DRAFT TECHNICAL MEMO

TO: Lorna Zappone

FROM: Sarah Murray, B.Sc. (Env.)

CC: Heather Templeton, P.Eng., Carolyn Adams, P.Eng.

SUBJECT: Contaminant Investigation
Glen Road Pedestrian Bridge Environmental Assessment

DATE: July 17, 2017

BACKGROUND

A Contaminant Investigation was carried out by WSP Canada Group Limited (WSP) as per the scope of work included in the Request for Proposal No. 9117-15-7302 for the Glen Road Pedestrian Bridge Environmental Assessment Study. The work included in this memo was completed in support of the evaluation of alternatives for the proposed improvements to the Glen Road Pedestrian Bridge, spanning in a north-south direction, between Bloor Street East and Glen Road in the City of Toronto, Ontario ("Site"). **Figure 1** shows the Site location.

PAST INVESTIGATIONS

A Phase One Environmental Site Assessment (ESA) entitled: "*Phase One Environmental Site Assessment, Glen Road Pedestrian Bridge, Toronto, Ontario*" was completed in August, 2016 and submitted under separate cover. The Phase One ESA identified the following high and moderate areas of potential environmental concern (APECs) located adjacent to or near the Site:

APECs with High Potential for Contamination

1. 441 Bloor Street East, adjacent to the southwest boundary of the Site. The background information review completed for the Phase One ESA identified records of historical private underground storage tanks (USTs) used for fuel storage on the property installed in 1990 and remaining in use as of 2008. The property was also identified as a generator of wastes including oil skimmings, sludges and light fuels in the 1990s until 2013 (most recent record). The property currently operates as a City of Toronto fire station.

2. 40 Glen Road, adjacent to the northwest boundary of the Site. The background information review completed for the Phase One ESA identified a Technical Standards and Safety Authority (TSSA) variance indicating that a UST was abandoned at this property. The property was also identified as a registered generator of light fuels in 2009.

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APECs with Moderate Potential for Contamination

1. 1A Dale Avenue, adjacent to the northeast boundary of the Site. The background information review completed for the Phase One ESA identified the property as a registered waste generator of light fuels from 2006 to 2008.

The sampling locations investigated for this study were based on the location of the identified APECs with high and moderate potential for contamination, as reported in the Phase One ESA.

SCOPE OF THE INVESTIGATION

The scope of the investigation was carried out in accordance with the current best practices, as outlined in the Canadian Standards Association (CSA) Z769-00 (R2013) Phase II Environmental Site Assessment, and in general accordance with the requirements of Ontario Regulation (O.Reg.) 153/04, and the Ministry of the Environmental Climate Change (MOECC) Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario ("MOECC Guidance Document").

This investigation is a component of the larger geotechnical investigation which included the advancement of six boreholes (BH16-01 to BH16-06) in areas of proposed bridge foundations. Of the six borehole locations, five were included in this sampling program; BH16-05 was completed as a geotechnical borehole only as it was not located near an APEC.

The scope of work for the investigation including the following:

1 Collection of soil samples from five boreholes (BH16-01 to BH16-04 and BH16-06) located within APECs identified in the Phase One ESA report. Soil samples selected for analysis were based on soil stratigraphy and field conditions described in the borehole logs;

2 Submission of soil samples to an accredited laboratory for the analysis of metals and inorganics, petroleum hydrocarbons (PHCs), benzene, toluene, ethylbenzene and total xylenes (BTEX), and polychlorinated biphenols (PCBs);

3 Collection of groundwater samples from monitoring wells installed in four of the boreholes (BH16-01, BH16-02, BH16-03, BH16-06);

4 Submission of collected groundwater samples to an accredited laboratory for the analysis of metals and inorganics, PHCs, BTEX and PCBs;

5 Submission of one soil sample (representative of worst-case conditions) from each of the proposed areas of future bridge foundations for the O.Reg 558 toxicity characteristic leaching procedure (TCLP) analysis to determine suitability of soil for off-site disposal (i.e. hazardous versus non-hazardous);

6 Submission of duplicate soil and groundwater samples for quality control and quality assurance (QA/QC) protocols;

7 Submission of asphalt aggregate samples for the analysis of asbestos; and

8 Preparation of a technical memo outlining the findings of the field program and soil and groundwater analytical results.

INVESTIGATION METHOD

DRILLING

The drilling program included the advancement of six boreholes (BH16-1 to BH16-6) to maximum depths of 20 mbgs. Borehole drilling was conducted by Geo-Environmental Drilling Inc., under the immediate direction of WSP Geotechnical Department, between May 3 and 11, 2017.

Boreholes BH16-1, BH16-2, BH16-3 and BH16-6 were advanced using a CM55 drill with hollow stem auger and split spoon sample collection methods. BH16-4 and BH16-5 were completed using a Pionjar drill as the boreholes were located on uneven ground conditions. The borehole locations are shown on **Figure 2**. Details of the subsurface conditions are included in the borehole logs included as **Attachment A**.

SOIL: SAMPLING

Soil samples were collected during the drilling program using 0.6 metre long split spoons. The split spoons were washed between samples to prevent cross contamination of soil samples. Soil samples were collected and handled in accordance with best practices used in the environmental consulting industry and WSP's standard operating procedures. Soil samples were recovered with dedicated nitrile gloves to prevent cross contamination between sampling locations and were placed directly into labeled polyethylene bags for screening. The vapour readings were measured and selected samples were jarred in laboratory prepared bottles for submission for chemical analysis. For samples considered for PHC fraction F1 analysis, a core was recovered in the field from the undisturbed portion of the bag and placed in a laboratory prepared vial containing a measured amount of methanol.

Site geological conditions were observed in the soil samples and recorded into a field log by a WSP field technician indicating the colour, odour, texture, soil type and moisture.

FIELD SCREENING MEASUREMENTS

Total organic vapours (TOVs) were measured to determine if combustible compounds may be present in the collected soil samples, and to assist with the selection of soil samples for laboratory analysis.

TOV readings were measured by inserting a photoionization detector (PID) into soil sample bags to detect vapours that may have accumulated inside the sample bags following sample collection. The PID detects TOVs that emit below an ionization potential of 10.6 eV, which includes a wide range of chemicals such as solvents and fuels. The PID provides an indication of organic contamination in soil but does not measure concentrations of individual contaminants.

The accuracy and precision of the PID depends on soil characteristics, site conditions and weather, which can be difficult to quantify. The instruments are considered to be an accurate and precise indicator of gross contamination in soil vapour.

GROUNDWATER: MONITORING WELL INSTALLATION

Four boreholes (BH16-01, BH16-02, BH16-03, and BH16-06) were completed as monitoring wells. The monitoring wells were constructed in accordance with O.Reg.903, as amended, under the *Ontario Water Resources Act*, with the following construction details:

- Each monitoring well was constructed using 51 mm diameter well screens and polyvinyl chloride (PVC) riser pipe;
- The screened interval was a maximum length of 3.05 metres with a No. 10 slot size screen;
- It should be noted that the monitoring well installed in BH16-1 was constructed using a screen 1.5 metres in length.
- Sand pack, consisting of No. 3 silica sand, was placed around the well screen and the sand pack was extended between 0.3 m above the top of the screen;
- A bentonite seal (hole plug) was then placed around the PVC riser pipe up to within 0.3 m of the ground surface; and
- The monitoring wells were completed with flush mount casing protective covers which were cemented or sealed into place.

The locations of the monitoring wells are shown on **Figure 2.**

GROUNDWATER: FIELD MEASUREMENT OF WATER QUALITY PARAMETERS

Water levels were measured in each of the monitoring wells on May 19, 2017. The water levels in the wells were measured using a Solinst interface probe with water level measurements recorded from the top of the monitoring well riser. No free-phase hydrocarbon products were observed or measured in any of the monitoring wells. The monitoring wells installed in BH16-1 and BH16-2 were found to be dry during the sampling event.

Water quality parameters were monitored during the purging of groundwater in BH16-3 and BH16-6 using a YSI 556 water quality meter, until the consecutive readings of water quality parameters varied by less than 10%. The YSI unit is able to detect water quality parameters such as temperature, pH and conductivity. The water quality parameters recorded area included in **Table 1** below.

Table 1 - Water Quality Parameter Results

MONITORING WELL ID	TEMPERATURE (°C)	CONDUCTIVITY (M/S)	PH
BH16-1	Dry	Dry	Dry
BH16-2	Dry	Dry	Dry
BH16-3	16.2	6.97	6.95
BH16-6	12.9	1.17	7.87

GROUNDWATER: SAMPLING

On May 19, 2017, a WSP field technician purged three well volumes from the monitoring wells installed in BH16-3 and BH16-6. As noted, the monitoring wells installed in BH16-1 and BH16-2 were dry. The collected groundwater samples were collected and conveyed directly into laboratory supplied sample containers. Samples submitted for metals analysis were filtered in the field. All groundwater samples were placed in a cooler with ice prior to submission to AGAT Laboratories.

ASPHALT: SAMPLING

A total of twelve asphalt samples collected from the boreholes located on paved roadway surfaces (BH16-01, BH16-02 and BH16-06) were analyzed for asbestos. The collection of asphalt samples was completed in accordance with O.Reg.278/05.

Three samples were collected from the asphalt at BH16-01 (from the top, middle and bottom of the core). The asphalt at BH16-01 Was noted to be consistent layering and colouring throughout.

The asphalt at BH16-02 and BH16-06 was noted to be similar in layering (both boreholes located on Bloor Street East). The asphalt core collected from both boreholes was noted to consist of a blue/dark grey aggregate in the top layer and a light grey aggregate in the middle (second) layer. The bottom of the asphalt core at BH16-02 contained large aggregates, however there was no bottom layer identified in the asphalt core from BH16-06. A combined three samples between BH16-02 and BH16-6 were analyzed from each of the three layers: two samples collected from the top layer at BH16-02 and one sample collected from the top layer at BH16-06; one sample collected from the second (middle) layer at BH16-02 and two samples collected from the second (middle) layer at BH16-06; and all three samples collected from the bottom of BH16-02 as no bottom layer was observed at BH16-06.

ANALYTICAL TESTING

SOIL AND GROUNDWATER SAMPLES

Soil and groundwater samples were analyzed by AGAT Laboratories (AGAT) in Mississauga, Ontario, a laboratory accredited with the Canadian Association for Laboratory Accreditation (CALA). Soil samples were collected for laboratory analysis of metals and inorganics, PHCs, BTEX and PCBs. Groundwater samples were collected for laboratory analysis of metals and inorganics, PHCs, BTEX and PCBs.

During the drilling of BH16-3, sewage-like odours were identified between 2.3 and 3.7 mbgs. As such, soil samples within this interval were analyzed for organic nitrogen, total kjeldahl nitrogen (TKN), ammonia, nitrate, nitrite and phenols.

Table 2 below is a summary of the soil samples submitted for laboratory analysis, including the corresponding sample depths intervals.

Table 2 – Summary of Sample Analyses in Soil

SAMPLE ID	SAMPLING DEPTHS	METALS AND INORGANICS	PHCS AND BTEX	PCBS	PHENOLS, TKN, ORGANIC NITROGEN, AMMONIA, NITRATE AND NITRITE	TCLP - METALS AND INORGANICS
BH16-1 SS2	0.76-1.37	X				X
BH16-1 SS3	1.52-2.13			X		
BH16-1 SS4	2.29-2.90		X			
BH16-2 SS1	0.30-0.76	X				
BH16-2 SS4	2.29-2.90		X			
BH16-3 SS3	1.52-2.13	X			X	X (combined sample)
BH16-3 SS4	2.29-2.90				X	
BH16-3 SS7	4.57-5.18		X			
BH16-4 SS1	0-0.61	X				X (combined sample)
BH16-4 SS5	2.44-3.05		X			
BH16-6 SS2	0.76-1.37	X				
BH16-6 SS3	1.52-2.13			X		
BH16-6 SS7	4.57-5.18		X			

A total of 55 soil samples were collected in bags for screening. The TOV readings recorded during the screening of the soil samples were all below 13 ppm and were not indicative of gross PHC impacts. In general, the soil samples with the highest vapour readings were submitted for PHC and BTEX analysis.

The analytical results were compared to the MOECC Table 3, Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Ground Water Condition for Industrial/ Commercial/ Community Property Use in medium to fine texture soils as stated in the "Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the *Environmental Protection Act*", April 15, 2011.

ASPHALT SAMPLES

Asphalt aggregate samples were collected by a WSP field technician during the drilling program and submitted to EMC Scientific Incorporated for analysis of asbestos content using polarized light microscopy – EPA 600.

RESIDUE MANAGEMENT PROCEDURES

Excess soil cuttings from drilling operations were collected and contained in drums for removal off-site pending the laboratory results. Three soil samples representing worst-case soil conditions were submitted to AGAT for TCLP analysis of metals and inorganics. The results of the TCLP analyses were compared against O.Reg.347 and classified as non-hazardous. The

TCLP analytical results are provided in the Laboratory Certificates of Analysis in **Attachment A**.

The removal of the drums was conducted by Ontario Mini Bin Disposal Services and disposed of at a licensed receiving facility.

QUALITY ASSURANCE AND QUALITY CONTROL MEASURES

Quality assurance and quality control of the soil samples was monitored and maintained in a number of ways:

1. The field investigation was completed under operation of WSP standard operating procedures for soil and groundwater sampling;
2. Samples were given unique identifications as they were collected, typically identifying the sample location and depth. The sample numbers were recorded in field notes for each location;
3. All non-dedicated sampling and monitoring equipment (e.g. interface probe) was cleaned using Alconox and distilled water following each use;
4. The split spoon samplers were washed between samples;
5. A chain-of-custody form was filled out prior to submitting the samples to the laboratory. The chain-of-custody documented sample movement from collection to receipt at the laboratory and provided sample identification, requested analysis and conditions of samples upon arrival at the laboratory (e.g., temperature, container status, etc.);
6. Soil samples were randomly selected by the WSP field staff for duplicate testing;
7. Samples were randomly selected by the laboratory for Quality Assurance checks. Generally, one sample for every ten samples submitted is checked. For each parameter, there is an acceptable upper and lower limit for the measured concentration of the parameter. Measured concentrations of analyzed samples must fall within the upper and lower acceptable limits in order for the sample to be valid. If a result exceeds the upper or lower acceptable limits, the sample must be re-analyzed.

REVIEW AND EVALUATION

GEOLOGY

The Site is covered with vegetation on the slopes of the valley and asphalted surfaces on roadways. The materials encountered during the drilling program consist of fill materials (silty clay to clayey, and silty sand) underlain by silt to sandy silt native materials, followed by a silty clay till. A silty clay/shale complex was identified at the base of BH16-3, approximately 10.7 mbgs.

Based on field observations and sieve results, the subsurface soil conditions are classified as fine textured. The grain size analytical results are provided in the Laboratory Certificates of Analysis in **Attachment B**.

SOIL: FIELD SCREENING

The measured TOV readings ranged from 0.1ppm (soil sample collected from BH16-4 between 2.29 and 2.90 mbgs) to 13.0ppm (soil sample collected from BH16-6 between 4.57 and 5.18 mbgs). The recorded TOV readings suggest an insignificant level of combustible compounds present in the subsurface, at the locations sampled.

SOIL QUALITY

A summary of the soil samples exceeding the applicable MOECC Table 3 SCS is included in **Table 3** below and presented in **Figure 3:**

Table 3 - Soil Exceedance Summary Table

SAMPLE ID	SAMPLING DEPTH (MBGS)	PARAMETER	MOECC TABLE 3 SCS (FINE) (UG/G)	RESULT (UG/G)
BH16-01 SS2	0.76-1.37	Cadmium	1.9	3.2
		Electrical Conductivity	1.4	1.79
		Sodium Adsorption Ratio	12 (no units)	24.1 (no units)
BH16-02 SS1	0.30-0.76	Electrical Conductivity	1.4	2.98
		Sodium Adsorption Ratio	12 (no units)	58.3 (no units)
BH16-04 SS1	0-0.61	Lead	120	231
		Zinc	340	349

Based on the results of the soil investigation, it is concluded that the surficial soils at BH16-01, BH16-02 and BH16-04 are in exceedance of the MOECC Table 3 SCS due to the elevated chemical concentrations of metals, electrical conductivity (EC) and sodium adsorption ratio (SAR).

The MOECC O.Reg 153/04 does not specify a criteria for the concentration of organic nitrogen and TKN in soil. However, in 1989 the MOECC, then referred to as the Ontario Ministry of the Environment, produced a document entitled "Guidelines for the Decommissioning and Cleanup of Sites in Ontario" which included a total nitrogen standard of 0.6%, which corresponds to 6,000 ug/g. Because the organic nitrogen and TKN concentrations detected in the soil at BH16-03 between 1.5 and 2.9 mbgs are much lower than the previous 1989 standard, they are not considered to present at contaminant concentrations.

No PCBs, PHCs or BTEX were reported to have concentrations exceeding the applicable MOECC Table 3 SCS in soil.

The analytical soil results are provided in **Table 4** (Metals and Inorganics and Phenols) and **Table 5** (PHCs, BTEX and PCBs) following the text. AGAT's Certificates of Analyses are included in **Attachment B**.

One composite soil sample representing worst-case soil conditions was submitted from BH16-1, BH16-3 and BH16-4 (one per borehole location) for the TCLP analysis of metals and inorganics. The results of the TCLP analysis indicate that the soil would be classified as a solid, non-hazardous waste. The TCLP analytical results are summarized in **Table 6** (TCLP metals and inorganics) and Certificates of Analyses are included in **Attachment B**.

GROUNDWATER QUALITY

Groundwater samples were collected from monitoring wells at BH16-3 and BH16-6 on May 19, 2017 and submitted for the analyses of metals and inorganics, PHCs, BTEX and PCBs. During the groundwater sampling event on May 19, 2017, monitoring well at BH16-01 and BH16-02 were observed to be dry and as such groundwater samples were not submitted from these two dry monitoring well locations. Groundwater samples submitted for metals analysis were filtered in the field. A summary of the groundwater samples exceeding the applicable MOECC Table 3 SCS is included in **Table 7** below and presented in **Figure 4:**

Table 7 – Groundwater Exceedance Summary Table

BOREHOLE ID	PARAMETER	MOECC TABLE 3 SCS (FINE) (UG/L)	RESULT (UG/L)
BH16-3	PHC F2	150	1200
BH16-6	CHLORIDE	2,300,000	2,490,000

No metals, BTEX or PCBs were reported to have concentrations exceeding the applicable MOECC Table 3 SCS in groundwater. The analytical groundwater results are provided in **Table 8** (Metals and Inorganics), **Table 9** (PHCs, PCBs and BTEX) following the text. AGAT's Certificates of Analyses are included in **Attachment B**.

ASBESTOS ANALYSIS

The twelve asphalt samples analyzed for asbestos were identified as non-detect, meaning that no asbestos fibres were observed in any of the samples submitted for analysis. The laboratory Certificates of Analysis are included in **Attachment B.**

QUALITY ASSURANCE AND QUALITY CONTROL RESULTS

AGAT completed a variety of quality assurance/quality control (QA/QC) measures on the soil and groundwater samples submitted as part of the sampling program. These QA/QC measures included: sample replicates, matrix spiked laboratory blanks, and process blanks.

In addition, WSP submitted one duplicate soil sample for analysis of PCBs, PHCs and BTEX and one duplicate groundwater sample for analysis of metals and inorganics and PHCs and BTEX. The duplicate sample analytical results for soil are included in **Table 10** and for groundwater in **Table 11** following the text. The submission of these samples demonstrated the accuracy and reliability of the laboratory procedures and instruments. Relative percent difference (RPD) for analytes in duplicate samples were evaluated for this investigation. The RPD calculation is only applicable when both original and duplicate concentrations are greater than five times the laboratory reporting detection limit (RDL).

Acceptable RPD limits are as follows:

— Metals and inorganics - 20% water; 30-40% soil (exception of conductivity at 10%)

— VOCs – 30% water; 50% soil

— PHCs and PCBs – 30% water; 30% soil

The results of the soil duplicate analysis indicated that the relative percent differences (RPDs) between the parent and the duplicate samples (see **Table 10**) were within acceptable limits.

WSP also submitted one duplicate groundwater sample for analysis of metals and inorganics, PHCs and BTEX. The results of the groundwater duplicate analysis indicated that the RPDs between the parent and duplicate samples were not within the acceptable limits for the following parameter analyzed in groundwater collected from BH16-6:

– Vanadium – 24.9%

The concentration of vanadium in the parent and duplicate groundwater samples were several orders of magnitude lower than the MOECC Table 3 SCS. The variability noted in the sampling and analysis will not affect the interpretation of the results.

CONCLUSIONS

Based on the results of the laboratory analysis of the submitted soil samples, exceedances to the MOECC Table 3 SCS were noted in the following samples:

— Soil sample collected between 0.76 and 1.37 mbgs from BH16-1 located in the north portion of the Site exceeded for cadmium, EC and SAR;

— Soil sample collected between 0.03 and 0.76 mbgs from BH16-2 in the south portion of the Site exceeded for EC and SAR; and

— Soil sample collected between surface and 0.61 mbgs from BH16-4 in the north portion of the Site exceeded for lead and zinc.

Detectable concentrations of organic nitrogen and TKN were observed at BH16-3 between 1.52 and 2.90 mbgs. Because there are no standards for organic nitrogen and TKN in O.Reg.153/04, the detected concentrations of organic nitrogen and TKN were compared to a 1989 guideline published by the MOECC (then referred to as the Ontario Ministry of Environment), which includes a standard of total nitrogen at 0.6% (which corresponds to 6,000 ug/g). Because the detections of organic nitrogen and TKN identified at BH16-3 are much lower than 6,000 ug/g the two parameters are not considered to be present at contaminant concentrations.

Based on the results of the laboratory analysis of the submitted groundwater samples, exceedances to the MOECC were noted in the following samples:

— Groundwater sample collected from the monitoring well installed in BH16-3 exceeded for PHC F2; and

— Groundwater sample collected from the monitoring well installed in BH16-6 exceeded for chloride.

The asphalt cores collected and analyzed for asbestos content were identified as non-detect, meaning that no asbestos fibres were observed in any of the asphalt samples.

RECOMMENDATIONS

Based on the results of the Contaminant Investigation, the following recommendations are made:

— Excess surficial soil generated during bridge foundation construction in the areas of BH16-1, BH16-2 and BH16-4 should be managed as contaminated material in accordance with MOECC regulations and disposed of at a MOECC licensed receiving facility. Additional soil

sampling may be warranted to determine the vertical limit of the soil to be managed as contaminated at these locations;

- Excess soil generated during bridge foundation construction in the area of BH16-3 between 1.5 and 3 mbgs should be managed with appropriate health and safety precautions due to the potential presence of sewage effluent within this depth interval;
- Excess groundwater generated during bridge foundation construction in the areas of BH16-3 must be managed as contaminated groundwater in accordance with MOECC regulations and disposed of at a MOECC licensed receiving facility;
- In general, groundwater generated during bridge foundation construction must be tested to ensure it is compliant with City of Toronto Sewer-Use Bylaw prior to discharging to sewers; and
- A MOECC licenced well contractor should be retained to decommission the four monitoring wells on the Subject Property, as outlined in O. Reg. 903 under the *Ontario Water Resources Act*. The decommissioning should be overseen by a qualified environmental consultant and copies of the well decommissioning records should be provided to the City of Toronto or a City of Toronto representative (i.e. Contract Administrator).

STATEMENT OF LIMITATIONS

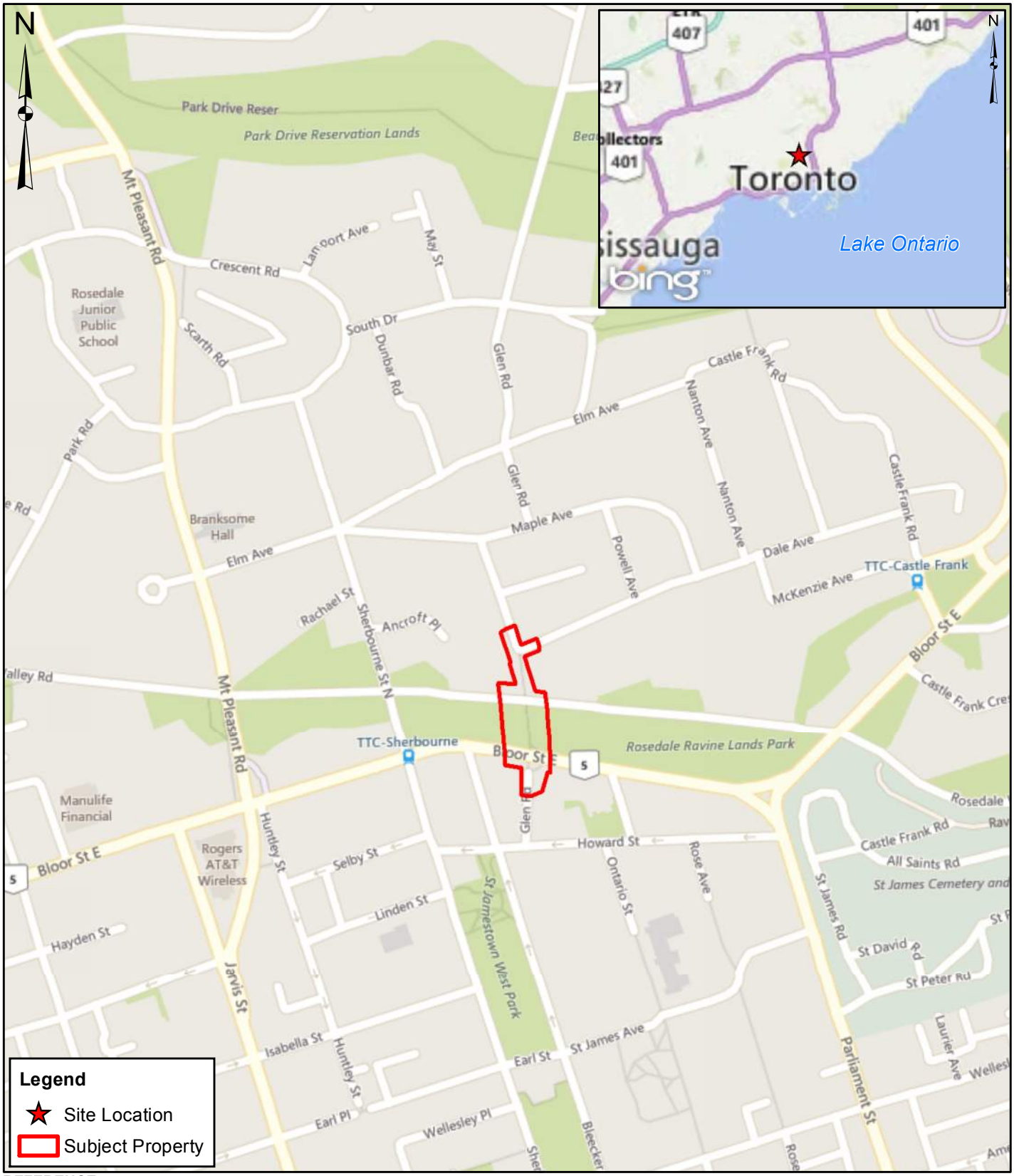
The Contaminant Investigation was carried out in accordance with generally accepted professional practices, industry standards and applicable environmental regulations. The Contaminant Investigation was conducted to obtain information about environmental conditions of the soil, groundwater and asphalt at the Site. This memo report has been prepared and based on information from other sources as indicated in the report, and on information obtained at discrete borehole and monitoring well sampling locations. The conditions reported herein were those encountered at the Site at the time the work was performed and as present at the discrete sampling locations. Conditions between sampling locations may be different than those encountered at the sampling locations and WSP is not responsible for such differences.

The Contaminant Investigation was prepared for the exclusive use by the City of Toronto. Any use of the report by any other party without the written consent of WSP is the sole responsibility of such party. WSP accepts no responsibility for damages that may be suffered by any third party as a result of decisions made or actions taken based on this report.

ENCLOSED

Figures
Tables
Attachment A – Borehole logs
Attachment B – Laboratory Certificates of Analyses

FIGURES



REFERENCE

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http://www.bing.com/maps
Projection: UTM Zone 17N Datum: NAD 83

0 100 200 300 400 Meters

Scale: As Shown

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ENVIRONMENTAL TESTING PROGRAM
GLEN ROAD PEDESTRIAN BRIDGE
TORONTO, ONTARIO

SITE LOCATION

DATE:
JULY 2017

PROJECT:
3216026

FIGURE
1

I:\EngSoftware\2016\32\3216026\I&E\Env Mgmt\ARC\MXD\Environmental Testing Program\Figure 1 Site Location.mxd

Scale: As Shown

REFERENCE
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Projection: UTM Zone 17N Datum: NAD 83

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ENVIRONMENTAL TESTING PROGRAM
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TORONTO, ONTARIO

BOREHOLE LOCATION PLAN

DATE:
JULY 2017

PROJECT:
3216026

FIGURE
2

I:\EngSoftware\2016\32\3216026\I&E\Env Mgmt\ARC\MXD\Environmental Testing Program\Figure 2 Borehole Location Plan.mxd

Sample ID Depth (m) Lab Job # Sampling Date	MOECC TABLE 3 ICC FINE GRAINED STANDARD	REPORTING LIMIT	UNITS	BH 16-01 SS2 0.76-1.37 8396936 05/03/2017
Metals and Inorganics				
Cadmium	1.9	0.5	ug/g	**3.2**
Electrical Conductivity	1.4	0.005	mS/cm	**1.79**
Sodium Adsorption Ratio	12	NA	NA	**24.1**

Sample ID Depth (m) Lab Job # Sampling Date	MOECC TABLE 3 ICC FINE GRAINED STANDARD	REPORTING LIMIT	UNITS	BH16-04 SS1 0-0.61 8369255 05/03/2017
Metals and Inorganics				
Lead	120	1	ug/g	**231**
Zinc	340	5	ug/g	**349**

Sample ID Depth (m) Lab Job # Sampling Date	MOECC TABLE 3 ICC FINE GRAINED STANDARD	REPORTING LIMIT	UNITS	BH 16-02 SS1 0.30-0.76 8396942 05/03/2017
Metals and Inorganics				
Electrical Conductivity	1.4	0.005	mS/cm	**2.98**
Sodium Adsorption Ratio	12	NA	NA	**58.3**

N

ANCROFT PL
GLEN RD
DALE AVE
BH16-01
BH16-04
ROSEDALE VALLEY RD
BH16-03
BH16-05
BH16-02
BH16-06
BLOOR ST E
REDROCKET LANE
GLEN RD
HOWARD ST
ONTARIO ST
SHERBOURNE

Legend
- Subject Property
- Borehole
- Monitoring Well

0 25 50 75 100 Meters

Scale: As Shown

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Projection: UTM Zone 17N Datum: NAD 83

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ENVIRONMENTAL TESTING PROGRAM
GLEN ROAD PEDESTRIAN BRIDGE
TORONTO, ONTARIO

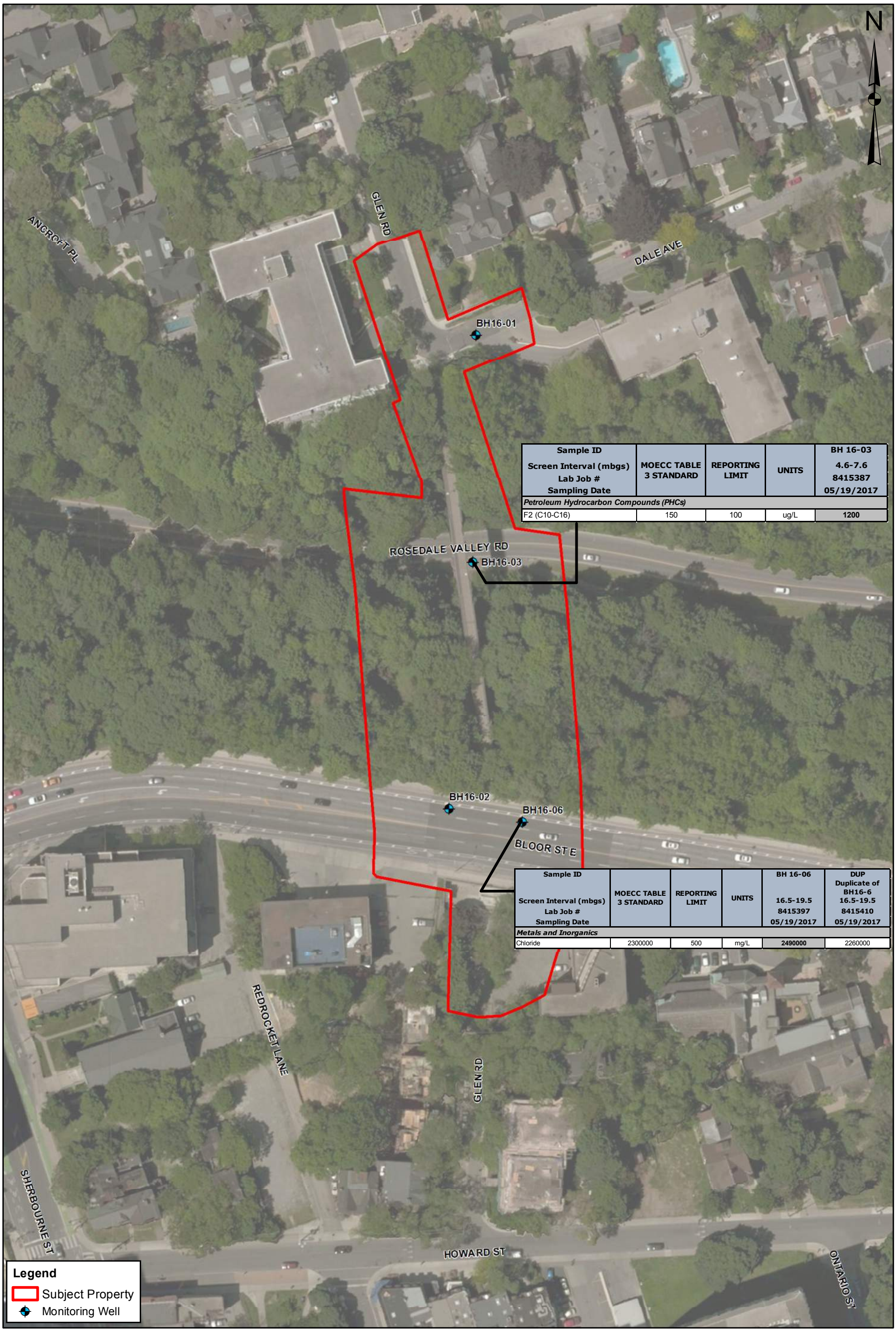
SOIL EXCEEDANCES

DATE:
JULY 2017

PROJECT:
3216026

FIGURE
3

I:\EngSoftware\2016\32\3216026\I&E\Env Mgmt\ARC\MXD\Environmental Testing Program\Figure 3 Soil Exceedances.mxd



Sample ID Screen Interval (mbgs) Lab Job # Sampling Date	MOECC TABLE 3 STANDARD	REPORTING LIMIT	UNITS	BH 16-03 4.6-7.6 8415387 05/19/2017
Petroleum Hydrocarbon Compounds (PHCs)				
F2 (C10-C16)	150	100	ug/L	**1200**

Sample ID Screen Interval (mbgs) Lab Job # Sampling Date	MOECC TABLE 3 STANDARD	REPORTING LIMIT	UNITS	BH 16-06 16.5-19.5 8415397 05/19/2017	DUP Duplicate of BH16-6 16.5-19.5 8415410 05/19/2017
Metals and Inorganics					
Chloride	2300000	500	mg/L	**2490000**	2260000

0 25 50 75 100 Meters

Scale: As Shown

REFERENCE
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Projection: UTM Zone 17N Datum: NAD 83

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GLEN ROAD PEDESTRIAN BRIDGE
TORONTO, ONTARIO

GROUNDWATER EXCEEDANCES

DATE:
JULY 2017

PROJECT:
3216026

FIGURE
4

I:\EngSoftware\2016\32\3216026\I&E\Env Mgmt\ARC\MXD\Environmental Testing Program\Figure 4 GW Exceedances.mxd

TABLES

Table 4: Summary of Analytical Results in Soil
Metals and Inorganics and Phenols
Glen Road Pedestrian Bridge, Toronto, Ontario

Sample ID Depth (m) Lab Job # Sampling Date	MOECC TABLE 3 STANDARD	REPORTING LIMIT	UNITS	BH 16-01 SS2 0.76-1.37 8396936 05/03/2017	BH 16-02 SS1 0.30-0.76 8396942 05/03/2017	BH16-03 SS3 1.52-2.13 8369142 05/03/2017	BH16-03 SS4 2.29-2.90 8369143 05/03/2017	BH16-04 SS1 0-0.61 8369255 05/03/2017	BH16-06 SS2 0.76-1.37 8396949 05/03/2017
Metals and Inorganics									
Antimony	50	0.8	ug/g	2.5	1	<0.8	<0.8	0.8	<0.8
Arsenic	18	1	ug/g	3	5	2	2	7	3
Barium	670	2	ug/g	50	94	31	38	90	26
Beryllium	10	0.5	ug/g	<0.5	0.5	<0.5	<0.5	<0.5	<0.5
Boron (Hot Water Soluble)	2	0.10	ug/g	0.25	0.57	0.22	0.26	0.54	0.24
Cadmium	1.9	0.5	ug/g	**3.2**	0.9	<0.5	<0.5	0.5	<0.5
Chromium	160	2	ug/g	16	21	11	13	45	32
Chromium VI	10	0.2	ug/g	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cobalt	100	0.5	ug/g	6.2	7	3.1	5.1	11.8	3.1
Copper	300	1	ug/g	15	26	7	10	120	12
Lead	120	1	ug/g	41	96	14	9	**231**	29
Mercury	20	0.10	ug/g	<0.10	0.26	0.16	<0.10	0.18	0.17
Molybdenum	40	0.5	ug/g	<0.5	<0.5	<0.5	<0.5	6.8	<0.5
Nickel	340	1	ug/g	14	16	7	11	47	7
Selenium	5.5	0.4	ug/g	<0.4	0.5	<0.4	<0.4	<0.4	<0.4
Silver	50	0.2	ug/g	<0.2	<0.2	<0.2	<0.2	0.3	<0.2
Thallium	3.3	0.4	ug/g	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Vanadium	86	1	ug/g	20	23	16	21	30	12
Zinc	340	5	ug/g	111	96	30	25	**349**	48
pH	5 to 9	NA	pH Units	8.19	9.22	7.26	7.66	7.51	11.2
Electrical Conductivity	1.4	0.005	mS/cm	**1.79**	**2.98**	0.415	0.462	0.724	1.4
Sodium Adsorption Ratio	12	NA	N/A	**24.1**	**58.3**	3.69	3.7	6.8	9.55
Cyanide, Free	0.051	0.040	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Organic Nitrogen	6,000	50	µg/g	NA	NA	416	235	NA	NA
Total Kjeldahl Nitrogen	6,000	50	µg/g	NA	NA	416	235	NA	NA
Ammonia as N (KCl Extr)	NV	5	µg/g	NA	NA	<5	<5	NA	NA
Nitrate as N (2:1)	NV	1	µg/g	NA	NA	<1	<1	NA	NA
Nitrite as N (2:1)	NV	1	µg/g	NA	NA	<1	<1	NA	NA
Boron (Total)	120	5	ug/g	6	7	<5	<5	9	<5
Uranium	33	0.5	ug/g	<0.5	0.6	<0.5	0.6	0.5	<0.5
Phenols									
Phenols	9.4	1	mg/Kg	NA	NA	<1	<1	NA	NA

Notes:

'NV ' : No Standard established NA: Parameter not analyzed

MOECC Table 3: Ontario Ministry of the Environment, "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, " March 2004, amended July 1, 2011. Full Depth Generic Site Condition Standards for Soil in a Non-Potable Ground Water Condition for Industrial/Commercial/Community Property Use with Fine Textured Soils.

The Standard used for Organic Nitrogen and Total Kjeldahl Nitrogen is from the 1989 document published by the Ontario Ministry of Environment entitled "Guidelines for the Decommissioning and Cleanup of Sites in Ontario".

100	Exceeds MOECC Table 3 Standards
100	Detection Limit Exceeds MOECC Standard

Table 5: Summary of Analytical Results in Soil
PHCs, BTEX and PCBs
Glen Road Pedestrian Bridge, Toronto, Ontario

Sample ID Depth (m) Lab Job # Sampling Date	MOECC TABLE 3 STANDARD	REPORTING LIMIT	UNITS	BH 16-01 SS3 1.52-2.13 8396938 05/10/2017	Dup 1 Duplicate of BH16-01-SS3 8396955 05/10/2017	BH 16-01 SS4 2.29-2.90 8396939 05/10/2017	Dup 2 Duplicate of BH16-01-SS4 8396956 05/10/2017	BH 16-02 SS4 2.29-2.90 8396945 05/10/2017	BH16-03 SS7 4.57-5.18 8369251 05/03/2017	BH16-04 SS5 2.44-3.05 8369257 05/03/2017	BH 16-06 SS3 1.52-2.13 8396951 05/11/2017	BH 16-06 SS7 4.57-5.18 8396952 05/11/2017
Petroleum Hydrocarbon Compounds (PHCs)												
F1 (C6-C10)	65	5	ug/g	NA	NA	<5	<5	<5	<5	<5	NA	<5
F1 (C6-C10) - BTEX	65	5	ug/g	NA	NA	<5	<5	<5	<5	<5	NA	<5
F2 (C10-C16)	250	10	ug/g	NA	NA	<10	<10	<10	<10	<10	NA	<10
F3 (C16-C34)	2500	50	ug/g	NA	NA	<50	<50	<50	<50	<50	NA	2000
F4 (C34-C50)	6600	50	ug/g	NA	NA	<50	<50	<50	<50	<50	NA	1100
F4 Gravimetric	6600	50	ug/g	NA	NA	NA	NA	NA	NA	NA	NA	NA
Reached Baseline at C50	NV	NV	NV	NA	NA	YES	YES	YES	YES	YES	NA	YES
Polychlorinated Biphenols (PCBs)												
Polychlorinated Biphenols	1.1	0.1	ug/g	<0.1	<0.1	NA	NA	NA	NA	NA	<0.1	NA
Volatile Organic Compounds (VOCs)												
Benzene	0.4	0.02	ug/g	NA	NA	<0.02	<0.02	<0.02	<0.02	<0.02	NA	0.12
Ethylbenzene	19	0.05	ug/g	NA	NA	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.05
Toluene	78	0.08	ug/g	NA	NA	<0.08	<0.08	<0.08	<0.08	<0.08	NA	<0.08
Total Xylenes	30	0.05	ug/g	NA	NA	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.05

Notes:

'NV ' : No Standard established NA: Parameter not analyzed

MOECC Table 3: Ontario Ministry of the Environment, "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, " March 2004, amended July 1, 2011. Full Depth Generic Site Condition Standards for Soil in a Non-Potable Ground Water Condition for Industrial/Commercial/Community Property Use with Fine Textured Soils.

100	Exceeds MOECC Table 3 Standards
100	Detection Limit Exceeds MOECC Standard

Table 6: Summary of Analytical Results in Soil
TCLP Metals and Inorganics
Glen Road Pedestrian Bridge, Toronto, Ontario

Sample ID Lab Job # Date Sampled	MOE O.Reg. 558 SCH. 4	REPORTING LIMIT	Units	BH16-01 SS-Combined 8396984 5/10/2017	BH16-03 SS-Combined 8369259 05/03/2017	BH16-04 SS-Combined 8369260 05/03/2017
TCLP Metals and Inorganics						
Leachable Fluoride (F-)	150	0.05	mg/L	0.13	0.18	0.23
Leachable Free Cyanide	20	0.05	mg/L	<0.05	<0.05	<0.05
Leachable Nitrate + Nitrite	1000	0.70	mg/L	<0.70	<0.70	<0.70
Leachable Mercury (Hg)	0.1	0.01	mg/L	<0.01	<0.01	<0.01
Leachable Arsenic (As)	2.5	0.010	mg/L	<0.010	<0.010	<0.010
Leachable Barium (Ba)	100	0.100	mg/L	0.665	0.896	0.618
Leachable Boron (B)	500	0.050	mg/L	<0.050	<0.050	<0.050
Leachable Cadmium (Cd)	0.5	0.010	mg/L	<0.010	<0.010	<0.010
Leachable Chromium (Cr)	5	0.010	mg/L	0.011	0.016	0.015
Leachable Lead (Pb)	5	0.010	mg/L	<0.010	0.071	<0.010
Leachable Selenium (Se)	1	0.010	mg/L	<0.010	<0.010	<0.010
Leachable Silver (Ag)	5	0.010	mg/L	<0.010	<0.010	<0.010
Leachable Uranium (U)	10	0.050	mg/L	<0.050	<0.050	<0.050

Notes:
'NV ' : No Standard established NA: Parameter not analyzed
MOECC O.Reg. 558 Sch. 4: Ontario Ministry of Environment - Leachate Quality Criteria
100 Exceeds MOECC Leachate Quality Criteria

Table 8: Summary of Analytical Results in Groundwater
Metals and Inorganics
Glen Road Pedestrian Bridge, Toronto, Ontario

Sample ID Screen Interval (mbgs) Lab Job # Sampling Date	MOECC TABLE 3 STANDARD	REPORTING LIMIT	UNITS	BH 16-03 4.6-7.6 8415387 05/19/2017	BH 16-06 16.5-19.5 8415397 05/19/2017	DUP Duplicate of BH16-06 16.5-19.5 8415410 05/19/2017
Metals and Inorganics						
Antimony	20000	1.0	ug/L	<1.0	<1.0	<1.0
Arsenic	1900	1.0	ug/L	2.6	7.9	9.4
Barium	29000	2.0	ug/L	288	2130	2100
Beryllium	67	0.5	ug/L	<0.5	<0.5	<0.5
Boron (Total)	45000	10.0	ug/L	59.8	50.8	46.3
Cadmium	2.7	0.2	ug/L	<0.2	<0.2	<0.2
Chromium	810	2.0	ug/L	5.3	49.5	43.3
Chromium VI	140	5	ug/L	<5	<5	<5
Cobalt	66	0.5	ug/L	<0.5	0.9	1
Copper	87	1.0	ug/L	<1.0	2.9	2.1
Lead	25	0.5	ug/L	0.7	1.5	1.7
Mercury	2.8	0.02	ug/L	<0.02	<0.02	<0.02
Molybdenum	9200	0.5	ug/L	3	<0.5	<0.5
Nickel	490	1.0	ug/L	<1.0	3.8	5.5
Selenium	63	1.0	ug/L	1.4	3	3.9
Silver	1.5	0.2	ug/L	<0.2	<0.2	<0.2
Thallium	510	0.3	ug/L	0.6	0.6	0.5
Vanadium	250	0.4	ug/L	3.7	9.5	12.2
Zinc	1100	5.0	ug/L	<5.0	<5.0	6.3
pH	5 to 9	NA	pH Units	7.95	7.79	7.67
Electrical Conductivity	NV	2	mS/cm	1230	7580	7540
Cyanide, Free	66	2	ug/L	<2	<2	<2
Sodium	2300000	1000	ug/L	73200	782000	774000
Chloride	2300000	500	mg/L	181000	**2490000**	2260000
Uranium	420	0.5	ug/L	<0.5	<0.5	<0.5

Notes:

'NV ' : No Standard established NA: Parameter not analyzed

MOECC Table 3: Ontario Ministry of the Environment, "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, " March 2004, amended July 1, 2011. Full Depth Generic Site Condition Standards for Non-Potable Ground Water for All Types of Property Use with fine textured soils.

100	Exceeds MOECC Table 3 Standards
100	Detection Limit Exceeds Applicable Standard

Table 9: Summary of Analytical Results in Groundwater
PHCs, PCBs and BTEX
Glen Road Pedestrian Bridge, Toronto, Ontario

Sample ID Screen Interval (mbgs) Lab Job # Sampling Date	MOECC TABLE 3 STANDARD	REPORTING LIMIT	UNITS	BH 16-03 4.6-7.6 8415387 05/19/2017	BH 16-06 16.5-19.5 8415397 05/19/2017	DUP Duplicate of BH16-06 16.5-19.5 8415410 05/19/2017
Petroleum Hydrocarbon Compounds (PHCs)						
F1 (C6-C10)	750	25	ug/L	<25	<25	<25
F1 (C6-C10) - BTEX	750	25	ug/L	<25	<25	<25
F2 (C10-C16)	150	100	ug/L	**1200**	<100	<100
F3 (C16-C34)	500	100	ug/L	<100	<100	<100
F4 (C34-C50)	500	100	ug/L	<100	<100	<100
F4 Gravimetric	500	500	ug/L	NA	NA	NA
Reached Baseline at C50	NV	NV	NV	YES	YES	YES
Polychlorinated Biphenyls (PCBs)						
Total PCBs	15	0.1	ug/L	<0.1	<0.1	<0.1
Benzene Ethylbenzez Toulene and Total Xylenes (BTEX)						
Benzene	430	0.20	ug/L	<0.20	<0.20	<0.20
Ethylbenzene	2300	0.10	ug/L	<0.10	<0.10	<0.10
Toluene	18000	0.20	ug/L	<0.20	<0.20	<0.20
Total Xylenes	4200	0.20	ug/L	<0.20	<0.20	<0.20

Notes:

'NV ' : No Standard established NA: Parameter not analyzed

MOECC Table 3: Ontario Ministry of the Environment, "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, " March 2004, amended July 1, 2011. Full Depth Generic Site Condition Standards for Non-Potable Ground Water for All Types of Property Use with fine textured soils.

100	Exceeds MOECC Table 3 Standards
100	Detection Limit Exceeds MOECC TABLE 3 STANDARD

Table 10: Summary of Relative Percent Differences (RPDs) in Soil
Glen Road Pedestrian Bridge, Toronto, Ontario

Parameter	MOECC Alert Criteria	RDL	Sample[(1)]	Duplicate	% Difference
			BH 16-01 SS4	Dup 2	
BTEX and PHCs					
F1 (C6-C10)	30%	5	<5	<5	-
F1 (C6-C10) - BTEX	30%	5	<5	<5	-
F2 (C10-C16)	30%	10	<10	<10	-
F3 (C16-C34)	30%	50	<50	<50	-
F4 (C34-C50)	30%	50	<50	<50	-

Parameter	MOECC Alert Criteria	RDL	Sample[(1)]	Duplicate	% Difference
			BH 16-01 SS3	Dup 1	
PCBs					
Polychlorinated Biphenols	30%	0.1	<0.1	<0.1	-

Notes:

(1)	All results reported in micrograms per gram (µg/g) unless otherwise noted.
<	Parameter not detected above value specified
% Difference	Relative Percent Difference = |(X-Y)/Average(X,Y)| x 100% where X is the sample and Y is the duplicate
-	RPD could not be calculated
55.2%	RPD exceeds MOECC Alert Criteria

Table 11: Summary of Relative Percent Differences (RPDs) in Groundwater
Glen Road Pedestrian Bridge, Toronto, Ontario

Parameter	MOECC Alert Criteria	RDL	Sample[(1)]	Duplicate	% Difference
			BH 16-06	DUP	
Metals and Inorganics					
Antimony	20%	1.0	<1.0	<1.0	-
Arsenic	20%	1.0	7.9	9.4	17.3%
Barium	20%	2.0	2130	2100	1.4%
Beryllium	20%	0.5	<0.5	<0.5	-
Boron (Total)	20%	10.0	50.8	46.3	-
Cadmium	20%	0.2	<0.2	<0.2	-
Chromium	20%	2.0	49.5	43.3	13.4%
Chromium VI	20%	5	<5	<5	-
Cobalt	20%	0.5	0.9	1	-
Copper	20%	1.0	2.9	2.1	-
Lead	20%	0.5	1.5	1.7	-
Mercury	20%	0.02	<0.02	<0.02	-
Molybdenum	20%	0.5	<0.5	<0.5	-
Nickel	20%	1.0	3.8	5.5	-
Selenium	20%	1.0	3	3.9	-
Silver	20%	0.2	<0.2	<0.2	-
Thallium	20%	0.3	0.6	0.5	-
Vanadium	20%	0.4	9.5	12.2	**24.9%**
Zinc	20%	5.0	<5.0	6.3	-
Electrical Conductivity	10%	2	7580	7540	0.5%
Cyanide, Free	20%	2	<2	<2	-
Sodium	20%	1000	782000	774000	1.0%
Chloride	20%	500	2490000	2260000	9.7%
Uranium	20%	0.5	<0.5	<0.5	-

Parameter	MOECC Alert Criteria	RDL	Sample[(1)]	Duplicate	% Difference
			BH 16-06	DUP	
BTEX and PHCs					
F1 (C6-C10)	30%	25	<25	<25	-
F1 (C6-C10) - BTEX	30%	25	<25	<25	-
F2 (C10-C16)	30%	100	<100	<100	-
F3 (C16-C34)	30%	100	<100	<100	-
F4 (C34-C50)	30%	100	<100	<100	-
F4 Gravimetric	30%	500	NA	NA	-

Notes:

(1)	All results reported in micrograms per gram (µg/g) unless otherwise noted.
<	Parameter not detected above value specified
% Difference	Relative Percent Difference = |(X-Y)/Average(X,Y)| x 100% where X is the sample and Y is the duplicate
-	RPD could not be calculated
40.5%	RPD exceeds MOECC Alert Criteria

ATTACHMENT A

BOREHOLE LOGS

LOG OF BOREHOLE BH16-1

PROJECT: Glenn Road Pedestrian Bridge EA Study
REF. NO.: 16M-01410-01
CLIENT: WSP-MMM Group Limited
Method: Hollow Stem Auger
ENCL NO.: 1
PROJECT LOCATION: Toronto, Ontario
Diameter: 203 mm
ORIGINATED BY EY
DATUM: Geodetic
Date: May/10/2017 to May/10/2017
COMPILED BY MP
BH LOCATION: N 4836859 E 314873
CHECKED BY VW

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
110.2	Ground Surface											
110.0 0.0	**ASPHALT:** 170mm						Flush Mount Cover					
109.8 0.2	**GRANULAR FILL:** 200mm sand, trace gravel, brown, moist, loose.		1T	SS	4		110					
0.4	**FILL:** silty clay to clayey silt, trace gravel, trace to some sand, brown to dark brown, moist, firm.		1B	SS								
1	---------- sandy from 1.1m to 1.4m ---------- occasional sand seams		2	SS	6		109					0 10 58 32
2			3	SS	7		Holeplug					
107.9							108					
2.3	**SILTY CLAY:** trace sand, brown to grey, moist, stiff.		4	SS	11							
3			5	SS	8		Sand 107					
4			6	SS	12		Screen 106					
5			7	SS	14		Bentonite					0 3 40 57
105.0							105					
5.2	**END OF THE BOREHOLE** Note: 1) 50mm dia. monitoring well was installed upon completion. Water Level Readings: Date Depth (m) Elevation (m) May10-17 dry May17-17 dry											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

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

LOG OF BOREHOLE BH16-2

PROJECT: Glenn Road Pedestrian Bridge EA Study
CLIENT: WSP-MMM Group Limited
PROJECT LOCATION: Toronto, Ontario
DATUM: Geodetic
BH LOCATION: N 4836725 E 314863

Method: Hollow Stem Auger
Diameter: 203 mm
Date: May/10/2017 to May/10/2017

REF. NO.: 16M-01410-01
ENCL NO.: 2
ORIGINATED BY EY
COMPILED BY MP
CHECKED BY VW

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
114.9	Ground Surface											
114.8	**ASPHALT:** 130mm						Flush Mount Cover					
114.6	**CONCRETE:** 150mm											
114.4	**GRANULAR FILL:** 200mm, sand, some gravel, trace silt, trace clay, brown, moist, loose.		1	SS	7							
0.5	**FILL:** silty sand, trace gravel, trace clay, brown, moist, loose.		2	SS	6		114					
1							Holeplug					
113.2			3	SS	4							
1.7	**FILL:** silty clay, trace gravel, trace to some sand, brown, moist, firm to very stiff.		3B	SS			113 Sand					
2	some sand		4	SS	6							3 32 46 19
3	sandy, trace debris		5	SS	8		112					
							Screen					
4			6	SS	16		111					
110.4												
4.5	**FILL:** sand and gravel, trace silt, brown, moist, loose.		7	SS	7		110					
5												
109.1												
5.8	**SILTY CLAY:** trace sand, brown, moist, stiff.		8	SS	9		109					0 2 40 58
6										49		
7							108					
106.2			9	SS	14		107					
8												
8.7	**SILTY CLAY TILL:** trace gravel, trace sand, grey, moist, stiff to very stiff. contain sand seams from 9.1m to 9.75m						106 Bentonite					
9			10	SS	15							
10							105					

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

LOG OF BOREHOLE BH16-2

PROJECT: Glenn Road Pedestrian Bridge EA Study
CLIENT: WSP-MMM Group Limited
PROJECT LOCATION: Toronto, Ontario
DATUM: Geodetic
BH LOCATION: N 4836725 E 314863

Method: Hollow Stem Auger
Diameter: 203 mm
Date: May/10/2017 to May/10/2017

REF. NO.: 16M-01410-01
ENCL NO.: 2
ORIGINATED BY EY
COMPILED BY MP
CHECKED BY VW

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Continued							20 40 60 80 100	10 20 30			
11	**SILTY CLAY TILL:** trace gravel, trace sand, grey, moist, stiff to very stiff.(Continued)		11	SS	15		104		○			Auger grinding
12							103					
102.1			12	SS	24				⊖			2 30 46 22
12.8	**END OF THE BOREHOLE** Note: 1) 50mm dia. monitoring well was installed upon completion. Water Level Readings: Date Depth (m) Elevation (m) May10-17 dry May 17-17 dry											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

LOG OF BOREHOLE BH16-3

PROJECT: Glenn Road Pedestrian Bridge EA Study
CLIENT: WSP-MMM Group Limited
PROJECT LOCATION: Toronto, Ontario
DATUM: Geodetic
BH LOCATION: N 4836787 E 314887

Method: Hollow Stem Auger
Diameter: 203 mm
Date: May/03/2017 to May/03/2017

REF. NO.: 16M-01410-01
ENCL NO.: 3
ORIGINATED BY EY
COMPILED BY MP
CHECKED BY VW

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	ELEVATION	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
89.2	Ground Surface					
89.1	**ASPHALT:** 100mm				Flush Mount Cover	
88.9 0.3	**GRANULAR FILL:** 200mm sand and gravel, brown, moist, loose **FILL:** silty sand, trace gravel, trace clay, brown to dark brown, moist, very loose.	1T	SS	7	89	
		1B	SS			
		2	SS	2	88	1 63 31 5
		3T	SS	3	W. L. 87.7 m May 17, 2017	
		3B	SS	3	W. L. 87.5 m Jun 13, 2017	
86.9					Holeplug	
2.3	**FILL:** sandy silt, trace gravel, some clay, gas odor, brown, moist, very loose to compact.	4	SS	3		
		5	SS	28	W. L. 86.1 m May 03, 2017	No sample recovery
85.5						
3.7	**SILT TO SANDY SILT:** trace gravel, some clay, grey, moist, very dense.	6	SS	55	85 Sand	
		7	SS	66		1 30 56 12
83.7					84	
5.5	**SILTY SAND:** trace gravel, grey, moist, very dense.				Screen	
		8	SS	50/ 75mm	83	
					82	
81.3		9T	SS	73	Sand	
7.9	**SILTY CLAY :** trace sand, occasional silt seams, grey, moist, hard.	9B	SS		81	
		10	SS	86	80	0 7 62 31
					Bentonite	

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

LOG OF BOREHOLE BH16-3

PROJECT: Glenn Road Pedestrian Bridge EA Study
REF. NO.: 16M-01410-01
CLIENT: WSP-MMM Group Limited
Method: Hollow Stem Auger
ENCL NO.: 3
PROJECT LOCATION: Toronto, Ontario
Diameter: 203 mm
ORIGINATED BY EY
DATUM: Geodetic
Date: May/03/2017 to May/03/2017
COMPILED BY MP
BH LOCATION: N 4836787 E 314887
CHECKED BY VW

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Continued											
	SILTY CLAY : trace sand, occasional silt seams, grey, moist, hard.(Continued)						79					
78.5												
10.7	**SILTY CLAY TILL /SHALE COMPLEX:** some shale fragments, grey, moist, hard.		11	SS	50/ 100mm							spoon bouncing
11 78.1			12	SS	100/ 75mm							
			13	SS	100/ 75mm							
11.1	**END OF THE BOREHOLE**											

Notes:
1) Borehole was open upon completion.
2) Borehole water level was at 3.1m upon completion of drilling.
3) 50mm dia. monitoring well was installed upon completion.

Water Level Readings:

Date	Depth (m)	Elevation (m)
May3-17	3.1	86.1
May17-17	1.5	87.7
June13-17	1.7	87.47

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

LOG OF BOREHOLE BH16-4

PROJECT: Glenn Road Pedestrian Bridge EA Study
REF. NO.: 16M-01410-01
CLIENT: WSP-MMM Group Limited
Method: Pionjar
ENCL NO.: 4
PROJECT LOCATION: Toronto, Ontario
Diameter: 51 mm
ORIGINATED BY EY
DATUM: Geodetic
Date: May/03/2017 to May/03/2017
COMPILED BY MP
BH LOCATION: N 4836819 E 314866
CHECKED BY VW

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
92.6	Ground Surface											
92.5	**TOPSOIL:** 100mm											
0.1	**FILL:** silty clay, some topsoil, trace gravel, trace sand, trace rootlets, brown to darkish brown, moist.		1	SS			92					
	stiff to very stiff		2	SS						100		
			3	SS			91			100		
90.8												
1.8	**SILTY CLAY TILL:** trace gravel, some sand, brown, moist. stiff to very stiff		4	SS		▽				113		
			5	SS			W. L. 90.2 m May 03, 2017					2 18 58 22
	occasional sand seams, occasional oxidized, moist to wet		6	SS								
89.1												
3.5	**END OF THE BOREHOLE**											

Notes:
1) Borehole caved-in at 2.7m and water level was at 2.4 m upon completion of drilling.
2) SPT blow count was not possible due to use of pionjar drilling method.

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

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

LOG OF BOREHOLE BH16-6

PROJECT: Glenn Road Pedestrian Bridge EA Study
CLIENT: WSP-MMM Group Limited
PROJECT LOCATION: Toronto, Ontario
DATUM: Geodetic
BH LOCATION: N 4836722 E 314883

Method: Hollow Stem Auger
Diameter: 203 mm
Date: May/11/2017 to May/11/2017

REF. NO.: 16M-01410-01
ENCL NO.: 6
ORIGINATED BY EY
COMPILED BY MP
CHECKED BY VW

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
114.9	Ground Surface											
114.8	**ASPHALT:** 110mm						Flush Mount Cover					
0.1												
114.6	**GRANULAR FILL:** 190mm sand,											
0.3	trace gravel, brown, moist, loose.											
	FILL: sand, trace gravel, trace to some silt, trace clay, brown, moist, very loose to loose.		1	SS	6							
1	---------- silty clay, trace gravel from 0.6m to 0.75m ----------		2	SS	4		114					
2			3	SS	2		113					3 78 16 3
			4T	SS	2							
112.2												
2.7	**FILL:** silty clay, trace gravel, trace sand, brown, moist, firm to very stiff.		4B	SS			112					
3			5T	SS	4							
			5B	SS								
4	---------- occasional sand seams		6	SS	9		111					
	---------- asphalt fragments, trace sand		7T	SS	69/ 225mm							
5			7B	SS			110					
	---------- occasional sand seams		8	SS	20							
6							109					

108.5	contain rootlets											
6.4	**SILTY CLAY:** trace gravel, trace sand, brown, moist, firm to very stiff.		9	SS	9							
7			10	SS	8		108					
8			11	SS	7		107					
							Holeplug					
9							106					
			12	SS	22							
10							105					

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

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

LOG OF BOREHOLE BH16-6

PROJECT: Glenn Road Pedestrian Bridge EA Study
CLIENT: WSP-MMM Group Limited
PROJECT LOCATION: Toronto, Ontario
DATUM: Geodetic
BH LOCATION: N 4836722 E 314883

Method: Hollow Stem Auger
Diameter: 203 mm
Date: May/11/2017 to May/11/2017

REF. NO.: 16M-01410-01
ENCL NO.: 6
ORIGINATED BY EY
COMPILED BY MP
CHECKED BY VW

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Continued										
104.4	**SILTY CLAY:** trace gravel, trace sand, brown, moist, firm to very stiff.(Continued)										
10.5	**SILTY CLAY TILL:** trace gravel, trace to some sand, grey, moist, very stiff.										
		13	SS	17		104					
		14	SS	20		103					1 28 50 21
		15	SS	27		102					
		16	SS	29		101					
		17	SS	18		100					
		18	SS	19		99					
						98					
						96					

Sand
W. L. 97.6 m
May 17, 2017
Screen
Sand
Bentonite

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

LOG OF BOREHOLE BH16-6

PROJECT: Glenn Road Pedestrian Bridge EA Study
REF. NO.: 16M-01410-01
CLIENT: WSP-MMM Group Limited
Method: Hollow Stem Auger
ENCL NO.: 6
PROJECT LOCATION: Toronto, Ontario
Diameter: 203 mm
ORIGINATED BY EY
DATUM: Geodetic
Date: May/11/2017 to May/11/2017
COMPILED BY MP
BH LOCATION: N 4836722 E 314883
CHECKED BY VW

(m) ELEV / DEPTH	SOIL PROFILE: DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH (kPa)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT / WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Continued											
94.5			19	SS	27							
20.4	**END OF THE BOREHOLE** Note: 1) 50mm dia. monitoring well was installation upon completion. Water Level Readings: Date Depth (m) Elevation (m) May11-17 dry May17-17 17.3 97.6											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

ATTACHMENT B

LABORATORY CERTIFICATES OF ANALYSES

AGAT Laboratories

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http://www.agatlabs.com

CLIENT NAME: WSP CANADA INC.
51 CONSTELLATION COURT
TORONTO, ON M9W1K4
(416) 798-0065

ATTENTION TO: Mani P

PROJECT: 16M-1410-01

AGAT WORK ORDER: 17T212314

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

TRACE ORGANICS REVIEWED BY: Oksana Gushyla, Trace Organics Lab Supervisor

DATE REPORTED: May 10, 2017

PAGES (INCLUDING COVER): 13

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 17T212314

PROJECT: 16M-1410-01

CLIENT NAME: WSP CANADA INC.

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

Inorganic Chemistry (Soil)

DATE RECEIVED: 2017-05-05

DATE REPORTED: 2017-05-10

		SAMPLE DESCRIPTION:		BH16-3 SS3	BH16-3 SS4
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-05-03	2017-05-03
Parameter	Unit	G / S	RDL	8369142	8369143
Organic Nitrogen	µg/g		50	416	235
Total Kjeldahl Nitrogen	µg/g		50	416	235
Ammonia as N (KCl Extr)	µg/g		5	<5	<5
Nitrate as N (2:1)	µg/g		1	<1	<1
Nitrite as N (2:1)	µg/g		1	<1	<1

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

8369142-8369143 Nitrate & Nitrite were determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil).
Elevated RDL indicates the degree of sample dilution prior to the analysis for Total Kjeldahl Nitrogen in order to keep analytes within the calibration range of the instrument and to reduce matrix interference.

Certified By: Amanjot Bhela

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 17T212314

PROJECT: 16M-1410-01

CLIENT NAME: WSP CANADA INC.

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - Metals & Inorganics (Soil)

DATE RECEIVED: 2017-05-05

DATE REPORTED: 2017-05-10

		SAMPLE DESCRIPTION:		BH16-3 SS3	BH16-3 SS4	BH16-4 SS1
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		2017-05-03	2017-05-03	2017-05-03
Parameter	Unit	G / S	RDL	8369142	8369143	8369255
Antimony	µg/g	50	0.8	<0.8	<0.8	0.8
Arsenic	µg/g	18	1	2	2	7
Barium	µg/g	670	2	31	38	90
Beryllium	µg/g	10	0.5	<0.5	<0.5	<0.5
Boron	µg/g	120	5	<5	<5	9
Boron (Hot Water Soluble)	µg/g	2	0.10	0.22	0.26	0.54
Cadmium	µg/g	1.9	0.5	<0.5	<0.5	0.5
Chromium	µg/g	160	2	11	13	45
Cobalt	µg/g	100	0.5	3.1	5.1	11.8
Copper	µg/g	300	1	7	10	120
Lead	µg/g	120	1	14	9	**231**
Molybdenum	µg/g	40	0.5	<0.5	<0.5	6.8
Nickel	µg/g	340	1	7	11	47
Selenium	µg/g	5.5	0.4	<0.4	<0.4	<0.4
Silver	µg/g	50	0.2	<0.2	<0.2	0.3
Thallium	µg/g	3.3	0.4	<0.4	<0.4	<0.4
Uranium	µg/g	33	0.5	<0.5	0.6	0.5
Vanadium	µg/g	86	1	16	21	30
Zinc	µg/g	340	5	30	25	**349**
Chromium VI	µg/g	10	0.2	<0.2	<0.2	<0.2
Cyanide	µg/g	0.051	0.040	<0.040	<0.040	<0.040
Mercury	µg/g	20	0.10	0.16	<0.10	0.18
Electrical Conductivity	mS/cm	1.4	0.005	0.415	0.462	0.724
Sodium Adsorption Ratio	NA	12	NA	3.69	3.70	6.80
pH, 2:1 CaCl2 Extraction	pH Units		NA	7.26	7.66	7.51

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Medium and Fine Textured Soils

8369142-8369255 EC & SAR were determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil). pH was determined on the 0.01M CaCl2 extract prepared at 2:1 ratio.

Certified By: Amanjot Bhela

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 17T212314

PROJECT: 16M-1410-01

CLIENT NAME: WSP CANADA INC.

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

O. Reg. 558 Metals and Inorganics

DATE RECEIVED: 2017-05-05

DATE REPORTED: 2017-05-10

Parameter	Unit	G / S	RDL	BH16-3 SS-Combined Soil 2017-05-03 8369259	BH16-4 SS-Combined Soil 2017-05-03 8369260
Arsenic Leachate	mg/L	2.5	0.010	<0.010	<0.010
Barium Leachate	mg/L	100	0.100	0.896	0.618
Boron Leachate	mg/L	500	0.050	<0.050	<0.050
Cadmium Leachate	mg/L	0.5	0.010	<0.010	<0.010
Chromium Leachate	mg/L	5	0.010	0.016	0.015
Lead Leachate	mg/L	5	0.010	0.071	<0.010
Mercury Leachate	mg/L	0.1	0.01	<0.01	<0.01
Selenium Leachate	mg/L	1	0.010	<0.010	<0.010
Silver Leachate	mg/L	5	0.010	<0.010	<0.010
Uranium Leachate	mg/L	10	0.050	<0.050	<0.050
Fluoride Leachate	mg/L	150	0.05	0.18	0.23
Cyanide Leachate	mg/L	20	0.05	<0.05	<0.05
(Nitrate + Nitrite) as N Leachate	mg/L	1000	0.70	<0.70	<0.70

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria

Certified By: Amanjot Bhela

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Certificate of Analysis

AGAT WORK ORDER: 17T212314

PROJECT: 16M-1410-01

CLIENT NAME: WSP CANADA INC.

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

Phenols in Soil

DATE RECEIVED: 2017-05-05

DATE REPORTED: 2017-05-10

		SAMPLE DESCRIPTION:		BH16-3 SS3	BH16-3 SS4
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-05-03	2017-05-03
Parameter	Unit	G / S	RDL	8369142	8369143
Phenols	mg/Kg		1	<1	<1

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

Certified By: Amanjot Bhela

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Certificate of Analysis

AGAT WORK ORDER: 17T212314

PROJECT: 16M-1410-01

CLIENT NAME: WSP CANADA INC.

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (Soil)

DATE RECEIVED: 2017-05-05

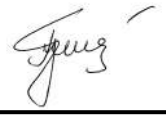
DATE REPORTED: 2017-05-10

		SAMPLE DESCRIPTION:		BH16-3 SS7	BH16-4 SS5
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-05-03	2017-05-03
Parameter	**Unit**	**G / S**	**RDL**	**8369251**	**8369257**
Benzene	µg/g	0.4	0.02	<0.02	<0.02
Toluene	µg/g	78	0.08	<0.08	<0.08
Ethylbenzene	µg/g	19	0.05	<0.05	<0.05
Xylene Mixture	µg/g	30	0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g	65	5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	65	5	<5	<5
F2 (C10 to C16)	µg/g	250	10	<10	<10
F3 (C16 to C34)	µg/g	2500	50	<50	<50
F4 (C34 to C50)	µg/g	6600	50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g	6600	50	NA	NA
Moisture Content	%		0.1	10.7	18.6
Surrogate	**Unit**	**Acceptable Limits**			
Terphenyl	%	60-140		86	92

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Medium and Fine Textured Soils

8369251-8369257 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.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX 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 with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Quality Control Data is available upon request.

Certified By:



AGAT Laboratories

Guideline Violation

AGAT WORK ORDER: 17T212314

PROJECT: 16M-1410-01

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CLIENT NAME: WSP CANADA INC.

ATTENTION TO: Mani P

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
8369255	BH16-4 SS1	ON T3 S ICC MFT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Lead	µg/g	120	231
8369255	BH16-4 SS1	ON T3 S ICC MFT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Zinc	µg/g	340	349

AGAT Laboratories

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Quality Assurance

CLIENT NAME: WSP CANADA INC.

AGAT WORK ORDER: 17T212314

PROJECT: 16M-1410-01

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

Soil Analysis

RPT Date: May 10, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inorganics (Soil)															
Antimony	8371373		<0.8	<0.8	NA	< 0.8	99%	70%	130%	101%	80%	120%	80%	70%	130%
Arsenic	8371373		3	4	NA	< 1	117%	70%	130%	103%	80%	120%	116%	70%	130%
Barium	8371373		59	56	5.2%	< 2	103%	70%	130%	101%	80%	120%	106%	70%	130%
Beryllium	8371373		<0.5	<0.5	NA	< 0.5	92%	70%	130%	102%	80%	120%	106%	70%	130%
Boron	8371373		6	6	NA	< 5	93%	70%	130%	103%	80%	120%	108%	70%	130%
Boron (Hot Water Soluble)	8371373		0.42	0.45	NA	< 0.10	100%	60%	140%	105%	70%	130%	98%	60%	140%
Cadmium	8371373		<0.5	<0.5	NA	< 0.5	105%	70%	130%	99%	80%	120%	97%	70%	130%
Chromium	8371373		13	13	0.0%	< 2	93%	70%	130%	105%	80%	120%	114%	70%	130%
Cobalt	8371373		5.5	5.5	0.0%	< 0.5	101%	70%	130%	101%	80%	120%	111%	70%	130%
Copper	8371373		18	22	20.0%	< 1	98%	70%	130%	104%	80%	120%	115%	70%	130%
Lead	8371373		25	21	17.4%	< 1	110%	70%	130%	115%	80%	120%	103%	70%	130%
Molybdenum	8371373		<0.5	0.5	NA	< 0.5	95%	70%	130%	101%	80%	120%	100%	70%	130%
Nickel	8371373		12	12	0.0%	< 1	106%	70%	130%	109%	80%	120%	107%	70%	130%
Selenium	8371373		<0.4	<0.4	NA	< 0.4	96%	70%	130%	108%	80%	120%	111%	70%	130%
Silver	8371373		0.9	0.7	NA	< 0.2	91%	70%	130%	97%	80%	120%	90%	70%	130%
Thallium	8371373		<0.4	<0.4	NA	< 0.4	95%	70%	130%	102%	80%	120%	97%	70%	130%
Uranium	8371373		<0.5	<0.5	NA	< 0.5	110%	70%	130%	114%	80%	120%	108%	70%	130%
Vanadium	8371373		19	20	5.1%	< 1	104%	70%	130%	107%	80%	120%	114%	70%	130%
Zinc	8371373		58	56	3.5%	< 5	103%	70%	130%	106%	80%	120%	113%	70%	130%
Chromium VI	8368700		<0.2	<0.2	NA	< 0.2	93%	70%	130%	100%	80%	120%	99%	70%	130%
Cyanide	8369142	8369142	<0.040	<0.040	NA	< 0.040	91%	70%	130%	108%	80%	120%	94%	70%	130%
Mercury	8371373		<0.10	<0.10	NA	< 0.10	101%	70%	130%	101%	80%	120%	98%	70%	130%
Electrical Conductivity	8368062		1.57	1.64	4.4%	< 0.005	95%	90%	110%	NA			NA		
Sodium Adsorption Ratio	8368971		0.026	0.022	16.7%	NA	NA			NA			NA		
pH, 2:1 CaCl2 Extraction	8368120		7.25	7.31	0.8%	NA	100%	80%	120%	NA			NA		
O. Reg. 558 Metals and Inorganics															
Arsenic Leachate	8369259	8369259	<0.010	<0.010	NA	< 0.010	109%	90%	110%	94%	80%	120%	112%	70%	130%
Barium Leachate	8369259	8369259	0.896	0.901	0.6%	< 0.100	100%	90%	110%	100%	80%	120%	101%	70%	130%
Boron Leachate	8369259	8369259	<0.050	<0.050	NA	< 0.050	101%	90%	110%	93%	80%	120%	73%	70%	130%
Cadmium Leachate	8369259	8369259	<0.010	<0.010	NA	< 0.010	102%	90%	110%	101%	80%	120%	100%	70%	130%
Chromium Leachate	8369259	8369259	0.016	0.016	NA	< 0.010	100%	90%	110%	102%	80%	120%	104%	70%	130%
Lead Leachate	8369259	8369259	0.071	0.071	0.0%	< 0.010	106%	90%	110%	108%	80%	120%	100%	70%	130%
Mercury Leachate	8369259	8369259	<0.01	<0.01	NA	< 0.01	99%	90%	110%	100%	80%	120%	99%	70%	130%
Selenium Leachate	8369259	8369259	<0.010	<0.010	NA	< 0.010	104%	90%	110%	98%	80%	120%	109%	70%	130%
Silver Leachate	8369259	8369259	<0.010	<0.010	NA	< 0.010	99%	90%	110%	92%	80%	120%	104%	70%	130%
Uranium Leachate	8369259	8369259	<0.050	<0.050	NA	< 0.050	100%	90%	110%	110%	80%	120%	104%	70%	130%
Fluoride Leachate	8369259	8369259	0.18	0.18	NA	< 0.05	101%	90%	110%	105%	90%	110%	98%	70%	130%
Cyanide Leachate	8369259	8369259	<0.05	<0.05	NA	< 0.05	91%	90%	110%	108%	90%	110%	103%	70%	130%
(Nitrate + Nitrite) as N Leachate	8369259	8369259	<0.70	<0.70	NA	< 0.70	101%	80%	120%	105%	80%	120%	106%	70%	130%

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Quality Assurance

CLIENT NAME: WSP CANADA INC.

AGAT WORK ORDER: 17T212314

PROJECT: 16M-1410-01

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

Soil Analysis (Continued)

RPT Date: May 10, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Inorganic Chemistry (Soil)															
Total Kjeldahl Nitrogen	8369142	8369142	416	416	0.0%	< 50	101%	80%	120%	102%	80%	120%	99%	70%	130%
Ammonia as N (KCl Extr)	8369142	8369142	< 5	< 5	NA	< 5	107%	80%	120%	109%	80%	120%	121%	70%	130%
Nitrate as N (2:1)	8369422		<1	<1	NA	< 1	98%	70%	130%	107%	70%	130%	108%	70%	130%
Nitrite as N (2:1)	8369422		<1	<1	NA	< 1	NA			99%	70%	130%	109%	70%	130%
Phenols in Soil															
Phenols	1	8369142	<1	<1	NA	< 1	106%	70%	130%		70%	130%	109%	70%	130%

Comments: NA signifies Not Applicable.
Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By: Amanjot Bhela

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Quality Assurance

CLIENT NAME: WSP CANADA INC.

AGAT WORK ORDER: 17T212314

PROJECT: 16M-1410-01

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date: May 10, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (Soil)															
Benzene	8368704		< 0.02	< 0.02	NA	< 0.02	114%	60%	130%	114%	60%	130%	103%	60%	130%
Toluene	8368704		< 0.08	< 0.08	NA	< 0.08	115%	60%	130%	112%	60%	130%	103%	60%	130%
Ethylbenzene	8368704		< 0.05	< 0.05	NA	< 0.05	109%	60%	130%	115%	60%	130%	106%	60%	130%
Xylene Mixture	8368704		< 0.05	< 0.05	NA	< 0.05	111%	60%	130%	112%	60%	130%	103%	60%	130%
F1 (C6 to C10)	8368704		< 5	< 5	NA	< 5	72%	60%	130%	87%	85%	115%	80%	70%	130%
F2 (C10 to C16)	8368384		< 10	< 10	NA	< 10	108%	60%	130%	94%	80%	120%	101%	70%	130%
F3 (C16 to C34)	8368384		61	63	NA	< 50	106%	60%	130%	83%	80%	120%	106%	70%	130%
F4 (C34 to C50)	8368384		< 50	< 50	NA	< 50	94%	60%	130%	81%	80%	120%	110%	70%	130%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

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Method Summary

CLIENT NAME: WSP CANADA INC.

AGAT WORK ORDER: 17T212314

PROJECT: 16M-1410-01

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Organic Nitrogen			CALCULATION
Total Kjeldahl Nitrogen	INOR-93-6048	QuikChem 10-107-06-2-I & SM 4500-Norg D	LACHAT FIA
Ammonia as N (KCl Extr)	INOR-93-6003	AQ-2 EPA 103-A & MOE Protocol/ON Reg. 267/03	AQ-2 DISCRETE ANALYZER
Nitrate as N (2:1)	INOR-93-6004	McKeague 4.12 & SM 4110 B	ION CHROMATOGRAPH
Nitrite as N (2:1)	INOR-93-6004	McKeague 4.12 & SM 4110 B	ION CHROMATOGRAPH
Antimony	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Barium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Boron	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Boron (Hot Water Soluble)	MET-93-6104	EPA SW 846 6010C; MSA, Part 3, Ch.21	ICP/OES
Cadmium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Copper	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Lead	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Nickel	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Selenium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Silver	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Thallium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Uranium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Zinc	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium VI	INOR-93-6029	SM 3500 B; MSA Part 3, Ch. 25	SPECTROPHOTOMETER
Cyanide	INOR-93-6052	MOE CN-3015 & E 3009 A;SM 4500 CN	TECHNICON AUTO ANALYZER
Mercury	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Electrical Conductivity	INOR-93-6036	McKeague 4.12, SM 2510 B	EC METER
Sodium Adsorption Ratio	INOR-93-6007	McKeague 4.12 & 3.26 & EPA SW-846 6010B	ICP/OES
pH, 2:1 CaCl2 Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	PH METER
Arsenic Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Barium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Boron Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Cadmium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Chromium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Lead Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Mercury Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Selenium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Silver Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Uranium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Fluoride Leachate	INOR-93-6018	EPA SW-846-1311 & SM4500-F- C	ION SELECTIVE ELECTRODE
Cyanide Leachate	INOR-93-6052	EPA SW-846-1311 & MOE 3015 & SM 4500 CN- I	TECHNICON AUTO ANALYZER
(Nitrate + Nitrite) as N Leachate	INOR-93-6053	EPA SW 846-1311 & SM 4500 - NO3- I	LACHAT FIA

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Method Summary

CLIENT NAME: WSP CANADA INC.

AGAT WORK ORDER: 17T212314

PROJECT: 16M-1410-01

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Phenols	INOR-121-6010	based on EPA 420.2	COLORIMETER
Trace Organics Analysis			
Benzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Toluene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Ethylbenzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Xylene Mixture	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method	P & T GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method	P & T GC/FID
F2 (C10 to C16)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
F4 (C34 to C50)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	BALANCE
Moisture Content	VOL-91-5009	CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009		GC/FID

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CLIENT NAME: WSP CANADA INC.
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(416) 798-0065

ATTENTION TO: Mani P

PROJECT: 16M-01410-01

AGAT WORK ORDER: 17T216290

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

DATE REPORTED: Jun 09, 2017

PAGES (INCLUDING COVER): 5

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Certificate of Analysis

AGAT WORK ORDER: 17T216290

PROJECT: 16M-01410-01

CLIENT NAME: WSP CANADA INC.

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

O. Reg. 558 Metals and Inorganics

DATE RECEIVED: 2017-05-16

DATE REPORTED: 2017-06-09

				BH 16-1
		SAMPLE DESCRIPTION:		SS-Combined
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-05-10
Parameter	Unit	G / S	RDL	8396984
Arsenic Leachate	mg/L	2.5	0.010	<0.010
Barium Leachate	mg/L	100	0.100	0.665
Boron Leachate	mg/L	500	0.050	<0.050
Cadmium Leachate	mg/L	0.5	0.010	<0.010
Chromium Leachate	mg/L	5	0.010	0.011
Lead Leachate	mg/L	5	0.010	<0.010
Mercury Leachate	mg/L	0.1	0.01	<0.01
Selenium Leachate	mg/L	1	0.010	<0.010
Silver Leachate	mg/L	5	0.010	<0.010
Uranium Leachate	mg/L	10	0.050	<0.050
Fluoride Leachate	mg/L	150	0.05	0.13
Cyanide Leachate	mg/L	20	0.05	<0.05
(Nitrate + Nitrite) as N Leachate	mg/L	1000	0.70	<0.70

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria

Certified By: Amanjot Bhela

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Quality Assurance

CLIENT NAME: WSP CANADA INC.

AGAT WORK ORDER: 17T216290

PROJECT: 16M-01410-01

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

Soil Analysis

RPT Date: Jun 09, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 558 Metals and Inorganics															
Arsenic Leachate	8437472		<0.010	<0.010	NA	< 0.010	100%	90%	110%	117%	80%	120%	119%	70%	130%
Barium Leachate	8437472		0.555	0.605	8.6%	< 0.100	100%	90%	110%	96%	80%	120%	89%	70%	130%
Boron Leachate	8437472		<0.050	<0.050	NA	< 0.050	103%	90%	110%	99%	80%	120%	112%	70%	130%
Cadmium Leachate	8437472		<0.010	<0.010	NA	< 0.010	99%	90%	110%	108%	80%	120%	100%	70%	130%
Chromium Leachate	8437472		<0.010	<0.010	NA	< 0.010	92%	90%	110%	109%	80%	120%	118%	70%	130%
Lead Leachate	8437472		<0.010	<0.010	NA	< 0.010	91%	90%	110%	96%	80%	120%	85%	70%	130%
Mercury Leachate	8437472		<0.01	<0.01	NA	< 0.01	102%	90%	110%	82%	80%	120%	72%	70%	130%
Selenium Leachate	8437472		<0.010	<0.010	NA	< 0.010	94%	90%	110%	113%	80%	120%	113%	70%	130%
Silver Leachate	8437472		<0.010	<0.010	NA	< 0.010	101%	90%	110%	108%	80%	120%	91%	70%	130%
Uranium Leachate	8437472		<0.050	<0.050	NA	< 0.050	103%	90%	110%	115%	80%	120%	87%	70%	130%
Fluoride Leachate	8437472		0.26	0.26	0.0%	< 0.05	101%	90%	110%	106%	90%	110%	96%	70%	130%
Cyanide Leachate	8437472		<0.05	<0.05	NA	< 0.05	93%	90%	110%	107%	90%	110%	113%	70%	130%
(Nitrate + Nitrite) as N Leachate	8437472		<0.70	<0.70	NA	< 0.70	97%	80%	120%	102%	80%	120%	102%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By: Amanjot Bhela

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Method Summary

CLIENT NAME: WSP CANADA INC.

AGAT WORK ORDER: 17T216290

PROJECT: 16M-01410-01

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Arsenic Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Barium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Boron Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Cadmium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Chromium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Lead Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Mercury Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Selenium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Silver Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Uranium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Fluoride Leachate	INOR-93-6018	EPA SW-846-1311 & SM4500-F- C	ION SELECTIVE ELECTRODE
Cyanide Leachate	INOR-93-6052	EPA SW-846-1311 & MOE 3015 & SM 4500 CN- I	TECHNICON AUTO ANALYZER
(Nitrate + Nitrite) as N Leachate	INOR-93-6053	EPA SW 846-1311 & SM 4500 - NO3- I	LACHAT FIA

AGAT Laboratories

SR-2

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Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption)

Laboratory Use Only

Work Order #: 17T216290

Cooler Quantity:

Arrival Temperatures: 4.0 | 4.1 | 4.5

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes:

Report Information:

Company: WSP Canada
Contact: ~~Pradeep Patel~~ Mani P.
Address: 51 Constellation Crt
Toronto
Phone: ~~437 333 8453~~ Fax: 416-798-0065
Reports to be sent to:
1. Email: ~~pradeep.patel@wspgroup.com~~
2. Email: Mani.P@wspgroup.com

Regulatory Requirements: ☐ No Regulatory Requirement

(Please check all applicable boxes)

☐ Regulation 153/04
Table (Indicate One) ☐ Ind/Com ☐ Res/Park ☐ Agriculture
Soil Texture (Check One) ☐ Coarse ☐ Fine

☐ Sewer Use
☐ Sanitary ☐ Storm
Region (Indicate One)

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
(Indicate One)

Is this submission for a Record of Site Condition? ☐ Yes ☐ No

Report Guideline on Certificate of Analysis ☒ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☐ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☒ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: 16M-01610-01
Site Location: Glen Rd. Toronto
Sampled By:
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☐ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics ☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals	ORPs: ☐ B-HWS ☐ Cl⁻ ☐ CN ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	CCME Fractions 1 to 4	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use
BH 16-1 SS-Combined	May 10/17	am	1	S	Hold.														
BH 16-2 SS-Combined	"	p.m	1	S															
BH 16-6 SS-Combined	May 11/17	a.m	1	S															

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
Pradeep Patel PP-Patel	May 16/17	5:10 pm		5/16/17	5:10 pm
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time

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CLIENT NAME: WSP CANADA INC.
51 CONSTELLATION COURT
TORONTO, ON M9W1K4
(416) 798-0065

ATTENTION TO: Mani P

PROJECT: 16M-01410-01

AGAT WORK ORDER: 17T216295

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

DATE REPORTED: May 31, 2017

PAGES (INCLUDING COVER): 11

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Certificate of Analysis

AGAT WORK ORDER: 17T216295

PROJECT: 16M-01410-01

CLIENT NAME: WSP CANADA INC.

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - Metals & Inorganics (Soil)

DATE RECEIVED: 2017-05-16

DATE REPORTED: 2017-05-31

		SAMPLE DESCRIPTION:		BH 16-1 SS2	BH 16-2 SS1	BH 16-6 SS2
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		2017-05-10	2017-05-10	2017-05-11
Parameter	Unit	G / S	RDL	8396936	8396942	8396949
Antimony	µg/g	50	0.8	2.5	1.0	<0.8
Arsenic	µg/g	18	1	3	5	3
Barium	µg/g	670	2	50	94	26
Beryllium	µg/g	10	0.5	<0.5	0.5	<0.5
Boron	µg/g	120	5	6	7	<5
Boron (Hot Water Soluble)	µg/g	2	0.10	0.25	0.57	0.24
Cadmium	µg/g	1.9	0.5	**3.2**	0.9	<0.5
Chromium	µg/g	160	2	16	21	32
Cobalt	µg/g	100	0.5	6.2	7.0	3.1
Copper	µg/g	300	1	15	26	12
Lead	µg/g	120	1	41	96	29
Molybdenum	µg/g	40	0.5	<0.5	<0.5	<0.5
Nickel	µg/g	340	1	14	16	7
Selenium	µg/g	5.5	0.4	<0.4	0.5	<0.4
Silver	µg/g	50	0.2	<0.2	<0.2	<0.2
Thallium	µg/g	3.3	0.4	<0.4	<0.4	<0.4
Uranium	µg/g	33	0.5	<0.5	0.6	<0.5
Vanadium	µg/g	86	1	20	23	12
Zinc	µg/g	340	5	111	96	48
Chromium VI	µg/g	10	0.2	<0.2	<0.2	<0.2
Cyanide	µg/g	0.051	0.040	<0.040	<0.040	<0.040
Mercury	µg/g	20	0.10	<0.10	0.26	0.17
Electrical Conductivity	mS/cm	1.4	0.005	**1.79**	**2.98**	1.40
Sodium Adsorption Ratio	NA	12	NA	**24.1**	**58.3**	9.55
pH, 2:1 CaCl2 Extraction	pH Units		NA	8.19	9.22	11.2

Certified By: Amanjot Bhela

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Certificate of Analysis

AGAT WORK ORDER: 17T216295

PROJECT: 16M-01410-01

CLIENT NAME: WSP CANADA INC.

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - Metals & Inorganics (Soil)

DATE RECEIVED: 2017-05-16 **DATE REPORTED: 2017-05-31**

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Medium and Fine Textured Soils

8396936 EC & SAR were determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil). pH was determined on the 0.01M CaCl2 extract prepared at 2:1 ratio.

Please note that metals values were confirmed by re-analysis.

8396942-8396949 EC & SAR were determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil). pH was determined on the 0.01M CaCl2 extract prepared at 2:1 ratio.

Certified By: Amanjot Bhela

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Certificate of Analysis

AGAT WORK ORDER: 17T216295

PROJECT: 16M-01410-01

CLIENT NAME: WSP CANADA INC.

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PCBs (Soil)

DATE RECEIVED: 2017-05-16

DATE REPORTED: 2017-05-31

		SAMPLE DESCRIPTION:		BH 16-1 SS3	BH 16-6 SS3	Dup 1
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		2017-05-10	2017-05-11	2017-05-10
Parameter	**Unit**	**G / S**	**RDL**	**8396938**	**8396951**	**8396955**
Aroclor 1242	µg/g		0.1	<0.1	<0.1	<0.1
Aroclor 1248	µg/g		0.1	<0.1	<0.1	<0.1
Aroclor 1254	µg/g		0.1	<0.1	<0.1	<0.1
Aroclor 1260	µg/g		0.1	<0.1	<0.1	<0.1
Polychlorinated Biphenyls	µg/g	1.1	0.1	<0.1	<0.1	<0.1
Moisture Content	%		0.1	15.4	16.3	16.5
Surrogate	**Unit**	**Acceptable Limits**				
Decachlorobiphenyl	%	60-140		116	112	100

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Medium and Fine Textured Soils

8396938-8396955 Results are based on the dry weight of soil extracted.

Certified By: N Popnikolof

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Certificate of Analysis

AGAT WORK ORDER: 17T216295

PROJECT: 16M-01410-01

CLIENT NAME: WSP CANADA INC.

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (Soil)

DATE RECEIVED: 2017-05-16

DATE REPORTED: 2017-05-31

		SAMPLE DESCRIPTION:		BH 16-1 SS4	BH 16-2 SS4	BH 16-6 SS7	Dup 2
		SAMPLE TYPE:		Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-05-10	2017-05-10	2017-05-11	2017-05-10
Parameter	**Unit**	**G / S**	**RDL**	**8396939**	**8396945**	**8396952**	**8396956**
Benzene	µg/g	0.4	0.02	<0.02	<0.02	0.12	<0.02
Toluene	µg/g	78	0.08	<0.08	<0.08	<0.08	<0.08
Ethylbenzene	µg/g	19	0.05	<0.05	<0.05	<0.05	<0.05
Xylene Mixture	µg/g	30	0.05	<0.05	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g	65	5	<5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	65	5	<5	<5	<5	<5
F2 (C10 to C16)	µg/g	250	10	<10	<10	<10	<10
F3 (C16 to C34)	µg/g	2500	50	<50	<50	2000	<50
F4 (C34 to C50)	µg/g	6600	50	<50	<50	1100	<50
Gravimetric Heavy Hydrocarbons	µg/g	6600	50	NA	NA	NA	NA
Moisture Content	%		0.1	22.2	15.0	14.3	23.0
Surrogate	**Unit**	**Acceptable Limits**					
Terphenyl	%	60-140		85	77	86	83

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Medium and Fine Textured Soils

8396939-8396956 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.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX 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 with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Quality Control Data is available upon request.

Certified By: N Popnikolof

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Guideline Violation

AGAT WORK ORDER: 17T216295

PROJECT: 16M-01410-01

CLIENT NAME: WSP CANADA INC.

ATTENTION TO: Mani P

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
8396936	BH 16-1 SS2	ON T3 S ICC MFT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Cadmium	µg/g	1.9	3.2
8396936	BH 16-1 SS2	ON T3 S ICC MFT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity	mS/cm	1.4	1.79
8396936	BH 16-1 SS2	ON T3 S ICC MFT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Sodium Adsorption Ratio	NA	12	24.1
8396942	BH 16-2 SS1	ON T3 S ICC MFT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity	mS/cm	1.4	2.98
8396942	BH 16-2 SS1	ON T3 S ICC MFT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Sodium Adsorption Ratio	NA	12	58.3

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Quality Assurance

CLIENT NAME: WSP CANADA INC.

AGAT WORK ORDER: 17T216295

PROJECT: 16M-01410-01

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

Soil Analysis

RPT Date: May 31, 2017			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inorganics (Soil)															
Antimony	8396936	8396936	2.5	2.5	NA	< 0.8	108%	70%	130%	101%	80%	120%	98%	70%	130%
Arsenic	8396936	8396936	3	3	NA	< 1	116%	70%	130%	106%	80%	120%	105%	70%	130%
Barium	8396936	8396936	50	49	2.0%	< 2	100%	70%	130%	102%	80%	120%	96%	70%	130%
Beryllium	8396936	8396936	< 0.5	< 0.5	NA	< 0.5	122%	70%	130%	116%	80%	120%	115%	70%	130%
Boron	8396936	8396936	6	5	NA	< 5	78%	70%	130%	113%	80%	120%	108%	70%	130%
Boron (Hot Water Soluble)	8396936	8396936	0.25	0.23	NA	< 0.10	97%	60%	140%	105%	70%	130%	98%	60%	140%
Cadmium	8396936	8396936	3.2	3.0	6.5%	< 0.5	99%	70%	130%	103%	80%	120%	111%	70%	130%
Chromium	8396936	8396936	16	16	0.0%	< 2	94%	70%	130%	110%	80%	120%	106%	70%	130%
Cobalt	8396936	8396936	6.2	6.2	0.0%	< 0.5	102%	70%	130%	106%	80%	120%	102%	70%	130%
Copper	8396936	8396936	15	15	0.0%	< 1	99%	70%	130%	113%	80%	120%	109%	70%	130%
Lead	8396936	8396936	41	39	5.0%	< 1	107%	70%	130%	107%	80%	120%	104%	70%	130%
Molybdenum	8396936	8396936	< 0.5	< 0.5	NA	< 0.5	107%	70%	130%	110%	80%	120%	102%	70%	130%
Nickel	8396936	8396936	14	14	0.0%	< 1	105%	70%	130%	109%	80%	120%	106%	70%	130%
Selenium	8396936	8396936	< 0.4	< 0.4	NA	< 0.4	89%	70%	130%	97%	80%	120%	99%	70%	130%
Silver	8396936	8396936	< 0.2	< 0.2	NA	< 0.2	96%	70%	130%	112%	80%	120%	107%	70%	130%
Thallium	8396936	8396936	< 0.4	< 0.4	NA	< 0.4	104%	70%	130%	109%	80%	120%	104%	70%	130%
Uranium	8396936	8396936	< 0.5	< 0.5	NA	< 0.5	103%	70%	130%	106%	80%	120%	100%	70%	130%
Vanadium	8396936	8396936	20	19	5.1%	< 1	102%	70%	130%	96%	80%	120%	96%	70%	130%
Zinc	8396936	8396936	111	107	3.7%	< 5	98%	70%	130%	119%	80%	120%	120%	70%	130%
Chromium VI	8397412		<0.2	<0.2	NA	< 0.2	95%	70%	130%	101%	80%	120%	101%	70%	130%
Cyanide	8391137		<0.040	<0.040	NA	< 0.040	96%	70%	130%	95%	80%	120%	95%	70%	130%
Mercury	8396936	8396936	< 0.10	<0.10	NA	<0.10	112%	70%	130%	111%	80%	120%	104%	70%	130%
Electrical Conductivity	8396936	8396936	1.79	1.94	8.0%	< 0.005	93%	90%	110%	NA			NA		
Sodium Adsorption Ratio	8396936	8396936	24.1	27.7	13.9%	NA	NA			NA			NA		
pH, 2:1 CaCl2 Extraction	8393044		6.78	6.77	0.1%	NA	101%	80%	120%	NA			NA		

Comments: NA signifies Not Applicable.
Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By: Amanjot Bhela

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Quality Assurance

CLIENT NAME: WSP CANADA INC.

AGAT WORK ORDER: 17T216295

PROJECT: 16M-01410-01

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date: May 31, 2017

PARAMETER	Batch	Sample Id	DUPLICATE Dup #1	DUPLICATE Dup #2	DUPLICATE RPD	Method Blank	REFERENCE MATERIAL Measured Value	REFERENCE MATERIAL Acceptable Limits Lower	REFERENCE MATERIAL Acceptable Limits Upper	METHOD BLANK SPIKE Recovery	METHOD BLANK SPIKE Acceptable Limits Lower	METHOD BLANK SPIKE Acceptable Limits Upper	MATRIX SPIKE Recovery	MATRIX SPIKE Acceptable Limits Lower	MATRIX SPIKE Acceptable Limits Upper
O. Reg. 153(511) - PCBs (Soil)															
Aroclor 1242	8396955	8396955	< 0.1	< 0.1	NA	< 0.1	NA	60%	140%	NA	60%	140%	NA	60%	140%
Aroclor 1248	8396955	8396955	< 0.1	< 0.1	NA	< 0.1	NA	60%	140%	NA	60%	140%	NA	60%	140%
Aroclor 1254	8396955	8396955	< 0.1	< 0.1	NA	< 0.1	NA	60%	140%	NA	60%	140%	NA	60%	140%
Aroclor 1260	8396955	8396955	< 0.1	< 0.1	NA	< 0.1	NA	60%	140%	NA	60%	140%	NA	60%	140%
Polychlorinated Biphenyls	8396955	8396955	< 0.1	< 0.1	NA	< 0.1	95%	60%	140%	79%	60%	140%	76%	60%	140%
O. Reg. 153(511) - PHCs F1 - F4 (Soil)															
Benzene	8395012		< 0.02	< 0.02	NA	< 0.02	107%	60%	130%	117%	60%	130%	112%	60%	130%
Toluene	8395012		< 0.08	< 0.08	NA	< 0.08	110%	60%	130%	115%	60%	130%	115%	60%	130%
Ethylbenzene	8395012		< 0.05	< 0.05	NA	< 0.05	117%	60%	130%	116%	60%	130%	114%	60%	130%
Xylene Mixture	8395012		< 0.05	< 0.05	NA	< 0.05	111%	60%	130%	114%	60%	130%	113%	60%	130%
F1 (C6 to C10)	8395012		< 5	< 5	NA	< 5	75%	60%	130%	87%	85%	115%	79%	70%	130%
F2 (C10 to C16)	8390581		< 10	< 10	NA	< 10	104%	60%	130%	83%	80%	120%	82%	70%	130%
F3 (C16 to C34)	8390581		< 50	< 50	NA	< 50	103%	60%	130%	81%	80%	120%	90%	70%	130%
F4 (C34 to C50)	8390581		< 50	< 50	NA	< 50	87%	60%	130%	98%	80%	120%	94%	70%	130%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By: N Popowkof

AGAT Laboratories

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TEL (905)712-5100
FAX (905)712-5122
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Method Summary

CLIENT NAME: WSP CANADA INC.

AGAT WORK ORDER: 17T216295

PROJECT: 16M-01410-01

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Barium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Boron	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Boron (Hot Water Soluble)	MET-93-6104	EPA SW 846 6010C; MSA, Part 3, Ch.21	ICP/OES
Cadmium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Copper	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Lead	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Nickel	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Selenium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Silver	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Thallium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Uranium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Zinc	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium VI	INOR-93-6029	SM 3500 B; MSA Part 3, Ch. 25	SPECTROPHOTOMETER
Cyanide	INOR-93-6052	MOE CN-3015 & E 3009 A;SM 4500 CN	TECHNICON AUTO ANALYZER
Mercury	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Electrical Conductivity	INOR-93-6036	McKeague 4.12, SM 2510 B	EC METER
Sodium Adsorption Ratio	INOR-93-6007	McKeague 4.12 & 3.26 & EPA SW-846 6010B	ICP/OES
pH, 2:1 CaCl2 Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	PH METER

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Method Summary

CLIENT NAME: WSP CANADA INC.

AGAT WORK ORDER: 17T216295

PROJECT: 16M-01410-01

ATTENTION TO: Mani P

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Aroclor 1242	ORG-91-5113	EPA SW-846 3541 & 8082	GC/ECD
Aroclor 1248	ORG-91-5113	EPA SW-846 3541 & 8082	GC/ECD
Aroclor 1254	ORG-91-5113	EPA SW-846 3541 & 8082	GC/ECD
Aroclor 1260	ORG-91-5113	EPA SW-846 3541 & 8082	GC/ECD
Polychlorinated Biphenyls	ORG-91-5113	EPA SW-846 3541 & 8082	GC/ECD
Decachlorobiphenyl	ORG-91-5113	EPA SW-846 3541 & 8082	GC/ECD
Moisture Content		MOE E3139	BALANCE
Benzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Toluene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Ethylbenzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Xylene Mixture	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method	P & T GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method	P & T GC/FID
F2 (C10 to C16)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
F4 (C34 to C50)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	BALANCE
Moisture Content	VOL-91-5009	CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009		GC/FID

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CLIENT NAME: WSP CANADA INC.
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TORONTO, ON M9W1K4
(416) 798-0065

ATTENTION TO: Rodney Obdeyn

PROJECT: 16M-01410-01

AGAT WORK ORDER: 17T218665

TRACE ORGANICS REVIEWED BY: Oksana Gushyla, Trace Organics Lab Supervisor

WATER ANALYSIS REVIEWED BY: Inesa Alizarchyk, Inorganic Lab Supervisor

DATE REPORTED: May 31, 2017

PAGES (INCLUDING COVER): 10

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 17T218665

PROJECT: 16M-01410-01

CLIENT NAME: WSP CANADA INC.

ATTENTION TO: Rodney Obdeyn

SAMPLING SITE:

SAMPLED BY:Pradeep Patel

O. Reg. 153(511) - PCBs (Water)

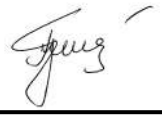
DATE RECEIVED: 2017-05-23

DATE REPORTED: 2017-05-31

		SAMPLE DESCRIPTION:		BH 16-3	BH 16-6	DUP
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2017-05-19	2017-05-19	2017-05-19
Parameter	**Unit**	**G / S**	**RDL**	**8415387**	**8415397**	**8415410**
Aroclor 1242	µg/L		0.1	<0.1	<0.1	<0.1
Aroclor 1248	µg/L		0.1	<0.1	<0.1	<0.1
Aroclor 1254	µg/L		0.1	<0.1	<0.1	<0.1
Aroclor 1260	µg/L		0.1	<0.1	<0.1	<0.1
Polychlorinated Biphenyls	µg/L	15	0.1	<0.1	<0.1	<0.1
Surrogate	**Unit**	**Acceptable Limits**				
Decachlorobiphenyl	%	60-140		76	88	88

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to 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 Textured Soils

Certified By:



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Certificate of Analysis

AGAT WORK ORDER: 17T218665

PROJECT: 16M-01410-01

CLIENT NAME: WSP CANADA INC.

ATTENTION TO: Rodney Obdeyn

SAMPLING SITE:

SAMPLED BY:Pradeep Patel

O. Reg. 153(511) - PHCs F1 - F4 (Water)

DATE RECEIVED: 2017-05-23

DATE REPORTED: 2017-05-31

		SAMPLE DESCRIPTION:		BH 16-3	BH 16-6	DUP
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2017-05-19	2017-05-19	2017-05-19
Parameter	**Unit**	**G / S**	**RDL**	**8415387**	**8415397**	**8415410**
Benzene	µg/L	430	0.20	<0.20	<0.20	<0.20
Toluene	µg/L	18000	0.20	<0.20	<0.20	<0.20
Ethylbenzene	µg/L	2300	0.10	<0.10	<0.10	<0.10
Xylene Mixture	µg/L	4200	0.20	<0.20	<0.20	<0.20
F1 (C6 to C10)	µg/L	750	25	<25	<25	<25
F1 (C6 to C10) minus BTEX	µg/L	750	25	<25	<25	<25
F2 (C10 to C16)	µg/L	150	100	**1200**	<100	<100
F3 (C16 to C34)	µg/L	500	100	<100	<100	<100
F4 (C34 to C50)	µg/L	500	100	<100	<100	<100
Gravimetric Heavy Hydrocarbons	µg/L	500	500	NA	NA	NA
Surrogate	**Unit**	**Acceptable Limits**				
Terphenyl	%	60-140		87	73	68

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 17T218665

PROJECT: 16M-01410-01

CLIENT NAME: WSP CANADA INC.

ATTENTION TO: Rodney Obdeyn

SAMPLING SITE:

SAMPLED BY:Pradeep Patel

O. Reg. 153(511) - PHCs F1 - F4 (Water)

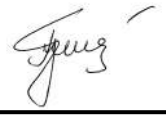
DATE RECEIVED: 2017-05-23 **DATE REPORTED: 2017-05-31**

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to 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 Textured Soils

8415387
Some sediment was observed in the sample. Whole bottle extraction was performed.
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.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6-C50 results are corrected for BTEX 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 with the contribution of PAHs. Under Ontario Regulation 153/04, results are considered valid without determining the PAH contribution if not requested by the client.
NA = Not Applicable
The F2 result is due to the presence of individual unidentified compounds.

8415397-8415410
Some sediment was observed in the sample. Whole bottle extraction was performed.
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.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6-C50 results are corrected for BTEX 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 with the contribution of PAHs. Under Ontario Regulation 153/04, results are considered valid without determining the PAH contribution if not requested by the client.
NA = Not Applicable

Certified By:



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Certificate of Analysis

AGAT WORK ORDER: 17T218665

PROJECT: 16M-01410-01

CLIENT NAME: WSP CANADA INC.

ATTENTION TO: Rodney Obdeyn

SAMPLING SITE:

SAMPLED BY:Pradeep Patel

O. Reg. 153(511) - Metals & Inorganics (Water)

DATE RECEIVED: 2017-05-23

DATE REPORTED: 2017-05-31

		SAMPLE DESCRIPTION:		BH 16-3		BH 16-6	DUP
		SAMPLE TYPE:		Water		Water	Water
		DATE SAMPLED:		2017-05-19		2017-05-19	2017-05-19
Parameter	Unit	G / S	RDL	8415387	RDL	8415397	8415410
Antimony	µg/L	20000	1.0	<1.0	1.0	<1.0	<1.0
Arsenic	µg/L	1900	1.0	2.6	1.0	7.9	9.4
Barium	µg/L	29000	2.0	288	2.0	2130	2100
Beryllium	µg/L	67	0.5	<0.5	0.5	<0.5	<0.5
Boron	µg/L	45000	10.0	59.8	10.0	50.8	46.3
Cadmium	µg/L	2.7	0.2	<0.2	0.2	<0.2	<0.2
Chromium	µg/L	810	2.0	5.3	2.0	49.5	43.3
Cobalt	µg/L	66	0.5	<0.5	0.5	0.9	1.0
Copper	µg/L	87	1.0	<1.0	1.0	2.9	2.1
Lead	µg/L	25	0.5	0.7	0.5	1.5	1.7
Molybdenum	µg/L	9200	0.5	3.0	0.5	<0.5	<0.5
Nickel	µg/L	490	1.0	<1.0	1.0	3.8	5.5
Selenium	µg/L	63	1.0	1.4	1.0	3.0	3.9
Silver	µg/L	1.5	0.2	<0.2	0.2	<0.2	<0.2
Thallium	µg/L	510	0.3	0.6	0.3	0.6	0.5
Uranium	µg/L	420	0.5	<0.5	0.5	<0.5	<0.5
Vanadium	µg/L	250	0.4	3.7	0.4	9.5	12.2
Zinc	µg/L	1100	5.0	<5.0	5.0	<5.0	6.3
Mercury	µg/L	2.8	0.02	<0.02	0.02	<0.02	<0.02
Chromium VI	µg/L	140	5	<5	5	<5	<5
Cyanide	µg/L	66	2	<2	2	<2	<2
Sodium	µg/L	2300000	1000	73200	5000	782000	774000
Chloride	µg/L	2300000	500	181000	5000	**2490000**	2260000
Electrical Conductivity	uS/cm		2	1230	2	7580	7540
pH	pH Units		NA	7.95	NA	7.79	7.67

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to 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 Textured Soils

8415387-8415410 Elevated RDLs indicate the degree of sample dilutions prior to analyses to keep analytes within the calibration range, reduce matrix interference and to avoid contaminating the instrument.

Certified By:

AGAT Laboratories

Guideline Violation

AGAT WORK ORDER: 17T218665

PROJECT: 16M-01410-01

5835 COOPERS AVENUE
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CLIENT NAME: WSP CANADA INC.

ATTENTION TO: Rodney Obdeyn

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
8415387	BH 16-3	ON T3 NPGW MFT	O. Reg. 153(511) - PHCs F1 - F4 (Water)	F2 (C10 to C16)	µg/L	150	1200
8415397	BH 16-6	ON T3 NPGW MFT	O. Reg. 153(511) - Metals & Inorganics (Water)	Chloride	µg/L	2300000	2490000

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Quality Assurance

CLIENT NAME: WSP CANADA INC.

AGAT WORK ORDER: 17T218665

PROJECT: 16M-01410-01

ATTENTION TO: Rodney Obdeyn

SAMPLING SITE:

SAMPLED BY:Pradeep Patel

Trace Organics Analysis

RPT Date: May 31, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (Water)															
Benzene	8414363		< 0.20	< 0.20	NA	< 0.20	107%	50%	140%	107%	60%	130%	111%	50%	140%
Toluene	8414363		< 0.20	< 0.20	NA	< 0.20	105%	50%	140%	102%	60%	130%	109%	50%	140%
Ethylbenzene	8414363		< 0.10	< 0.10	NA	< 0.10	95%	50%	140%	97%	60%	130%	100%	50%	140%
Xylene Mixture	8414363		< 0.20	< 0.20	NA	< 0.20	69%	50%	140%	91%	60%	130%	104%	50%	140%
F1 (C6 to C10)	8414363		< 25	< 25	NA	< 25	87%	60%	140%	88%	60%	140%	81%	60%	140%
F2 (C10 to C16)	8394998		< 100	< 100	NA	< 100	96%	60%	140%	75%	60%	140%	61%	60%	140%
F3 (C16 to C34)	8394998		< 100	< 100	NA	< 100	97%	60%	140%	77%	60%	140%	66%	60%	140%
F4 (C34 to C50)	8394998		< 100	< 100	NA	< 100	102%	60%	140%	86%	60%	140%	81%	60%	140%
O. Reg. 153(511) - PCBs (Water)															
Aroclor 1242	8412996		< 0.1	< 0.1	NA	< 0.1	NA	60%	140%	NA	60%	140%	NA	60%	140%
Aroclor 1248	8412996		< 0.1	< 0.1	NA	< 0.1	NA	60%	140%	NA	60%	140%	NA	60%	140%
Aroclor 1254	8412996		< 0.1	< 0.1	NA	< 0.1	NA	60%	140%	NA	60%	140%	NA	60%	140%
Aroclor 1260	8412996		< 0.1	< 0.1	NA	< 0.1	NA	60%	140%	NA	60%	140%	NA	60%	140%
Polychlorinated Biphenyls	8412996		< 0.1	< 0.1	NA	< 0.1	80%	60%	140%	62%	60%	140%	65%	60%	140%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By:

AGAT Laboratories

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Quality Assurance

CLIENT NAME: WSP CANADA INC.

AGAT WORK ORDER: 17T218665

PROJECT: 16M-01410-01

ATTENTION TO: Rodney Obdeyn

SAMPLING SITE:

SAMPLED BY:Pradeep Patel

Water Analysis

RPT Date: May 31, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inorganics (Water)															
Antimony	8413401		<1.0	<1.0	NA	< 1.0	100%	70%	130%	98%	80%	120%	99%	70%	130%
Arsenic	8413401		<1.0	<1.0	NA	< 1.0	101%	70%	130%	98%	80%	120%	103%	70%	130%
Barium	8413401		24.2	20.4	17.0%	< 2.0	100%	70%	130%	103%	80%	120%	101%	70%	130%
Beryllium	8413401		<0.5	<0.5	NA	< 0.5	103%	70%	130%	104%	80%	120%	117%	70%	130%
Boron	8413401		10.1	<10.0	NA	< 10.0	105%	70%	130%	100%	80%	120%	108%	70%	130%
Cadmium	8413401		<0.2	<0.2	NA	< 0.2	100%	70%	130%	102%	80%	120%	108%	70%	130%
Chromium	8413401		<2.0	<2.0	NA	< 2.0	100%	70%	130%	99%	80%	120%	101%	70%	130%
Cobalt	8413401		<0.5	<0.5	NA	< 0.5	104%	70%	130%	102%	80%	120%	106%	70%	130%
Copper	8413401		<1.0	<1.0	NA	< 1.0	102%	70%	130%	100%	80%	120%	106%	70%	130%
Lead	8413401		<0.5	<0.5	NA	< 0.5	109%	70%	130%	103%	80%	120%	108%	70%	130%
Molybdenum	8413401		<0.5	<0.5	NA	< 0.5	101%	70%	130%	100%	80%	120%	105%	70%	130%
Nickel	8413401		2.0	1.9	NA	< 1.0	107%	70%	130%	105%	80%	120%	112%	70%	130%
Selenium	8413401		<1.0	<1.0	NA	< 1.0	94%	70%	130%	96%	80%	120%	104%	70%	130%
Silver	8413401		<0.2	<0.2	NA	< 0.2	102%	70%	130%	107%	80%	120%	114%	70%	130%
Thallium	8413401		<0.3	<0.3	NA	< 0.3	106%	70%	130%	100%	80%	120%	101%	70%	130%
Uranium	8413401		<0.5	<0.5	NA	< 0.5	106%	70%	130%	101%	80%	120%	107%	70%	130%
Vanadium	8413401		0.4	0.4	NA	< 0.4	109%	70%	130%	103%	80%	120%	107%	70%	130%
Zinc	8413401		6.8	6.3	NA	< 5.0	104%	70%	130%	104%	80%	120%	107%	70%	130%
Mercury	8415387	8415387	<0.02	<0.02	NA	< 0.02	101%	70%	130%	101%	80%	120%	101%	70%	130%
Chromium VI	8415387	8415387	<5	<5	NA	< 5	104%	70%	130%	102%	80%	120%	101%	70%	130%
Cyanide	8415387	8415387	<2	<2	NA	< 2	96%	70%	130%	99%	80%	120%	97%	70%	130%
Sodium	8409705		8280	8220	0.7%	< 500	98%	70%	130%	98%	80%	120%	94%	70%	130%
Chloride	8415065		12000	11400	5.7%	< 100	94%	70%	130%	101%	70%	130%	114%	70%	130%
Electrical Conductivity	8415387	8415387	1230	1240	0.5%	< 2	103%	90%	110%	NA			NA		
pH	8415387	8415387	7.95	8.02	0.9%	NA	100%	90%	110%	NA			NA		

Comments: NA signifies Not Applicable.
Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
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Method Summary

CLIENT NAME: WSP CANADA INC.

AGAT WORK ORDER: 17T218665

PROJECT: 16M-01410-01

ATTENTION TO: Rodney Obdeyn

SAMPLING SITE:

SAMPLED BY:Pradeep Patel

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Aroclor 1242	ORG-91-5112	EPA SW-846 3510 & 8082	GC/ECD
Aroclor 1248	ORG-91-5112	EPA SW-846 3510 & 8082	GC/ECD
Aroclor 1254	ORG-91-5112	EPA SW-846 3510 & 8082	GC/ECD
Aroclor 1260	ORG-91-5112	EPA SW-846 3510 & 8082	GC/ECD
Polychlorinated Biphenyls	ORG-91-5112	EPA SW-846 3510 & 8082	GC/ECD
Decachlorobiphenyl	ORG-91-5112	EPA SW-846 3510 & 8082	GC/ECD
Benzene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Toluene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Ethylbenzene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Xylene Mixture	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F1 (C6 to C10)	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F2 (C10 to C16)	VOL-91-5010	MOE PHC-E3421	GC/FID
F3 (C16 to C34)	VOL-91-5010	MOE PHC-E3421	GC/FID
F4 (C34 to C50)	VOL-91-5010	MOE PHC-E3421	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5010	MOE PHC-E3421	BALANCE
Terphenyl	VOL-91-5010		GC/FID
Water Analysis			
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Thallium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Mercury	MET-93-6100	EPA SW-846 7470 & 245.1	CVAAS
Chromium VI	INOR-93-6034	SM 3500-Cr B	SPECTROPHOTOMETER
Cyanide	INOR-93-6052	MOE METHOD CN- 3015 & SM 4500 CN- I	TECHNICON AUTO ANALYZER
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE

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Laboratory Analysis Report

To:

Danielle Vella
WSP Canada Inc.
51 Constellation Court
Toronto, Ontario
M9W 1K4

EMC LAB REPORT NUMBER: A31754
Job/Project Name: Glen Road Pedestrian Bridge, Toronto, ON
Analysis Method: Polarized Light Microscopy – EPA 600
Date Received: Jun 6/17 **Date Analyzed:** Jun 13/17
Analyst: Malgorzata Sybydlo, *Laboratory Manager*

Job No: 16M-01410-00
Number of Samples: 12
Date Reported: Jun 13/17

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
AS1-1	A31754-1	BH16-01 top of core/ Asphalt (blue/dark grey aggregates)	Black, tar	**ND**			100
AS1-2	A31754-2	BH16-01 middle of core/ Asphalt (blue/dark grey aggregates)	Black, tar	**ND**			100
AS1-3	A31754-3	BH16-01 bottom of core/ Asphalt (blue/dark grey aggregates)	Black, tar	**ND**			100
AS2-1	A31754-4	BH16-02 top layer/ Asphalt (blue/dark grey aggregates)	Black, tar	**ND**			100
AS2-2	A31754-5	BH16-02 top layer/ Asphalt (blue/dark grey aggregates)	Black, tar	**ND**			100
AS2-3	A31754-6	BH16-06 top layer/ Asphalt (blue/dark grey aggregates)	Black, tar	**ND**			100
AS3-1	A31754-7	BH16-02 second layer/ Asphalt (light grey aggregates)	Black, tar	**ND**			100
AS3-2	A31754-8	BH16-06 second layer/ Asphalt (light grey aggregates)	Black, tar	**ND**			100
AS3-3	A31754-9	BH16-06 second layer/ Asphalt (light grey aggregates)	Black, tar	**ND**			100
AS4-1	A31754-10	BH16-02 bottom layer/ Asphalt (large aggregates)	Black, tar	**ND**			100
AS4-2	A31754-11	BH16-02 bottom layer/ Asphalt (large aggregates)	Black, tar	**ND**			100

emcscientific
INCORPORATED

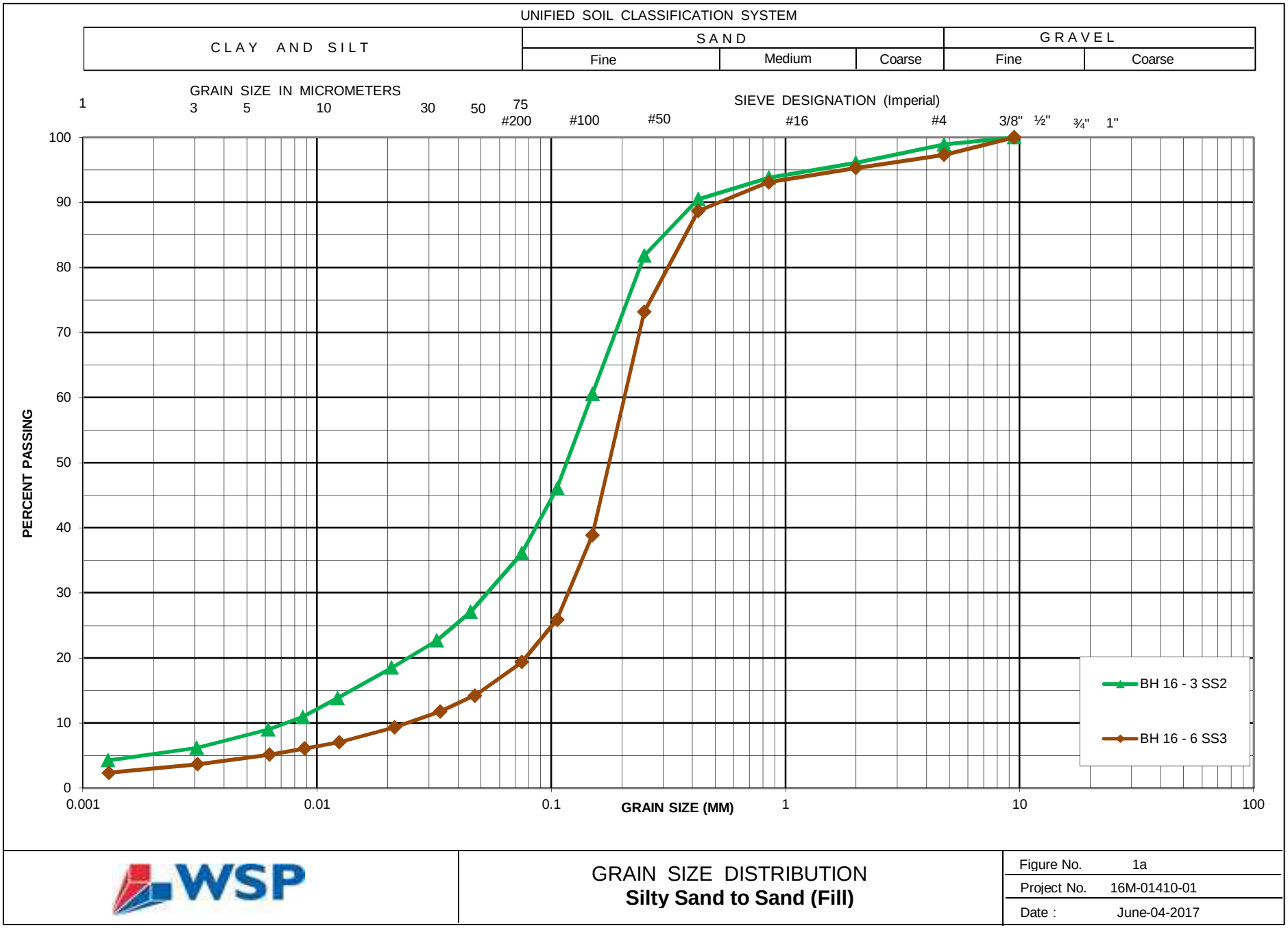
Laboratory Analysis Report

EMC LAB REPORT NUMBER: A31754
Client's Job/Project No.: 16M-01410-00
Analyst: Malgorzata Sybydlo, *Laboratory Manager*

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
AS4-3	A31754-12	BH16-02 bottom layer/ Asphalt (large aggregates)	Black, tar	**ND**			100

Note:
1. Bulk samples are analyzed using Polarized Light Microscopy (PLM) and dispersion staining techniques. The analytical procedures are in accordance with EPA 600/R-93/116 method.
2. The results are only related to the samples analyzed. **ND** = None Detected (no asbestos fibres were observed), **NA** = Not Analyzed (analysis stopped due to a previous positive result).
3. This report may not be reproduced, except in full without the written approval of EMC Scientific Inc. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. Government.
4. The Ontario Regulatory Threshold for asbestos is 0.5%. The limit of quantification (LOQ) is 0.5%.

Grain Size Results



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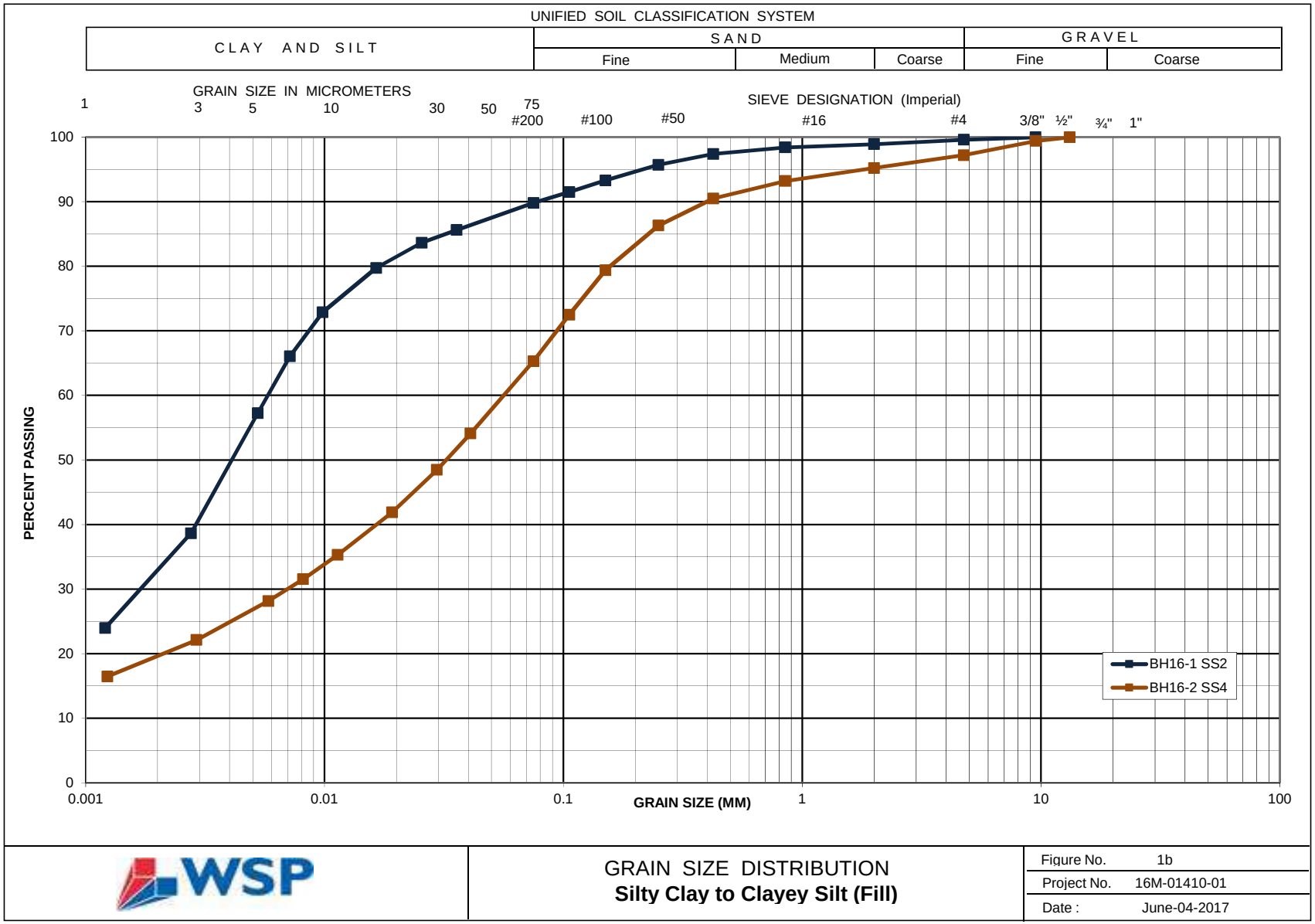
GRAIN SIZE DISTRIBUTION
Silty Sand to Sand (Fill)

Figure No.	1a
Project No.	16M-01410-01
Date :	June-04-2017



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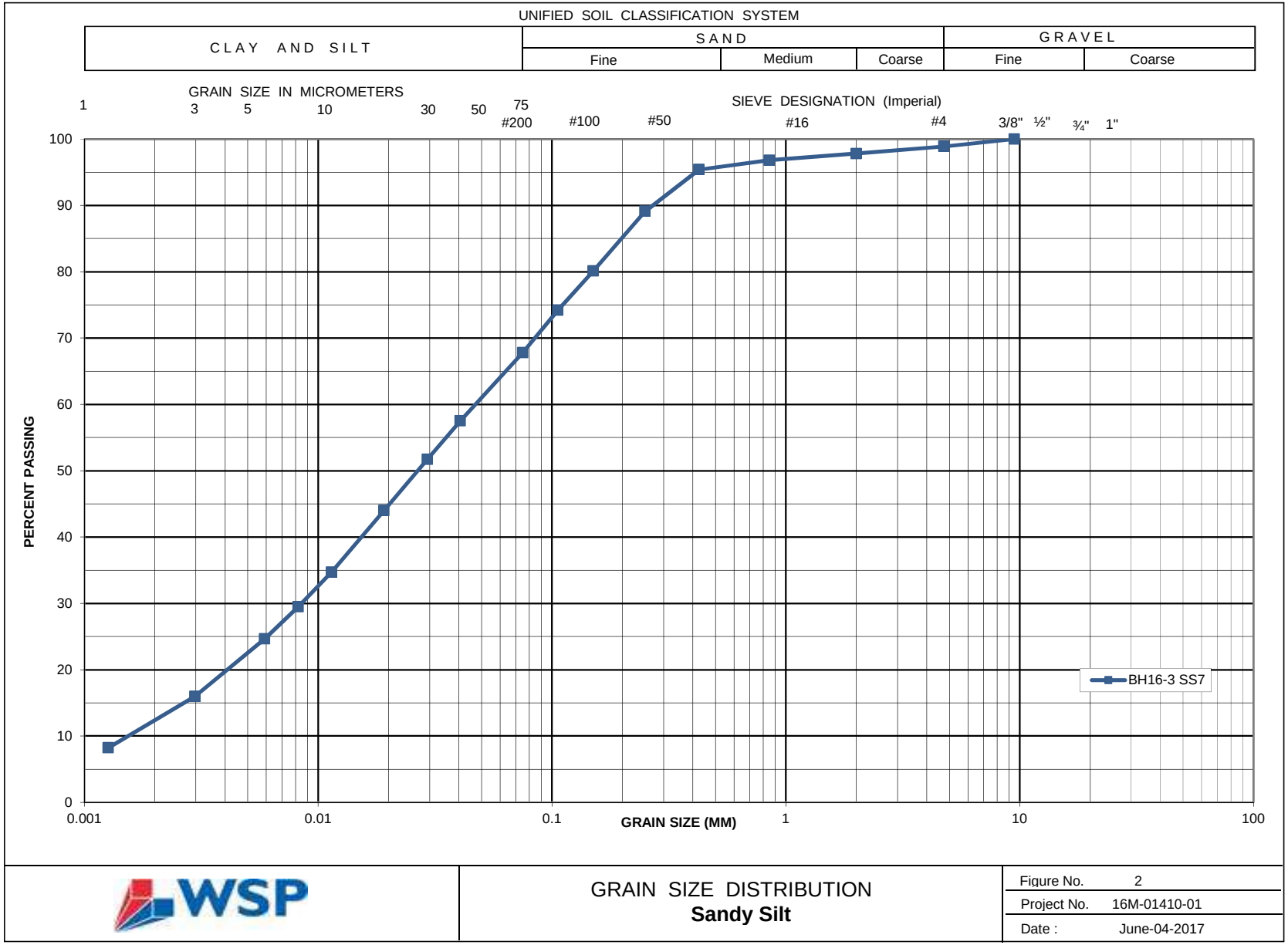
GRAIN SIZE DISTRIBUTION

Silty Clay to Clayey Silt (Fill)

Figure No.	1b
Project No.	16M-01410-01
Date :	June-04-2017



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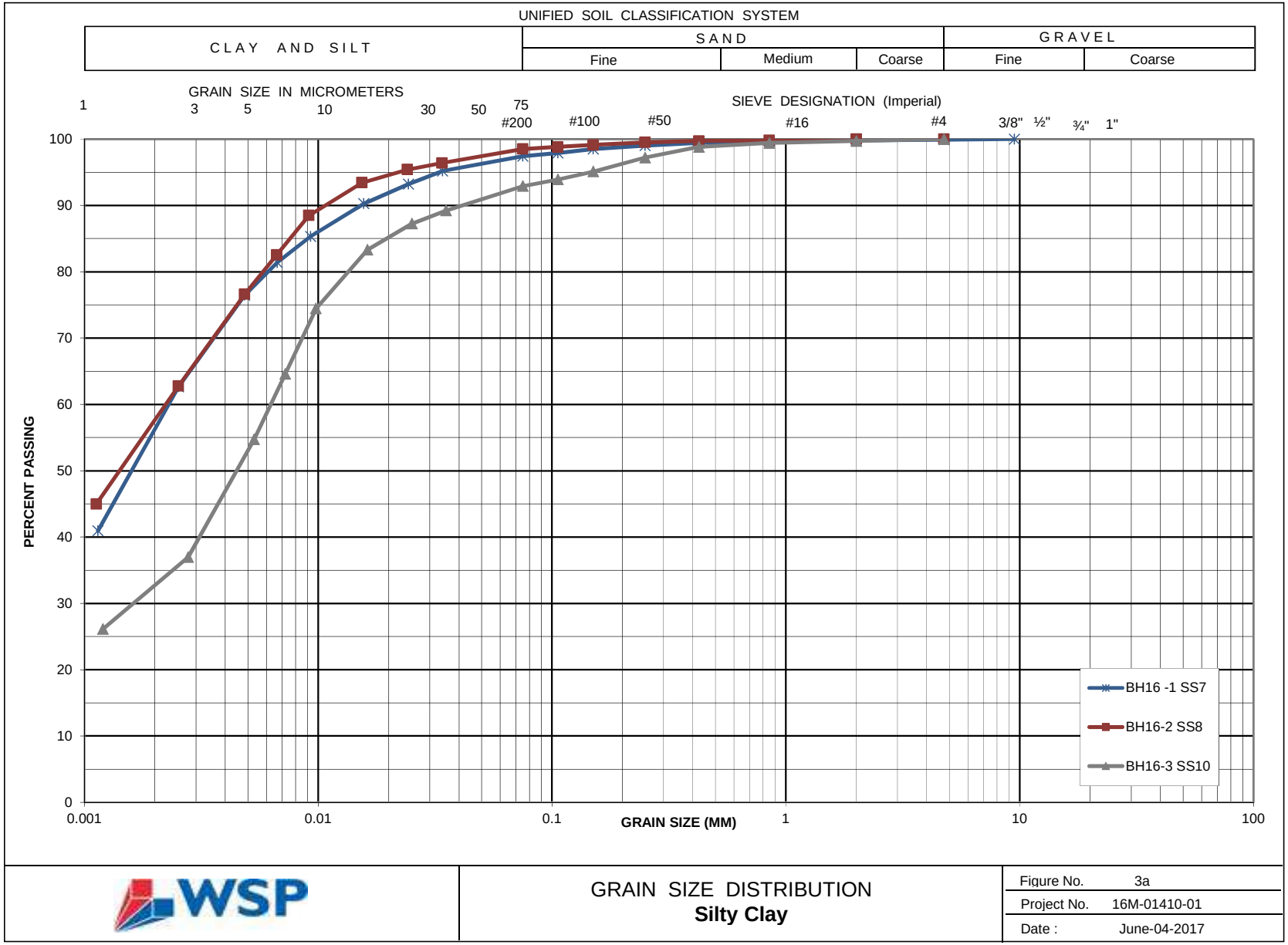
GRAIN SIZE DISTRIBUTION

Sandy Silt

Figure No.	2
Project No.	16M-01410-01
Date :	June-04-2017



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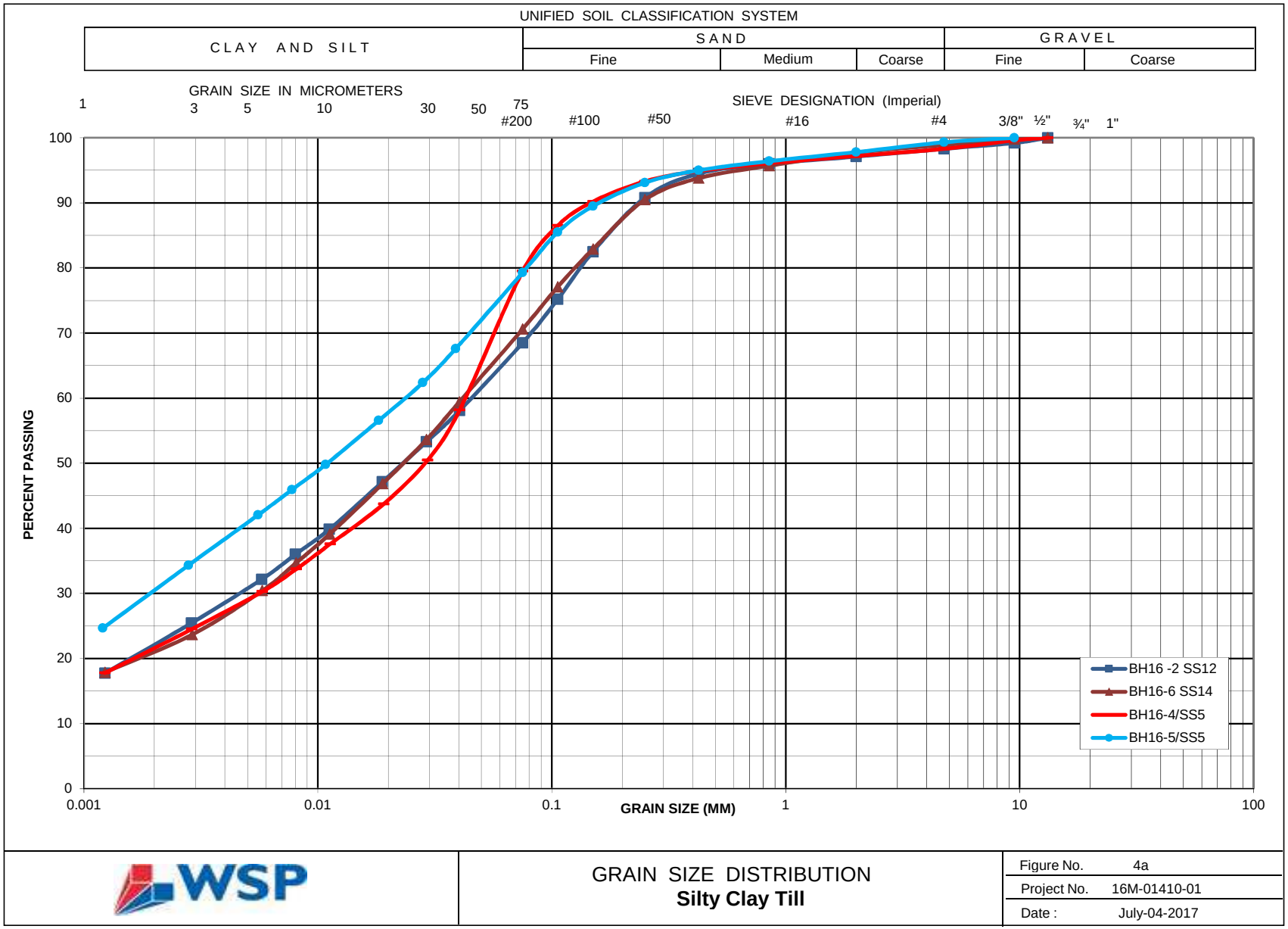
GRAIN SIZE DISTRIBUTION

Silty Clay

Figure No.	3a
Project No.	16M-01410-01
Date :	June-04-2017



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GRAIN SIZE DISTRIBUTION

Silty Clay Till

Figure No.	4a
Project No.	16M-01410-01
Date :	July-04-2017