



**Soil Engineers Ltd.**

**GEOTECHNICAL • ENVIRONMENTAL • BUILDING SCIENCE**

**100 NUGGET AVENUE, TORONTO, ONTARIO M1S 3A7 • TEL: (416)754-8515 • FAX: (416)754-8516**

<b>BARRIE</b>	<b>MISSISSAUGA</b>	<b>BOWMANVILLE</b>	<b>NEWMARKET</b>	<b>GRAVENHURST</b>	<b>PETERBOROUGH</b>	<b>HAMILTON</b>
Tel: (705) 721-7863	Tel: (905) 542-7605	Tel: (905) 623-8333	Tel: (905) 853-0647	Tel: (705) 684-4242	Tel: (705) 748-0576	Tel: (905) 777-7956
Fax: (705) 721-7864	Fax: (905) 542-2769	Fax: (905) 623-4630	Fax: (905) 853-5464	Fax: (705) 684-8322	Fax: (905) 623-4630	Fax: (905) 542-2769

**A REPORT TO  
MILLFORD DEVELOPMENT LIMITED**

**LIMITED PHASE II ENVIRONMENTAL SITE ASSESSMENT**

**PROPOSED RESIDENTIAL DEVELOPMENT**

**55 EAGLE STREET**

**TOWN OF NEWMARKET**

**Reference No. 0907-E017**

**December 18, 2009**

**DISTRIBUTION**

3 Copies - Millford Development Limited  
1 Copies - Soil Engineers Ltd. (Newmarket)



## EXECUTIVE SUMMARY

Soil Engineers Ltd. has been retained to conduct a Limited Phase II Environmental Site Assessment (ESA) at a parcel of land located north of Eagle Street and east of Yonge Street in the Town of Newmarket.

The purpose of the investigation was to establish a chemical profile of the current subsurface soil and groundwater conditions at the subject property based on the recommendations given in our Phase I ESA.

The field work was performed at selected locations on the subject site; soil and groundwater samples were collected from the site and submitted for chemical analyses in accordance with the "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" (EPA), March 9, 2004.

The results of the analyses of the soil indicate concentrations of the tested parameters fall within Table 1, full depth generic, potable groundwater site condition standards for non-agricultural property uses under Part XV.1 of the EPA.

The results of the analyses of the groundwater indicate concentrations of all tested parameters fall within Table 1, generic potable groundwater site condition standards under Part XV.1 of the EPA, with the exception of samples found to exceed the guideline standards for Metals and Inorganics in samples from MW1 and MW2.



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## 1.0 BACKGROUND

Soil Engineers Ltd. previously completed a Phase I Environmental Site Assessment (ESA) Report Reference No. 0907-E017, dated July 31, 2009, for the subject site.

The site is shown on the Site Location Plan, Drawing No. 1.

The Phase I ESA has revealed the following items of environmental concern attendant to the subject property that require further investigation:

- Possible fill of unknown quality in the envelope of the former building located on the subject site.
- Fill materials of unknown quality found in our previous geotechnical investigation on the subject site.
- Gas stations are located within 300 m of the subject site.
- Automotive repair facilities are located within 500 m of the subject site.

In order to determine the environmental liability associated with the subject site as a result of the above-mentioned concerns, a Phase II ESA was recommended for the property.

In accordance with our proposal dated September 2, 2009, and approved on September 4, 2009 by Ms. Enza Orsi of Millford Development Limited, we have completed a Limited Phase II investigation and herein present our findings and recommendations.

The purpose of this investigation was to establish a chemical profile of the current subsurface soil and groundwater conditions at the subject property with regard to the previously noted concerns. This study was conducted in general conformance with the CSA Standard Z769-00.



## 2.0 TESTING PROGRAMME

The Limited Phase II ESA consisted of drilling boreholes, digging test pits, installing groundwater monitoring wells, digging test pits, retrieving soil and groundwater samples, and chemical analyses of samples from selected locations on the site; the assessment was conducted based on the identified potential sources of environmental concern, and with consideration to the accessibility of the testing equipment.

The investigation consisted of 2 boreholes and 2 test pits which were utilized for the environmental assessment. Monitoring wells were installed in both boreholes.

The rationale for the selected borehole locations is given below:

- Borehole 1 (with monitoring well) – located at the southwestern sector of the property to address the past and present use of the neighbouring properties for gasoline service stations. The soil and groundwater samples retrieved from this area were tested for General Metals and Inorganic parameters, Benzene, Toluene, Ethylbenzene and Xylenes (BTEX), and Petroleum Hydrocarbon parameters, F1 to F4.
- Borehole 2 (with monitoring well) – located at the southeastern sector of the property to address the past and present use of the neighbouring properties for automotive repair facilities. The soil and groundwater samples retrieved at these areas were tested for General Metals and Inorganic parameters, BTEX and Petroleum Hydrocarbon parameters, F1 to F4.



- Test Pits 1 and 2 – located in the south-central sector of the subject site. Test Pits 1 and 2 were conducted to address the possible fill of unknown quality in the envelope of the former building located on the subject site and the fill material found in the previous geotechnical investigation, respectively. The soil samples retrieved at these areas were tested for General Metals and Inorganic parameters.

Representative “worst-case” soil samples recovered from the boreholes were chemically analyzed in accordance with the current guideline criteria as set out in the “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act” (EPA), March 9, 2004.

#### **Rationale for Selected Site Condition Standards**

The subject site is now vacant land consisting mostly of a woodlot with a watercourse bisecting the property. A portion of the property will likely be developed for residential usage. It should be noted that a body of water has been identified at the property; therefore, it is considered an Environmentally Sensitive Site. The site condition standards used for the assessment are the Table 1, full depth generic, potable groundwater site condition standards for all non-agricultural property use under Part XV.1 of the EPA.



### 3.0 FIELD WORK

The field work, consisting of 2 boreholes and 2 test pits to depths ranging from 1.0 to 6.4 m, was performed on September 29, 2009 and December 9, 2009; the locations of the boreholes and test pits are shown on the Borehole Location Plan, Drawing No. 2, and Test Pit Location Plan, Drawing No. 3, respectively. Prior to drilling the boreholes and digging the test pits, the underground utility services were located and marked out in the field by the public utilities.

The boreholes were advanced to the soil sampling depths by a Geoprobe 7822DT, direct push machine equipped for soil sampling provided and operated by Strata Soil Sampling Inc. Continuous tube samples enclosed in sample liners were recovered from the boreholes for soil classification and visual and olfactory observations. The test pit samples were obtained by digging from the ground surface to a depth of approximately 1.1 m. The field work was witnessed and the findings were recorded by our environmental engineering personnel. Detailed descriptions of the encountered subsurface conditions are presented on the Borehole and Test Pit Logs, comprising Figures 1 to 4.

Prior to recovering a sample during drilling, the sampling equipment was brushed clean using a solution of Alconox detergent and distilled water, and each discrete sample was handled by our experienced environmental technician with new disposable nitrile gloves in order to avoid the risk of cross-contamination between the samples. Each borehole sample was split, with part of the sample sealed in a laboratory-prepared glass jar and stored in a cooler, and the remaining part of the sample sealed in a Ziploc® bag for field vapour measurements using a combustible gas detector (Tracetehtor) in methane elimination mode calibrated with hexane and having a minimum detection level of 2 ppm.



Based on the soil vapour measurements and visual and olfactory observations, representative worst case soil samples were selected and sent to a laboratory accredited under MOE O. Reg. 153/04 for chemical analyses. Groundwater samples collected from the monitoring well was also sent for chemical analyses.

Groundwater monitoring wells were installed at Boreholes 1 and 2 upon completion for groundwater sampling and chemical testing. The wells were constructed using a 50-mm diameter PVC screen, 3.0 m in length. A sandpack, consisting of clean silica sand, was placed around the screened zone; 50-mm PVC risers capped at the top were installed from the screen section to just below the top grade. A bentonite seal was placed above the sandpack and a concrete seal above the bentonite. The monitoring wells were completed at the surface with flush-mount and monument protective casing, cemented in place.

On October 1, 2009 groundwater samples were collected using dedicated, low-density polyethylene tubing and Waterra foot valves. The samples were placed in laboratory-prepared jars and stored in a cooler for delivery to the laboratory. The monitoring wells were first developed and purged of a minimum of 3 well casing volumes prior to sampling, to remove standing water and filter pack water and to allow for the influx of fresh formation water. The groundwater samples were placed in laboratory-prepared jars and stored in a cooler for delivery to the laboratory within 24 hours.





#### 4.0 SUBSURFACE CONDITIONS

Detailed descriptions of the encountered subsurface conditions are presented on the Borehole and Test Pit Logs, comprising Figures 1 to 4. The depth of the soil strata changes was referred to the prevailing ground surface at each of the borehole and test pit locations. The revealed stratigraphy is briefly discussed herein.

Beneath topsoil or topsoil fill and earth fill layers, the site is underlain predominantly by strata of silty clay, sandy silt and/or silty fine sand.

Groundwater was not detected in the monitoring wells upon completion of the field work. On October 1, 2009, groundwater samples were collected. The groundwater levels in the monitoring wells were measured at depths of 3.4 m and 3.0 m from the prevailing ground surface prior to sampling.

The values of the headspace vapour concentrations for the soil samples are given on the Borehole Logs.

Please note, based on the visual and olfactory observations, the groundwater samples collected from the monitoring well did not exhibit petroleum impacts, as hydrocarbon odours and water sheen were not observed at the time of sampling.



## 5.0 CHEMICAL ANALYSES AND RESULTS

Based on the soil vapour measurements and visual and olfactory observations, representative “worst-case” soil samples from each borehole, together with groundwater samples collected from the monitoring wells, were sent for chemical analyses. The selected soil and groundwater samples were submitted to AGAT Laboratories Limited for analyses for Metals and Inorganics and Petroleum Hydrocarbons (CCME F1 – F4, BTEX), in accordance with Part XV.1 of the EPA.

### 5.1 Soil Samples

A summary of the soil testing programme is given in the following table:

BH/TP No.	Sample ID	Lab ID	Depth (m)	Material	Test Conducted
BH 1	BH 1/5	1498805	2.4 – 3.0	Silty Clay Fill	General Metals and Inorganics
	BH 1/8	1498812	4.2 – 4.8	Silty Clay	BTEX and Petroleum Hydrocarbons, F1-F4
BH 2	BH 2/2	1498809	0.6 – 1.2	Sandy Silt	General Metals and Inorganics
	BH 2/6	1498811	3.0 – 3.6	Silty Fine Sand	BTEX and Petroleum Hydrocarbons, F1-F4
TP 1	TP 1/2	1498813	0.5 – 1.0	Silty Clay Fill	General Metals and Inorganics
TP 2	TP 2/2	1498814	0.5 – 1.1	Silty Clay Fill	General Metals and Inorganics

The Certificates of Analyses for the soil samples are presented in Appendix ‘A’.

A review of the results of the soil analyses indicates that the concentrations of the tested parameters fall within the selected Table 1 for all types of non-agricultural property usage with the exceptions of an Electrical Conductivity (EC) value of 0.665 and a Sodium Adsorption Ratio (SAR) value of 4.46 for Sample TP 2/2; these values are slightly higher than the respective guideline values of 0.57 and 2.4.



## 5.2 Groundwater Samples

A summary of the groundwater testing programme is given in the following table:

BH No.	Sample ID	Lab ID	Depth (m)	Material	Test Conducted
1	MW-1	1573397	-	Groundwater	BTEX and Petroleum Hydrocarbons, F1-F4, General Metals and Inorganics
2	MW-2	1573402			

The Certificates of Analyses for the groundwater samples are presented in Appendix 'B'.

A review of the results of the analyses for groundwater samples shows that the tested parameters are either below the reportable detection limits or within Part XV.1 of the EPA, full depth background site condition standards, Table 1, for all types of non-agricultural property usage except for the following exceedances:

Borehole No.	Sample ID	Parameter	Unit	Guideline Limit (Table 1)	Guideline Limit (Table 2)	Sample Value
1	MW-1	Cobalt	ug/L	0.90	40	2.57
2	MW-2	Chromium	ug/L	8.9	750	17.3
		Cobalt	ug/L	0.90	40	1.48

## 5.3 QA/QC Rationale

### Soil Sample

A field duplicate for a selected soil sample was submitted to AGAT for analyses for Metals and Inorganics, in accordance with Part XV.1 of the EPA.



A summary of the QA/QC soil testing programme is given in the following table:

<b>BH No.</b>	<b>Sample ID</b>	<b>Lab ID</b>	<b>Depth (m)</b>	<b>Material</b>	<b>Test Conducted</b>
2	Duplicate 1	1498810	0.6 – 1.2	Sandy Silt	General Metals and Inorganics

The Certificate of Analysis for the duplicate soil sample is presented in Appendix 'C'.

A review of the results of the analyses for the QA/QC soil sample shows that the tested parameters yielded similar results to the test samples.

### **Groundwater Sample**

A field duplicate for selected groundwater sample was submitted to AGAT for analyses for Metals and Inorganics, in accordance with Part XV.1 of the EPA.

A summary of the QA/QC groundwater testing programme is given in the following table:

<b>BH No.</b>	<b>Sample ID</b>	<b>Lab ID</b>	<b>Depth (m)</b>	<b>Material</b>	<b>Test Conducted</b>
2	Duplicate-2	1573404	-	Groundwater	General Metals and Inorganics

The Certificates of Analysis for the groundwater sample is presented in Appendix 'D'.

A review of the results of the analyses for QA/QC water sample shows that the tested parameters yielded similar results to the test samples.



## 6.0 DISCUSSION AND RECOMMENDATIONS

Soil Engineers Ltd. previously completed a Phase I ESA, Report Reference No. 0907-E017, dated July 31, 2009, for the subject site.

The Phase I ESA has revealed the following items of environmental concern attendant to the subject property that require further investigation:

- Possible fill of unknown quality in the envelope of the former building located on the subject site.
- Fill materials of unknown quality found in our previous geotechnical investigation on the subject site.
- Gas stations are located within 300 m of the subject site.
- Automotive repair facilities are located within 500 m of the subject site.

Consequently, a Phase II ESA, consisting of soil and groundwater sampling and laboratory analyses, was conducted to investigate the possible potential environmental impact on the subject site due to the above-mentioned environmental concerns.

A review of the results of the soil analyses indicates that the concentrations of the tested parameters fall within the selected Table 1 for all types of non-agricultural property usage with the exceptions of an Electrical Conductivity (EC) value of 0.665 and a Sodium Adsorption Ratio (SAR) value of 4.46 for Sample 2/2; these values are slightly higher than the respective guideline values of 0.57 and 2.4. Based on the sampling depth and the proximity of the test pit to Eagle Street, the exceeding EC and SAR in the soil are likely caused by winter de-icing activities and are therefore considered acceptable under O.Reg. 153/04, Section 48(3), provided the material remains in situ.



The results of the analyses of the groundwater indicate concentrations of all tested parameters fall within Table 1, full depth generic, potable groundwater site condition standards for non-agricultural property uses under Part XV.1 of the EPA, except for the following exceedances:

<b>Borehole No.</b>	<b>Sample ID</b>	<b>Parameter</b>	<b>Unit</b>	<b>Guideline Limit (Table 1)</b>	<b>Guideline Limit (Table 2)</b>	<b>Sample Value</b>
1	MW-1	Cobalt	ug/L	0.90	40	2.57
2	MW-2	Chromium	ug/L	8.9	750	17.3
		Cobalt	ug/L	0.90	40	1.48

Due to the water body within the site, both the soil and groundwater analyses results were compared with standard criteria under the EPA guidelines, full depth generic site condition standards in a potable groundwater condition, Table 1, for non-agricultural property use.

It is recommended to segregate the environmentally sensitive areas and the lands immediately adjacent. This is subject to municipal and regional approval. Doing so will limit the area that will be subject to the stricter criteria used when developing on or near the environmentally sensitive areas.



## 7.0 QUALIFICATIONS

Soil Engineers Ltd., formerly known as Soil-Eng Limited (founded in 1976), offers to its clients a range of specialized engineering services. Our company is staffed with both engineers and scientists who draw upon their combined experience to provide a team approach to problem solving. Specifically, our environmental division employs more than 10 people who are trained to understand the Ontario Ministry of the Environment regulations. We play an integral role in the development of industrial, commercial, institutional and residential subdivisions, complexes, structures, and their related infrastructures, by providing our clients with the needed expertise for their projects.

The review of records and the site visit for this assessment and site remediation were conducted by Mr. Ahmed Hassan. He has a Bachelor's Degree in Civil Engineering from Ryerson University and is licensed to practice in Ontario. He has 7 years of experience in consulting engineering services. His background includes Civil and Environmental Engineering. He has been trained to conduct Phase I and Phase II ESAs, and site remediation, in accordance with the CSA Standard.

Mr. Ian Chiu is the Vice-President of Soil Engineers Ltd. He has a Bachelor's Degree in Applied Science (Civil) from the University of Toronto and is licensed to practice in Ontario (PEO Licence No. 8113706). He has 25 years of experience on various building and engineering projects in Ontario. He supervises the Environmental Services Section, has a comprehensive understanding of its projects, and is responsible for over 250 Phase I and Phase II reports with over 125 Records of Site Condition acknowledged by the MOE.



One must understand that the mandate of Soil Engineers Ltd. is to collect a finite number of soil and groundwater samples and submit selected samples to chemically characterize the contaminants in the subject site for a Limited Phase II environmental assessment. No other warranty or representation, expressed or implied, as to the accuracy of the information is included or intended by this assessment.

One must be aware that the subsurface conditions may vary between borehole locations.

Any deleterious debris found on the surface or buried on site must be removed and disposed of properly. It should be noted that the information supplied in this report may not be sufficient to obtain approval for the disposal of any excess soil or materials generated during future construction, and supplementary chemical testing of soil samples may be necessary to obtain such approval.

Should any further adverse environmental conditions become apparent in the future, we request immediate notification in order to provide further assessment and recommendations.





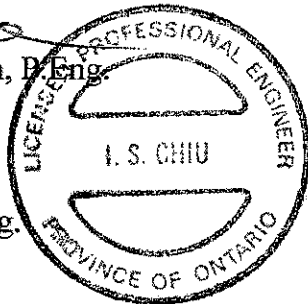
This report was prepared by Soil Engineers Ltd. for the account of Millford Development Limited, and for review by their designated agents, financial institutions and government agencies, and can be used for development approval purposes by the Town of Newmarket and their peer reviewer who may rely on the results of the report. The material in it reflects the judgement of Ahmed Hassan, P.Eng., and Ian Chiu, P.Eng., in light of the information available to it at the time of preparation. Any use which a Third Party makes of this report, or any reliance on decisions to be made based on it, are the responsibility of such Third Parties. Soil Engineers Ltd. accepts no responsibility for damages, if any, suffered by any Third Party as a result of decisions made or actions based on this report.

**SOIL ENGINEERS LTD.**

  
Ahmed Hassan, P.Eng.

  
Ian Chiu, P.Eng.

AH/IC:cy



*Ianchiu@Soilengineers ltd. com.*

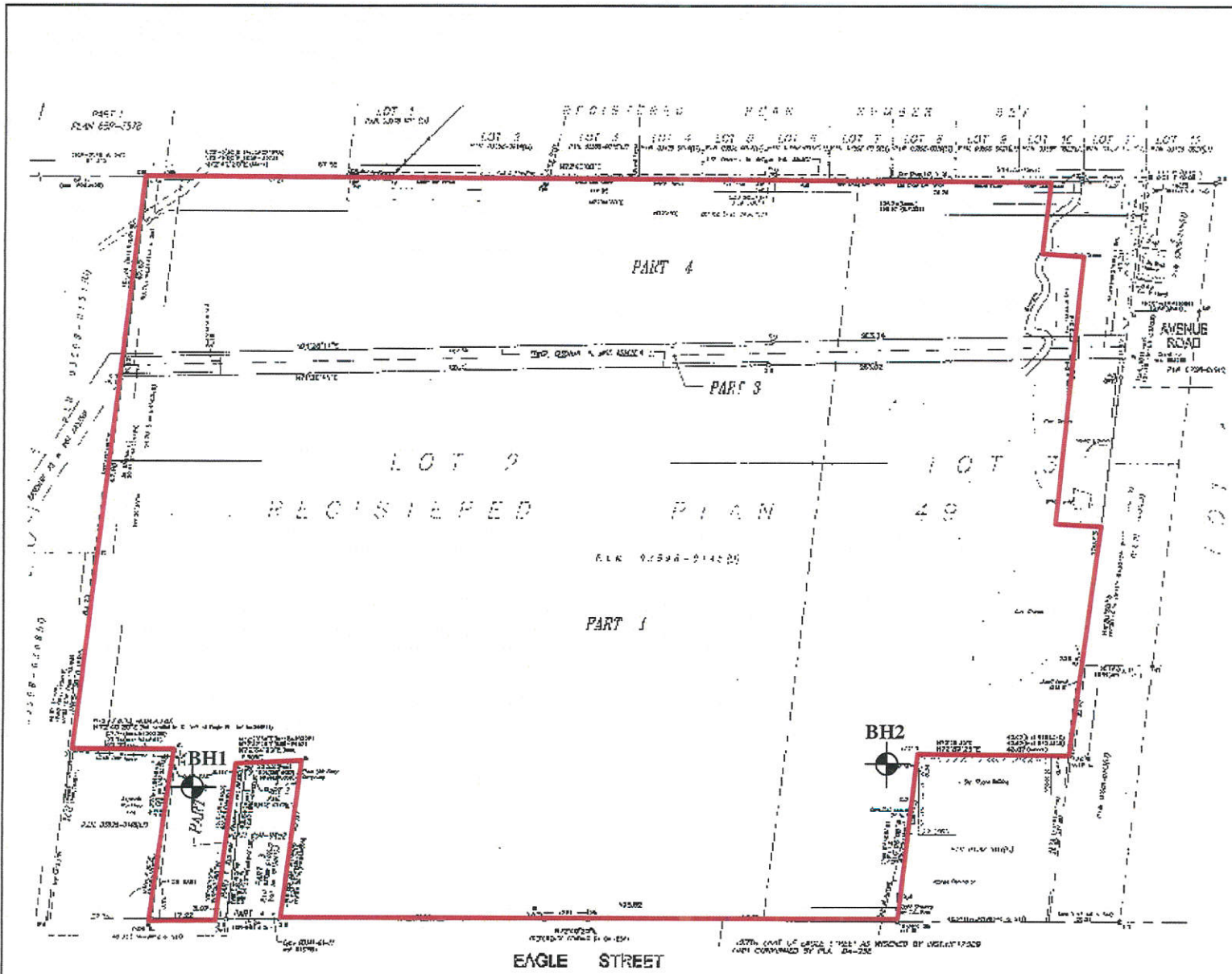


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 Approximate Location of Subject Site



Title	Site Location Plan
Project	Proposed Residential Development North of Eagle Street and east of Yonge Street Town of Newmarket
Reference No.	0907-E017
Date	November 25, 2009
Scale	See Map
Drawing No.	1

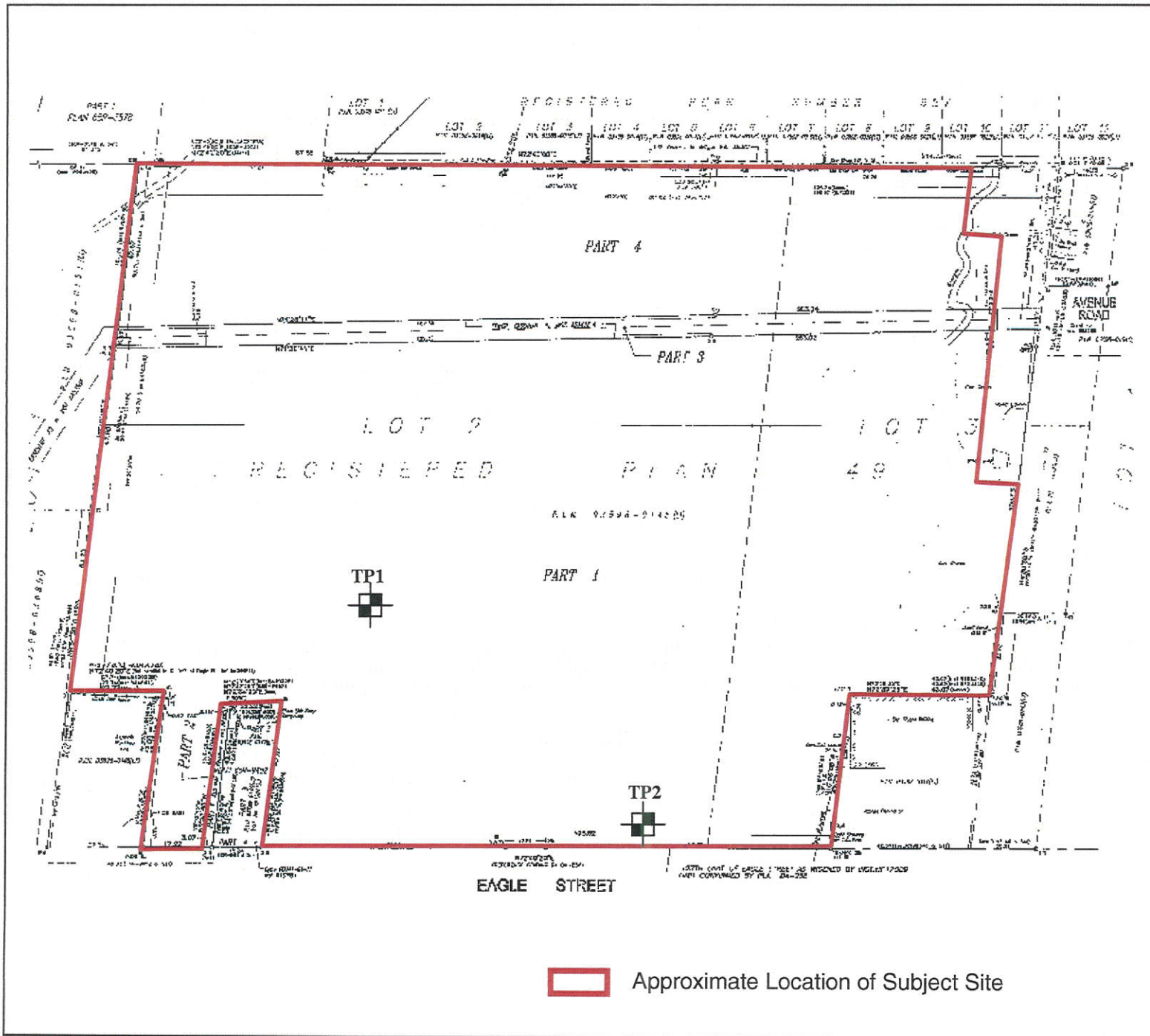



**Legend**

 Borehole with Monitoring well



Title	Borehole Location Plan
Project	Proposed Residential Development North of Eagle Street and east of Yonge Street Town of Newmarket
Reference No.	0907-E017
Date	November 25, 2009
Scale	NTS
Drawing No.	2



	
Title	Test Pit Location Plan
Project	Proposed Residential Development North of Eagle Street and east of Yonge Street Town of Newmarket
Reference No.	0907-E017
Date	November 25, 2009
Scale	See Map
Drawing No.	3

## LIST OF ABBREVIATIONS AND DESCRIPTION OF TERMS

The abbreviations and terms commonly employed on the borehole logs and figures, and in the text of the report are as follows:

### 1. SAMPLE TYPES

AS	Auger sample
CS	Chunk sample
DO	Drive open
DS	Denison type sample
FS	Foil sample
RC	Rock core with size and percentage of recovery
ST	Slotted tube
TO	Thin-walled, open
TP	Thin-walled, piston
WS	Wash Sample

### 2. PENETRATION RESISTANCE/'N'

Dynamic Cone Penetration Resistance:

A continuous profile showing the number of blows for each foot of penetration of a 2-inch diameter 90° point cone driven by a 140-pound hammer falling 30 inches.  
Plotted as \_\_\_\_\_

Standard Penetration Resistance or 'N' value:

The number of blows of a 140-pound hammer falling 30 inches required to advance a 2-inch O.D. drive open sampler one foot into undisturbed soil.  
Plotted as 'O'

WH	Sampler advanced by static weight
PH	Sampler advanced by hydraulic pressure
PM	Sampler advanced by manual pressure
NP	No penetration

### 3. SOIL DESCRIPTION

a) Cohesionless Soils:

<u>'N' (Blows/ft)</u>	<u>Relative Density</u>
0 to 4	very loose
4 to 10	loose
10 to 30	compact
30 to 50	dense
over 50	very dense

b) Cohesive Soils:

Undrained Shear

<u>Strength (ksf)</u>	<u>'N' (Blows/ft)</u>	<u>Consistency</u>
Less than 0.25	0 to 2	very soft
0.25 to 0.50	2 to 4	soft
0.50 to 1.0	4 to 8	firm
1.0 to 2.0	8 to 16	stiff
2.0 to 4.0	16 to 32	very stiff
over 4.0	over 32	hard

c) Method of Determination of Undrained Shear Strength of Cohesive Soils:

x 0.0 - Field vane test in borehole  
The number denotes the sensitivity to remoulding.

△ - Laboratory vane test

□ - Compression test in laboratory

For a saturated cohesive soil, the undrained shear strength is taken as one half of the undrained compressive strength.

### METRIC CONVERSION FACTORS

1 ft. = 0.3048 metres  
1 lb. = 0.453 kg

1 inch = 25.4 mm  
1 ksf = 47.88 kN/m<sup>2</sup>



**Soil Engineers Ltd.**

CONSULTING SOIL, FOUNDATION & ENVIRONMENTAL ENGINEERS

100 NUGGET AVENUE, SCARBOROUGH, ONTARIO M1S 3A7

TEL: (416) 754-8515

FAX: (416) 754-8516

**JOB NO:** 0907-E017

# LOG OF BOREHOLE NO: 1

**FIGURE NO:** 1

**JOB DESCRIPTION:** Proposed Residential Development

**JOB LOCATION:** 55 Eagle Street, Town of Newmarket

**METHOD OF BORING:** Geoprobe 7822 DT

**DATE:** September 29, 2009

Depth Elev. (m)	SOIL DESCRIPTION	SAMPLES			Depth Scale (m)	× Shear Strength (kN/m <sup>2</sup> ) 50 100 150 200 Penetration Resistance ○ (blows/0.3m) 10 30 50 70 90	Atterberg Limits PL ——— LL ● Moisture Content (%) 10 20 30 40	WATER LEVEL
		Number	Type	Gas (ppm)				
0.0	Ground Surface				0			
	15 cm TOPSOIL, Fill							
	Brown	1	DO	0				
		2	DO	0				
	<b>SILTY CLAY, Fill</b>							
	a tr. of topsoil inclusions a tr. of gravel	3	DO	5				
		4	DO	5				
		5	DO	0				
3.0	Grey	6	DO	5				
		7	DO	0				
	<b>SILTY CLAY</b>							
	a tr. of sand	8	DO	0				
		9	DO	5				
		10	DO	0				
6.1	<b>END OF BOREHOLE</b>				6			
	Installed 46 mm Ø standpipe to 6.1 m. Sand backfill from 2.7 to 6.1 m. Bentonite seal from 0.3 to 2.7 m. Concrete from 0.0 to 0.3 m. Provided with a lockable steel protective case.				7			
					8			
					9			
					10			

W.L. @ depth of 3.4 m on October 1, 2009



**Soil Engineers Ltd.**

**JOB NO:** 0907-E017

# LOG OF BOREHOLE NO: 2

**FIGURE NO: 2**

**JOB DESCRIPTION:** Proposed Residential Development

**JOB LOCATION:** 55 Eagle Street, Town of Newmarket

**METHOD OF BORING:** Geoprobe 7822 DT

**DATE:** September 29, 2009

Depth Elev. (m)	SOIL DESCRIPTION	SAMPLES			Depth Scale (m)	× Shear Strength (kN/m <sup>2</sup> ) ○ Penetration Resistance (blows/0.3m)	Atterberg Limits PL ————— LL ● Moisture Content (%)	WATER LEVEL
		Number	Type	Gas (ppm)				
0.0	Ground Surface				0			
	20 cm TOPSOIL							
	Brown	1	DO	5				
	SANDY SILT a tr. of clay	2	DO	0	1			
		3	DO	0				
		4	DO	5	2			
2.4			5	DO	5			
	SILTY FINE SAND a tr. of clay and gravel		— brown grey		3			
		6	DO	0				
		7	DO	0	4			
		8	DO	5				
		9	DO	0	5			
		10	DO	0	6			
6.4		11	DO	0				
	END OF BOREHOLE				7			
	Installed 46 mm Ø standpipe to 6.4 m. Sand backfill from 2.9 to 6.1 m. Bentonite seal from 0.3 to 2.9 m. Concrete from 0.0 to 0.3 m. Provided with a lockable steel protective case.				8			
					9			
					10			

W.L. @ depth of 3.0 m on October 1, 2009



**Soil Engineers Ltd.**

JOB NO: 0907-E017

# LOG OF TEST PIT NO: 1

FIGURE NO: 1

JOB DESCRIPTION: Proposed Residential Development

JOB LOCATION: 55 Eagle Street, Town of Newmarket

METHOD OF BORING: Hand-Dug

DATE: September 29, 2009

Depth Elev. (m)	SOIL DESCRIPTION	SAMPLES			Depth Scale (m)	× Shear Strength (kN/m <sup>2</sup> )		Atterberg Limits		WATER LEVEL
		Number	Type	Gas (ppm)		Penetration Resistance ○ (blows/0.3m)	Moisture Content (%) ●	PL	LL	
0.0	Surface				0					
	10 TOPSOIL, Fill	1	CS	0						
1.0	Brown SILTY CLAY, Fill topsoil inclusions	2	CS	0						
	END OF TEST PIT				1					
					2					
					3					
					4					
					5					
					6					
					7					
					8					
					9					
					10					



Soil Engineers Ltd.



JOB NO: 0907-E017

# LOG OF TEST PIT NO: 2

FIGURE NO: 2

JOB DESCRIPTION: Proposed Residential Development

JOB LOCATION: 55 Eagle Street, Town of Newmarket

METHOD OF BORING: Hand-Dug

DATE: December 9, 2009

Depth Elev. (m)	SOIL DESCRIPTION	SAMPLES			Depth Scale (m)	× Shear Strength (kN/m <sup>2</sup> )	Atterberg Limits		WATER LEVEL
		Number	Type	Gas (ppm)		50 100 150 200	PL	LL	
						○ Penetration Resistance (blows/0.3m)	● Moisture Content (%)		
						10 30 50 70 90	10 20 30 40		
0.0	Ground Surface				0				
	20 cm TOPSOIL								
	Brown	1	CS	0					
	SILTY CLAY, Fill								
	occ. topsoil and gravel	2	CS	0					
1.1	END OF TEST PIT				1				
					2				
					3				
					4				
					5				
					6				
					7				
					8				
					9				
					10				



Soil Engineers Ltd.



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**BARRIE**  
Tel: (705) 721-7863  
Fax: (705) 721-7864

**MISSISSAUGA**  
Tel: (905) 542-7605  
Fax: (905) 542-2769

**BOWMANVILLE**  
Tel: (905) 623-8333  
Fax: (905) 623-4630

**NEWMARKET**  
Tel: (905) 853-0647  
Fax: (905) 853-5484

**GRAVENHURST**  
Tel: (705) 684-4242  
Fax: (705) 684-8522

**PETERBOROUGH**  
Tel: (705) 748-0576  
Fax: (905) 623-4630

**HAMILTON**  
Tel: (905) 777-7956  
Fax: (905) 542-2769

## APPENDIX 'A'

### CERTIFICATES OF ANALYSES

(SOIL SAMPLES)

REFERENCE NO. 0907-E017



# Certificate of Analysis

AGAT WORK ORDER: 09T360280  
PROJECT NO: 0907-E017

5835 COOPERS AVENUE  
MISSISSAUGA, ON  
CANADA L4Z 1Y2

PH: (905)712-5100  
FAX: (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Arif Chowdhury

## O. Reg. 153 Metals & Inorganics in Soil - Table 1

DATE SAMPLED: Sep 29, 2009

DATE RECEIVED: Oct 05, 2009

DATE REPORTED: Oct 13, 2009

SAMPLE TYPE: Soil

Parameter	Unit	G / S	RDL	BH 1/5	BH 2/2
				1498805	1498809
Antimony	µg/g	1.0	0.8	<0.8	<0.8
Arsenic	µg/g	17	0.3	2.4	1.8
Barium	µg/g	210	0.2	91.0	67.3
Beryllium	µg/g	1.2	0.2	0.6	0.5
Boron (Hot Water Extractable)	µg/g		0.10	0.45	0.49
Cadmium	µg/g	1.0	0.2	<0.2	<0.2
Chromium	µg/g	71	0.3	21.0	17.6
Cobalt	µg/g	21	0.2	7.1	6.2
Copper	µg/g	85	0.2	13.3	9.9
Lead	µg/g	120	0.3	14.4	8.7
Molybdenum	µg/g	2.5	0.3	0.3	<0.3
Nickel	µg/g	43	0.3	13.5	10.8
Selenium	µg/g	1.9	0.4	<0.4	<0.4
Silver	µg/g	0.42	0.2	<0.2	<0.2
Thallium	µg/g	2.5	0.2	<0.2	<0.2
Vanadium	µg/g	91	0.2	29.7	26.0
Zinc	µg/g	160	0.2	53.6	41.1
Chromium, Hexavalent	µg/g	2.5	0.40	<0.40	<0.40
Cyanide, Free	µg/g	0.12	0.08	<0.08	<0.08
Mercury	µg/g	0.23	0.011	0.048	0.035
Electrical Conductivity (2:1)	mS/cm	0.57	0.002	0.215	0.189
Sodium Adsorption Ratio (2:1)	N/A	2.4	N/A	0.241	0.196
pH, 2:1 CaCl2 Extraction	N/A		N/A	7.52	7.51
Chloride (2:1)	µg/g	330	2.0	3.5	7.5
Nitrate + Nitrite (2:1)	µg/g	61	1.0	<1.0	<1.0

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to T1(All)

1498805-1498809 EC, SAR, Chloride & Nitrate/Nitrite were determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil).  
pH was determined on the extract obtained from the 2:1 leaching procedure (2 parts 0.01M CaCl2:1 part soil).

**Certified By:**

*Elizabeth Rotkowska*



# Certificate of Analysis

AGAT WORK ORDER: 09T360280  
PROJECT NO: 0907-E017

5835 COOPERS AVENUE  
MISSISSAUGA, ON  
CANADA L4Z 1Y2

PH: (905)712-5100  
FAX: (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Arif Chowdhury

## O. Reg. 153 Metals and Inorganics in Soil - Table 1

DATE SAMPLED: Sep 29, 2009		DATE RECEIVED: Oct 05, 2009		DATE REPORTED: Oct 13, 2009	SAMPLE TYPE: Soil
Parameter	Unit	G / S	RDL	TP 1/2 1498813	
Antimony	µg/g	1.0	0.8	<0.8	
Arsenic	µg/g	17	0.3	2.2	
Barium	µg/g	210	0.2	57.7	
Beryllium	µg/g	1.2	0.2	0.4	
Boron (Hot Water Extractable)	µg/g		0.10	0.21	
Cadmium	µg/g	1.0	0.2	<0.2	
Chromium	µg/g	71	0.3	14.4	
Cobalt	µg/g	21	0.2	5.6	
Copper	µg/g	85	0.2	12.9	
Lead	µg/g	120	0.3	10.4	
Molybdenum	µg/g	2.5	0.3	0.3	
Nickel	µg/g	43	0.3	10.2	
Selenium	µg/g	1.9	0.4	<0.4	
Silver	µg/g	0.42	0.2	<0.2	
Thallium	µg/g	2.5	0.2	<0.2	
Vanadium	µg/g	91	0.2	21.5	
Zinc	µg/g	160	0.2	37.6	
Chromium, Hexavalent	µg/g	2.5	0.40	<0.40	
Cyanide, Free	µg/g	0.12	0.08	<0.08	
Mercury	µg/g	0.23	0.011	0.026	
Electrical Conductivity (2:1)	mS/cm	0.57	0.002	0.196	
Sodium Adsorption Ratio (2:1)	N/A	2.4	N/A	0.186	
pH, 2:1 CaCl2 Extraction	N/A		N/A	7.82	
Chloride (2:1)	µg/g	330	2.0	<2.0	
Nitrate + Nitrite (2:1)	µg/g	61	1.0	<1.0	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to T1(All)  
1498813 EC, SAR, Chloride & Nitrate/Nitrite were determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil).  
pH was determined on the extract obtained from the 2:1 leaching procedure (2 parts 0.01M CaCl2:1 part soil).

Certified By: 



# Certificate of Analysis

AGAT WORK ORDER: 09T375364  
PROJECT NO: 0907-E017

5835 COOPERS AVENUE  
MISSISSAUGA, ON  
CANADA L4Z 1Y2

PH: (905)712-5100  
FAX: (905)712-5122  
http://www.agatlabs.com

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Ahmed Hassan

## O. Reg. 153 Metals & Inorganics in Soil - Table 1

DATE SAMPLED: Dec 09, 2009

DATE RECEIVED: Dec 11, 2009

DATE REPORTED: Dec 17, 2009

SAMPLE TYPE: Soil

Parameter	Unit	G / S	RDL	TP2/2 1608814
Antimony	µg/g	1.0	0.8	<0.8
Arsenic	µg/g	17	0.3	5.7
Barium	µg/g	210	0.2	49.5
Beryllium	µg/g	1.2	0.2	0.5
Boron (Hot Water Extractable)	µg/g		0.10	0.21
Cadmium	µg/g	1.0	0.2	<0.2
Chromium	µg/g	71	0.3	18.2
Cobalt	µg/g	21	0.3	13.5
Copper	µg/g	85	0.2	49.7
Lead	µg/g	120	0.3	8.6
Molybdenum	µg/g	2.5	0.3	0.4
Nickel	µg/g	43	0.3	26.2
Selenium	µg/g	1.9	0.4	<0.4
Silver	µg/g	0.42	0.2	<0.2
Thallium	µg/g	2.5	0.2	<0.2
Vanadium	µg/g	91	0.2	26.9
Zinc	µg/g	160	0.2	55.2
Chromium, Hexavalent	µg/g	2.5	0.40	<0.40
Cyanide, Free	µg/g	0.12	0.08	<0.08
Mercury	µg/g	0.23	0.011	0.012
Electrical Conductivity (2:1)	mS/cm	0.57	0.002	<b>0.665</b>
Sodium Adsorption Ratio (2:1)	N/A	2.4	N/A	<b>4.46</b>
pH, 2:1 CaCl2 Extraction				7.79
Chloride (2:1)	µg/g	330	2.0	312
(Nitrate + Nitrite) as N (2:1)	µg/g	61	1.0	<1.0

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to T1(All)

1608814 EC, SAR, Chloride & Nitrate/Nitrite were determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil).  
pH was determined on the extract obtained from the 2:1 leaching procedure (2 parts 0.01M CaCl2:1 part soil).

**Certified By:**

*Elizabeth Polakowska*



## Guideline Violation

AGAT WORK ORDER: 09T375364  
PROJECT NO: 0907-E017

5835 COOPERS AVENUE  
MISSISSAUGA, ON  
CANADA L4Z 1Y2

PH: (905)712-5100  
FAX: (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Ahmed Hassan

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	GUIDEVALUE	RESULT
1608814	TP2/2	T1(All)	O. Reg. 153 Metals & Inorganics in Soil - Table 1	Electrical Conductivity (2:1)	0.57	0.665
1608814	TP2/2	T1(All)	O. Reg. 153 Metals & Inorganics in Soil - Table 1	Sodium Adsorption Ratio (2:1)	2.4	4.46



# Certificate of Analysis

AGAT WORK ORDER: 09T360280  
PROJECT NO: 0907-E017

5835 COOPERS AVENUE  
MISSISSAUGA, ON  
CANADA L4Z 1Y2

PH: (905)712-5100  
FAX: (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Arif Chowdhury

## (P & T) BTEX - Soil (GC/MS)

DATE SAMPLED: Sep 29, 2009

DATE RECEIVED: Oct 05, 2009

DATE REPORTED: Oct 13, 2009

SAMPLE TYPE: Soil

Parameter	Unit	G / S	RDL	BH 2/6 1498811	BH 1/8 1498812
Benzene	µg/g	0.002	0.002	<0.002	<0.002
Toluene	µg/g	0.002	0.002	<0.002	<0.002
Ethylbenzene	µg/g	0.002	0.002	<0.002	<0.002
m & p-Xylene	µg/g		0.002	<0.002	<0.002
o-Xylene	µg/g		0.002	<0.002	<0.002
Xylenes (Total)	µg/g	0.002	0.002	<0.002	<0.002

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard; Refers to T1(All)

- 1498811 Toluene-d8 Surrogate Recovery: 110%  
4-Bromofluorobenzene Surrogate Recovery: 103%  
Results are based on the dry weight of the soil.  
Results relate only to the items tested.
- 1498812 Toluene-d8 Surrogate Recovery: 120%  
4-Bromofluorobenzene Surrogate Recovery: 103%  
Results are based on the dry weight of the soil.  
Results relate only to the items tested.

Certified By:



# Certificate of Analysis

AGAT WORK ORDER: 09T360280  
PROJECT NO: 0907-E017

5835 COOPERS AVENUE  
MISSISSAUGA, ON  
CANADA L4Z 1Y2

PH: (905)712-5100  
FAX: (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Arif Chowdhury

## O. Reg. 153 - Petroleum Hydrocarbons F1 - F4 (C6 - C50) in Soil (-BTEX)

DATE SAMPLED: Sep 29, 2009

DATE RECEIVED: Oct 05, 2009

DATE REPORTED: Oct 13, 2009

SAMPLE TYPE: Soil

Parameter	Unit	G / S	RDL	BH 2/6	BH 1/8
				1498811	1498812
C6 - C10 (F1)	µg/g		5	<5	<5
C6 - C10 (F1 minus BTEX)	µg/g		5	<5	<5
C>10 - C16 (F2)	µg/g		10	<10	<10
C>16 - C34 (F3)	µg/g		50	<50	<50
C>34 - C50 (F4)	µg/g		50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g		50	NA	NA
Moisture Content	%		0.1	9.0	17.0

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

1498811-1498812 Results are based on sample dry weight.

The C6-C10 fraction is calculated using toluene response factor.

The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.

Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.

Total C6 - C50 results are corrected for BTEX and PAH contributions (when is available).

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

nC6 and nC10 response factors are within 30% of Toluene response factor.

nC10, nC16 and nC34 response factors are within 10% of their average.

C50 response factor is within 70% of nC10 + nC16 + nC34 average.

Linearity is within 15%.

Extraction and holding times were met for this sample.

Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Certified By:





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Tel: (705) 721-7863  
Fax: (705) 721-7864

**MISSISSAUGA**  
Tel: (905) 542-7605  
Fax: (905) 542-2769

**BOWMANVILLE**  
Tel: (905) 623-8333  
Fax: (905) 623-4630

**NEWMARKET**  
Tel: (905) 853-0647  
Fax: (905) 853-5484

**GRAVENHURST**  
Tel: (705) 684-4242  
Fax: (705) 684-8522

**PETERBOROUGH**  
Tel: (705) 748-0576  
Fax: (905) 623-4630

**HAMILTON**  
Tel: (905) 777-7956  
Fax: (905) 542-2769

## APPENDIX 'B'

### **CERTIFICATES OF ANALYSES (GROUNDWATER SAMPLES)**

**REFERENCE NO. 0907-E017**



# Certificate of Analysis

AGAT WORK ORDER: 09T360280  
PROJECT NO: 0907-E017

5835 COOPERS AVENUE  
MISSISSAUGA, ON  
CANADA L4Z 1Y2

PH: (905)712-5100  
FAX: (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Arif Chowdhury

(P & T) - BTEX - Water (GC/MS)					
DATE SAMPLED: Oct 01, 2009		DATE RECEIVED: Oct 05, 2009		DATE REPORTED: Oct 13, 2009	
				SAMPLE TYPE: Water	
Parameter	Unit	G / S	RDL	MW-1 1498753	MW-2 1498757
Benzene	µg/L	5.0	0.20	<0.20	<0.20
Toluene	µg/L	0.8	0.20	<0.20	0.64
Ethylbenzene	µg/L	2.4	0.10	<0.10	<0.10
m & p-Xylene	µg/L		0.20	<0.20	<0.20
o-Xylene	µg/L		0.10	<0.10	<0.10
Xylenes (Total)	µg/L	72	0.20	<0.20	<0.20

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to T1(AII-GW)

1498753 Results relate only to the items tested.  
Surrogate Recovery for Toluene-d8: 108 %  
Surrogate Recovery for 4-Bromofluorobenzene: 81%

1498757 Results relate only to the items tested.  
Surrogate Recovery for Toluene-d8: 104%  
Surrogate Recovery for 4-Bromofluorobenzene: 80 %

Certified By: 



# Certificate of Analysis

AGAT WORK ORDER: 09T360280  
PROJECT NO: 0907-E017

5835 COOPERS AVENUE  
MISSISSAUGA, ON  
CANADA L4Z 1Y2

PH: (905)712-5100  
FAX: (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Arif Chowdhury

## O. Reg 153 Petroleum Hydrocarbon F1 - F4 in Water (-BTEX)

DATE SAMPLED: Oct 01, 2009

DATE RECEIVED: Oct 05, 2009

DATE REPORTED: Oct 13, 2009

SAMPLE TYPE: Water

Parameter	Unit	G / S	RDL	MW-1 1498753	MW-2 1498757
C6 - C10 (F1)	µg/L		100	<100	<100
C6 - C10 (F1 minus BTEX)	µg/L		100	<100	<100
C>10 - C16 (F2)	µg/L		100	<100	<100
C6 - C16 (F1 + F2)	µg/L		100	<100	<100
C>16 - C34 (F3)	µg/L		100	<100	<100
C>34 - C50 (F4)	µg/L		100	<100	<100
C>16 - C50 (F3 + F4)	µg/L		100	<100	<100
Gravimetric Heavy Hydrocarbons	µg/L		500	NA	NA

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

**1498753-1498757** The C6-C10 fraction is calculated using Toluene response factor.  
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.  
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.  
Total C6-C50 results are corrected for BTEX and PAH contributions.  
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.  
nC6 and nC10 response factors are within 30% of Toluene response factor.  
nC10, nC16 and nC34 response factors are within 10% of their average.  
C50 response factor is within 70% of nC10 + nC16 nC34 average.  
Linearity is within 15%.  
Extraction and holding times were met for this sample.  
Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Certified By:



# Certificate of Analysis

AGAT WORK ORDER: 09T370333  
PROJECT NO: 0907-E017

5835 COOPERS AVENUE  
MISSISSAUGA, ON  
CANADA L4Z 1Y2

PH: (905)712-5100  
FAX: (905)712-5122  
http://www.agatlabs.com

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Arif Chowdhury

## O. Reg 153 - Metals & Inorganics in water - Table 1

DATE SAMPLED: Nov 18, 2009

DATE RECEIVED: Nov 19, 2009

DATE REPORTED: Nov 25, 2009

SAMPLE TYPE: Water

Parameter	Unit	G / S	RDL	MW 1	MW 2
				1573397	1573402
Antimony	µg/L	6.0	1.00	<1.00	<1.00
Arsenic	µg/L	25	0.60	1.05	<0.60
Barium	µg/L		0.50	80.4	395
Beryllium	µg/L	4.0	1.00	<1.00	<1.00
Boron	µg/L	200	10.0	20.5	36.2
Cadmium	µg/L	0.5	0.20	<0.20	<0.20
Chromium	µg/L	8.9	0.60	3.02	17.3
Cobalt	µg/L	0.9	0.50	2.57	1.48
Copper	µg/L	2.5	0.80	0.82	1.60
Lead	µg/L	1	0.50	<0.50	<0.50
Molybdenum	µg/L	40	0.50	1.20	7.04
Nickel	µg/L	25	0.60	3.96	11.2
Selenium	µg/L	5.0	0.80	<0.80	<0.80
Silver	µg/L	0.25	0.20	<0.20	<0.20
Thallium	µg/L	0.5	0.30	<0.30	<0.30
Vanadium	µg/L	6.0	0.40	0.48	5.93
Zinc	µg/L	20	5.00	<5.00	10.2
Sodium	mg/L		0.05	32.2	111
Mercury	µg/L	0.02	0.02	<0.02	<0.02
Cyanide, Free	µg/L	5.0	2.0	<2.0	<2.0
Chromium VI	µg/L	10	5.0	<5.0	<5.0
Nitrate as N	mg/L		0.05	0.11	5.65
Nitrite as N	mg/L		0.05	0.59	<0.05
pH	N/A		N/A	7.93	7.70
Electrical Conductivity	µS/cm		2	1180	3370

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to T1(All-GW)

Certified By:



## Guideline Violation

AGAT WORK ORDER: 09T370333  
PROJECT NO: 0907-E017

5835 COOPERS AVENUE  
MISSISSAUGA, ON  
CANADA L4Z 1Y2

PH: (905)712-5100  
FAX: (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Arif Chowdhury

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	GUIDEVALUE	RESULT
1573397	MW 1	T1(All-GW)	O. Reg 153 - Metals & Inorganics in water - Table 1	Cobalt	0.9	2.57
1573402	MW 2	T1(All-GW)	O. Reg 153 - Metals & Inorganics in water - Table 1	Chromium	8.9	17.3
1573402	MW 2	T1(All-GW)	O. Reg 153 - Metals & Inorganics in water - Table 1	Cobalt	0.9	1.48



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**100 NUGGET AVENUE, TORONTO, ONTARIO M1S 3A7 • TEL: (416)754-8515 • FAX: (416)754-8516**

<b>BARRIE</b>	<b>MISSISSAUGA</b>	<b>BOWMANVILLE</b>	<b>NEWMARKET</b>	<b>GRAVENHURST</b>	<b>PETERBOROUGH</b>	<b>HAMILTON</b>
Tel: (705) 721-7863	Tel: (905) 542-7605	Tel: (905) 623-8333	Tel: (905) 853-0647	Tel: (705) 684-4242	Tel: (705) 748-0576	Tel: (905) 777-7956
Fax: (705) 721-7864	Fax: (905) 542-2769	Fax: (905) 623-4630	Fax: (905) 853-5484	Fax: (705) 684-8522	Fax: (905) 623-4630	Fax: (905) 542-2769

**APPENDIX 'C'**

**CERTIFICATE OF ANALYSIS**

**(QA/QC SOIL SAMPLE)**

**REFERENCE NO. 0907-E017**



# Certificate of Analysis

AGAT WORK ORDER: 09T360280  
PROJECT NO: 0907-E017

5835 COOPERS AVENUE  
MISSISSAUGA, ON  
CANADA L4Z 1Y2

PH: (905)712-5100  
FAX: (905)712-5122  
http://www.agatlabs.com

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Arif Chowdhury

## O. Reg. 153 Metals & Inorganics in Soil - Table 1

DATE SAMPLED: Sep 29, 2009

DATE RECEIVED: Oct 05, 2009

DATE REPORTED: Oct 13, 2009

SAMPLE TYPE: Soil

Parameter	Unit	G / S	RDL	Duplicate 1 1498810
Antimony	µg/g	1.0	0.8	<0.8
Arsenic	µg/g	17	0.3	1.0
Barium	µg/g	210	0.2	41.3
Beryllium	µg/g	1.2	0.2	<0.2
Boron (Hot Water Extractable)	µg/g		0.10	<0.10
Cadmium	µg/g	1.0	0.2	<0.2
Chromium	µg/g	71	0.3	8.3
Cobalt	µg/g	21	0.2	3.3
Copper	µg/g	85	0.2	6.8
Lead	µg/g	120	0.3	3.0
Molybdenum	µg/g	2.5	0.3	<0.3
Nickel	µg/g	43	0.3	5.6
Selenium	µg/g	1.9	0.4	<0.4
Silver	µg/g	0.42	0.2	<0.2
Thallium	µg/g	2.5	0.2	<0.2
Vanadium	µg/g	91	0.2	14.0
Zinc	µg/g	160	0.2	21.6
Chromium, Hexavalent	µg/g	2.5	0.40	<0.40
Cyanide, Free	µg/g	0.12	0.08	<0.08
Mercury	µg/g	0.23	0.011	<0.011
Electrical Conductivity (2:1)	mS/cm	0.57	0.002	0.155
Sodium Adsorption Ratio (2:1)	N/A	2.4	N/A	0.462
pH, 2:1 CaCl2 Extraction	N/A		N/A	7.91
Chloride (2:1)	µg/g	330	2.0	40.5
Nitrate + Nitrite (2:1)	µg/g	61	1.0	<1.0

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to T1(All)

1498810 EC, SAR, Chloride & Nitrate/Nitrite were determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil).  
pH was determined on the extract obtained from the 2:1 leaching procedure (2 parts 0.01M CaCl2:1 part soil).

Certified By:

*Elizabeth Potkowska*



# *Soil Engineers Ltd.*

GEOTECHNICAL • ENVIRONMENTAL • BUILDING SCIENCE

100 NUGGET AVENUE, TORONTO, ONTARIO M1S 3A7 • TEL: (416)754-8515 • FAX: (416)754-8516

<b>BARRIE</b> Tel: (705) 721-7863 Fax: (705) 721-7864	<b>MISSISSAUGA</b> Tel: (905) 542-7605 Fax: (905) 542-2769	<b>BOWMANVILLE</b> Tel: (905) 623-8333 Fax: (905) 623-4630	<b>NEWMARKET</b> Tel: (905) 853-0647 Fax: (905) 853-5484	<b>GRAVENHURST</b> Tel: (705) 684-4242 Fax: (705) 684-8522	<b>PETERBOROUGH</b> Tel: (705) 748-0576 Fax: (905) 623-4630	<b>HAMILTON</b> Tel: (905) 777-7956 Fax: (905) 542-2769
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## APPENDIX 'D'

### CERTIFICATES OF ANALYSIS

(QA/QC GROUNDWATER SAMPLE)

REFERENCE NO. 0907-E017





# Certificate of Analysis

AGAT WORK ORDER: 09T370334  
PROJECT NO: 0907-E017

5835 COOPERS AVENUE  
MISSISSAUGA, ON  
CANADA L4Z 1Y2

PH: (905)712-5100  
FAX: (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Arif Chowdhury

## O. Reg 153 - Metals & Inorganics in water - Table 1

DATE SAMPLED: Nov 18, 2009

DATE RECEIVED: Nov 19, 2009

DATE REPORTED: Nov 25, 2009

SAMPLE TYPE: Water

Parameter	Unit	G / S	RDL	Duplicate-2	
				1573404	
Antimony	µg/L	6.0	1.00	<1.00	
Arsenic	µg/L	25	0.60	0.71	
Barium	µg/L		0.50	83.0	
Beryllium	µg/L	4.0	1.00	<1.00	
Boron	µg/L	200	10.0	25.5	
Cadmium	µg/L	0.5	0.20	<0.20	
Chromium	µg/L	8.9	0.60	12.2	
Cobalt	µg/L	0.9	0.50	1.91	
Copper	µg/L	2.5	0.80	0.93	
Lead	µg/L	1	0.50	<0.50	
Molybdenum	µg/L	40	0.50	2.93	
Nickel	µg/L	25	0.60	7.55	
Selenium	µg/L	5.0	0.80	1.09	
Silver	µg/L	0.25	0.20	<0.20	
Thallium	µg/L	0.5	0.30	<0.30	
Vanadium	µg/L	6.0	0.40	0.98	
Zinc	µg/L	20	5.00	<5.00	
Sodium	mg/L		0.05	36.6	
Mercury	µg/L	0.02	0.02	<0.02	
Cyanide, Free	µg/L	5.0	2.0	<2.0	
Chromium VI	µg/L	10	5.0	<5.0	
Nitrate as N	mg/L		0.05	0.13	
Nitrite as N	mg/L		0.05	0.52	
pH	N/A		N/A	7.91	
Electrical Conductivity	µS/cm		2	1210	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to T1(AII-GW)

Certified By: \_\_\_\_\_



## Guideline Violation

AGAT WORK ORDER: 09T370334  
PROJECT NO: 0907-E017

5835 COOPERS AVENUE  
MISSISSAUGA, ON  
CANADA L4Z 1Y2

PH: (905)712-5100  
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<http://www.agatlabs.com>

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Arif Chowdhury

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	GUIDEVALUE	RESULT
1573404	Duplicate-2	T1(All-GW)	O. Reg 153 - Metals & Inorganics in water - Table 1	Chromium	8.9	12.2
1573404	Duplicate-2	T1(All-GW)	O. Reg 153 - Metals & Inorganics in water - Table 1	Cobalt	0.9	1.91