	Direct shear test
ENV	Environmental/ chemical analysis
M	Sieve analysis for particle size
MH	Combined sieve and hydrometer (H) analysis
MPC	Modified proctor compaction test
SPC	Standard proctor compaction test
OC	Organic content test
U	Unconsolidated Undrained Triaxial Test
V	Field vane (LV-laboratory vane test)
γ	Unit weight

<p>PROJECT: Phase II ESA CLIENT: City of Hamilton PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton DATUM: Geodetic, NAD83 UTM Zone 17T, mASL BH LOCATION: N 4790744.782 E 594092.131</p>	<p>DRILLING DATA Method: Hollow Stem Auger Diameter: 108 mm Date: Mar/14/2017</p> <p style="text-align: right;">REF. NO.: 161-17781-00 ENCL NO.: 1</p>
---	---

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m									
78.7	Ground Surface													
0.0	FILL: Silty sand, some gravel, brown, dry, compact		1	SS	18									
77.8	0.9 Silty clay, trace sand and gravel, dark brown to black, trace debris, moist, firm to very stiff		2	SS	27									SS2: VOCs, M&I, PAHs, PHCs
	Grey-brown, trace sand, becoming firm		3	SS	8									
	Red and brown, trace sand, gravel and debris		4	SS	7									
75.6	3.1 Clayey silt and sand, red-brown and black, moist, firm		5	SS	6									
74.9	3.8 Silty sand and clay, brown, moist, very loose/very soft to compact/stiff		6	SS	4									
	Black staining, odour		7	SS	2									SS7: VOCs, M&I, PAHs, PHCs, PCBs
	Stiff		8	SS	3									
			9	SS	10									
71.8	6.9 SILTY CLAY: Some sand, trace gravel, brown and grey, moist, stiff to very stiff		10	SS	15							100		SS10: VOCs, M&I, PAHs, PHCs
			11	SS	12							188	1 10 55 33	
			12	SS	11							88		
69.7	END OF BOREHOLE NOTE: 1) Borehole dry and open to 7.6 m on completion													

WSP SOIL LOG IW VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

GROUNDWATER ELEVATIONS
 Measurement

GRAPH NOTES + 3, x 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

PROJECT: Phase II ESA CLIENT: City of Hamilton PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton DATUM: Geodetic, NAD83 UTM Zone 17T, mASL BH LOCATION: N 4790738.85 E 594142.196	DRILLING DATA Method: Hollow Stem Auger Diameter: 108 mm Date: Mar/14/2017 REF. NO.: 161-17781-00 ENCL NO.: 2
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	WATER CONTENT (%)			POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m				PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L			
78.8	Ground Surface												GR SA SI CL	
0.0	FILL: Sand, some gravel, black and brown, moist, compact		1	SS	13								SS1: VOCs, M&I, PAHs, PHCs	
77.9	0.9		2	SS	10									
			3	SS	11									
			4	SS	10									
75.6	3.2		5	SS	10						175			
	SILTY CLAY: some sand, trace gravel, grey and brown, moist, stiff		6	SS	12						175		SS6: VOCs, M&I, PAHs, PHCs	
74.4	4.4													

END OF BOREHOLE NOTE:
 1) Borehole open and dry to 4.3 m on completion

WSP SOIL LOG IW VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, x 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

PROJECT: Phase II ESA	DRILLING DATA
CLIENT: City of Hamilton	Method: Hollow Stem Auger
PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton	Diameter: 108 mm
DATUM: Geodetic, NAD83 UTM Zone 17T, mASL	Date: Mar/14/2017
BH LOCATION: N 4790775.957 E 594192.49	REF. NO.: 161-17781-00
	ENCL NO.: 3

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m									
78.5	Ground Surface													GR SA SI CL
0.0	FILL: Sand and gravel, some debris, grey and black, dry, very dense	[Cross-hatch pattern]	1	SS	64/101mm									
77.7														
0.8	Sand, some silt, trace gravel and debris, black and brown, moist, dense	[Cross-hatch pattern]	2	SS	40									SS2: M&I, PAHs
77.0														
1.5	Silty sand, trace gravel, brick pieces, black and red, moist, compact to very loose	[Cross-hatch pattern]	3	SS	25									
75.2														
3.3	Some clay and black staining Clayey silt, trace sand, grey and black, wet, soft	[Cross-hatch pattern]	5	SS	4									
74.8														
3.7	Peaty silty sand, black, some plant debris, moist, loose	[Cross-hatch pattern]	6	SS	6									SS4: VOCs, PHCs, PCBs
	Becoming dark grey													
73.5														
5.0	Becoming wet Silty sand, black, PHC odour, wet, very loose	[Cross-hatch pattern]	7	SS	5									
72.2														
6.3	Organic silty sand, dark brown, moist, very loose	[Cross-hatch pattern]	9	SS	2									
70.7														
7.8	PEAT: Some sand and silt, brown to black, moist, very soft	[Wavy pattern]	11	SS	2									SS10: VOCs, M&I, PAHs, PHCs
69.5														
9.0	END OF BOREHOLE NOTE: 1) Borehole open to 6.4 m on completion 2) Water level measured at 3.8 m on completion													

WSP SOIL LOG (W) VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH.CAM.EDITS.GPJ SPL.GDT 4/28/17

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

PROJECT: Phase II ESA
 CLIENT: City of Hamilton
 PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
 DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
 BH LOCATION: N 4790787.586 E 594276.3

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 108 mm
 Date: Mar/16/2017
 REF. NO.: 161-17781-00
 ENCL NO.: 4

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m									
77.8	Ground Surface													
0.0	FILL: Gravelly sand, grey and brown, dry, very dense	[Cross-hatched]	1	SS	50/ 27mm									
1.0	Black staining, dense	[Cross-hatched]	2	SS	40									SS2: VOCs, M&I, PAHs, PHCs
76.3	Clayey silt mixed with sand and gravel, brown, black staining, moist, firm to very stiff	[Cross-hatched]	3	SS	17									
1.5		[Cross-hatched]	4	SS	4									
74.7	Gravelly sand, some debris, mixed with organic material, dark grey, wet, very loose	[Cross-hatched]	5	SS	4									SS5: VOCs, M&I, PAHs, PHCs
3.1		[Cross-hatched]	6	SS	2									
4.0		[Cross-hatched]	7	SS	3									
5.0		[Cross-hatched]	8	SS	2									
6.0		[Cross-hatched]	9	SS	2									
7.0		[Cross-hatched]	10	SS	1									
8.0	Some clay	[Cross-hatched]	11	SS	2									
8.4	Organic sandy silt, black, PHC odour, wet, very loose	[Cross-hatched]	12	SS	0									
9.1	PEAT: Trace clay and organics, brown, moist, very soft	[Wavy]	13	SS	4									
9.8	END OF BOREHOLE NOTE: 1) Borehole open to 6.1 m on completion 2) Water level measured at 3.1 m on completion													

WSP SOIL LOG (W, VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES

+ 3, × 3: Numbers refer to Sensitivity
 ○ ε=3% Strain at Failure

PROJECT: Phase II ESA CLIENT: City of Hamilton PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton DATUM: Geodetic, NAD83 UTM Zone 17T, mASL BH LOCATION: N 4790831.304 E 594275.579	DRILLING DATA Method: Hollow Stem Auger Diameter: 108 mm Date: Mar/15/2017 REF. NO.: 161-17781-00 ENCL NO.: 5
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m									
78.0	Ground Surface													GR SA SI CL
0.0	FILL: Gravelly sand, brown, moist, dense		1	SS	40									
77.3														
0.8	Silty clay mixed with sand, some gravel, dark brown, orange and grey sand, moist, firm		2	SS	6									
2.3	Clay mixed with sand, red-brown, black staining, moist, soft wet		4	SS	5									
	Some debris, very soft		5	SS	3									
4.6	Organic silty clay, sandy, dark brown, black staining, moist, very soft		7	SS	1									
5.3	Silty clay and sand, trace gravel, some organics, grey, moist, firm		8	SS	5									
6.1	SILTY CLAY: brown to grey, moist, stiff		9	SS	12									
6.7	END OF BOREHOLE NOTE: 1) Borehole open to 6.7 m on completion 2) Water level measured at 4.6 m on completion													

WSP SOIL LOG (W, VOC 0-300 PPM)-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

GROUNDWATER ELEVATIONS
 Measurement

GRAPH NOTES
 + 3, x 3: Numbers refer to Sensitivity
 ○ ε=3% Strain at Failure

PROJECT: Phase II ESA
 CLIENT: City of Hamilton
 PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
 DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
 BH LOCATION: N 4790805.625 E 594354.14

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 108 mm
 Date: Mar/22/2017
 REF. NO.: 161-17781-00
 ENCL NO.: 6

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m									
77.2	Ground Surface													
0.0	FILL: Sand, some silt, trace gravel, grey, moist, compact to very dense		1	SS	28									
1			2	SS	38									
2	Black, wet		3	SS	64									
3	Some clay, wood pieces, loose		4	SS	7									
4			5	SS	7									
4	Some debris, compact		6	SS	11									
72.6	4.6 Silty clay mixed with sand and organic material, grey, wet, very soft to firm		7	SS	4									
6			8	SS	3									
7			9	SS	2									
8			10	SS	3									
8			11	SS	4									
68.8	8.4 Organic silty clay, very soft to firm, black, moist		12	SS	1									
9			13	SS	6									
67.8	9.4 PEAT: trace clay and organics, brown to black, firm, moist		14	SS	6									
10														
66.7	END OF BOREHOLE													

WSP SOIL LOG (w/ VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17)

SS3:
VOCs, M&I,
PAHs, PHCs

SS13:
VOCs, M&I,
PAHs, PHCs

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, x 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

PROJECT: Phase II ESA
 CLIENT: City of Hamilton
 PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
 DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
 BH LOCATION: N 4790767.07 E 594324.037

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 108 mm
 Date: Mar/16/2017
 REF. NO.: 161-17781-00
 ENCL NO.: 7

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m									
77.4	Ground Surface													
0.0	FILL: Sand and gravel mixed with silt, clay, and organics, brown and grey, moist, dense		1	SS	47									SS3: VOCs, M&I, PAHs, PHCs
1	Black staining, organics, very dense		2	SS	50/ 152mm									
2	Some debris, compact		3	SS	18									
3	Becoming wet, loose		4	SS	7									
4	Some red clay		5	SS	8									
73.6	sand and gravel mixed with organic material, some debris, moist, very loose to loose		6	SS	1							46		
3.8	Black, saturated, loose		7	SS	7								55	
5	Moist, very loose		8	SS	3								71	
6	Loose		9	SS	4								50	
7			10	SS	4								50	
69.8	ORGANIC CLAYEY SILT: Dark brown, black staining, moist, very soft to soft		11	SS	2								75	
7.6			12	SS	3								75	
68.3	PEAT: some silt and clay, trace organics, brown, moist, very soft		13	SS	2								66	
9.1														
67.7	END OF BOREHOLE													
9.8	NOTE: 1) Borehole open to 5.8 m on completion 2) Water level measured at 4.3 m on completion													

WSP SOIL LOG (W.VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17)

GROUNDWATER ELEVATIONS

Measurement

GRAPH NOTES

+ 3, x 3: Numbers refer to Sensitivity
 ○ ε=3% Strain at Failure

PROJECT: Phase II ESA CLIENT: City of Hamilton PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton DATUM: Geodetic, NAD83 UTM Zone 17T, mASL BH LOCATION: N 4790715.819 E 594290.232	DRILLING DATA Method: Hollow Stem Auger Diameter: 108 mm Date: Mar/15/2017 REF. NO.: 161-17781-00 ENCL NO.: 8
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m									
77.9	Ground Surface													GR SA SI CL
0.0	FILL: Silty clay, dark brown, some black sand, moist, stiff		1	SS	10									SS1: VOCs, M&I, PAHs, PHCs
77.2														
0.8	Silty sand, organics, black and orange, saturated, very loose		2	SS	2		77							
75.8	Organic sandy silt, dark brown and grey, black staining, wet, very loose		3	SS	2		76							
2.1	Black and brown, some silt		4	SS	3		75							
74.1	SILTY CLAY: Trace sand, red-brown, trace mottling, moist, stiff		5	SS	2		74							
3.8			6	SS	13									0 4 37 59
73.5														

4.4 **END OF BOREHOLE**
NOTE:
 1) Borehole open to 3.1 m on completion
 2) Water level measured at 2.4 m on completion

WSP SOIL LOG IW VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

PROJECT: Phase II ESA
 CLIENT: City of Hamilton
 PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
 DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
 BH LOCATION: N 4790700.198 E 594357.325

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 108 mm
 Date: Mar/15/2017
 REF. NO.: 161-17781-00
 ENCL NO.: 9

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m									
79.6	Ground Surface													
0.0	FILL: Sand and gravel, brown, some red and black coarse sand, moist, loose		1	SS	7									
78.8														
0.8	Sand and gravel, brown to black, trace organics, moist, very loose		2	SS	2									SS2: VOCs, M&I, PAHs, PHCs
78.1														
1.5	Silty sand, red, moist, very loose to compact		3	SS	3									
	Black staining													
	Dark brown with grey mottling, trace silt		5	SS	9									
	Becoming clayey, grey, wet		7	SS	1									SS7: VOCs, M&I, PAHs, PHCs
74.3														
5.3	Organic silty clay, dark brown and black, wet, stiff		8	SS	8									
73.5														
6.1	Silty clay, sandy, trace organics, grey and brown, wet, very soft		9	SS	1									
72.9														
6.7	END OF BOREHOLE NOTE: 1) Borehole open to 5.2 m on completion 2) Water level measured at 4.6 m on completion													

WSP SOIL LOG IW VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

GROUNDWATER ELEVATIONS
 Measurement

GRAPH NOTES + 3, x 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

PROJECT: Phase II ESA CLIENT: City of Hamilton PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton DATUM: Geodetic, NAD83 UTM Zone 17T, mASL BH LOCATION: N 4790748.665 E 594404.702	DRILLING DATA Method: Hollow Stem Auger Diameter: 108 mm Date: Mar/16/2017 REF. NO.: 161-17781-00 ENCL NO.: 10
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	WATER CONTENT (%)			POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m				W _p	W	W _L			
77.5	Ground Surface													GR SA SI CL
0.0	FILL: Sand and gravel, brown and black, moist, compact		1	SS	18									
76.7														
0.8	Silty sand, black, moist, compact		2	SS	12									
	becoming wet		3	SS	21									
75.1														
2.4	Organic silty clay, grey, moist, soft		4	SS	3									
	Some sand, black staining, some roots, wood pieces		5	SS	3									
73.7														
3.8	SILTY CLAY: trace organics, grey, moist, stiff		6	SS	10						225			
			7	SS	10						225			
72.3														
5.2	END OF BOREHOLE NOTE: 1) Borehole open to 2.4 m on completion 2) Water level measured at 1.5 m on completion													

WSP SOIL LOG IW VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, x 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

SS3:
VOCs, M&I,
PAHs, PHCs,
PCBs

<p>PROJECT: Phase II ESA CLIENT: City of Hamilton PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton DATUM: Geodetic, NAD83 UTM Zone 17T, mASL BH LOCATION: N 4790767.963 E 594420.103</p>	<p>DRILLING DATA Method: Hollow Stem Auger Diameter: 108 mm Date: Mar/22/2017</p> <p>REF. NO.: 161-17781-00 ENCL NO.: 11</p>
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SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kNm ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE									
77.4 0.0	Ground Surface FILL: Sand and gravel, brown, moist, very dense		1	SS	58/ 178mm								GR SA SI CL SS1: VOCs, M&I, PAHs, PHCs
76.6 0.8	Silty clay and sand, dark brown, moist, firm		2	SS	7								
75.8 1.5	SILTY CLAY: Trace sand, trace gravel, dark brown, moist, stiff Grey/brown		3	SS	10								
			4	SS	14								SS4: VOCs, M&I, PAHs, PHCs
			5	SS	13						42		1 5 42 52
			6	SS	14								
			7	SS	12								

END OF BOREHOLE NOTE:
 1) Borehole open and dry on completion
 2) 50 mm dia. monitoring well installed in the borehole upon completion of drilling
 3) Water level measurements in monitoring well:

Date	W.L. Depth (m)
March 30, 2017	1.3
April 11, 2017	0.9

WSP SOIL LOG IW VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

GROUNDWATER ELEVATIONS
 Measurement

GRAPH NOTES + 3, x 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

<p>PROJECT: Phase II ESA CLIENT: City of Hamilton PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton DATUM: Geodetic, NAD83 UTM Zone 17T, mASL BH LOCATION: N 4790536.201 E 594281.725</p>	<p>DRILLING DATA Method: Hollow Stem Auger Diameter: 108 mm Date: Mar/17/2017</p> <p>REF. NO.: 161-17781-00 ENCL NO.: 12</p>
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SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE									
80.2	Ground Surface												
80.0	ASPHALTIC CONCRETE: 130mm												
0.1	FILL: Sand and gravel, brick/debris, brown, moist, compact		1	SS	20								
1			2	SS	18								
2	Some silt, black staining, loose		3	SS	7								
77.8	SILTY CLAY: Trace organics, brown, moist, stiff to very stiff		4	SS	13						175		SS3: VOCs, M&I, PAHs, PHCs
2.4			5	SS	19						225		SS5: VOCs, M&I, PAHs, PHCs
76.6													

END OF BOREHOLE
NOTE:
 1) Borehole open and dry on completion
 2) 50 mm dia. monitoring well installed in the borehole upon completion of drilling
 3) Water level measurements in monitoring well:
 Date W.L. Depth (m)
 March 30, 2017 DRY
 April 11, 2017 DRY

WSP SOIL LOG IW VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

PROJECT: Phase II ESA CLIENT: City of Hamilton PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton DATUM: Geodetic, NAD83 UTM Zone 17T, mASL BH LOCATION: N 4790623.713 E 594191.235	DRILLING DATA Method: Hollow Stem Auger Diameter: 108 mm Date: Mar/21/2017 REF. NO.: 161-17781-00 ENCL NO.: 13
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m									
79.6	Ground Surface													
0.0	FILL: Sand, some gravel, brown, moist, dense to very dense		1	SS	45		79							SS2: VOCs, M&I, PAHs, PHCs
1			2	SS	70		79							
78.1	SILTY CLAY: Trace sand, grey and brown, mottled, moist, very stiff		3	SS	19		78					225		SS5: VOCs, M&I, PAHs, PHCs
1.5			4	SS	19		78					225		
2			5	SS	16		78					225		
3			6	SS	17		78					225		
4			7	SS	15		78					225		
5.2	END OF BOREHOLE NOTE: 1) Borehole open and dry on completion 2) 50 mm dia. monitoring well installed in the borehole upon completion of drilling 3) Water level measurements in monitoring well: Date W.L. Depth (m) March 30, 2017 3.4 April 11, 2017 2.5													

WSP SOIL LOG IW VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

GROUNDWATER ELEVATIONS
 Measurement

GRAPH NOTES + 3, x 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

PROJECT: Phase II ESA
 CLIENT: City of Hamilton
 PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
 DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
 BH LOCATION: N 4790665.151 E 594201.065

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 108 mm
 Date: Mar/21/2017
 REF. NO.: 161-17781-00
 ENCL NO.: 14

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m									
79.5	Ground Surface													
79.9	ASPHALTIC CONCRETE: 150mm FILL:													
0.2	Sand and gravel, grey and black, damp, very loose to compact		1	SS	22									SS1: VOCs, M&I, PAHs, PHCs
	Some silt, bricks, and stones		2	SS	8									
	Some clay and debris, becoming loose		3	SS	3									
	Black staining, PHC odour		4	SS	3									
	Becoming wet		5	SS	2									
75.5	SANDY SILTY CLAY: grey, black staining, moist, soft to stiff		6	SS	9							188		
4.0	Some silt, trace sand and organics, soft, slight PHC odour		7	SS	2							175		
	Some silt, trace sand and organics, soft, slight PHC odour		8	SS	2							75		
73.4	ORGANIC SILTY CLAY: soft, trace black staining, wet		9	SS	3							44 25		
6.1	SILTY CLAY: Grey and brown, wet, very stiff		10	SS	16							225		SS10: VOCs, M&I, PAHs, PHCs
72.6														
6.9														
72.0														
7.5	END OF BOREHOLE NOTE: 1) Borehole dry and open to 7.6 m on completion													

WSP SOIL LOG IW VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES

+ 3, × 3: Numbers refer to Sensitivity

○ ε=3% Strain at Failure

<p>PROJECT: Phase II ESA CLIENT: City of Hamilton PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton DATUM: Geodetic, NAD83 UTM Zone 17T, mASL BH LOCATION: N 4790687.198 E 594256.515</p>	<p>DRILLING DATA Method: Hollow Stem Auger Diameter: 108 mm Date: Mar/20/2017</p> <p style="text-align: right;">REF. NO.: 161-17781-00 ENCL NO.: 15</p>
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SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	WATER CONTENT (%)			POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE				"N" BLOWS 0.3 m	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W			
79.6	Ground Surface											GR SA SI CL	
79.6 0.1	ASPHALTIC CONCRETE: 100mm FILL: Sand and gravel, trace stones, grey and brown, dry, compact to dense		1	SS	35								
79.1			2	SS	14							SS2: VOCs, M&I, PAHs, PHCs	
78.1	Some silt, black staining		3	SS	9					47	225	1 7 38 54	
1.5	SILTY CLAY: Trace sand, trace gravel, grey and brown, trace mottling, moist, stiff to very stiff		4	SS	15						225	SS4: VOCs, M&I, PAHs, PHCs	
			5	SS	13						225		
			6	SS	8						225		
			7	SS	11						188		
			8	SS	9						163		

END OF BOREHOLE
NOTE:
 1) Borehole open and dry on completion
 2) 50 mm dia. monitoring well installed in the borehole upon completion of drilling
 3) Water level measurements in monitoring well:
 Date: April 11, 2017 W.L. Depth (m): 4.9

WSP SOIL LOG IW VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAMI EDITS.GPJ SPL.GDT 4/28/17

PROJECT: Phase II ESA
 CLIENT: City of Hamilton
 PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
 DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
 BH LOCATION: N 4790688.19 E 594322.513

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 108 mm
 Date: Mar/20/2017
 REF. NO.: 161-17781-00
 ENCL NO.: 16

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m									
79.1	Ground Surface													
0.0	FILL: Silty sand mixed with clay, some gravel, trace debris, brown, moist, loose to compact	[Cross-hatched pattern]	1	SS	6		79							SS4: VOCs, M&I, PAHs, PHCs
1	Some stones and black staining		2	SS	25		78							
2	Increasing silt content		3	SS	11		77							
3	Black staining		4	SS	13		76							
4			5	SS	9		75.3							
3.8	Silty clay, some sand, trace organics and debris, brown, moist, soft		6	SS	2		75							
5	Black staining		7	SS	3		74							
6	Decreased black staining, some organics		8	SS	3		73							
6.9	Some sand, trace black staining		9	SS	3		72.3							
6.9	SILTY CLAY: trace to some sand, grey, moist, very stiff		10	SS	17		72							
7.5	END OF BOREHOLE NOTE: 1) Borehole open to 6.7 m on completion 2) Water level measured at 6.6 m on completion													

WSP SOIL LOG IW VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

<p>PROJECT: Phase II ESA CLIENT: City of Hamilton PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton DATUM: Geodetic, NAD83 UTM Zone 17T, mASL BH LOCATION: N 4790644.468 E 594295.917</p>	<p>DRILLING DATA Method: Hollow Stem Auger Diameter: 108 mm Date: Mar/20/2017</p> <p style="text-align: right;">REF. NO.: 161-17781-00 ENCL NO.: 17</p>
---	--

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m									
79.2	Ground Surface													
79.0	ASPHALTIC CONCRETE: 150mm													
0.2	FILL: Sand and gravel, some stones, grey and brown, moist, compact		1	SS	19									SS1: VOCs, M&I, PAHs, PHCs
78.5	Silty sand, some gravel, grey and brown, moist, loose		2	SS	9									
0.8	Some pieces of concrete and brick		3	SS	9									
76.9	Sand and gravel, black and grey, moist, compact to dense		4	SS	32									SS4: VOCs, M&I, PAHs, PHCs
2.3			5	SS	14									
75.4	SILTY CLAY: grey-brown, moist, firm to very stiff		6	SS	23							225		
3.8	Shale fragments		7	SS	13							225		
73.3			8	SS	7							125		

5.9	<p>END OF BOREHOLE NOTE: 1) Borehole open and dry to 5.9 m on completion</p>													
-----	--	--	--	--	--	--	--	--	--	--	--	--	--	--

WSP SOIL LOG IW VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

PROJECT: Phase II ESA
 CLIENT: City of Hamilton
 PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
 DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
 BH LOCATION: N 4790619.803 E 594242.31

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 108 mm
 Date: Mar/17/2017
 REF. NO.: 161-17781-00
 ENCL NO.: 18

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m									
79.7	Ground Surface													
78.9	ASPHALTIC CONCRETE: 70mm FILL: Sand and gravel, grey and black, damp, compact to very dense		1	SS	50/ 50mm									SS1: VOCs, M&I, PAHs, PHCs, PCBs
78.7	1.1 Silty clay mixed with sand, moist, stiff		2	SS	10									
77.5	2.3 SILTY CLAY: Trace sand, brown, moist, stiff Trace mottling		3	SS	9									
77.5			4	SS	13							225		
77.5			5	SS	14							225		
77.5			6	SS	13							225		
74.6			7	SS	11							175		SS7: VOCs, M&I, PAHs, PHCs
5.2	END OF BOREHOLE NOTE: 1) Borehole open and dry to 5.2 m on completion													

WSP SOIL LOG IW VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

GROUNDWATER ELEVATIONS
 Measurement

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

PROJECT: Phase II ESA
 CLIENT: City of Hamilton
 PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
 DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
 BH LOCATION: N 4790608.463 E 594305.394

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 108 mm
 Date: Mar/21/2017
 REF. NO.: 161-17781-00
 ENCL NO.: 19

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE									
79.5	Ground Surface												
70.0	ASPHALTIC CONCRETE: 130mm FILL: Sand and gravel, grey and brown, damp, compact to very dense		1	SS	74								SS1: VOCs, M&I, PAHs, PHCs
0.1			2	SS	24								
77.9	Silty clay mixed with sand, trace gravel, brown, moist, firm to very stiff		3	SS	13								
1.5			4	SS	12								
			5	SS	16								
			6	SS	9								
			7	SS	6								
			8	SS	5								SS8: VOCs, M&I, PAHs, PHCs
	Black staining, PHC odour		9	SS	12							225	
73.4	SILTY CLAY: Trace organics, some sand, grey, moist, stiff												
6.1													
72.8	END OF BOREHOLE												
6.7	NOTE: 1) Borehole open and dry on completion 2) 50 mm dia. monitoring well installed in the borehole upon completion of drilling 3) Water level measurements in monitoring well: Date W.L. Depth (m) March 30, 2017 5.1 April 11, 2017 4.1												

WSP SOIL LOG IW VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES

+ 3 , × 3 : Numbers refer to Sensitivity ○ ε=3% Strain at Failure

PROJECT: Phase II ESA CLIENT: City of Hamilton PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton DATUM: Geodetic, NAD83 UTM Zone 17T, mASL BH LOCATION: N 4790587.295 E 594296.313	DRILLING DATA Method: Hollow Stem Auger Diameter: 108 mm Date: Mar/21/2017 REF. NO.: 161-17781-00 ENCL NO.: 20
--	--

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE									
79.3	Ground Surface												
79.0	ASPHALTIC CONCRETE: 130mm												
0.1	FILL: Sand and gravel, trace silt, brown and grey, moist, compact to very dense		1	SS	50/152mm								
			2	SS	31								
			3	SS	20								
			4	SS	16								
76.3	Sandy silt and clay, trace gravel, dark brown, trace black staining, very moist, firm		5	SS	6								
75.5	Silty clay, some sand, dark brown, black staining, very moist, PHC odour, firm to stiff		6	SS	4								
			7	SS	7								SS7: VOCs, PHCs
	----- Becoming grey		8	SS	9								
73.2	SILTY CLAY: Some sand, grey, moist, stiff		9	SS	11								SS9: VOCs, PHCs
72.6													

END OF BOREHOLE

NOTE:

- Borehole open and dry on completion
- 50 mm dia. monitoring well installed in the borehole upon completion of drilling
- Water level measurements in monitoring well:

Date	W.L. Depth (m)
March 30, 2017	3.4
April 11, 2017	3.3

WSP SOIL LOG IW VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

PROJECT: Phase II ESA CLIENT: City of Hamilton PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton DATUM: Geodetic, NAD83 UTM Zone 17T, mASL BH LOCATION: N 4790509.914 E 594274.72	DRILLING DATA Method: Hollow Stem Auger Diameter: 108 mm Date: Mar/31/2017 REF. NO.: 161-17781-00 ENCL NO.: 21
---	--

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE									
80.3	Ground Surface												
80.4	ASPHALTIC CONCRETE: 50mm FILL: Sand and gravel, mixed with organics, brown, moist, compact		1	SS	13								
79.5	0.8 Silty sand, some clay, trace gravel, pieces of brick, brown, moist, loose		2	SS	8								
78.6	1.7 Sand, some gravel, black and red, moist, loose		3	SS	9								
	Some silt and clay, very loose		4	SS	3								
	compact		5	SS	3								
			6	SS	10								
75.7	4.6 SILTY CLAY: Grey and brown, moist, very stiff		7	SS	21								
			8	SS	19								
			9	SS	22								
			10	SS	16								
			11	SS	20								
72.0	8.2 END OF BOREHOLE NOTE: 1) Auger refusal at 7.9 m after retrieving SS11 2) Borehole open and dry on completion 3) 50 mm dia. monitoring well installed in the borehole upon completion of drilling to augered depth 4) Water level measurements in monitoring well: Date: April 11, 2017 W.L. Depth (m): 7.0												

WSP SOIL LOG (W) VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3 , × 3 : Numbers refer to Sensitivity ○ ε=3% Strain at Failure

PROJECT: Phase II ESA
 CLIENT: City of Hamilton
 PROJECT LOCATION: 330 Wentworth St N, 80 Brant St, Hamilton
 DATUM: Geodetic, NAD83 UTM Zone 17T, mASL
 BH LOCATION: N 4790524.332 E 594211.23

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 108 mm
 Date: Mar/31/2017
 REF. NO.: 161-17781-00
 ENCL NO.: 22

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m									
81.0	Ground Surface													
80.9	ASPHALTIC CONCRETE: 70mm FILL: Sand and gravel, trace clay, grey and brown, damp, compact	[Hatched]	1	SS	14									
80.3	Sandy silt and clay, trace gravel and debris, brown, moist, compact	[Cross-hatched]	2	SS	10									SS2: VOCs, M&I, PAHs, PHCs
78.7	SILTY CLAY: Trace to some sand, brown, moist, very stiff Becoming grey, trace black staining	[Diagonal lines]	4	SS	15									SS4: VOCs, M&I, PHCs
			5	SS	20									
			6	SS	18									
			7	SS	15									
			8	SS	20									
			9	SS	9									
			10	SS	6									
73.4	stiff firm													
7.6	END OF BOREHOLE NOTE: 1) Borehole open and dry on completion 2) 50 mm dia. monitoring well installed in the borehole upon completion of drilling 3) Water level measurements in monitoring well: Date April 11, 2017 W.L. Depth (m) 6.7													

WSP SOIL LOG IW VOC 0-300 PPM-2016 DRAFT LOG REPORTS - GEOTECH CAM EDITS.GPJ SPL.GDT 4/28/17

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

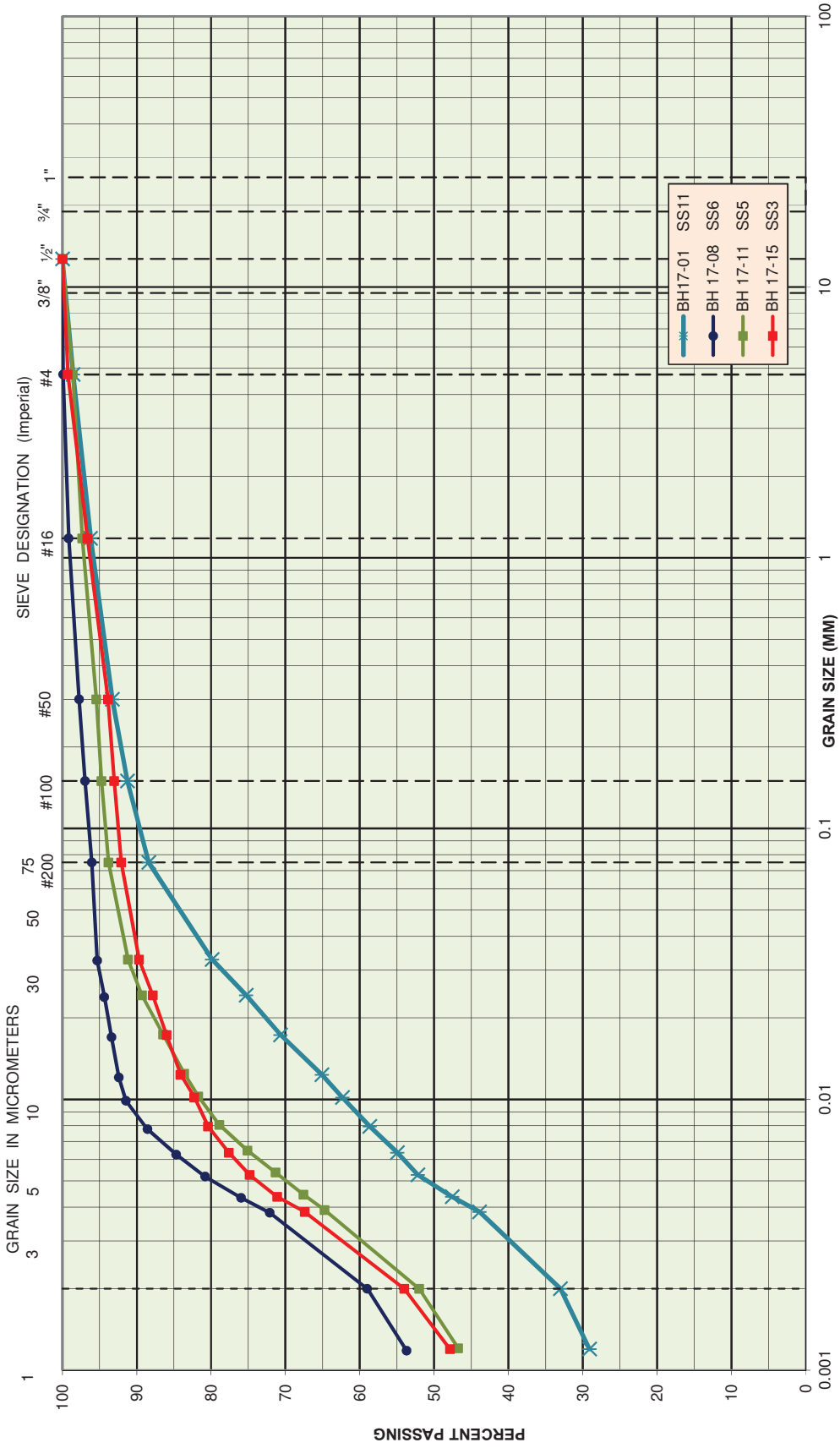
GRAPH NOTES + 3, x 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

Appendix B

**GRAIN SIZE DISTRIBUTION CURVES (FIGURES B-1 AND B-2)
ATTERBERG LIMITS RESULTS (FIGURE B-3)**

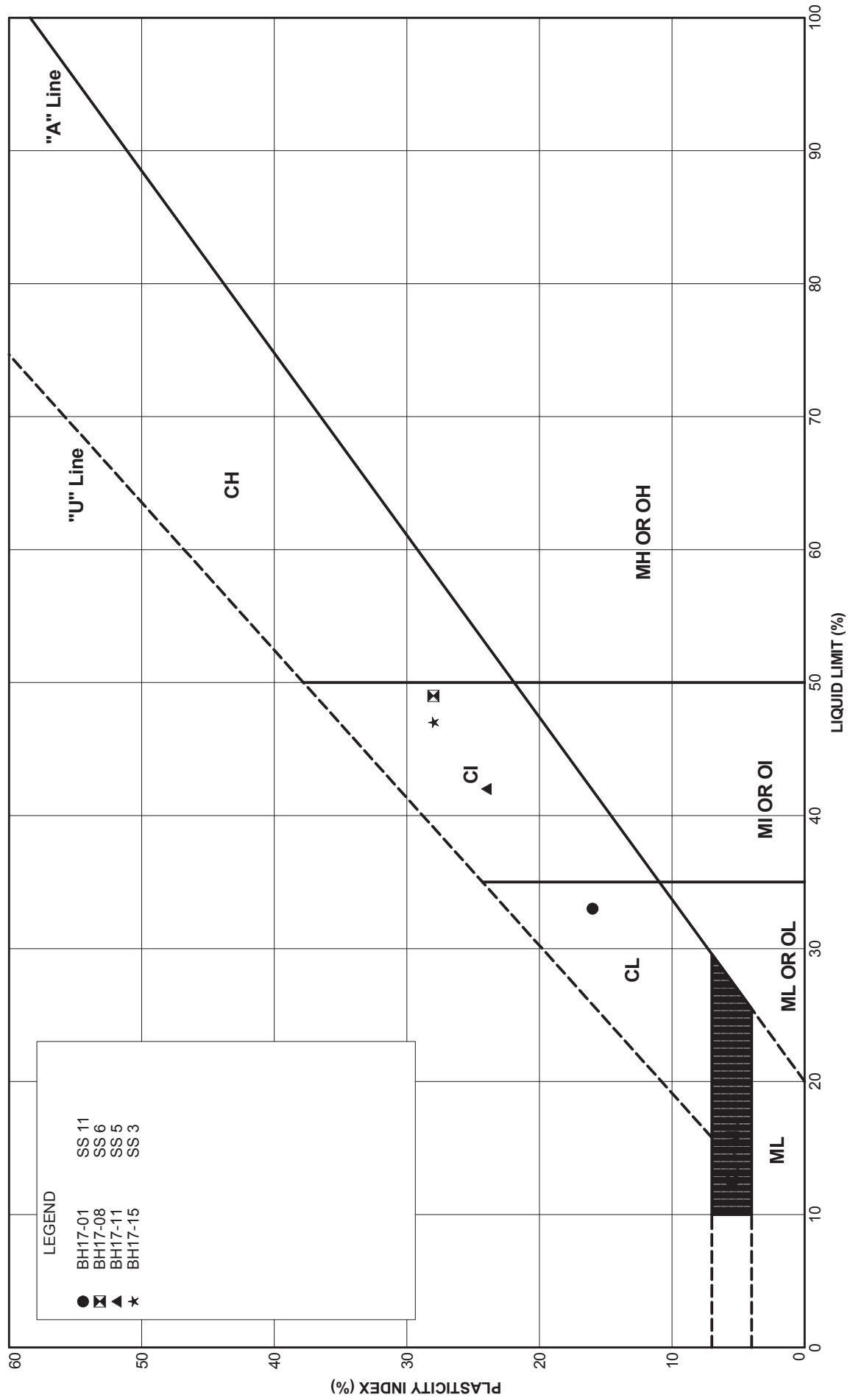
UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY AND SILT			SAND			GRAVEL		
			Fine	Medium	Coarse	Fine	Coarse	Coarse



GRAIN SIZE DISTRIBUTION
Silty Clay

Project No:	161-17781-00	Figure No:	B-1
Project Name:	HSR-MSF Hamilton	Client:	City of Hamilton
Sampling Date:	March 2017	Lab Testing Date:	April 10, 2017



LEGEND

●	BH17-01	SS 11
⊠	BH17-08	SS 6
▲	BH17-11	SS 5
★	BH17-15	SS 3



PLASTICITY CHART

FIGURE NO.	B-2
JOB NO.	161-17781-00
DATE	April 10, 2017

Appendix 02

CULTURAL AND HERITAGE RISK ASSESSMENT



MEMO

4 Hughson Street South, Hamilton, ON L8N 3Z1
Telephone: 905-529-4414 ~ Fax: 905-521-2699 ~ www.wspgroup.com

TO:	MS. SHABA SHRINGI	DATE:	May 11, 2017
FROM:	WSP CANADA INC.		#C12-07-14
SUBJECT:	CULTURAL AND HERITAGE RISK ASSESSMENT		

Dear Ms. Shringi,

WSP Canada Inc. (WSP) was contracted by the City of Hamilton to complete Phase I, II and III Environmental Site Assessments (ESA) for the City of Hamilton's Future HSR Maintenance Storage Facility located between Brant Street, Wentworth Street N., and Birch Avenue in the City of Hamilton, Ontario (Site).

As a component of this work, WSP was to prepare a Cultural and Heritage Risk Assessment Report to be included as an appendix (Appendix 02) of the Phase II ESA report. The objective of a Cultural and Heritage Risk Assessment study was to evaluate the property's archaeological potential (Stage 1), which could have an influence on the project's timeline.

WSP has completed a site visit, and a cursory review of pertinent provincial and federal government files and databases. WSP also conducted background research on the properties. During the review, it was discovered that the properties have previously been assessed in 2013 by Archaeological Services Inc. (ASI) in the following report:

Archaeological Services Inc.

2013 Stage 1 Archaeological Assessment of the Hamilton RT B-Line Maintenance and Storage Facility and Associated Spur Line Corridor, Class Environmental Assessment Study, Former Township of Barton, Wentworth County, City of Hamilton, Ontario. Prepared for: Hatch Mott MacDonald on behalf of the City of Hamilton.

The report stated that the Stage 1 background study determined that no archaeological site or sites have been registered within 1 km of the study area and, although a review of the geography of the study area suggested that the study area has potential for the identification of Aboriginal and Euro-Canadian archaeological resources, the property inspection determined that the entire Hamilton RT B-Line MSF study area has been disturbed by previous construction activity including industrial, commercial, and residential development.

In light of these results, ASI made the following recommendations:

1. **Due to extensive and deep land alterations that have severely damaged the integrity of any potential archaeological resources, the lands within the RT B-Line Maintenance and Storage Facility study area do not retain archaeological potential. These lands do not require further archaeological assessment;**
2. **Should the proposed work extend beyond the current study area then further Stage 1 assessment must be conducted to determine the archaeological potential of the surrounding lands.**

As the ASI report and its recommendations have been entered into the MTCS Register, WSP is in agreement with the conclusions presented above. Based on this report, the lands for the proposed HSR Future HSR Maintenance Storage Facility do not retain archaeological potential and further assessment is not required.

Yours truly,

WSP Canada Inc.

A handwritten signature in black ink, appearing to read "Douglas A. Yahn", written over a faint horizontal line.

Douglas A. Yahn, MES
Senior Archaeological Consultant

Appendix 03

UNDERGROUND UTILITIES RISK ASSESSMENT

CITY OF HAMILTON

UNDERGROUND UTILITIES RISK ASSESSMENT

FUTURE HSR STORAGE AND MAINTENANCE
FACILITY

MAY, 2017

UNDERGROUND UTILITIES RISK ASSESSMENT

FUTURE HSR STORAGE AND MAINTENANCE FACILITY

City of Hamilton

Project n°: 161-17781-00
11 May 2017

Distribution:
1 c Client
1 c File

—
WSP Canada Inc.
4 Hughson Street South, Suite 300
Hamilton, Ontario, Canada L8N 3Z1

Phone: +1 905-529-4414
www.wspgroup.com



SIGNATURES

PREPARED BY



Dennis Redwood
Project Engineer

REVIEWED BY



Gord Shields, P.Eng.
Senior Project Manager

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1 INTRODUCTION

WSP were engaged by the City of Hamilton to undertake a Utilities Risk Assessment for the Due Diligence, Demolition and site preparation for the future HSR – Maintenance Storage facility.

2 330 WENTWORTH STREET (DARTS PARKING AND SALT BARN)

2.1 INTRODUCTION / SITE DESCRIPTION

The 330 Wentworth Street site is accessed from the Birch Avenue access. The site area is approximately 2.9 Ha. The area is fairly flat in elevation at between 79.60 m and 79.80 m.

Figure 2-1 Aerial site plan



The site is currently used for parking of the DARTS - Accessible Transportation Services (ATS) vehicles and also as a transfer/storage area for City of Hamilton waste disposal and there is a large salt barn and storage area for the City of Hamilton equipment, including small vehicles, plant, and materials.

2.2 STORMWATER DRAINAGE INFRASTRUCTURE

2.2.1 GENERAL WATERSHED DESCRIPTION

The site all asphalt/concrete surfacing and is positively drained by a catchbasin/storm sewer system.

2.2.2 WATERCOURSES / DITCHES / SWALES

No watercourses or ditches/swales are present on the site.

2.2.3 CATCHBASINS

There are four catchbasins on the site which are connected to the storm water sewer system.

2.2.4 SOAKWAYS

No known soakways are on the site.

2.2.5 STORM MANHOLES/SEWERS - PRIVATE AND PUBLIC

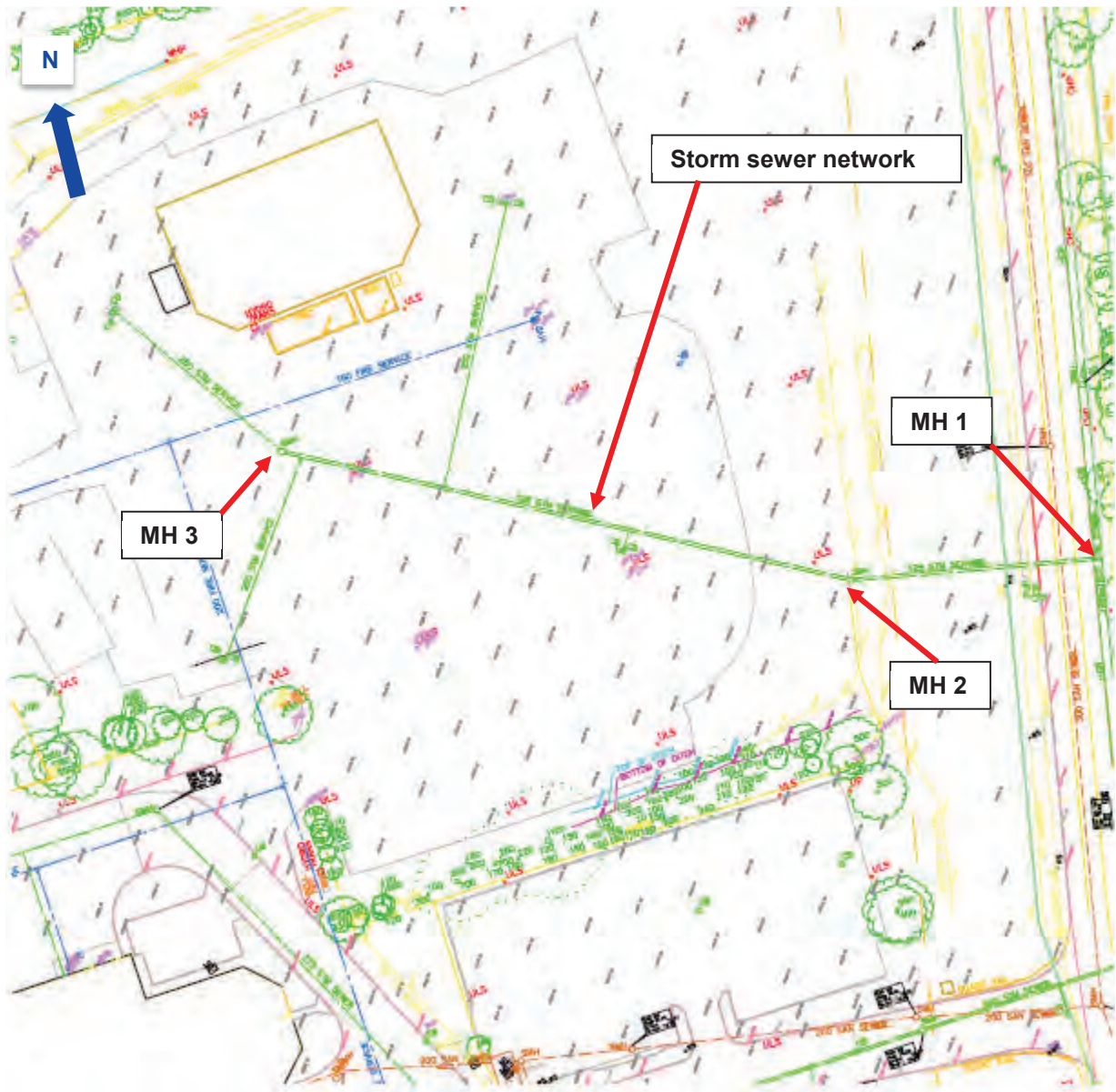
There are 2 stormwater manholes (MH) on the site and a 525mm dia. storm sewer (approx. 102m length) between the two manholes (MH3 and MH2). MH 2 is on the site boundary and this MH 2 discharges into MH 1 on Birch Avenue with a 525mm dia. sewer (approx. 46m length). See Figure 2.2 for layout of the storm water drainage network.

Table 2-1 Storm Sewer MH Details

MH NO.	MH COVER ELEVATION	MH INVERT ELEVATION
MH 2	79.60m	75.80m
MH 3	79.60m	76.90m

It is not known if there is an oil/grit interceptor operating at this site before the storm sewers discharge into the public sewer in Birch Ave (MH1). During the future demolition works, the specifications should ensure the existing stormwater drainage is protected by the provision of erosion control measures.

Figure 2-2 Layout of storm water drainage on the site (excerpt from survey plan)



2.2.6 SUMMARY

The stormwater system is self-contained within the site and can be removed/capped at MH 2 to enable redevelopment of the site and re-establishment of the stormwater drainage following development.

2.3 SANITARY DRAINAGE INFRASTRUCTURE

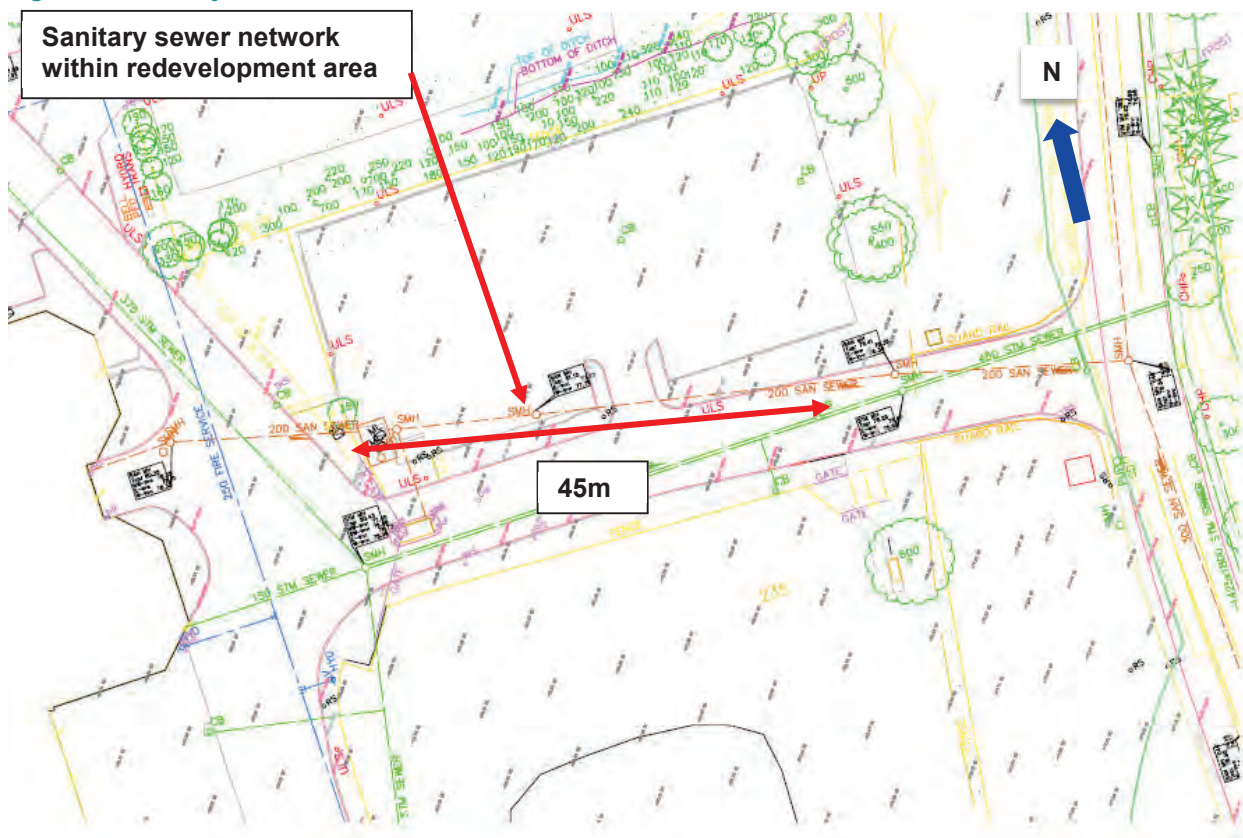
2.3.1 BUILDING DRAINAGE

There is no sanitary building drainage from the one building (Salt Barn) on the site.

2.3.2 MANHOLES/SEWERS – PRIVATE AND PUBLIC

There is a short section (45m of 200mm dia. sewer) of the existing sanitary sewer system (including manhole on the site passing below the existing carpark, this system collects discharge from the existing Hamilton Maintenance building.

Figure 2-3 Sanitary sewer network



2.3.3 SUMMARY

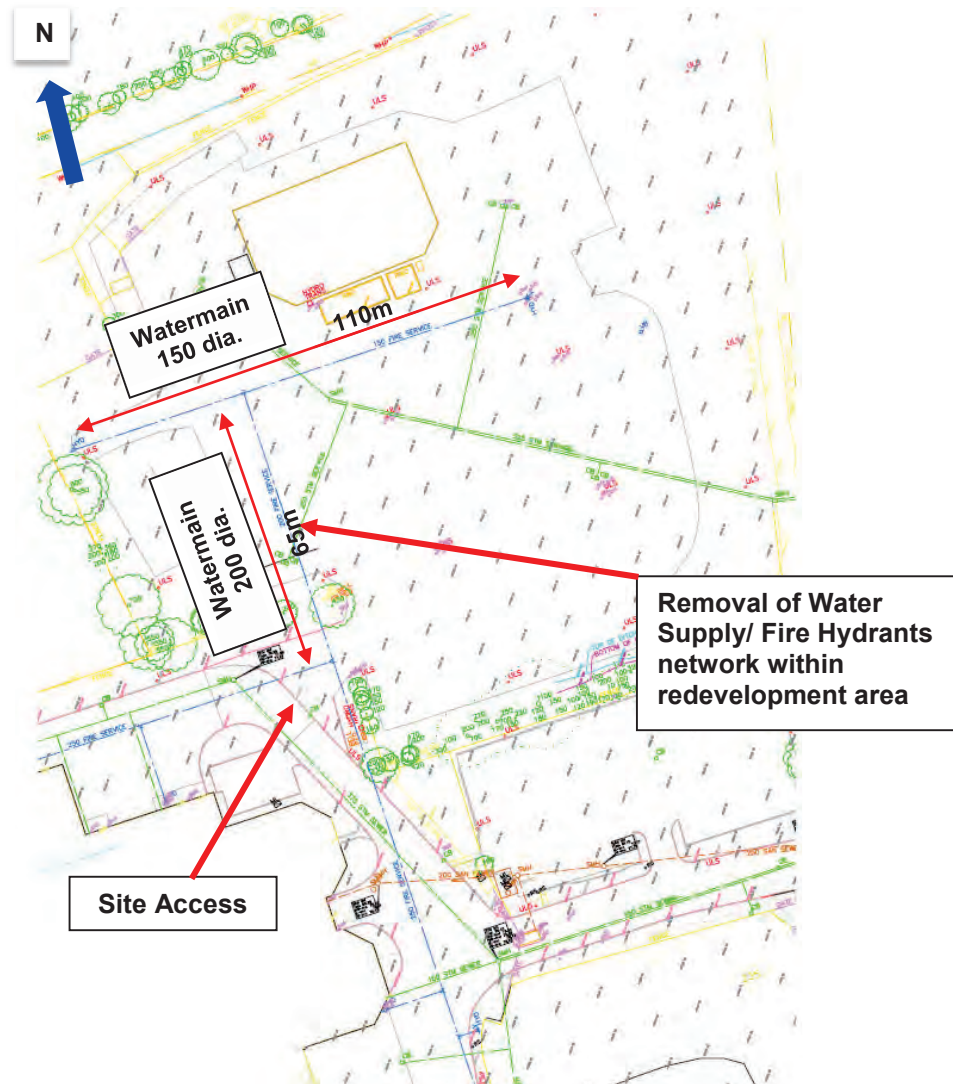
The demolition works and future footprint of the building should not affect the existing underground sanitary infrastructure currently on the site assuming the car parking area is not completely removed and structures placed in this area.

2.4 WATER SUPPLY / WATERMAINS

2.4.1 WATERMAINS – PRIVATE AND PUBLIC

There is a 250mm dia. watermain for Fire hydrant supply which enters the site at the site access. This watermain splits into a 200mm dia. to serve fire hydrants in two directions from a 150mm dia. mains. See Figure 2-4 below for location of water supply pipework. The sections of watermain affected by future development requiring removal is shown in Figure 2-4 below.

Figure 2-4 Water supply and Fire hydrant location



2.4.2 VALVE CHAMBERS

No valve chambers were observed on site and none are shown on the survey drawing.

2.4.3 CURB STOPS

No curb stops are shown on the survey drawing.

2.4.4 SUMMARY

The demolition works and future footprint of the maintenance building will require isolation and removal of approximately 175m of the existing sections underground watermain infrastructure currently on the site.

2.5 ELECTRICAL SUPPLIES

2.5.1 OVERHEAD POWER

There are no overhead Horizon Utilities power supplies on the 330 Wentworth site, however there are hydro poles on the rear boundary of the site in the 80 Brant Street/CP Rail land adjacent to the site, which do not have any cables/wire connected to them.

Figure 2-5 Photo of hydro poles at CP Rail land boundary



Figure 2-6 Photo of overhead cables



There are a two poles with overhead wires which have cables for powering the lighting. Figure 2-6 above.

2.5.2 UNDERGROUND POWER (HV AND LV)

No underground Utility supplies were reported to be on the site by the Horizon Utilities. The Figure 2-7 plan below from Horizon Utilities show power supply from Hillyard Street into the 330 Wentworth Road facility. This underground supply route is not affect by the demolition or development works.

Figure 2-7 Horizon Utilities – plan showing power supply location for the 330 Wentworth Street site.



There is an underground power supply to the Salt Barn, the routing for this power cable supply is shown on the Figure 2-8 Electrical Site Plan drawing below. This supply will need to be isolated at source at the Hydro transformer cabinet prior to demolition of the Salt Barn.

2.6 TRANSFORMERS

There are two power supply/transformer cabinets on the site, one is located adjacent to the salt barn and the other (which is the source connection) is located, no other transformers were observed on the site. The transformer on the site boundary (shown in Figure 2-9 below) will need to be maintained or relocated as this also feeds other facilities and equipment outside the site boundary.

Figure 2-8 Electrical Site Plan

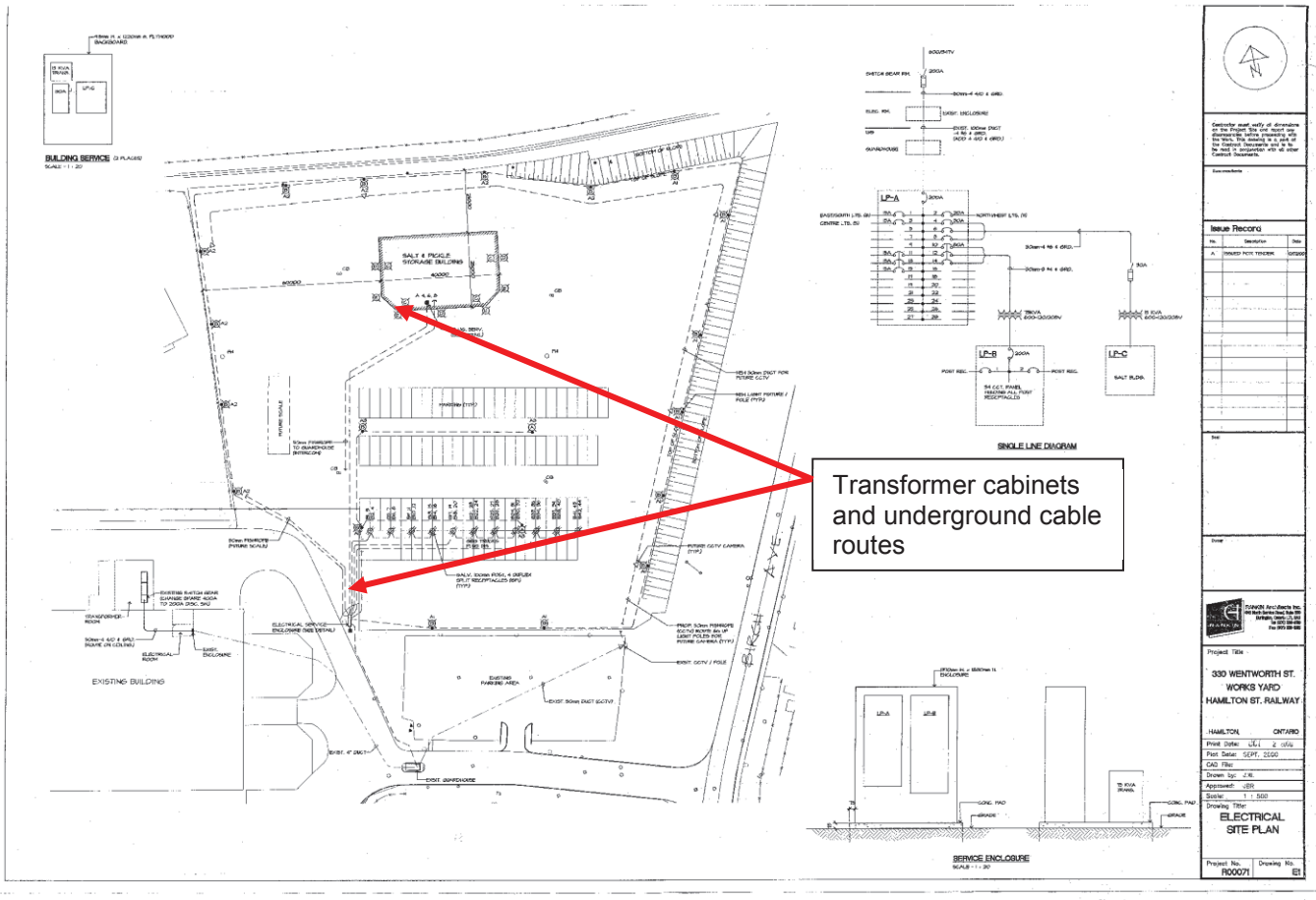


Figure 2-9 Survey Plan showing location of transformer cabinet

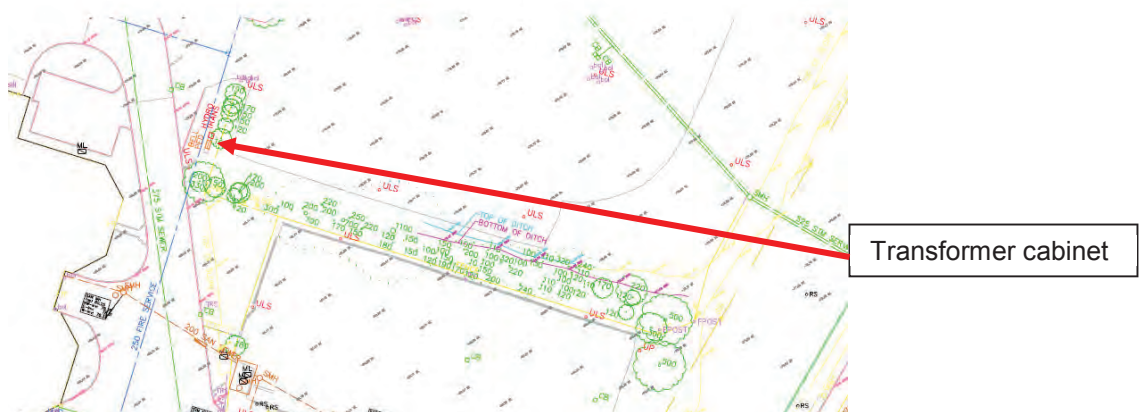


Figure 2-10 Photo showing location of transformer cabinet for the Salt Barn



2.6.1 LIGHTING CABLING (LV)

There are a number of lighting poles and vehicle charging points connected by underground LV cabling across the site. The routing for these lighting supplies is shown on the attached plan. The supply will need to be isolated at source prior to demolition works.

2.6.2 CHAMBERS

No power chambers were observed on site and no chambers are located on the site survey drawing.

2.7 GAS SUPPLIES

2.7.1 GAS – PRIVATE AND PUBLIC

There are no gas supplies, no chambers or gas governors in this part of the site which will be affected by the demolition or future development works.

2.8 COMMUNICATIONS – BELL OR OTHERS

2.8.1 CABLES CONDUITS – PRIVATE AND PUBLIC

There are two Bell pedestals at the site boundary adjacent to the entrance, it is not known where the cables from these pedestals connect to but there is CCTV on the site and a cable conduit route to the site entrance gate house shown on the survey plan.

2.8.2 OVERHEAD CABLES

No overhead cables were observed on the site.

2.8.3 CHAMBERS

No chambers were observed on the site.

2.9 LOCATES

The following locates were undertaken by Ontario One Call;

Table 2-2 Locates at 330 Wentworth Street

UTILITY	LOCATE RESULT	COMMENTS
City of Hamilton	Clear	
Horizon Utilities	Clear	
Union Gas	Clear	
Bell Canada	Cables present	Bell pedestal and underground cable near entrance
Rogers	Clear	
Cogeco	Clear	
Zayo Canada Inc.	Clear	
CRAMM street lighting	Clear	
Air Liquide Canada pipelines	Clear	

3 80 BRANT STREET/CP RAIL LAND

3.1 INTRODUCTION / SITE DESCRIPTION

The 80 Brant Street site can be accessed from the Brant Street Avenue access which is at the northern eastern boundary and the CP Rail land from Hillyard Street on the western boundary.

The southern boundary has redundant railway track which has a spur split which accessed the site to a former loading bay.

The site area is approximately 3.8 Ha of approximate dimensions 390m x 170m at its widest point.

Figure 3-1 Aerial site plan



The site has been cleared of all above ground buildings, however two visible foundation bases/ underground structures relating to a loading area/weighing station (see Figure 3-2) in the western side of the site and a loading area/weighing station (see Figure 3-3) in the eastern side of the site.

Figure 3-2 Photo of Weigh Station/Loading ramp (West)



Figure 3-3 Photo of Weigh station/loading area (East)



3.2 STORMWATER DRAINAGE INFRASTRUCTURE

3.2.1 GENERAL WATERSHED DESCRIPTION

The area is fairly flat in elevation at between 78.90 m and 76.50m, drainage is overland in an easterly direction from the Hillyard Street (western side) towards the Brant Street side (eastern side).

3.2.2 WATERCOURSES / DITCHES / SWALES

No watercourses or ditches/swales are present on the site.

3.2.3 CATCHBASINS

No catchbasins were observed on the site.

3.2.4 SOAKWAYS

No known soakways are on the site.

3.2.5 STORM MANHOLES/SEWERS - PRIVATE AND PUBLIC

The site has no visible positive storm drainage system and no records or drawings showing any drainage system.

3.3 SANITARY DRAINAGE INFRASTRUCTURE

3.3.1 BUILDING DRAINAGE

No buildings remain on the site and no public sanitary connections at the site boundaries are shown on survey plan.

3.3.2 MANHOLES / SEWERS – PRIVATE AND PUBLIC

Adjacent to the western site boundary on Hillyard Street, there is a sanitary connection to the public sanitary sewer/manhole near the site entrance on Hillyard Street possibly servicing the adjacent site 4 Hillyard Street. No known sanitary sewers are on the site.

3.3.3 SUMMARY

The demolition works and future footprint of the building should not affect the existing sanitary infrastructure adjacent to the site in Brant Street and Hillyard Street.

3.4 WATER SUPPLY / WATERMAINS

3.4.1 WATERMAINS – PRIVATE AND PUBLIC

There are watermains on Brant Street and Hillyard Street, however no known watermains are on the site. Any remaining connections shall be located, isolated and removed prior to demolition works.

3.4.2 VALVES/CHAMBERS

There are 2 water service valve boxes in Hillyard Street and one service valve on Brant Street near the site entrances, no valves/chambers were observed on site and none are shown on the survey drawings.

3.4.3 CURB STOPS

No curb stops are shown on the survey drawings.

3.4.4 SUMMARY

The demolition works and future footprint of the building should not affect the existing underground watermains infrastructure currently adjacent to the site on Brant Street and Hillyard Street.

3.5 ELECTRICAL SUPPLIES

3.5.1 OVERHEAD POWER

There is an overhead power supply into the 80 Brant Street close by to the Brant Street site entrance, see Figure 3.4 Plan from Horizon Utilities and Figure 3.5 Photo showing this equipment below.

Figure 3-4 Horizon Utilities location plan - Overhead Power supply and transformer cabinet

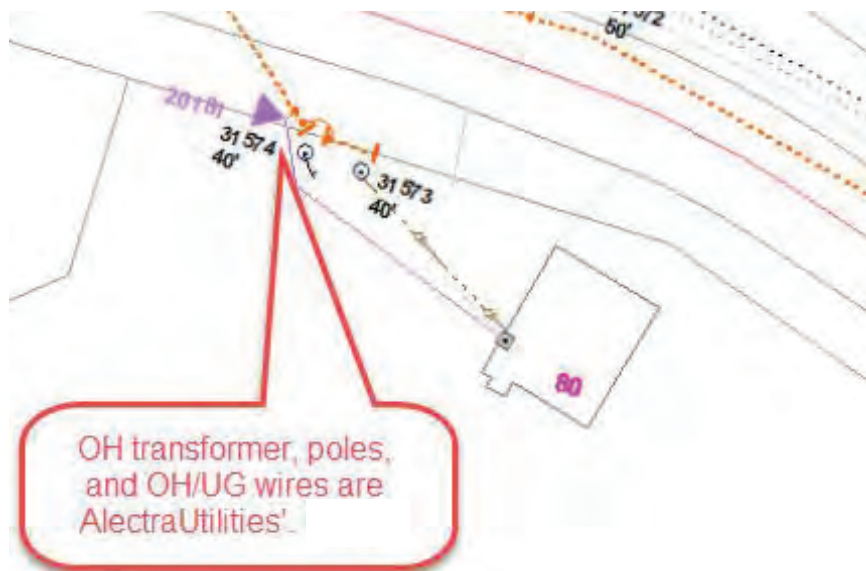


Figure 3-5 Photo showing overhead power supply and transformer cabinet



Figure 3-6 photo showing power supply and transformer cabinet



This above power supply board was a private landowner's supply for local buildings/lighting which were on the site. The electrical connections and underground cables from this load supply have been isolated or removed.

There are existing hydro poles along the southern boundary where the railway tracks are located, which have been stripped of power cables. The poles should be checked by Horizon Utilities and any remaining cables isolated prior to demolition/removal.

Figure 3-7 Photo showing Hydro poles on CP Rail boundary of site at 80 Brant Street



3.5.2 UNDERGROUND POWER (HV AND LV)

No known underground Utility supplies were reported to be on the site by the Horizon Utilities.

3.5.3 LIGHTING CABLING (LV)

There are 3 lighting poles (described as ULS on the survey drawing) connected by underground LV cabling across the site. The routing for these lighting supplies is unknown. The supply will need to be isolated at source prior to demolition works.

3.5.4 CHAMBERS

No power chambers were observed on site and no chambers are located on the site survey drawing.

3.6 GAS SUPPLIES

3.6.1 GAS – PRIVATE AND PUBLIC

There is no gas supplies on the site, no chambers or gas governors.

3.7 COMMUNICATIONS – BELL OR OTHERS

3.7.1 CABLES CONDUITS – PRIVATE AND PUBLIC

Bell cable was located by the Ontario One Call locate process. The underground cable traverses from Hillyard Street to the abandoned weight station on the site. This cable will need to be disconnected at the site boundary.

3.7.2 OVERHEAD CABLES

No overhead cables were observed on the site.

3.7.3 CHAMBERS

No chambers were observed on the site.

3.8 LOCATES

The following locates were undertaken by Ontario One Call;

Table 3-1 Locates at 80 Brant Street

UTILITY	LOCATE RESULT	COMMENTS
City of Hamilton	Clear	
Horizon Utilities	Equipment present	Hydro pole and underground cable to an already demolished structure/building
Union Gas	Clear	
Bell Canada	Cables present	Bell underground cable from Hillyard St. to Weigh Stn
Rogers	Clear	
Cogeco	Clear	
Zayo Canada Inc.	Clear	
CRAMM street lighting	Clear	
Air Liquide Canada pipelines	Clear	

4 2 HILLYARD STREET

4.1 INTRODUCTION / SITE DESCRIPTION

The 2 Hillyard Street site is accessed from Hillyard Street.

The site area is approximately 0.89 Ha of approximate dimensions 100m x 70m.

The area is fairly flat in elevation at between 79.80 m and 78.70m.

The site is currently used by Petrie Truck Supply Ltd for the storage for body parts for trucks and engineering repairs to vehicles.

Figure 4-1 Aerial site plan



4.2 STORMWATER DRAINAGE INFRASTRUCTURE

4.2.1 GENERAL WATERSHED DESCRIPTION

The site is mainly existing asphalt/concrete surfacing and is drained is overland to the north of the site.

4.2.2 WATERCOURSES / DITCHES / SWALES

No watercourses or ditches/swales are present on the site.

4.2.3 CATCHBASINS

No catchbasins were observed on the site.

4.2.4 SOAKWAYS

No known soakways are on the site.

4.2.5 STORM MANHOLES/SEWERS - PRIVATE AND PUBLIC

No known storm sewer system is on the site.

4.3 SANITARY DRAINAGE INFRASTRUCTURE

4.3.1 BUILDING DRAINAGE

There are three buildings on the site which may have sanitary building drainage. This system shall be disconnected from its discharge point at the site boundary.

4.3.2 MANHOLES / SEWERS – PRIVATE AND PUBLIC

The sanitary flows from the site may discharge into the public sewer in Hillyard Street. This connection should be located, disconnected and plugged at the site boundary.

4.3.3 SUMMARY

The existing sanitary discharge should be disconnected and plugged prior to the demolition works.

4.4 WATER SUPPLY / WATERMAINS

4.4.1 WATERMAINS – PRIVATE AND PUBLIC

There is a 150mm dia. watermain supply which enters the site from Hillyard Street into the building adjacent to the street. See Figure 4.2 Plan showing water supply location.

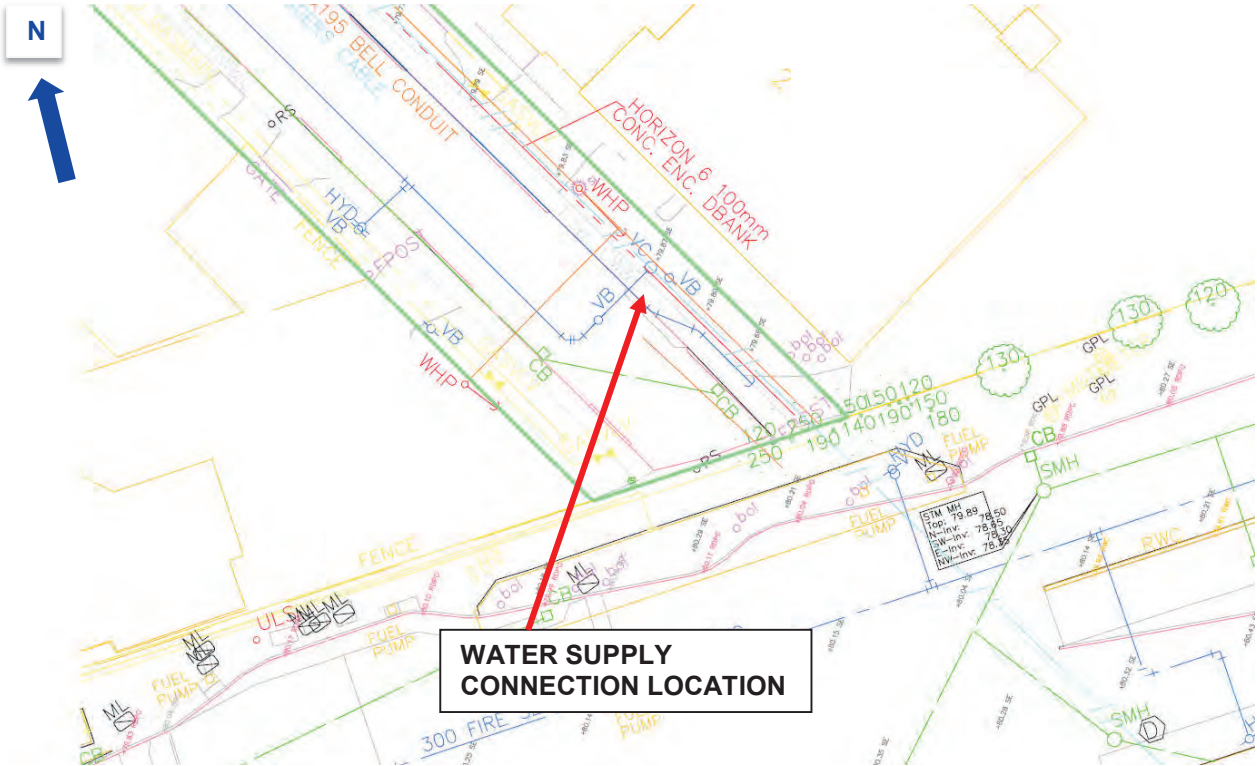
4.4.2 VALVE CHAMBERS

No valve chambers were observed on site; there is a valve chamber/box in Hillyard Street at the site boundary.

4.4.3 CURB STOPS

No curb stops are shown on the site drawings.

Figure 4-2 Plan showing water supply connection location



4.4.4 SUMMARY

The demolition works and future footprint of the building should not affect the existing underground watermain infrastructure currently adjacent to the site in Hillyard Street. Watermain on the site will need to be isolated and removed.

4.5 ELECTRICAL SUPPLIES

4.5.1 OVERHEAD POWER

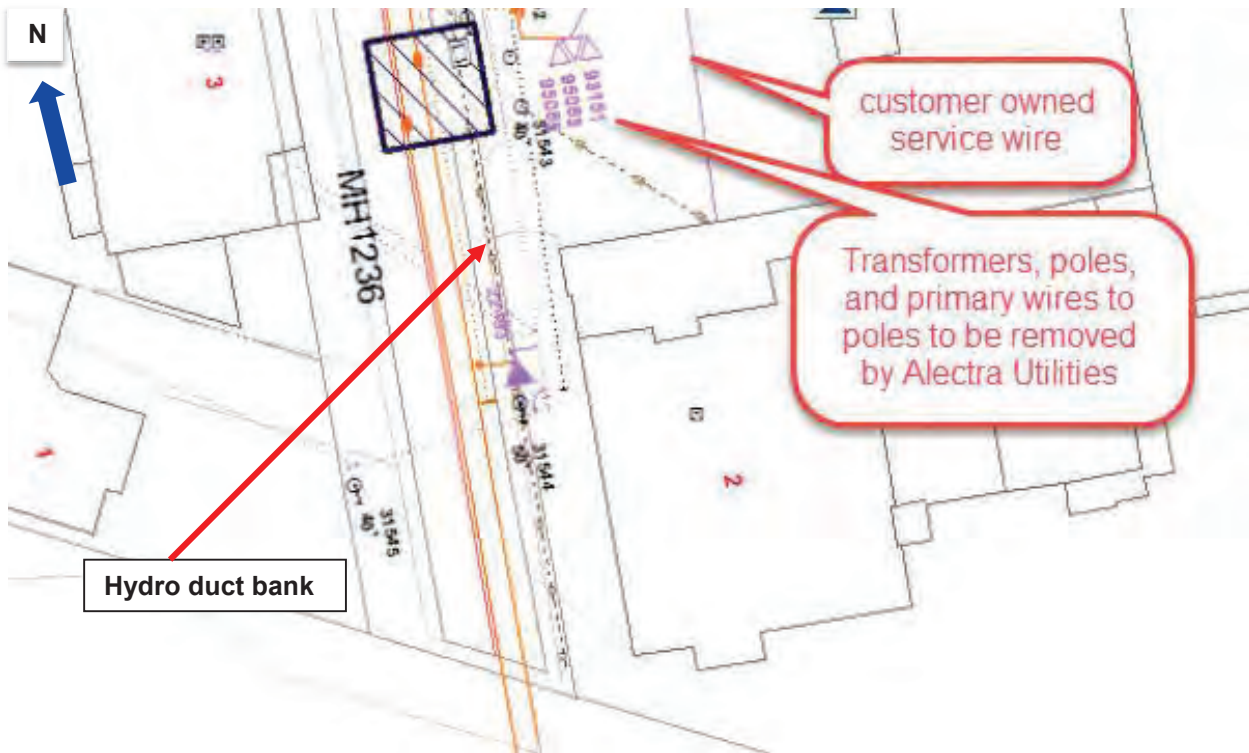
There is an overhead power supply into the 2 Hillyard Street site, see Figure 4-3 and Figure 4-4 from Horizon Utilities below. The overhead equipment and hydro poles shall be isolated and removed by Horizon Utilities.

Any works in/around the existing overhead cables and the underground duct bank adjacent to the site entrance shall be undertaken in accordance with Electrical Safety Authority (ESA) guidance and Ontario Electrical Safety Code (26th Edition/ 2015).

Figure 4-3 Photo of Overhead power supply and transformers



Figure 4-4 Horizon Utilities equipment plan at 2 Hillyard Street



4.5.2 UNDERGROUND POWER (HV AND LV)

No known underground Utility supplies were reported to be on the site by the Horizon Utilities.

4.5.3 TRANSFORMERS

There are hydro power supply/transformer located on the hydro poles on the site as shown in Figure 4-4.

4.5.4 LIGHTING CABLING (LV)

There were no visible lighting poles on the site, just lighting attached to buildings, no underground lighting or power cables were identified during the site visit.

4.5.5 CHAMBERS

No underground power chambers were observed on site.

4.6 GAS SUPPLIES

4.6.1 GAS – PRIVATE AND PUBLIC

There is a gas supply to the site from Hillyard Street, this supply will need to be isolated at the boundary by Union Gas prior to demolition work.

4.7 COMMUNICATIONS – BELL OR OTHERS

4.7.1 CABLES CONDUITS – PRIVATE AND PUBLIC

There are Bell and Rogers cable ducts/conduits under the sidewalk in Hillyard Street adjacent to the site.

There are no visible connections from these services into the 2 Hillyard Street site. Rogers and Bell should be contacted to disconnect any services that are supplied into the site prior to demolition.

4.7.2 OVERHEAD CABLES

No overhead cables were observed on the site.

4.7.3 CHAMBERS

No chambers were observed on the site.

Stormwater Management Brief

Stormwater from the existing site is discharged into the municipal storm sewers located under Brant Street, Birch Avenue and Hillyard Street. The total imperviousness within the Project limits is approximately 81% with an overall runoff coefficient of 0.78. There are currently no stormwater management measures on site for water quantity and/or quality controls.

Under proposed condition, the impervious cover on site will increase and as a result, stormwater management will be required. The impervious area on site will be increased to 96% and the overall run-off coefficient will be increased to 0.88. The proposed runoff from the site will be collected by a series catch basins and manholes, and conveyed via storm sewers to the existing 1450 x 1800 mm municipal storm sewer under Birch Avenue. The proposed Maintenance Storage Facility (MSF) site will be graded to contain surface runoff from the major drainage system (storm events in excess of the 5-year storm, up to and including the 100-year storm) within the site and direct it towards the municipal storm sewer system. Stormwater runoff in excess of the 100-year design storm event will be directed overland towards the Birch Avenue ROW.

Water Quantity Control

As a result of proposed work on site, water quantity control is required. Since proposed runoff is collected and conveyed by the storm sewer system and then ultimately discharged into the existing 1450 x 1800 mm municipal storm sewer along Birch Avenue, the 100-year post-development peak flow will be required to be controlled to the 5-year pre-development flow rate. For the entire site, approximately 1280 m³ of storage is required. The required storage will be provided on rooftop (Maintenance and Bus Storage buildings) and within the storm sewer system. A maximum ponding of 150mm is proposed on rooftop. An orifice plate will be installed in control MH 28 before discharging into the existing Birch Avenue storm sewer.

Water Quality Control

As stipulated in the City of Hamilton Comprehensive Development Guidelines and Financial Policies Manual (2018), quality control measures within the Urban Hamilton watershed (outletting to Hamilton Harbor) must achieve Level 1 Enhanced Protection through the long-term removal of 80% suspended solids. Water quality control is required for the proposed site as a result of the increase in impervious cover. Quality control is achieved through installation of an Oil/Grit Separator (OGS) unit at MH27 (just upstream of the location where the proposed storm sewer discharges into the existing Birch Avenue storm sewer) to ensure that runoff is treated prior to entering the receiving system. A Stormceptor[®] MAX or equivalent is specified for the OGS unit.

Summary

The proposed approach to stormwater management is as follows:

- A storm sewer network is proposed to collect and convey runoff from the site with its ultimate discharge into the existing Birch Avenue storm sewer.
- A combination of rooftop and pipe storage is proposed to meet the quantity control requirements for the MSF site.
- An orifice plate will be installed in the control MH 28 before discharging into the existing Birch Avenue storm sewer.

- One in-line OGS unit will be installed to treat stormwater prior to discharge into the receiving system and to meet the quality control requirements for the proposed site.



Draft

Stormwater Management Report

Hamilton Transit Maintenance Storage Facility



Prepared for City of Hamilton
by IBI Group

June 7, 2019

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1 Introduction

IBI Group has been retained by the City of Hamilton and Hamilton Transit to design a new state-of-the-art Maintenance Storage Facility (MSF) for the Hamilton Street Railway (HSR) in the Hamilton downtown core area. The MSF is expected to be approximately 492,000 square feet (ft²) in size and will primarily include a maintenance garage, wash stations, a paint booth and body shop, bus fueling stations (including diesel and compressed natural gas), administrative offices, reception, meeting rooms, training areas, staff parking, and storage for a fleet of approximately 200 HSR busses. The proposed 9.68 hectare industrial site is bordered by Brant Street, Birch Avenue, and Hillyard Street in the City of Hamilton. The site area is comprised of several properties, including 2 Hillyard Street, 10 Hillyard Street, 80 Brant Street, the former CP Rail tracks between Hillyard Street and Birch Avenue, and the fleet yard at 330 Wentworth Street North. **Figure 1**, presented in **APPENDIX A**, depicts the Project limits for the new MSF. In addition to the design and construction of the HSR MSF, the scope of work for the Project includes, but is not limited to:

- **Salt Dome:** The existing site currently houses a salt dome (approximately 5,000 ft²) and associated operations located at 330 Wentworth Street North. The location of the existing salt dome and associated operations is within the footprint of the proposed Project site and as such, the dome requires relocation. The scope of work includes demolition of the existing salt dome, and design and construction of a replacement salt dome, including associated programming and operations of similar capacity within the boundaries of the property. This will require staging of the demolition and new construction in order to permit full operations of the Salt Dome during the winter months (November - April), or construction of a temporary structure to allow for continuous operation in the event that new construction impacts salt dome operations over the winter months.
- **Staff Parking:** Staff parking within the property (the proposed site including existing operations at 330 Wentworth Street North) is currently beyond capacity. The scope of work for the Project includes investigating options to expand and create appropriate parking for City of Hamilton staff, as well as the design and construction of the approved parking option.
- **Traffic Flow:** Scope of work involves analyzing the overall site traffic flow with consideration that existing operations do not impede the proposed operations or flow of either the salt dome or the MSF. Design and implementation of the approved option is included within the Project scope.
- **Pedestrian Traffic Flow:** Scope of work involves analyzing the overall flow of pedestrian traffic on site with respect to existing, new and relocated facilities, and making recommendations for the safest access to and from staff parking and facilities. Design and construction of the approved option is included within the Project scope.
- **Vehicular Fueling Stations:** Scope of work involves analyzing the existing operations with respect to fueling of City vehicles (including HSR) and incorporating fuelling operations (gas, diesel, compressed natural gas, and propane) into the overall traffic flow for the site in order to permit efficient access by a variety of vehicles. Design and construction of fueling stations is included within the Project scope.

The City of Hamilton is undertaking the complete demolition of existing facilities (with the exception of the salt dome and associated operations) on the property in advance of construction of the HSR MSF.

2 Drainage Design Criteria

The proposed Project site is located within the Hamilton Conservation Authority (HCA) jurisdiction but falls outside of their Regulation limits. The site is also located within the Urban Hamilton watershed which outlets to Hamilton Harbour (approximately 650 m north of the site). The nearest watercourse is 280 m north of the Project boundary (discharging into Hamilton Harbour), however, there are no water bodies or areas of natural significance within the Project limits. HCA and City of Hamilton SWM guidelines govern the proposed drainage design. A list of applicable SWM guidelines and background documentation for the proposed MSF is summarized below.

- City of Hamilton Comprehensive Development Guidelines and Financial Policies Manual (CDGFPM) (2018)
- HCA Planning & Regulations Policies and Guidelines (PRPG) (October 2011)
- Ministry of the Environment, Conservation and Parks (MOECP) Stormwater Management Planning and Design Manual (SMPDM) (March 2003)
- Phase I Environmental Site Assessment – Future HSR Storage and Maintenance Facility (Phase I ESA) (May 11, 2017, prepared by WSP)
- Phase II Environmental Site Assessment – Future HSR Storage and Maintenance Facility (Phase II ESA) (May 11, 2017, prepared by WSP)

The following **Table 1** outlines the drainage design criteria for the proposed works at the HSR MSF.

Table 1: Drainage Design Criteria

DESIGN CRITERIA	REQUIREMENT	REFERENCE
Minor Drainage System	The minor storm drainage system will be sized to convey runoff from a 5-year storm event.	City of Hamilton CDGFPM G.2.1
Water Quantity Control	Discharge to Municipal STM Sewer: Control 100-year post-development peak flow to the 5-year pre-development flow rate.	City of Hamilton CDGFPM F.1.4 & G.2.1
Water Quality Control	Level 1 – Enhanced Protection: Long-term removal of 80% of suspended solids (required for areas outleting to Hamilton Harbour).	City of Hamilton CDGFPM G.5.3.3 & MOECP SMPDM 3.3.1.1
Water Balance Control	Minimum on-site retention of all run-off from a 5 mm rainfall event.	MOECP SMPDM 3.2
IDF Curve Data	For the hydrological analyses, rainfall intensity will be calculated using the City of Hamilton Mount Hope IDF curve parameters.	City of Hamilton CDGFPM M.7 Appendix G

3 Existing Drainage Conditions

3.1 Existing Land Use, Soils, Groundwater and Physiography

The existing land use within and adjacent to the Project boundary is predominantly industrial. The 330 Wentworth Street North portion of the site is currently in use as a fleet yard for municipal vehicles, the 2 Hillyard Street property is in use by TM Steel Fabrication, 10 Hillyard Street is occupied by Scrapmen Recycling, the 80 Brant Street property is in use by Brant Hill Recycling, and the former Toronto, Hamilton & Buffalo (TH&B) Railway tracks are overgrown and no longer in use. Under existing conditions, the southern half of the site is occupied by storage facilities and associated parking, and the northern half is a combination of existing buildings and vacant area covered with naturalized vegetation. Under proposed conditions, land use on site will remain industrial.

The site is located within the Iroquois Plain physiographic region of Southern Ontario which stretches along the eastern and the northern shores of western Lake Ontario. The Iroquois Plain was created approximately 12,500 years ago along the shores of glacial Lake Iroquois. It is comprised of outwash sand deposits with more recent stream deposits of sand, gravel, silt, and clay. The proposed site is also situated within the former Sherman Inlet. In the early twentieth century, fill was imported from off-site sources to fill in the Sherman Inlet and associated wetlands. The fill is variable in nature and comprised of sand, silt, clay, ash, cinders, gravel, glass, wood, cobbles, brick, metal debris, slag, concrete, and foundry sand. The results of the geotechnical investigation conducted on site revealed that the depth of fill in the boreholes ranged from 0.8 m to 9.1 m across the site, indicating approximately 10 m of fill present on site from the infilling. In the former wetland areas of the site, organic peat material is present beneath the fill. Native clayey silt to silty clay soil underlies the peat and fill. Bedrock mapping shows the overburden thickness to be approximately 30 m in the vicinity of Project boundary, with the underlying bedrock consisting of red shale of the Queenston Formation.

Monitoring wells installed within the proposed site boundary during previous subsurface investigations indicate that the shallow groundwater table lies between approximately 1 and 6 metres below ground surface within the fill. Shallow groundwater flow at the site is estimated to be highly influenced by the presence of fill materials associated with the infilling of the former Sherman Inlet. Groundwater flow patterns are inferred to follow the branches of the former Sherman Inlet, with overall flow directed to the north towards Hamilton Harbour. The hydraulic conductivity of the fill materials is estimated to be high, while the hydraulic conductivity of the underlying native clayey silt to silty clay soils is estimated to be low.

3.2 Existing Drainage Elements

The following drainage infrastructure currently exists within the Project limits and the right-of-ways (ROWs) adjacent to the Project boundary:

- 375 mm diameter storm sewer @ 0.95% slope along Brant Street flowing east.
- 1450 x 1800 mm storm sewer @ 0.14% slope along Birch Avenue flowing north.
- Storm sewer network in southeast quadrant of site which connects to the 1450 x 1800 mm Birch Avenue storm sewer.
- Storm sewer along Hillyard Street flowing north.
- Ditch running along the eastern boundary of site (parallel to Birch Avenue).

3.3 Existing Drainage Areas

The fleet yard area of the proposed site at 330 Wentworth Street North (located in the southeastern quadrant of the site) is relatively flat. From the yard area, the ground surface slopes in a southeasterly direction towards the hydro corridor and Birch Avenue. The vacant northeastern portion of the Project limits at 80 Brant Street is also relatively flat and slopes gently towards the east. The 2 Hillyard Street and 10 Hillyard Street properties in the northwestern portion of the site generally slope down to the east as well. The southwestern quadrant of the site slopes down to the west towards Hillyard Street. Overall, based on preliminary topographic information, the majority of the Project site slopes at approximately 0.6% towards the intersection of Brant Street and Birch Avenue.

For the existing site, drainage boundaries and associated outlets were established for stormwater runoff based upon review of existing topographic information and site servicing plans. **Figure 2**, presented in **APPENDIX B**, depicts the existing condition within the Project limits, including existing infrastructure and landscaping, drainage area discretization and the direction of overland flow routes. As illustrated in **Figure 2**, the existing site was sub-divided into three drainage catchment areas. C1 drains northeasterly towards the existing 375 mm diameter Brant Street storm sewer. C2 drains southeasterly into catch basins which discharge into an existing storm sewer network that ultimately outlets to the existing 1450 x 1800 mm Birch Avenue storm sewer. C3 drains southwesterly into a catch basin which discharges into an existing storm sewer along Hillyard Street. The total imperviousness within the Project limits is approximately 81% under existing conditions, with an overall runoff coefficient of 0.78. There are currently no stormwater management facilities on site for water quantity and/or quality control.

The following **Table 2** summarizes the existing catchment areas and peak flows generated for various design storms under existing conditions on site using the Rational Method for flow calculation and the City of Hamilton Mount Hope IDF curves (CDGFPM, 2018) for determination of rainfall intensity.

Table 2: Existing Condition Peak Flows

CATCHMENT ID	AREA (ha)	FLOW (m ³ /s)			
		2-YEAR	5-YEAR	10-YEAR	100-YEAR
C1	6.36	0.999	1.389	1.648	2.450
C2	2.42	0.405	0.564	0.669	0.995
C3	0.90	0.143	0.200	0.237	0.352
Total	9.68	1.548	2.152	2.554	3.797

4 Proposed Drainage Conditions

4.1 Proposed Drainage Areas

Based on the proposed development and construction of the new HSR MSF, the impervious cover on site will increase and as a result, stormwater management will be required. **Figure 3**, presented in **APPENDIX C**, depicts the proposed condition within the Project limits, including proposed infrastructure and landscaping, drainage area discretization and the direction of overland flow

routes. As illustrated in **Figure 3**, the proposed site was delineated as one drainage catchment area, labelled C1. An internal storm sewer network is proposed to collect and convey runoff from within the site and ultimately discharge it into the existing 1450 x 1800 mm storm sewer within the Birch Avenue ROW. The site will be graded to contain surface runoff (up to the 100-year design storm event) within the site and direct it towards the internal storm sewer system. Stormwater runoff in excess of the 100-year design storm event will be directed overland towards the Birch Avenue ROW. Under proposed conditions, the impervious area on site will be increased to 95% and the overall run-off coefficient will be increased to 0.87. The proposed site grading plan, site servicing plan, and roof plan are presented in **APPENDIX D**, **APPENDIX E**, and **APPENDIX F**, respectively.

The following **Table 3** summarizes the proposed catchment area and peak flows generated for various design storms under proposed conditions at the HSR MSF site using the same methodology as in the existing condition analysis.

Table 3: Proposed Condition Peak Flows

CATCHMENT ID	AREA (ha)	FLOW (m ³ /s)			
		2-YEAR	5-YEAR	10-YEAR	100-YEAR
C1	9.68	1.728	2.403	2.852	4.240

5 Design Features of Proposed SWM System

5.1 Minor and Major System Drainage

Runoff from the minor drainage system (storm events up to and including the 5-year storm) will be collected via catch basins and conveyed along the proposed internal storm sewer system towards the existing 1450 x 1800 mm Birch Avenue storm sewer where it will discharge into the receiving sewer system. The proposed MSF site will be graded to contain surface runoff from the major drainage system (storm events in excess of the 5-year storm, up to and including the 100-year storm) within the site and direct it towards the proposed internal storm sewer system. Stormwater runoff in excess of the 100-year design storm event will be directed overland towards the Birch Avenue ROW.

5.2 Low Impact Development (LID) Measures

A 1194.55 m² green roof is proposed within the MSF building footprint as an LID measure to reduce hard surfaces and decrease the rate of stormwater runoff leaving the proposed site.

5.3 Water Quantity Control

As a result of proposed work on site, water quantity control is required. Since proposed runoff is collected and conveyed by the internal storm sewer system and then ultimately discharged into the existing 1450 x 1800 mm storm sewer along Birch Avenue, the City of Hamilton CDGFPM stipulates that the 100-year post-development peak flow be controlled to the 5-year pre-development flow rate. Based on the quantity control criteria, on-site storage is required to discharge proposed runoff at the specified flow rate. For the entire site, 1280.08 m³ of storage is required. The proposed internal storm sewer system will provide some pipe storage, however, rooftop storage is required to accommodate the remaining storage volume. **Table 4** below

summarizes the quantity control requirements for the proposed site. Refer to **APPENDIX G** for water quantity control calculations and the determination of required storage volume for the HSR MSF site.

Table 4: Water Quantity Control Requirements

LOCATION	FLOW (m ³ /s)		REQUIRED STORAGE VOLUME (m ³)	PIPE STORAGE (m ³)	ROOFTOP STORAGE (m ³)
	PROPOSED 100-YEAR	CONTROLLED RELEASE RATE			
HSR MSF Site	4.240	2.152	1280.08	253.20	1112.00

5.4 Water Quality Control

As stipulated in the City of Hamilton CDGFPM, quality control measures within the Urban Hamilton watershed (outletting to Hamilton Harbor) must achieve Level 1 Enhanced Protection through the long-term removal of 80% suspended solids. Water quality control is required for the proposed site as a result of the increase in impervious cover. Quality control is achieved through installation of an Oil/Grit Separator (OGS) unit at MH27 (just upstream of the location where the proposed storm sewer discharges into the existing Birch Avenue storm sewer) to ensure that runoff is treated prior to entering the receiving system. A Stormceptor® MAX or equivalent is specified for the OGS unit. Refer to **APPENDIX H** for water quality control calculations and the determination of OGS size for the proposed site.

5.5 Water Balance Control

Based on the water balance control criteria outlined in the MOECP SMPDM, the proposed design for the HSR MSF site must provide, at a minimum, on-site retention of all runoff from the first 5 millimeters of each rainfall event through infiltration and/or evapotranspiration. However, since the proposed MSF site is discharging to a receiving municipal storm sewer, the minimum 5 mm water balance requirement (based on erosion and sediment control) is not applicable.

6 Erosion and Sediment Control

6.1 Introduction

If uncontrolled, the construction activity associated with the proposed development could result in increased rates of erosion and sedimentation within and adjacent to the site area and receiving drainage system. Erosion, for the purposes of this discussion, is described as the process whereby soil particles are detached from an exposed surface and transported by water, wind or some other agent. Sedimentation is defined as the deposition of (eroded) particles at a "downstream" point, typically a watercourse. The potential environmental impacts from increased erosion and sedimentation include: degradation of water quality, destruction of fisheries habitat, and increased flooding potential.

Erosion and sedimentation processes are typically accelerated due to construction activities. The Guidelines on Erosion and Sediment Control for Urban Construction Sites (May 1987, produced by MNR, MOE, MTC, MMA, MEA, ACAO and UDI) indicate that construction activities can increase erosion and sedimentation rates by 2 to 3 orders of magnitude over that expected from a natural forested area. Erosion and sediment control are therefore an integral and important

component in the design and construction of any project. An Erosion and Sediment Control Plan (ESCP) will be established in accordance with EPA Document No. EPA 832/R-92-005 requirements or local standards and code, whichever is more stringent.

6.2 Erosion and Sediment Control Measures

To minimize potential environmental impacts, the following erosion and sedimentation control practices will serve to guide the design and implementation phase of the ESCP:

- Limit size of disturbed area;
- Limit duration of soil exposure;
- Retain existing vegetation where feasible;
- Limit slope length and gradient of disturbed areas;
- Preserve overland sheet flow and micro-drainage (avoid concentrated channel flows);
- Break and redirect flows to lower gradients;
- Design and implement staged stripping;
- Prevent disturbance of previously stripped and stabilized parcels; and
- Stabilize stripped parcels with temporary vegetative controls.

Appropriate permanent/temporary erosion control measures to be considered in the design and implementation of the ESCP are:

Hydroseeding – One step application of seed and hydraulic slurry with adhesive binder (provides permanent stabilization for moderate to steep slopes).

Seed and Straw Mulch – Alternative two step application that will be applied to provide permanent/temporary vegetative stabilization of disturbed areas.

Mulch (straw, wood etc.) – Used to provide temporary erosion protection of exposed slopes during over-wintering and for disturbed areas inactive for greater than 45 days.

Sod – Utilized to provide quick permanent stabilization of disturbed areas. Applications include lateral ditches with gradients < 5% and slopes with steep to moderate grades.

Erosion Control Blanket – Applied as temporary/permanent erosion protection for slopes greater than 2:1 or as a ditch liner. For permanent applications, seed will be applied prior to installation.

Aggregate Stone – Appropriate material, such as riprap, will be used to provide immediate permanent erosion protection of lateral ditches > 5% gradient; and along chute/spillways. Geotextile fabric will be applied prior to placement of any aggregate material.

6.3 Sediment Control

The following elements should be included in the sediment control plan:

- Provision of a series of temporary interceptor/conveyor ditches to direct runoff to adjacent receiving systems;
- Provision of rock check dams within drainage swales/ditches;
- Placement of a series of silt control fencing for the interception of sheet flow drainage;
- Catch basin inlet protection by providing a filtering measures placed around existing catch basins to trap sediments; and
- Truck washing /mud mat is to be implemented and trucks are to be washed prior to leaving the site.

All sediment control measures should not be removed until final stabilization of the site. In addition, any accumulated sediment shall be removed, as part of a maintenance program, from all control measures when accumulation reaches 50% of the height or volume of the control structure.

Environmental Inspection Process – As a component of erosion and sedimentation control, environmental inspections of the construction site will be conducted. Environmental inspections will be conducted to assess the performance of erosion and sedimentation control measures and identify any required maintenance. The frequent inspections will also permit the identification of localized erosion and sedimentation control issues that require site specific attention.

Implementation and Recommendation – A 200 m standby supply of prefabricated silt fence barrier, in addition to silt fence requirements, shall be maintained at the construction site prior to commencement of grading operations and throughout the duration of the contract.

- Where interceptor ditches and/or subsurface drains are specified, they shall be constructed prior to commencement of any related cut or fill activities.
- Cut and fill earth slopes and ditches, shall be treated with the specified cover material (seed and mulch, seed and erosion control blanket, seed and sod, rip rap, etc.) within 45 days from the commencement of the cut, fill or ditching operation. Commencement of a cut, fill or ditching operation shall be considered to have occurred when the original stabilizing cover has been removed, including grubbing, or has been covered with fill material.
- Run-off from construction materials and any stockpiles shall be contained and discharged so as to prevent entry of sediment to watercourses.
- Where dewatering is required, the effluent shall be discharged in a manner that prevents the entry of sediments to watercourses, or scouring and erosion at the outlet.

7 Conclusion

This report has documented the existing drainage conditions at the HSR MSF site and described the proposed drainage and approach to stormwater management as a result of the development. The findings of this report are summarized as follows:

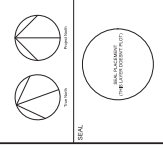
- An internal storm sewer system is proposed to collect and convey runoff from within the Project boundary and ultimately discharge it into the existing Birch Avenue storm sewer.
- A green roof is proposed within the MSF building footprint as an LID measure to reduce hard surfaces and decrease the rate of stormwater runoff leaving the proposed site.
- A combination of pipe and rooftop storage is proposed to meet the quantity control requirements for the MSF site.
- One in-line OGS unit will be installed to treat stormwater prior to discharge into the receiving system and to meet the quality control requirements for the proposed site.

APPENDIX A: KEY PLAN



CONTRACTOR:
 4100 Lakeshore Blvd. E. Suite 200
 Scarborough, Ontario M1S 2B9
 416-291-4400
CLIENT:
 Hamilton Transit & Streetcar
 100 King Street West
 Hamilton, Ontario L8P 2K5
 905-521-4100

NO.	DESCRIPTION	DATE
1	ISSUED FOR PERMIT	2019-05-14



PROJECT MANAGER:
 100 King Street West
 Hamilton, Ontario L8P 2K5
 905-521-4100

PROJECT:
 HAMILTON TRANSIT FACILITY
 100 BRANT ST
 HAMILTON, ONTARIO

PROJECT NO.:
 2019-05-14

DATE:
 2019-05-14

SCALE:
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DATE:
 2019-05-14

SHEET TITLE:
 SITE KEY PLAN

SHEET NUMBER: **FIGURE 1**
 SHEET OF: **X**

APPENDIX B: EXISTING DRAINAGE CONFIGURATION



Hamilton
 71 Main Street West
 Hamilton, Ontario, L8P 4Y5

CLIENT
 Hamilton Transit
 100-1015 Lakeshore Blvd. East
 Hamilton, Ontario, L8S 4L9

DATE
 2015.06.23

PROJECT
 HAMILTON TRANSIT FACILITY

PROJECT MANAGER
 JOHN W. BROWN

DESIGNED BY
 JOHN W. BROWN

DRAWN BY
 JOHN W. BROWN

CHECKED BY
 JOHN W. BROWN

SCALE
 1:500



PROJECT INFORMATION

PROJECT NO.
 100-1015 Lakeshore Blvd. East
 Hamilton, Ontario, L8S 4L9

PROJECT NAME
 HAMILTON TRANSIT FACILITY

PROJECT MANAGER
 JOHN W. BROWN

DESIGNED BY
 JOHN W. BROWN

DRAWN BY
 JOHN W. BROWN

CHECKED BY
 JOHN W. BROWN

SCALE
 1:500

CLIENT
 Hamilton Transit
 100-1015 Lakeshore Blvd. East
 Hamilton, Ontario, L8S 4L9

DATE
 2015.06.23

PROJECT
 HAMILTON TRANSIT FACILITY

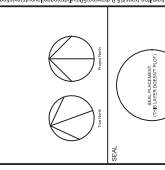
PROJECT MANAGER
 JOHN W. BROWN

DESIGNED BY
 JOHN W. BROWN

DRAWN BY
 JOHN W. BROWN

CHECKED BY
 JOHN W. BROWN

SCALE
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PROJECT INFORMATION

PROJECT NO.
 100-1015 Lakeshore Blvd. East
 Hamilton, Ontario, L8S 4L9

PROJECT NAME
 HAMILTON TRANSIT FACILITY

PROJECT MANAGER
 JOHN W. BROWN

DESIGNED BY
 JOHN W. BROWN

DRAWN BY
 JOHN W. BROWN

CHECKED BY
 JOHN W. BROWN

SCALE
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CLIENT
 Hamilton Transit
 100-1015 Lakeshore Blvd. East
 Hamilton, Ontario, L8S 4L9

DATE
 2015.06.23

PROJECT
 HAMILTON TRANSIT FACILITY

PROJECT MANAGER
 JOHN W. BROWN

DESIGNED BY
 JOHN W. BROWN

DRAWN BY
 JOHN W. BROWN

CHECKED BY
 JOHN W. BROWN

SCALE
 1:500

FIGURE 2

EXISTING CONDITION

SHEET NUMBER
 100-1015 Lakeshore Blvd. East
 Hamilton, Ontario, L8S 4L9

SCALE 1:500

0m 5m 10m

CLIENT
 Hamilton Transit
 100-1015 Lakeshore Blvd. East
 Hamilton, Ontario, L8S 4L9

DATE
 2015.06.23

PROJECT
 HAMILTON TRANSIT FACILITY

PROJECT MANAGER
 JOHN W. BROWN

DESIGNED BY
 JOHN W. BROWN

DRAWN BY
 JOHN W. BROWN

CHECKED BY
 JOHN W. BROWN

SCALE
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FIGURE 2

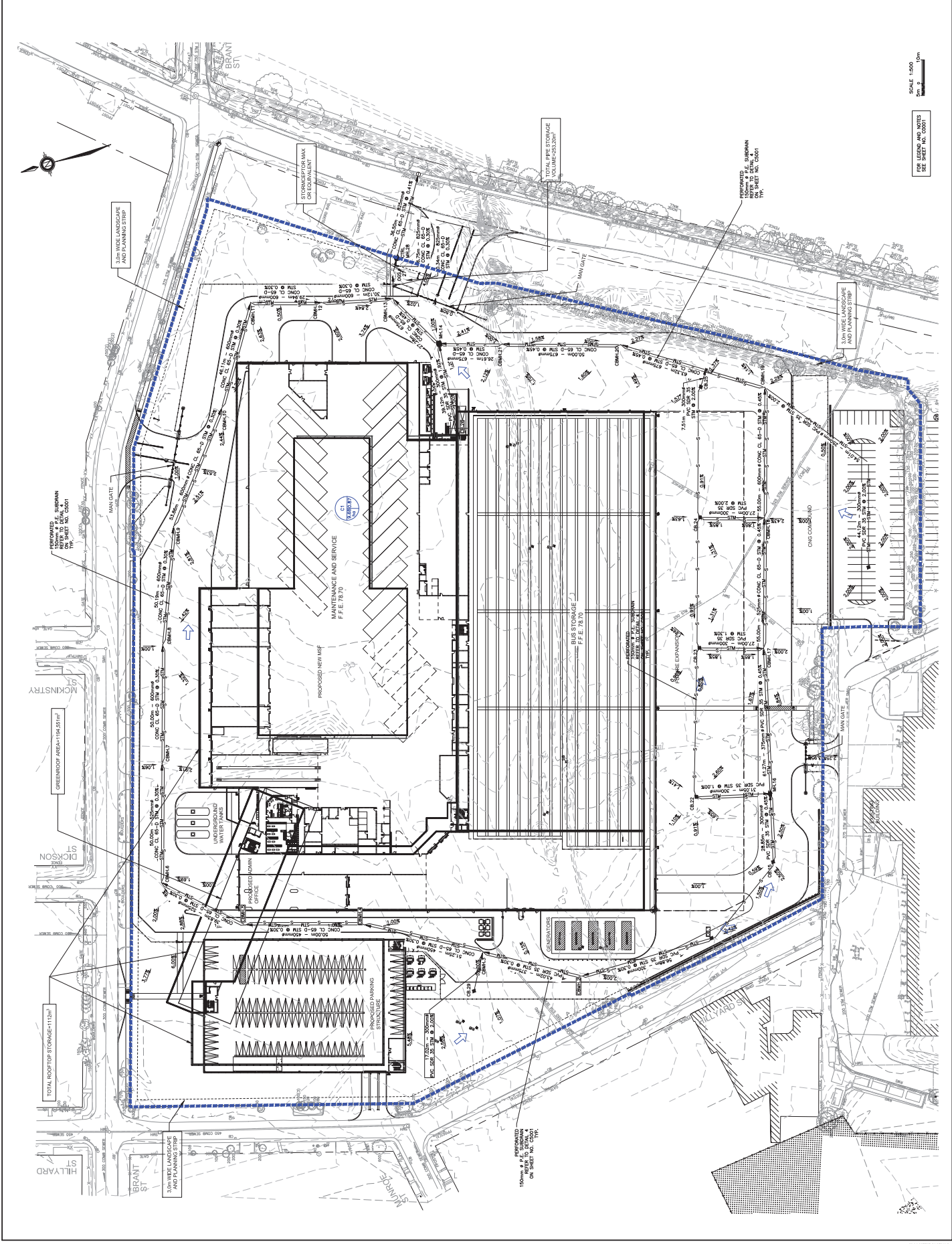
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APPENDIX C: PROPOSED DRAINAGE CONFIGURATION



APPENDIX D: SITE GRADING PLAN

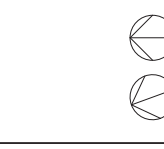


71 Main Street West
Hamilton, Ontario L8P 4V5

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CONSULTANTS

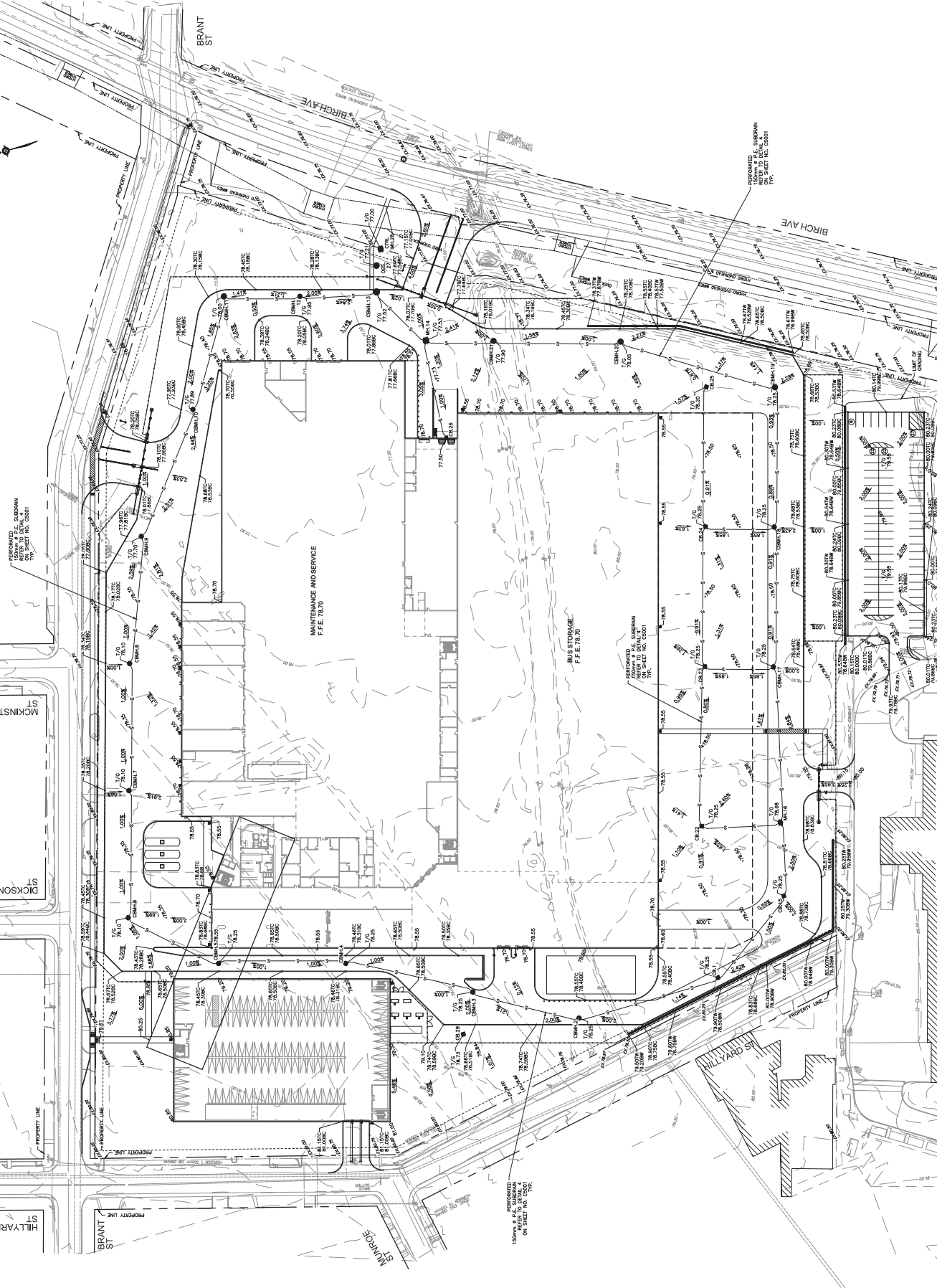


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PROJECT NO. 10-1075-10-01-0000
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PROJECT MANAGER: HAMILTON, ONTARIO
DATE: 2012.03.01
DRAWN BY: J. B. BISHOP
CHECKED BY: J. B. BISHOP
DATE: 2012.03.01
PROJECT: HAMILTON TRANSIT FACILITY

HAMILTON TRANSIT FACILITY
HAMILTON, ONTARIO
BRAND ST
PROJECT NO. 10-1075-10-01-0000
PROJECT MANAGER: HAMILTON, ONTARIO
DATE: 2012.03.01
DRAWN BY: J. B. BISHOP
CHECKED BY: J. B. BISHOP
DATE: 2012.03.01
PROJECT: HAMILTON TRANSIT FACILITY

SHEET NUMBER: C1001
SCALE: 1:500
DATE: 2012.03.01

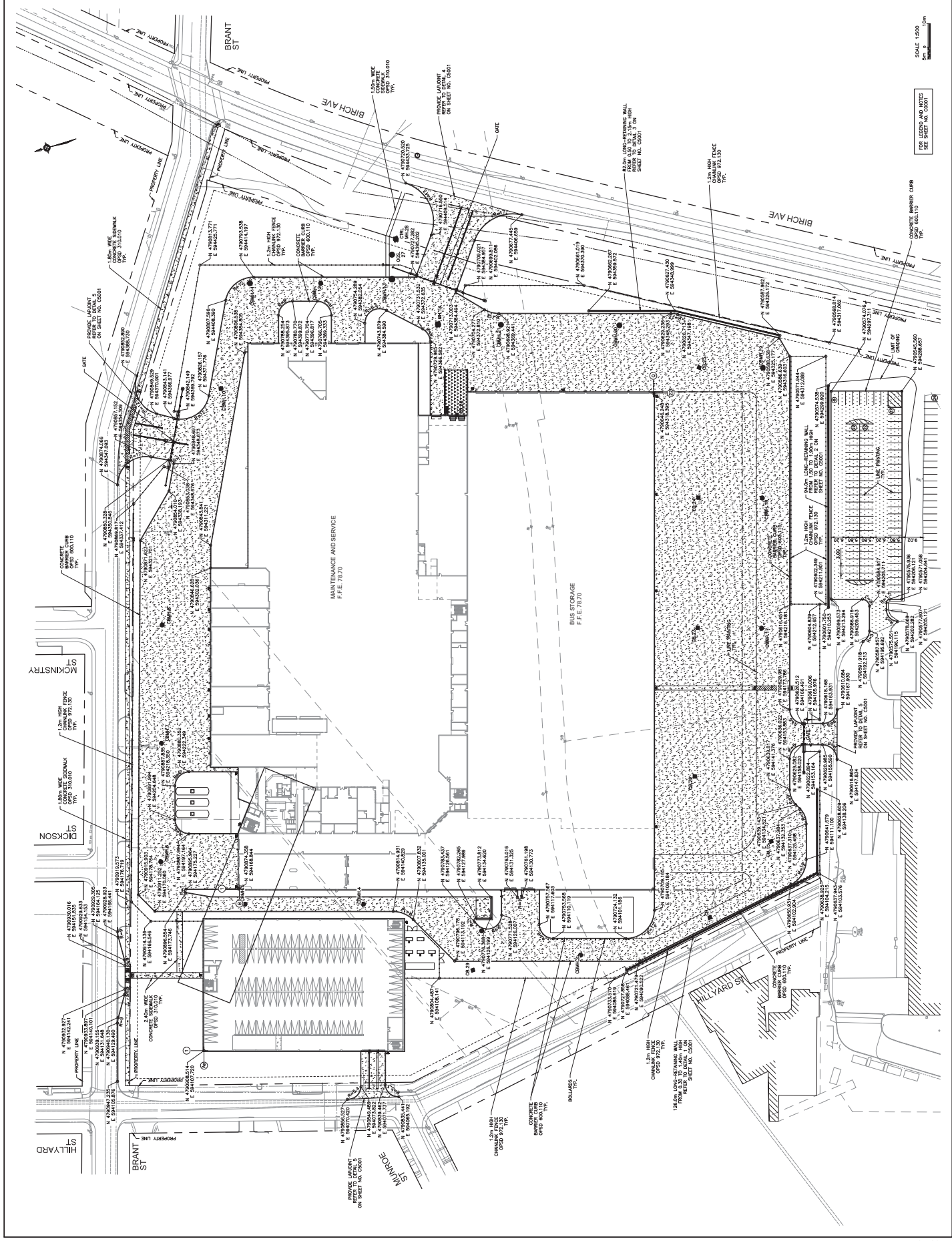


FOR LEGEND AND NOTES SEE SHEET NO. C1001

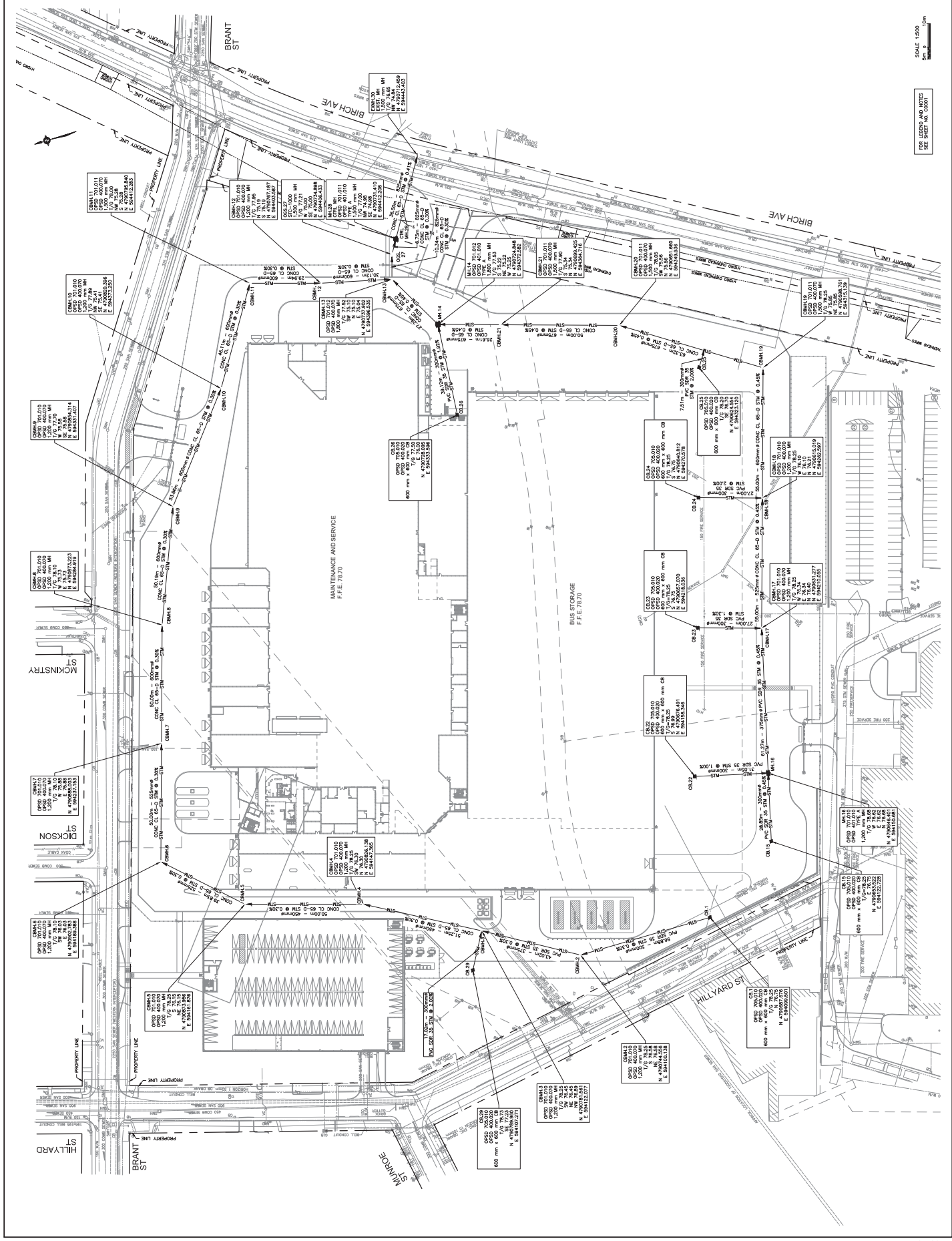
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2018.03.01	ISSUE FOR PERMIT	...



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CLIENT	TRANSIT CANADA
PROJECT MANAGER	...
DESIGNER	...
DATE	...
SCALE	1:500
SHEET NUMBER	C1002
DATE	A



APPENDIX E: SITE SERVICING PLAN



SCALE: 1:500
DATE: 2015-01-27

FOR LEGEND AND NOTES
SEE SHEET C2001

APPENDIX F: ROOF PLAN

COMPONENT: CONSTRUCTION CONTRACT FOR THE HAMILTON TRANSIT FACILITY
 HAMILTON TRANSIT FACILITY
 HAMILTON, ONTARIO

SCALE: 1/4" = 1'-0" (AS SHOWN)
 1/8" = 1'-0" (AS SHOWN)
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DATE: 14.05.2018

NO.: 001

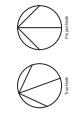
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DATE: 14.05.2018

NO.: 001

BY: [Signature]

CONTRACT NO. 1018



PROJECT NO: 1018

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PROJECT LOCATION: HAMILTON, ONTARIO

PROJECT OWNER: HAMILTON TRANSIT

PROJECT MANAGER: [Name]

DESIGNER: [Name]

DATE: [Date]

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PROJECT NAME: HAMILTON TRANSIT FACILITY

PROJECT LOCATION: HAMILTON, ONTARIO

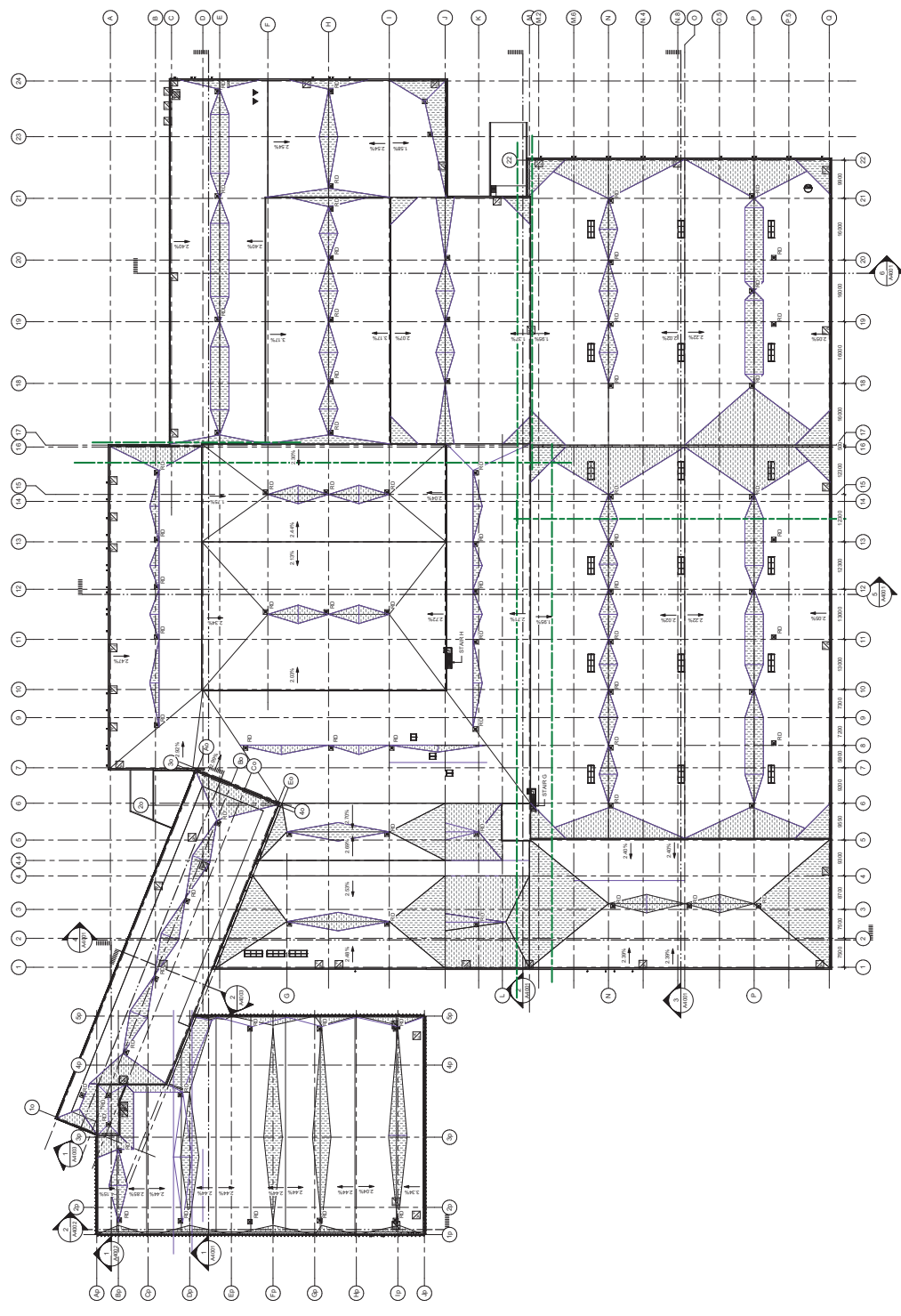
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PROJECT MANAGER: [Name]

DESIGNER: [Name]

DATE: [Date]

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1. OVERALL ROOF PLAN
 (SEE 1'-0")

APPENDIX G: WATER QUANTITY CONTROL CALCULATIONS

IDF Curve Data

Hamilton (min) 10

Return Period	A	B	C	i (mm/hr)
City of Hamilton				
2	646.0	6.0	0.781	74.10
5	1049.5	8.0	0.803	103.04
10	1343.7	9.0	0.814	122.29
25	1719.5	10.0	0.823	146.10
50	1954.8	10.0	0.826	164.61
100	2317.4	11.0	0.836	181.81

Storage Calculation for 100-Year Storm

Location/Station: Hamilton Transit MSF
 Proposed Catchment ID: C1

Post-Development: C1 100-year storm Q_{100} (m³/s) = 4.240
Pre-Development: C1+C2+C3 5-year storm Q_5 (m³/s) = 2.152

Q_{control} (m³/s) = 2.152

Inflow Parameters (Post-Development)		
Area =	9.68	ha
R.C =	0.87	

IDF Curve Data (City of Mississauga 100-Year)	A =	2317.4
	B =	11.0
	C =	0.836

Time (min)	Intensity (mm/hr)	Peak Flow (m ³ /s)	Inflow Volume (m ³)	Release Rate (m ³ /s)	Outflow Volume (m ³)	Storage (m ³)
10.00	181.81	4.240	2544.26	2.152	1291.20	1253.06
11.00	174.88	4.079	2691.93	2.152	1420.32	1271.61
12.00	168.50	3.930	2829.52	2.152	1549.44	1280.08
13.00	162.61	3.793	2958.17	2.152	1678.56	1279.61
14.00	157.15	3.665	3078.83	2.152	1807.68	1271.15
15.00	152.08	3.547	3192.34	2.152	1936.80	1255.54
16.00	147.36	3.437	3299.41	2.152	2065.92	1233.49
17.00	142.95	3.334	3400.64	2.152	2195.04	1205.60
18.00	138.81	3.238	3496.58	2.152	2324.16	1172.42
19.00	134.94	3.147	3587.70	2.152	2453.28	1134.42
Storage required to control 100-year post-development peak flow to 5-year pre-development flow rate (m³):						1280.08

Hamilton Transit MSF Stormwater Management Summary

Location/Station	Drainage Catchment ID	Pre-Development Condition																					
		Area (ha)						% Impervious	Runoff Coefficient (-)		Time of Concentration (min)	Rainfall Intensity (mm/hr)						Flow (m ³ /s)					
		Hard Surface	Vegetation	Permeable Pavement	Gravel	Compacted Gravel	Total		Actual C	⁽¹⁾ C Used in Flow Calculation		i ₂	i ₅	i ₁₀	i ₂₅	i ₅₀	i ₁₀₀	Q ₂	Q ₅	Q ₁₀	Q ₂₅	Q ₅₀	Q ₁₀₀
Existing	C1	5.0199	1.3366	0.0000	0.0000	0.0000	6.36	78.97	0.76	0.76	10.00	74.10	103.04	122.29	146.10	164.61	181.81	0.999	1.389	1.648	1.969	2.219	2.450
	C2	2.0974	0.3276	0.0000	0.0000	0.0000	2.42	86.49	0.81	0.81	10.00	74.10	103.04	122.29	146.10	164.61	181.81	0.405	0.564	0.669	0.799	0.901	0.995
	C3	0.7265	0.1733	0.0000	0.0000	0.0000	0.90	80.74	0.77	0.77	10.00	74.10	103.04	122.29	146.10	164.61	181.81	0.143	0.200	0.237	0.283	0.319	0.352
	Total	7.8438	1.8374	0.0000	0.0000	0.0000	9.68	81.02	0.78	-	-	-	-	-	-	-	-	1.548	2.152	2.554	3.051	3.438	3.797

Hamilton Transit MSF Stormwater Management Summary

Location/Station	Drainage Catchment ID	Post-Development Condition																Required Storage Volume (m ³)	Provided Storage Volume (m ³)	Adequate Storage Provided?									
		Area (ha)				Runoff Coefficient ()	Time of Concentration (min)	Rainfall Intensity (mm/hr)						Flow (m ³ /s)															
		Hard Surface	Vegetation	Permeable Pavement	Gravel			Compacted Gravel	Total	% Impervious	i ₂	i ₅	i ₁₀	i ₁₅	i ₂₀	i ₃₀	i ₆₀				i ₁₀₀	Q ₂	Q ₅	Q ₁₀	Q ₁₅	Q ₂₀	Q ₃₀	Q ₆₀	Q ₁₀₀
Hamilton Transit MSF	Proposed	9.1938	0.4874	0.0000	0.0000	0.0000	9.68	94.97	0.87	10.00	74.10	103.04	122.29	146.10	164.61	181.81	1.728	2.403	2.852	3.408	3.839	4.240	4.240	4.240	4.240	4.240	1280.08	1365.20	YES
	C1	9.1938	0.4874	0.0000	0.0000	0.0000	9.68	94.97	0.87	10.00	74.10	103.04	122.29	146.10	164.61	181.81	1.728	2.403	2.852	3.408	3.839	4.240	4.240	4.240	4.240	4.240	1280.08	1365.20	YES
	Total	9.1938	0.4874	0.0000	0.0000	0.0000	9.68	94.97	0.87	10.00	74.10	103.04	122.29	146.10	164.61	181.81	1.728	2.403	2.852	3.408	3.839	4.240	4.240	4.240	4.240	4.240	1280.08	1365.20	-

APPENDIX H: WATER QUALITY CONTROL CALCULATIONS

Detailed Stormceptor Sizing Report – Hamilton Transit MSF

Project Information & Location			
Project Name	Hamilton Transit MSF	Project Number	115096
City	Hamilton	State/ Province	Ontario
Country	Canada	Date	5/3/2019
Designer Information		EOR Information (optional)	
Name	Kaitlyn Hauck	Name	
Company	IBI Group	Company	
Phone #	416-679-1930	Phone #	
Email	katie.hauck@ibigroup.com	Email	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	Hamilton Transit MSF
Recommended Stormceptor Model	StormceptorMAX
Target TSS Removal (%)	80.0
TSS Removal (%) Provided	-
PSD	Fine Distribution
Rainfall Station	HAMILTON A

The recommended Stormceptor model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	% TSS Removal Provided
STC 300	32
STC 750	49
STC 1000	50
STC 1500	50
STC 2000	57
STC 3000	59
STC 4000	65
STC 5000	66
STC 6000	70
STC 9000	76
STC 10000	75
STC 14000	79
StormceptorMAX	Custom

Stormceptor

The Stormceptor oil and sediment separator is sized to treat stormwater runoff by removing pollutants through gravity separation and flotation. Stormceptor’s patented design generates positive TSS removal for each rainfall event, including large storms. Significant levels of pollutants such as heavy metals, free oils and nutrients are prevented from entering natural water resources and the re-suspension of previously captured sediment (scour) does not occur. Stormceptor provides a high level of TSS removal for small frequent storm events that represent the majority of annual rainfall volume and pollutant load. Positive treatment continues for large infrequent events, however, such events have little impact on the average annual TSS removal as they represent a small percentage of the total runoff volume and pollutant load.

Design Methodology

Stormceptor is sized using PCSWMM for Stormceptor, a continuous simulation model based on US EPA SWMM. The program calculates hydrology using local historical rainfall data and specified site parameters. With US EPA SWMM’s precision, every Stormceptor unit is designed to achieve a defined water quality objective. The TSS removal data presented follows US EPA guidelines to reduce the average annual TSS load. The Stormceptor’s unit process for TSS removal is settling. The settling model calculates TSS removal by analyzing:

- Site parameters
- Continuous historical rainfall data, including duration, distribution, peaks & inter-event dry periods
- Particle size distribution, and associated settling velocities (Stokes Law, corrected for drag)
- TSS load
- Detention time of the system

Hydrology Analysis

PCSWMM for Stormceptor calculates annual hydrology with the US EPA SWMM and local continuous historical rainfall data. Performance calculations of Stormceptor are based on the average annual removal of TSS for the selected site parameters. The Stormceptor is engineered to capture sediment particles by treating the required average annual runoff volume, ensuring positive removal efficiency is maintained during each rainfall event, and preventing negative removal efficiency (scour). Smaller recurring storms account for the majority of rainfall events and average annual runoff volume, as observed in the historical rainfall data analyses presented in this section.

Rainfall Station

State/Province	Ontario	Total Number of Rainfall Events	3863
Rainfall Station Name	HAMILTON A	Total Rainfall (mm)	20907.2
Station ID #	3194	Average Annual Rainfall (mm)	614.9
Coordinates	43°10'N, 79°56'W	Total Evaporation (mm)	1960.8
Elevation (ft)	77	Total Infiltration (mm)	1496.0
Years of Rainfall Data	34	Total Rainfall that is Runoff (mm)	17450.4

Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed.
- For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

Drainage Area	
Total Area (ha)	5.11
Imperviousness %	92.8

Up Stream Storage	
Storage (ha-m)	Discharge (cms)
0.000	0.000

Water Quality Objective	
TSS Removal (%)	80.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (L)	
Peak Conveyed Flow Rate (L/s)	
Water Quality Flow Rate (L/s)	

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cms)	

Design Details	
Stormceptor Inlet Invert Elev (m)	
Stormceptor Outlet Invert Elev (m)	
Stormceptor Rim Elev (m)	
Normal Water Level Elevation (m)	
Pipe Diameter (mm)	
Pipe Material	
Multiple Inlets (Y/N)	No
Grate Inlet (Y/N)	No

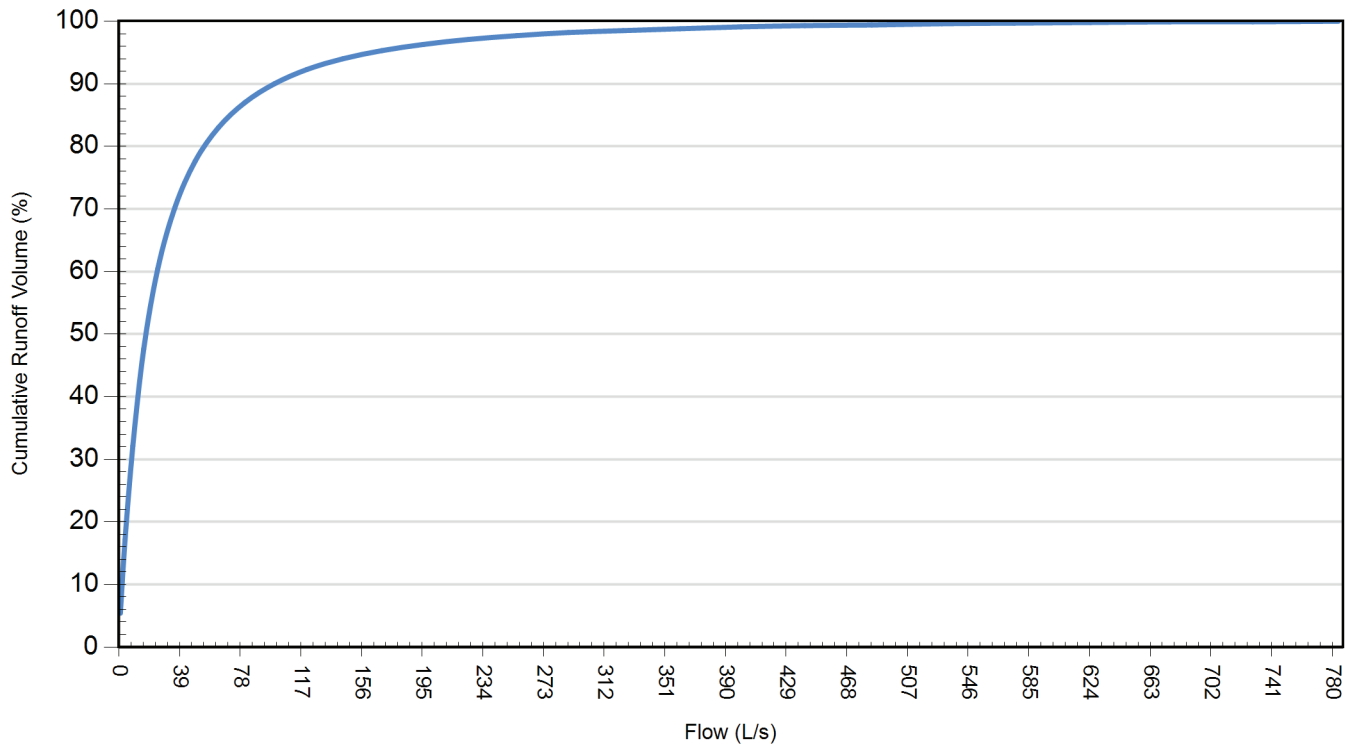
Particle Size Distribution (PSD)		
Removing the smallest fraction of particulates from runoff ensures the majority of pollutants, such as metals, hydrocarbons and nutrients are captured. The table below identifies the Particle Size Distribution (PSD) that was selected to define TSS removal for the Stormceptor design.		
Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Site Name		Hamilton Transit MSF	
Site Details			
Drainage Area		Infiltration Parameters	
Total Area (ha)	5.11	Horton's equation is used to estimate infiltration	
Imperviousness %	92.8	Max. Infiltration Rate (mm/hr)	61.98
Surface Characteristics		Min. Infiltration Rate (mm/hr)	10.16
Width (m)	452.00	Decay Rate (1/sec)	0.00055
Slope %	2	Regeneration Rate (1/sec)	0.01
Impervious Depression Storage (mm)	0.508	Evaporation	
Pervious Depression Storage (mm)	5.08	Daily Evaporation Rate (mm/day)	2.54
Impervious Manning's n	0.015	Dry Weather Flow	
Pervious Manning's n	0.25	Dry Weather Flow (lps)	0
Maintenance Frequency		Winter Months	
Maintenance Frequency (months) >	12	Winter Infiltration	0
TSS Loading Parameters			
TSS Loading Function			
Buildup/Wash-off Parameters		TSS Availability Parameters	
Target Event Mean Conc. (EMC) mg/L		Availability Constant A	
Exponential Buildup Power		Availability Factor B	
Exponential Washoff Exponent		Availability Exponent C	
		Min. Particle Size Affected by Availability (micron)	

Cumulative Runoff Volume by Runoff Rate			
Runoff Rate (L/s)	Runoff Volume (m³)	Volume Over (m³)	Cumulative Runoff Volume (%)
1	48442	846093	5.4
4	152899	741667	17.1
9	287557	607125	32.1
16	425332	469213	47.6
25	539876	354499	60.4
36	628080	266616	70.2
49	694210	200288	77.6
64	742495	151971	83.0
81	778335	116146	87.0
100	804778	89716	90.0
121	825156	69278	92.3
144	840635	53816	94.0
169	852247	42190	95.3
196	861266	33189	96.3
225	868241	26204	97.1
256	873582	20862	97.7
289	877934	16511	98.2
324	881431	13016	98.5
361	884086	10357	98.8
400	886207	8236	99.1
441	887980	6463	99.3
484	889468	4977	99.4
529	890631	3813	99.6
576	891677	2766	99.7
625	892604	1839	99.8
676	893277	1166	99.9
729	893763	680	99.9
784	894101	342	100.0

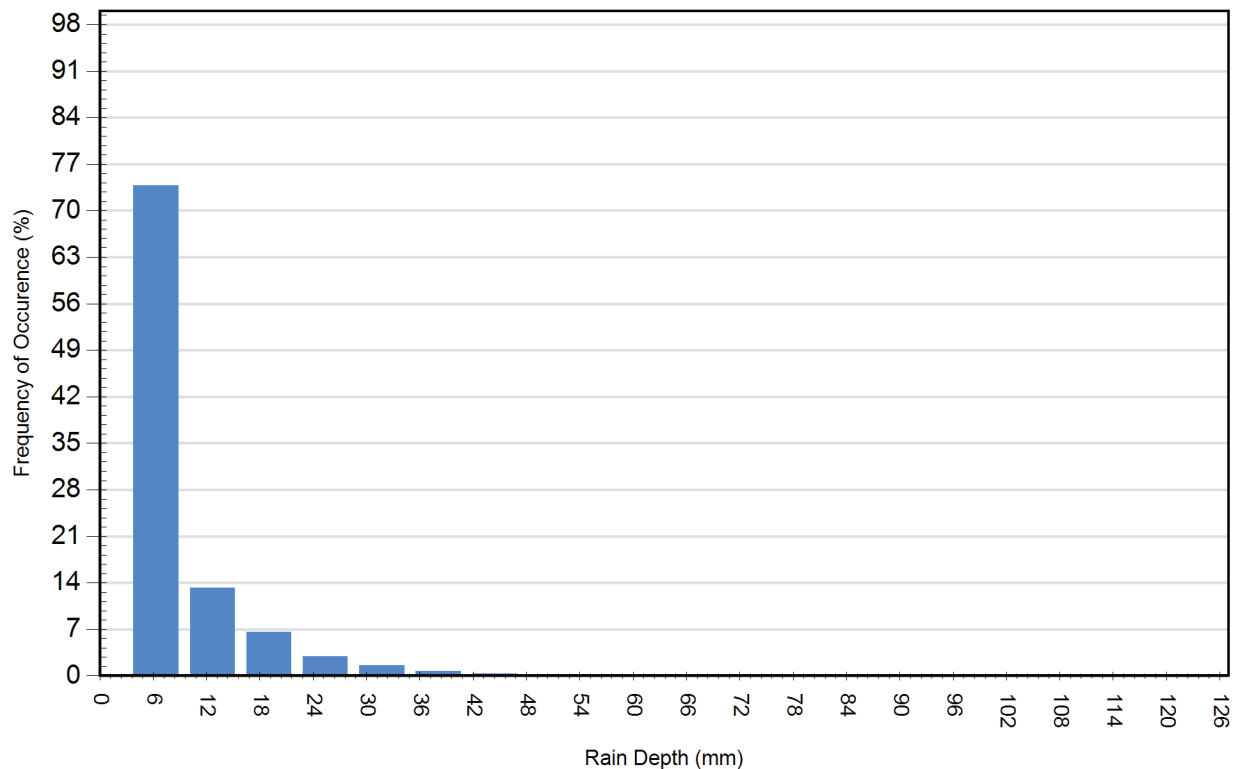
Cumulative Runoff Volume by Runoff Rate

For area: 5.11(ha), imperviousness: 92.8%, rainfall station: HAMILTON A



Rainfall Event Analysis				
Rainfall Depth (mm)	No. of Events	Percentage of Total Events (%)	Total Volume (mm)	Percentage of Annual Volume (%)
6.35	2852	73.8	4781	22.9
12.70	515	13.3	4749	22.7
19.05	254	6.6	3943	18.9
25.40	112	2.9	2471	11.8
31.75	61	1.6	1736	8.3
38.10	28	0.7	985	4.7
44.45	11	0.3	461	2.2
50.80	9	0.2	417	2.0
57.15	9	0.2	493	2.4
63.50	8	0.2	489	2.3
69.85	0	0.0	0	0.0
76.20	0	0.0	0	0.0
82.55	0	0.0	0	0.0
88.90	0	0.0	0	0.0
95.25	2	0.1	181	0.9
101.60	1	0.0	97	0.5
107.95	1	0.0	106	0.5
114.30	0	0.0	0	0.0
120.65	0	0.0	0	0.0

Frequency of Occurrence by Rainfall Depths



For Stormceptor Specifications and Drawings Please Visit:
<http://www.imbriumsystems.com/technical-specifications>