



**PHASE TWO ENVIRONMENTAL SITE ASSESSMENT  
THUNDERING WATERS DEVELOPMENT,  
EAST & NORTH OF DORCHESTER ROAD & WEST OF  
PROGRESS STREET,  
NIAGARA FALLS, ONTARIO**

**Submitted to:**

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## TABLE OF CONTENTS

		PAGE
1.0	EXECUTIVE SUMMARY .....	1
2.0	INTRODUCTION .....	5
2.1	Site Description.....	5
2.2	Property Ownership .....	5
2.3	Current and Proposed Future Uses.....	6
2.4	Applicable Site Condition Standard.....	6
<b>3.0</b>	<b>BACKGROUND INFORMATION .....</b>	<b>8</b>
3.1	Physical Setting .....	8
3.2	Past Investigations.....	8
<b>4.0</b>	<b>SCOPE OF THE INVESTIGATION .....</b>	<b>10</b>
4.1	Overview of Site Investigation .....	10
4.2	Media Investigated.....	11
4.3	Phase One ESA Conceptual Site Model .....	11
4.4	Deviations from Sampling and Analysis Plan .....	12
4.5	Impediments .....	12
5.1	General.....	13
5.2	Drilling.....	13
5.3	Testpitting .....	13
5.4	Soil: Sampling.....	14
5.5	Field Screening Measurements.....	15
5.6	Ground Water: Monitoring Well Installation .....	15
5.7	Ground Water: Field Measurement of Water Quality Parameters.....	16
5.8	Ground Water: Sampling.....	16
5.9	Sediment: Sampling.....	16
5.10	Analytical Testing.....	17
5.11	Residue Management Procedures.....	17
5.12	Elevation Surveying .....	17
5.13	Quality Assurance and Quality Control Measures .....	17
<b>6.0</b>	<b>REVIEW AND EVALUATION .....</b>	<b>19</b>
6.1	Geology .....	19
6.2	Ground Water: Elevations and Flow Direction.....	19
6.3	Ground Water: Hydraulic Gradients .....	20
6.4	Medium and Fine Soil Texture .....	21





6.5	Soil: Field Screening .....	21
6.6	Soil Quality.....	22
6.7	Ground Water Quality .....	24
6.8	Sediment Quality.....	24
6.9	Quality Assurance and Quality Control Results .....	25
6.10	Phase Two Conceptual Site Model .....	27
7.0	CONCLUSIONS.....	32
7.1	Signatures.....	35
<b>REFERENCES .....</b>		<b>37</b>

**LIST OF FIGURES**

Figure 1:	Property Location Map
Figure 2a:	Phase Two Property Layout, Borehole/ Monitoring Well & Testpit Location Plan
Figure 2b:	Phase Two Property Layout, Borehole/ Monitoring Well & Testpit Location Plan (Southern Portion)
Figure 2c:	Phase Two Property Layout, Borehole/ Monitoring Well & Testpit Location Plan (Northern Portion)
Figure 3:	Geological Profile A-A'
Figure 4:	Geological Profile B-B'
Figure 5a:	Depth to Ground Water and Ground Water Elevation Plan
Figure 5b:	Interpreted Ground Water Flow Plan (March 1, 2016)
Figure 6:	Soil Sample Locations with Table 1 Exceedances
Figure 7:	Ground Water Sample Locations with Table 1 Exceedances
Figure 8:	Conceptual Site Model
Figure 9:	Human Health Conceptual Model
Figure 10:	Ecological Conceptual Model
Figure 11:	Area of Metals and EC Impacted Soil Above Table 1 SCS

**LIST OF TABLES**

Table 1:	Ground Water Elevation Data
Table 2:	Summary of Soil Analyses for General Inorganics and Metals
Table 2A:	Summary of Soil Analyses for EC
Table 3:	Summary of Soil Analyses for VOCs and PHCs
Table 4:	Summary of Soil Analyses for PAHs
Table 5:	Maximum Concentrations for Analytical Results for Soil
Table 6:	Summary of Ground Water Analyses for Metals
Table 7:	Summary of Ground Water Analyses for VOCs and PHCs
Table 8:	Maximum Concentrations for Analytical Results for Ground Water



## **LIST OF APPENDICES**

- Appendix A Grain Size Analysis, Borehole/Monitoring Well & Testpit Logs
- Appendix B Sampling and Analysis Plan
- Appendix C Residue Management
- Appendix D Hydraulic Conductivity Results
- Appendix E Laboratory Certificates of Analysis
- Appendix F Limitations



## 1.0 EXECUTIVE SUMMARY

Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler) was retained by GR (CAN) Investments Co., Ltd. (the Client), to conduct a Phase Two Environmental Site Assessment (ESA) of a property known as the Thundering Waters Development, in Niagara Falls, Ontario (the Phase Two Property; **Figure 1**). The Phase Two Property does not have a current municipal address. The Client is considering developing the Phase Two Property for proposed mixed land use. A Record of Site Condition (RSC), acknowledged by the Ministry of the Environment and Climate Change (MOECC), may be required as a condition of the planned redevelopment from vacant to mixed land use. The Client is seeking confirmation with the City of Niagara Falls and the Regional Municipality of Niagara (RMON) regarding this issue.

Amec Foster Wheeler previously completed a Phase I ESA, the findings of which were documented in the report entitled “*Phase I Environmental Site Assessment Thundering Waters Development, East & North of Dorchester Road & West of Progress Street, Niagara Falls, Ontario*” dated January 25, 2016, (Phase I ESA).

This Phase Two ESA was carried out in accordance with Amec Foster Wheeler’s proposal dated October 16, 2015 and authorization to proceed, signed by the Client on November 15, 2015. A delineation testpitting and ground water sampling program was carried out in accordance with Amec Foster Wheeler’s proposal dated December 2, 2016 and authorization to proceed, signed by the Client on December 3, 2016.

The primary findings of this Phase Two ESA are as follows:

- Amec Foster Wheeler drilled five boreholes, installed and monitored five monitoring wells, excavated 50 testpits, completed hydrogeological testing and an elevation survey between December 2, 2015 and January 3, 2017. The locations of the boreholes, monitoring wells and testpits were selected to address Areas of Potential Environmental Concern (APECs) and Potentially Contaminating Activities (PCAs) identified during the Phase I ESA.
- The subsurface conditions encountered at the Phase Two Property are described as follows: a layer of topsoil was present across the Phase Two Property ranging from 0 to 0.15 metres below ground surface (mbgs). Beneath the topsoil, a layer of fill was encountered in all boreholes (with the exception of BH/MW104 and BH/MW105) and testpits (with the exception of TP108, TP111, TP118 and TP120). The fill was generally dominated by reworked native silty clay material (BH/MW102, BH/MW103, BH/MW104, BH/MW105, TP102, TP103, TP104, TP105, TP106, TP107, TP109, TP110, TP112, TP113, TP114, TP115, TP116, TP117, and TP121) or layers of silty clay and silty sand (BH/MW101, TP101, and TP119) materials. The fill materials ranged in depth across the Phase Two Property from 0 (TP108, TP111, TP118 and TP120) to 4.4 mbgs (BH/MW101). A native silty clay with traces of sand and fine to medium gravel was present beneath the fill materials in all boreholes and testpits. The silty clay extended to the termination depth



of the boreholes. Trace slag was noted in TP221 (0-0.5 mbgs). Black and/or white seams (inferred organics) were noted in the fill material in TP221, TP226, TP227 and TP228. The stratigraphy in the delineation testpits was consistent with the boreholes and testpits completed in 2015.

- Bedrock was not encountered at the maximum drilled depth of the boreholes (6.1 mbgs). The bedrock is anticipated to be of the Middle and Lower Silurian Age, consisting of sandstone, shale, dolostone and siltstone of the Lockport Formation. Bedrock is anticipated to be encountered at depths ranging from 20 to 25 mbgs.
- Visual or olfactory evidence of petroleum hydrocarbon impacts was not observed by Amec Foster Wheeler during the drilling or testpitting programs.
- It is Amec Foster Wheeler's opinion that the results of the Combustible Organic Vapour (COV) and Total Organic Vapour (TOV) head space screening program suggest a low potential for the presence of significant combustible soil headspace vapour levels in the boreholes and testpits.
- On March 1, 2016 following completion of the hydraulic testing, the depth to ground water measured from surface ranged from approximately 0.17 to 3.49 mbgs at the Phase Two Property which corresponds to geodetic elevations ranging from 171.80 to 179.62 metres above sea level (mASL). It is worth noting that BH/MW102 was not located, BH/MW105 and BH/MW200 were previously dry and were not recorded during this monitoring event. In the southern portion of the site, excluding BH/MW103 (which is located approximately 4-5 m lower than the other monitoring wells), BH/MW102 and BH/MW200 (which were not recorded), the geodetic ground water elevations ranged from 179.00 to 179.62 mASL. Using the three-point method, the horizontal ground water flow was calculated to be south towards the Welland River with a gradient of approximately 0.002 metres/metre (m/m). It is worth noting that the Phase Two Property is large, has significant changes in topography and has significant areas of fill while others are native. It is believed that generally the ground water flow direction would be towards the Welland River in the southern portion of the Phase Two Property and towards the Queenston-Chippawa Power Canal in the northern portion of the Phase Two Property.
- The assessment criteria applicable to the Phase Two Property, if a RSC was to be filed for the Phase Two Property are the Table 1 Full Depth Background Site Condition Standards for residential/parkland/institutional/industrial/commercial/community property use and medium and fine textured soils (Table 1 SCS).
- The results of the soil testing indicated exceedances of the Table 1 SCS, as follows:
  - Thallium in fill materials at BH/MW101, BH/MW103 and BH/MW104;
  - Conductivity in fill materials at TP117;



- The remaining analyses were below the Table 1 SCS, including remaining metals, mercury, hexavalent chromium, SAR, BTEX/VOCs, PHCs and PAHs.
- The results of the ground water testing indicated exceedances of the Table 1 SCS, as follows:
  - Cobalt in ground water at BH/MW103;
  - Silver in ground water at BH/MW202. During the resampling in January 2017, there was no exceedance of the Table 1 SCS for silver; and
  - Uranium in ground water at BH/MW103 and BH/MW104.

The soil samples with impacts were all collected from the fill materials (silty sand or silty clay) which were found in all boreholes with the exception of thallium in BH/MW104 and molybdenum in TP109 which were in the native silty clay materials. The fill extended as deep as 4.4 mbgs and it is believed to be associated with the infilling of the former Welland River. Based on additional boreholes drilled during Amec Foster Wheeler's geotechnical investigation, fill material was encountered in a majority of the locations on-site.

The EC impact noted in the area of TP117 and TP224 to TP229 was noted at depths ranging from 0.5 to 2.0 m and possibly deeper. The EC impact may be attributed to former road salt storage or the stockpiling of snow (containing road salt). This area was not fully delineated during the delineation program.

As there are impacts above the Ministry's standards in the soil and ground water at the Phase Two Property, a RSC could not be filed at this time. Once the additional sampling has been completed, the contaminants would need to be addressed using one of or a combination of the following techniques before an RSC could be filed:

- Soil Remediation – the impacted materials would be removed for off-Site disposal at a licensed landfill; or
- Site Specific Risk Assessment – impacted materials can remain in place if they are below site specific criteria that would be generated for the Phase Two Property.

**Figure 11** outlines the estimated areas of impacted soil above the Table 1 SCS for various metals parameters and EC. Based on an average soil depth of 1 m, the estimated tonnage of impacted soil is 1,800 tonnes based on a bulking factor of 1.8 tonnes/cubic metres (m<sup>3</sup>). It is noted that the EC impact has not been fully delineated. The order of magnitude costing to remove this soil from the Phase Two Property is discussed in a separate letter.

The ground water results indicate metal impacts above the Table 1 SCS in MW202 based on the original ground water sampling in 2015. Two of the three wells (MW103 and MW104) could not be sampled in the January 2017 event due to damage or insufficient water. As a RSC may be



required for the Phase Two Property, the Client should consider the reinstallation of monitoring wells to replace the previous wells.

Furthermore, if the applicable standards are revised to Table 3 SCS (i.e., if the wetland boundary is confirmed), there are no exceedances for metals in ground water. The concentration of thallium in soil would exceed the Table 3 SCS for residential/parkland/institutional property use but not industrial/commercial/community property use. However, the EC concentrations exceed the Table 3 SCS.

Once the ground water monitoring wells no longer be required, they must be maintained or abandoned in accordance with the requirements of Section 21(3) of Ontario Regulation 903 – Wells which states *“the well owner shall immediately abandon the well if it is not being used or maintained for future use as a well”*.



## 2.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler) was retained by GR (CAN) Investments Co., Ltd. (the Client), to conduct a Phase Two Environmental Site Assessment (ESA) of a property known as the Thundering Waters Development, in Niagara Falls, Ontario (the Phase Two Property; **Figure 1**). The Phase Two Property does not have a current municipal address. The Client is considering developing the Phase Two Property for proposed mixed land use. A Record of Site Condition (RSC), acknowledged by the Ministry of the Environment and Climate Change (MOECC), may be required as a condition of the planned redevelopment from vacant to mixed land use. The Client is seeking confirmation with the City of Niagara Falls and the Regional Municipality of Niagara (RMON) regarding this issue.

Amec Foster Wheeler previously completed a Phase I ESA, the findings of which were documented in the report entitled “*Phase I Environmental Site Assessment Thundering Waters Development, East & North of Dorchester Road & West of Progress Street, Niagara Falls, Ontario*” dated January 25, 2016, (Phase I ESA).

This Phase Two ESA was carried out in accordance with Amec Foster Wheeler’s proposal dated October 16, 2015 and authorization to proceed, signed by the Client on November 15, 2015. A delineation testpitting and ground water sampling program was carried out in accordance with Amec Foster Wheeler’s proposal dated December 2, 2016 and authorization to proceed, signed by the Client on December 3, 2016.

A Phase Two ESA in support of a RSC is legislated under Ontario Regulation 153/04 as amended (*O. Reg. 153/04* as amended). The regulation outlines the procedure to follow to complete Phase One and Two ESAs including the requirement to complete a Phase One ESA prior to completing a Phase Two ESA. As such, should the Client require a RSC, the Phase I ESA will need to be updated to a Phase One ESA that meets *O. Reg. 153/04* as amended requirements.

### 2.1 Site Description

The Phase Two Property is located east and north of Dorchester Road and west of Progress Street in Niagara Falls, Ontario (**Figure 1**). The Phase Two Property is currently owned by the Client and is bisected by a railway running northeast to southwest. The Phase Two Property was vacant, undeveloped land and lies in a municipal urban setting in an area of mixed vacant, industrial and commercial land uses. **Figures 2a, 2b and 2c** illustrate the property boundaries of the Phase Two Property.

### 2.2 Property Ownership

The property ownership and Client names and contact information is as follows:



<b>Owner</b>	GR (CAN) Investments Co., Ltd.	4342 Queen Street, Suite 203 Niagara Falls, Ontario L2E 7J7 P: 1 (905) 233-4427 Gang (Allan) Hu <a href="mailto:allanghu@gmail.com">allanghu@gmail.com</a>
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### 2.3 Current and Proposed Future Uses

The Phase Two Property was vacant, undeveloped land covered with dense vegetation. Railway tracks were observed bisecting the Phase Two Property from northeast to southwest. The proposed future use is residential, commercial and parkland. Section 168.3.1 of the Environmental Protection Act (EPA) may prohibit the residential, commercial and parkland property use unless a RSC is filed. As mentioned previously, the Client will confirm the requirement for a RSC.

### 2.4 Applicable Site Condition Standard

Under *O. Reg. 153/04* as amended, the MOEE has outlined SCS in the document “*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*” dated 15 April 2011. The SCS applicable to the Phase Two Property have been evaluated on the basis of the following rationale:

- The proposed property use is residential, commercial and parkland and therefore the SCS for residential/parkland/institutional property use would apply;
- Two samples were submitted for grain size distribution tests. Grain size distribution tests on a composite sample of the silty sand fill (TP119-4 and TP121-4) and a composite sample of the native silty clay (TP108-4 and TP112-6) indicated that 37% and 89% of the samples consisted of particles less than 75 micrometres (µm) in diameter, respectively (**Appendix A**). The silty sand is classified as a coarse textured soil (i.e., contains more than 50% by mass of particles that are 75 µm or larger in mean diameter (*O. Reg. 153/04, s.42 (2)*) and the silty clay of classified as a medium and fine textured soil (i.e., contains 50% or more by mass of particles that are smaller than 75 µm in mean diameter (*O. Reg. 153/04, s.42 (2)*)). As more than 1/3 of the soil at the property consists of medium and fine textured soils, the soil materials at the Phase Two Property have been classified as medium and fine textured (*O. Reg. 153/04, s.42 (1)*);
- Municipal services are located throughout the Phase Two Study Area, however, three domestic water wells are located within 250 metres (m) of the Phase Two Property (based on a search of the MOECC interactive well record mapping tool completed by Amec Foster Wheeler on March 16, 2016);





- In accordance with *O. Reg. 153/04*, the Phase Two Property does include land that is within 30 m of a “water body”;
- The depth to bedrock is greater than 2 m; and
- The Phase Two Property is classified as an environmentally sensitive area under *O. Reg. 153/04* as amended, as:
  - The Phase Two Property appears to include land (or be within 30 m of land) that would be classified as an area of natural significance as defined by *O. Reg. 153/04* as amended; and
  - Soil pH values were reported between 7.2 and 7.8 in the nine soil/fill samples (including two field duplicates) submitted for pH determination from the borehole and testpit samples. The reported soil pH for all soil samples was within 5.0 to 9.0 units for surface soil (surface to 1.5 metres below ground surface [mbgs]) and 5.0 to 11.0 units for subsurface soil (below 1.5 mbgs).

Based on the above site characteristics, the SCS currently applicable to the Phase Two Property, for the purposes of filing a RSC, are the Table 1 Full Depth Generic SCS for a non-potable ground water condition, residential/parkland/institutional/industrial/commercial/community property use and fine and medium textured soils (the Table 1 SCS). The Client will confirm the boundaries of the area of natural significance (wetland) and forward this information to Amec Foster Wheeler. It is possible that the SCS may change (or for a portion of the Phase Two Property) pending this study result.



### **3.0 BACKGROUND INFORMATION**

#### **3.1 Physical Setting**

The Phase Two Property lies at an approximate elevation of 180 metres above sea level (mASL) (**Niagara Topographic Series, 1984**). The UTM coordinates (NAD 83) are Zone 17, 4768774 Northing and 654873 Easting. The topography across the Phase Two Property is relatively flat and graded evenly with the surrounding properties to the east and northwest. A drainage ditch was noted which originates near the railway tracks and traverses the central area of the southern portion of the Phase Two Property and discharges into the Welland River. The Welland River and Queenston-Chippawa Power Canal are located approximately 0.025 to 0.130 kilometres (km) south and west of the Phase Two Property, respectively. Therefore, the Phase Two Property includes land within 30 m of a “waterbody” as outlined in *O. Reg. 153/04* as amended.

The surficial geology within the Phase Two Property and surrounding area is interpreted to consist of glaciocustrine deposits which consist of sand, gravelly sand and gravel, near shore and beach deposits (“*Quaternary Geology of the Niagara Area, Southern Ontario*”, preliminary map p. 764, Ontario Division of Mines, 1972).

Bedrock is anticipated be of the Middle and Lower Silurian Age, consisting of sandstone, shale, dolostone and siltstone of the Lockport Formation (“*Bedrock Geology of Ontario*”, Ontario Geological Survey, 1991). Bedrock is anticipated to be encountered at depths ranging from 20 to 25 mbgs across the Phase Two Property (“*Niagara Sheet Southern Ontario Drift Thickness*”, Preliminary Map p. 537, Ontario Department of Mines, 1969).

The regional ground water flow direction, based on topographic features and knowledge gained from other sites in the area, is expected to be to the southwest towards the Welland River. Locally, however, the shallow ground water flow may be influenced by underground utility trenches, conduits, and structures, variations in soil type, and minor fluctuations in topography.

#### **3.2 Past Investigations**

Background materials relevant to the discussion provided herein are documented in more detail in Amec Foster Wheeler’s Phase I ESA.

Based on the Amec Foster Wheeler Phase I ESA, Areas of Potential Environmental Concern (APECs) associated with current or former Potentially Contaminating Activities (PCAs) associated with the Phase I Property and the surrounding properties are as follows:



Area of Potential Environmental Concern	Location of APEC on Phase One Property	Potentially Contaminating Activity*	Location of PCA	Contaminants of Potential Concern	Media Potentially Impacted
APEC-1: Historic Infilling	Southern portion of Phase One Property	#30 – Importation of Fill Material of Unknown Quality	On-Site	Metals, SAR, EC, PAHs, BTEX, PHCs	Soil Ground Water
APEC-2: Former Cyro Canada Inc	Northwestern portion of Phase One Property	#8 – Chemical Manufacturing, Processing, and Bulk Storage	Off-Site	Metals, VOCs, PHCs	Soil Ground Water
APEC-3: Chemtrade Logistics	Northeastern portion of Phase One Property	#8 – Chemical Manufacturing, Processing, and Bulk Storage	Off-Site	Metals, VOCs, PHCs	Soil Ground Water

\*Potentially Contaminating Activity (PCA) described specifically for the Phase One Property with reference to the applicable item number in the Table of Potentially Contaminating Activities provided in Schedule D of *O. Reg. 153/04* as amended, where applicable.

EC – Electrical Conductivity

PHCs – Petroleum Hydrocarbons

SAR – Sodium Absorption Ratio

VOCs – Volatile Organic Compounds

BTEX – Benzene, toluene, ethylbenzene, xylenes

PAHs – Polycyclic Aromatic Hydrocarbons

As such, Amec Foster Wheeler completed the following scope of work for the Phase Two ESA.



## 4.0 SCOPE OF THE INVESTIGATION

### 4.1 Overview of Site Investigation

The investigation consisted of the following activities:

- Developing a Health & Safety Plan and a Sampling and Analysis Plan for the intrusive work at the Phase Two Property. In accordance with Schedule E of *O. Reg. 153/04 as amended*, a copy of the Sampling and Analysis Plan is provided in **Appendix B**;
- Undertaking clearance of all public underground utility services (i.e., telephone, hydro, natural gas, cable television and sewer/water). In addition, Amec Foster Wheeler retained a private utility locate contractor to identify the location of any private services on the Phase Two Property. Amec Foster Wheeler requested that the owner identify any privately owned services as well prior to commencement of the work (none were identified by the owner);
- Advancing a total of five boreholes (BH/MW1, BH/MW2, BH/MW3, BH/MW4 and BH/MW5) at the Phase Two Property to maximum depths of 6.1 mbgs using a Geoprobe 7822 DT;
- Advancing a total of twenty-one testpits (TP101 through TP121) at the Phase Two Property to maximum depths ranging from 1.5 to 4.0 mbgs using a CAT 420F IT rubber tired backhoe;
- A total of twenty-nine delineation testpits were excavated across the Phase Two Property using a rubber tired backhoe to maximum depths ranging from 1.0 to 2.0 mbgs;
- Field screening all soil samples collected during the drilling and testpitting programs both visually and measuring Combustible Organic Vapours (COVs) and Total Organic Vapours (TOVs) utilizing a RKI Eagle 2, equipped with dual sensors which were calibrated to a known isobutylene standard (for TOV sensor) and to a known hexane standard (for COV sensor);
- Installing ground water monitoring wells in the five boreholes (BH/MW1, BH/MW2, BH/MW3, BH/MW4 and BH/MW5) and developing the wells with dedicated sampling equipment after installation;
- Conducting ground water monitoring at the newly installed monitoring wells as well as two existing monitoring wells including measuring ground water levels and checking for free-phase petroleum product/sheens;
- Purging the monitoring wells using a low flow sampling technique with dedicated sampling equipment prior to collecting ground water samples;



- Completing an additional round of ground water sampling in January 2017 for metals analysis;
- Submitting selected soil and ground water samples for laboratory analyses for potential contaminants of concern (COCs) including: metals including hydrides, inorganics (including pH, Electrical Conductivity (EC) and Sodium Adsorption Ratio (SAR)) petroleum hydrocarbons (PHC) in the F1 to F4 ranges, volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs);
- Completing a hydrogeological assessment in the newly installed and existing monitoring wells;
- Evaluating the results of the chemical analyses against the applicable assessment criteria; and
- Preparing a Phase Two ESA report documenting the findings of the investigation.

#### **4.2 Media Investigated**

Soil samples were collected during the drilling and testpitting programs. Furthermore, as the potential COCs included VOCs and PHCs which can become mobilized and potentially be transported to the ground water, ground water media was sampled. Ground water samples were collected in four monitoring wells installed during the Phase Two ESA as well as two monitoring wells which were previously installed at the Phase Two Property.

No sediment samples were analyzed because no water bodies are present on the Phase Two Property.

#### **4.3 Phase One ESA Conceptual Site Model**

As part of the Phase I ESA, a conceptual site model (CSM) was not required. Should the Client require an RSC, the Phase I ESA report will need to be revised in order to support a RSC.

Based on the Phase I ESA findings, APECs resulting from current or former PCAs associated with the Phase I Property and the surrounding properties are as follows:



Area of Potential Environmental Concern	Location of APEC on Phase One Property	Potentially Contaminating Activity*	Location of PCA	Contaminants of Potential Concern	Media Potentially Impacted
APEC-1: Historic Infilling	Southern portion of Thundering Waters	#30 – Importation of Fill Material of Unknown Quality	On-Site	Metals, SAR, EC, BTEX, PAHs, PHCs	Soil Ground Water
APEC-2: Former Cyro Canada Inc	Northwestern portion of Thundering Waters	#8 – Chemical Manufacturing, Processing, and Bulk Storage	Off-Site	Metals, VOCs, PHCs	Soil Ground Water
APEC-3: Chemtrade Logistics	Northeastern portion of Thundering Waters	#8 – Chemical Manufacturing, Processing, and Bulk Storage	Off-Site	Metals, VOCs, PHCs	Soil Ground Water

\*Potentially Contaminating Activity (PCA) described specifically for the Phase Two Property with reference to the applicable item number in the Table of Potentially Contaminating Activities provided in Schedule D of *O. Reg. 153/04* as amended, where applicable.

EC – Electrical Conductivity

PHCs – Petroleum Hydrocarbons

SAR – Sodium Absorption Ratio

VOCs – Volatile Organic Compounds

BTEX – Benzene, toluene, ethylbenzene, xylenes

PAHs – Polycyclic Aromatic Hydrocarbons

As such, Amec Foster Wheeler completed the following scope of work for the Phase Two ESA.

#### 4.4 Deviations from Sampling and Analysis Plan

The Sampling and Analysis Plan is included in **Appendix B**. There were no major deviations from the Sampling and Analysis Plan with the exception of the additional two ground water samples from the existing monitoring wells. In addition, a delineation testpitting program was completed in December 2016 and the monitoring wells were re-sampled in January 2017. During the resampling of the monitoring wells, BH/MW104 could not be sampled due to lack of water and high sediment levels and BH/MW103 is no longer present (damaged beyond repair).

#### 4.5 Impediments

There were no physical impediments or denial of access during the Phase Two ESA with the exception of thick brush and vegetation which made some areas of the Phase Two Property inaccessible.



## 5.0 INVESTIGATION METHOD

### 5.1 General

This section describes the methods used during this subsurface investigation work, including all conventional drilling, testpitting, soil sampling, monitoring well installation and ground water monitoring activities. Quality Assurance/Quality Control (QA/QC) procedures are also discussed. The borehole drilling, testpitting, monitoring well installations, ground water monitoring, and hydrogeological testing activities were undertaken between December 2, 2015 and January 3, 2017.

The investigation activities were conducted in accordance with Amec Foster Wheeler's SOPs as of July 2011 and updated in October 2013. The Sampling and Analysis Plan (**Appendix B**) lists the relevant SOPs.

### 5.2 Drilling

#### Drilling

Five boreholes (BH/MW1, BH/MW2, BH/MW3, BH/MW4, and BH/MW5) were drilled on December 2 and 3, 2015 by Direct Environmental Drilling Inc. (DED) of St. Thomas, Ontario (MOECC License Number 7320). The boreholes were advanced to a maximum depth of 6.1 mbgs using a Geoprobe 7822 DT. Continuous core samples of 1.5 m lengths were obtained throughout the borehole advancement using the Geoprobe's macro core sampling system, which uses dedicated (disposable) sample liners to prevent cross contamination.

All five of the boreholes (BH/MW1, BH/MW2, BH/MW3, BH/MW4 and BH/MW5) were completed as ground water monitoring wells to depths of 6.1 mbgs.

The locations of the boreholes/monitoring wells are indicated on **Figure 2**. The borehole logs are included in **Appendix A**.

The sampling equipment was cleaned between each sample to minimize the potential for cross-contamination. Soil cuttings generated during the borehole investigation were stored in 205 litre (L) drums. Residue Management is discussed in Section 5.10 and **Appendix C**.

### 5.3 Testpitting

Twenty-one testpits (TP101 through TP121) were excavated on December 8 and 9, 2015 by Cotton Inc. of Niagara Falls, Ontario. The testpits were advanced to a maximum depth ranging from 1.5 to 4.0 mbgs. Samples were obtained at every 0.5 m using a decontaminated stainless steel shovel.



Twenty-nine testpits (TP201 to TP229) were excavated on December 21 and 22, 2016 by H.S. Cole Excavating of St. Catharines, Ontario using a Hitachi Zaxis 160 LC Backhoe. The delineation testpits were advanced to a maximum depth of 2.0 mbgs. Samples were obtained at every 0.5 m using a decontaminated stainless steel shovel.

The locations of the testpits are indicated on **Figures 2a and 2b**. The testpit logs are included in **Appendix A**.

The sampling equipment was cleaned between each sample to minimize the potential for cross-contamination.

#### **5.4 Soil: Sampling**

Soil samples collected during the drilling and testpitting programs were split into duplicate fractions upon recovery. The primary sample fractions were placed into laboratory supplied unpreserved glass jars with Teflon-lined lids and subsequently stored in coolers on ice for future potential laboratory analysis. The duplicate sample fractions were placed in resealable plastic sample bags and stored at ambient temperature for subsequent field vapour screening. All soil samples were collected in accordance with strict environmental sampling protocols to minimize loss of volatile organics and to ensure reliable and representative results. All soil sampling equipment (including trowels, spatulas, spoons, etc.) was thoroughly decontaminated between soil sample locations to prevent potential cross-contamination.

The subsurface conditions encountered at the Phase Two Property are described in the borehole and testpit logs provided in **Appendix A**. In general, the fill was dominated by silty sand with organics, and traces of gravel and cobbles which is believed to be reworked native material from the material used to fill the former Welland River. The fill materials ranged in depth from 0.5 to 2.0 mbgs at most borehole and testpit locations, with the exception of TP114, TP115 and TP116 (4.0 mbgs). A native silty clay with traces of sand seams and fine gravel, was present beneath the fill materials in all boreholes and testpits. The silty clay/clayey silt extended to the termination depths of the shallower testpits and to depth ranging from 4.6 to 6.1 mbgs in the deeper boreholes (where monitoring wells were installed). A peat/organic layer was encountered in BH/MW101 at a depth of 4.4 mbgs. Trace slag was noted in TP221 (0.5 mbgs). Black and/or white seams were noted in the fill material in TP221, TP226, TP227 and TP228. Bedrock was not encountered during the drilling program. The stratigraphy in the delineation testpits was consistent with the boreholes and testpits completed in 2015.

Visual or olfactory evidence of petroleum hydrocarbon or other chemical impacts were not observed by Amec Foster Wheeler during the drilling or testpitting program.

Representative cross-sections oriented north to south and east to west are provided in **Figures 3 and 4**, respectively.





## 5.5 Field Screening Measurements

All soil samples collected during the drilling and testpitting programs were screened in the field for gross evidence of negative environmental impact including staining and odours. Soil sample headspace screening was also performed to facilitate sample selections for laboratory analysis and to provide an assessment of the vertical contaminant distributions at each location. The duplicate soil sample fractions were screened for COV and TOV concentrations using the sample headspace method. COV and TOV concentrations were measured using an RKI EAGLE 2™ combustible vapour analyzer equipped with dual sensors and calibrated to known hexane and isobutylene standards and operated in methane elimination mode. The RKI EAGLE 2™ is capable of detecting 0-11,000 parts per million (ppm) and 0-100 % Lower Explosive Limit (LEL) with an accuracy of +/- 5% and the calibration standard is Hexane. The equipment is calibrated every day prior to the commencement of fieldwork.

The TOV/COV screening measures the cumulative organic/combustible vapour present within sample headspace. TOV/COV results are semi-quantitative at best and are generally only used for relative sample comparison purposes when selecting samples from individual boreholes for laboratory analysis.

Soil samples were selected for laboratory analysis based on observations in the field. The depth intervals of samples selected for analysis and the parameters they were submitted for are included in the Tables appendix at the end of this report.

The soil vapour concentrations are included in the borehole and testpit logs in **Appendix A**. There were no deviations from the field screening method from the Sampling and Analysis Plan.

## 5.6 Ground Water: Monitoring Well Installation

Overburden monitoring wells were installed in the five boreholes (BH/MW1, BH/MW2, BH/MW3, BH/MW4 and BH/MW5) to obtain hydrogeologic and ground water quality information from the hydrostratigraphic zone. The monitoring wells were installed by DED on December 2 and 3, 2015 using a Geoprobe 7822 DT to depths of 6.1 mbgs. The monitoring wells were installed by using 100 millimetre (mm) diameter direct push casings. The casings are washed prior to coming to the Phase Two Property and drilling proceeds from the least to inferred most contaminated borehole in order to reduce the potential for cross-contamination. No ground water samples were collected during drilling.

The monitoring wells were constructed using 32 mm diameter, schedule 40, flush-joint threaded PVC monitoring well supplies. The monitoring wells were completed with a 3.05 m length of #10 mil slotted intake screen. The tops of the intake screens were then extended to the ground surface using solid riser pipe. A silica sand filter pack was placed between the intake screen and the wall of the borehole. The filter pack was extended approximately 0.3 m above the top of the well screen. A grout/bentonite seal was placed above the sand pack to surface. The wells were completed with stick-up casings. The locations of the monitoring wells are shown in **Figure 2**. Details of the monitoring well constructions are included in the borehole logs in **Appendix A**.



The ground water monitoring wells installed were instrumented with dedicated Waterra™ foot valve inertial pumps fitted with polyethylene tubing to facilitate well development. The wells were developed by removing three well volumes using dedicated instrumentation (i.e., foot valve and tubing) on December 7, 2015 and January 8, 2016. In addition, Amec Foster Wheeler developed two wells formerly installed at the Phase Two Property on January 8, 2016 (BH/MW201 and BH/MW202). The locations of the former monitoring wells are shown in **Figure 2**. During both developing events, BH/MW105 was dry. Amec Foster Wheeler decided to omit this well from any further ground water monitoring. Amec Foster Wheeler recorded the stabilization parameters (including pH, conductivity and temperature) as outlined in Amec Foster Wheeler's SOPs. During development, an oil/water interface meter was used to measure potential accumulations of Light Non-Aqueous Phase Liquids (LNAPL) or Dense Non-Aqueous Phase Liquids (DNAPL), and ground water levels in the wells.

### **5.7 Ground Water: Field Measurement of Water Quality Parameters**

The wells (BH/MW101, BH/MW102, BH/MW103, BH/MW104, BH/MW201 and BH/MW202) were purged on January 20, 2016 using low flow sampling techniques until the pH, conductivity and temperature had reached stabilization criteria as outlined in Amec Foster Wheeler's SOPs. MW202 was purged on January 3, 2017 using low flow sampling techniques. It is noted that MW104 had insufficient ground water and high silt content to sample and MW103 is damaged and can no longer be sampled. During purging, an oil/water interface meter was used to measure potential accumulations of LNAPL or DNAPL, and ground water levels in the wells.

### **5.8 Ground Water: Sampling**

Following monitoring and purging activities, Amec Foster Wheeler collected ground water samples (BH/MW101, BH/MW102, BH/MW103, BH/MW104, BH/MW201 and BH/MW202) on January 20, 2016 using low flow sampling techniques. MW202 was sampled on January 3, 2017 using low flow sampling techniques. The samples were collected into laboratory-provided containers using the dedicated instrumentation. Ground water samples for metals were field-filtered. All samples were stored in coolers on ice after collection and during transportation to the laboratory where they were delivered under continuous Chain of Custody documentation.

Representative ground water samples collected during the investigation in the wells were submitted for laboratory analysis of suspect parameters of concern. The sampling methodology including jar, bottle and preservative requirements followed the Analytical Protocol. Field duplicate samples as well as other QA/QC samples including field, trip and spike blanks were collected as required throughout the assessment work.

Ground water elevation measurements were collected on March 1, 2016 and are further discussed in Section 6.2.

### **5.9 Sediment: Sampling**

No sediment samples were collected during the Phase Two ESA.



## 5.10 Analytical Testing

Amec Foster Wheeler collected soil/fill and ground water samples which were submitted to Paracel Laboratories Ltd. (Paracel), an ISO 17025-certified laboratory located in Ottawa, Ontario for laboratory analysis.

## 5.11 Residue Management Procedures

The soil cuttings generated during the drilling investigation were placed in 205 L steel drums on-Site. Soil/fill removed as part of the testpit excavation activities were placed back in the testpit in reverse order of removal and nominally compacted with the bucket of the backhoe upon completion. Liquid wastes generated during the investigation (well development and purged water) were stored on-Site in 205 L steel drums. Residue management is discussed further in **Appendix C**.

## 5.12 Elevation Surveying

An elevation survey was completed by Amec Foster Wheeler on January 19, 2016 and V&S Engineering on February 10, 2016. The ground surface elevations at the borehole/monitoring well and testpits locations were surveyed to a permanent and recoverable benchmark. The benchmark is described as *“the top of concrete pedestal for flashing lights at CN crossing at Dorchester Road”*. This benchmark was assigned an arbitrary elevation of 100.00 m which was then assigned a geodetic elevation of 178.42 m above sea level (mASL) as per the V&S Engineering survey.

## 5.13 Quality Assurance and Quality Control Measures

Soil samples collected during the drilling and testpitting programs were split into duplicate fractions upon recovery. The primary sample fractions were placed into laboratory supplied unpreserved glass jars with Teflon-lined lids and subsequently stored in coolers on ice for future potential laboratory analysis. Samples that were potentially going to be submitted for analysis for PHC F1 and VOCs were collected in 40 millilitre (mL) vials and field preserved. Samples for analysis for metals and other parameters were placed into 250 mL glass jars with Teflon-lined lids and subsequently stored in coolers on ice packs for future potential laboratory analysis. Each sample was labelled using a unique identifier except for blind duplicate samples that were assigned aliases. All samples were delivered to the laboratory under continuous Chain of Custody documentation. No deviations from the Sampling and Analysis Plan were noted.

The sampling methodology including jar, bottle and preservative requirements followed Analytical Protocol. Field duplicate soil and ground water samples as well as other QA/QC samples including field, trip and spike blanks for ground water samples were to be collected as required throughout the assessment work. A minimum of one field duplicate for every ten samples in soil was submitted. The field instruments were calibrated on a daily basis.



All soil sampling equipment was thoroughly decontaminated between soil sample locations to prevent potential cross-contamination. Decontamination activities included:

- Physical removal of any adhered debris;
- Wash/scrub in “Alconox” soap solution;
- Distilled water rinse; and
- Methanol rinse/air drying.

In addition to field activities pertaining to quality assurance (decontamination of non-dedicated equipment, blind duplicate samples, instrument calibration, etc.), an analytical quality assurance program was also implemented.

The chemical analyses completed on selected soil samples were carried out at Paracel.

The validity of the analytical results reported for the samples collected during this investigation has been assessed using the criteria presented in the Analytical Protocol.

The Analytical Protocol establishes Acceptance Limits for use when assessing the reliability of data reported by analytical laboratories. These include maximum hold times for the storage of samples/sample extracts between collection and analysis, specified/approved analytical methods, required field and/or laboratory quality assurance samples such as blanks and field and laboratory duplicates, specified recovery ranges for spiked samples and surrogates (compounds added to samples in known concentrations for data validation purposes), required Reporting Limits (RL, maximum allowable detection limits) and specified precision required when analyzing laboratory duplicate samples.

The results of the analytical quality assurance program are discussed in Section 6.9.



## **6.0 REVIEW AND EVALUATION**

### **6.1 Geology**

The Phase Two ESA included the investigation of three geologic units including the reworked silty clay materials, silty sand fill and silty clay found at depth.

The reworked fill materials found near the surface were above the ground water level with the exception of BH/MW101. DNAPLs or petroleum related ground water contaminants (if any) could be present in this unit and therefore this unit was investigated for DNAPLs or petroleum related contaminants in BH/MW101. The thickness of this unit ranged from 0.1 to 3.0 m in BH/MW101. In BH/MW102, BH/MW103, BH/MW104 and BH/MW105, this unit ranged from 0.1 to 0.5 m and from 0.1 to 4.0 m in TP101 through TP121.

The silty sand fill was partially saturated, therefore below the ground water level the silty sand is considered an aquifer and consists of medium permeability silty sand. The mobility of DNAPLs or petroleum related contaminants (if any) was considered to be possible; however, ground water sample results indicated that contamination in the ground water was not present. The thickness of this unit ranged from 2.0 to 3.5 m (TP119). The saturated aquifer thickness determined from the ground water elevations on March 1, 2016 to the bottom of the silty sand geologic unit ranged from to 3.1 to 4.4 m.

The silty clay is considered an aquitard and consists of a silty clay with a low permeability. The mobility of DNAPLs or petroleum related contaminants (if any) were considered to be minimal and therefore this unit was not investigated for DNAPLs or petroleum related contaminants. The thickness of this unit was not determined as the boreholes were terminated in this unit.

No other geologic unit or bedrock was encountered in any of the boreholes or testpits at the Phase Two Property.

The relative elevations of the first geologic unit (reworked fill materials) was ground surface (173.20 to 183.40 mASL) to 176.20 to 180.35 mASL. The relative elevation of the top of the silty sand geologic unit ranged from 178.03 to 179.52 mASL and the relative elevation of the bottom of this geologic unit ranged from 176.53 to 179.02 mASL. The relative elevation of the top of the silty clay geologic unit ranged from 176.20 to 181.72 mASL; the bottom of this geologic unit was not encountered during this Phase Two ESA.

The relative water level elevations of the silty sand and silty clay geologic unit were 179.62 mASL (BH/MW101), 171.80 mASL (BH/MW103), 177.19 mASL (BH/MW104), 179.11 mASL (BH/MW201) and 179.00 mASL (BH/MW202) on March 1, 2016.

### **6.2 Ground Water: Elevations and Flow Direction**

The monitoring wells were placed in order for the screened intervals to assess the aquifer and to interpret the horizontal flow direction. The screened intervals were set to straddle the water table based on observations during drilling. No free flowing product was noted in the monitoring



wells. Further details of the ground water monitoring wells are included in **Table 1**.

On March 1, 2016 following completion of the hydraulic testing, the depth to ground water measured from surface ranged from approximately 0.17 to 3.49 mbgs at the Phase Two Property which corresponds to geodetic elevations ranging from 171.80 to 179.62 mASL as seen in **Figure 5a**. It is worth noting that BH/MW102 was not located, BH/MW105 and BH/MW200 were previously dry and were not recorded during this monitoring event.

In the southern portion of the Phase Two Property, excluding BH/MW103 (which is located approximately 4-5 m lower than the other monitoring wells), BH/MW102 and BH/MW200 (which were not recorded), the geodetic ground water elevations ranged from 179.00 to 179.62 mASL as seen in **Figure 5b**. Using the three-point method, the horizontal ground water flow was calculated to be south towards the Welland River with a gradient of approximately 0.002 metres/metre (m/m).

It is worth noting that the Phase Two Property is large, has significant changes in topography and has significant areas of fill while others are native. It is believed that generally the ground water flow direction would be towards the Welland River in the southern portion of the Phase Two Property and towards the Queenston-Chippawa Power Canal in the northern portion of the Phase Two Property.

### **6.3 Ground Water: Hydraulic Gradients**

Hydraulic testing (single well response tests) were initiated on February 2, 2016 to assess the hydraulic conductivity of the screened overburden soils at the Phase Two Property.

Rising head tests were conducted at BH/MW101, BH/MW103, BH/MW104 and BH/MW202 by removing a volume of water sufficient to cause a displacement of the water level in the monitoring well and allowed it to recover back to equilibrium. A non-vented pressure transducer programmed to take measurements every minute was placed in the monitoring well prior to the start of the test and recorded the water level through the test. Manual water level measurements were initially taken to corroborate the transducer data, due to expected very slow recovery, the transducers were left in the monitoring wells to record the recovery over several days.

On February 19, 2016 water levels were measured in the monitoring wells, it was determined that the tests in BH/MW101 and BH/MW202 were complete however the tests in and BH/MW103 and BH/MW104 were not and were left to continue recording. It was also determined that the data for the test in BH/MW202 was not sufficient and needed to be repeated. The transducer was reset to record every second and the test was repeated.

On March 1, 2016 water levels were measured in the monitoring wells, it was determined that the tests in BH/MW103 and BH/MW104 were reasonably complete.

The hydraulic test data was analysed using the Bouwer-Rice method (Bouwer & Rice, 1976) in AQTESOLV version 4.5 (Duffield, 2007).



The estimated hydraulic conductivities are presented in the following table.

Monitoring Well	Test Type	Hydraulic Conductivity
BH/MW101	Rising Head	$5.7 \times 10^{-8}$ m/s
BH/MW103	Rising Head	$3.6 \times 10^{-10}$ m/s
BH/MW104	Rising Head	$4.2 \times 10^{-10}$ m/s
BH/MW202	Rising Head	$4.8 \times 10^{-7}$ m/s

The results of the hydraulic testing are consistent with expected results based on the soil descriptions in the borehole logs. BH/MW101 is screened in sandy silt fill and peat. BH/MW103 and BH/MW104 are screened in silty clay and BH/MW202 is screened in buried topsoil and silty clay to clayey silt, but has a sand pack which extends up into fill.

The results of the analysis can be found in **Appendix D**.

As discussed in Section 6.2, on March 1, 2016, the horizontal ground water flow was calculated to be south towards the Welland River with a gradient of approximately 0.002 m/m (**Figure 5b**).

#### **6.4 Medium and Fine Soil Texture**

One type of native soil was encountered at the Phase Two Property, a silty clay with traces of fine gravel. Grain size of the native silty clay (TP108-4 and TP112-6) indicated that 89% of the samples consisted of particles less than 75 µm in diameter, respectively (**Appendix A**). The silty clay is classified as a medium and fine textures soil (i.e., contains 50% or more by mass of particles that are smaller than 75 µm in mean diameter (*O. Reg. 153/04, s.42 (2)*)). As more than 1/3 of the soil at the property consists of medium and fine textured soils, the soil materials at the Phase Two Property have been classified as medium and fine textured (*O. Reg. 153/04, s.42 (1)*).

#### **6.5 Soil: Field Screening**

COV concentration headspace measurements recorded in the soil samples collected from the boreholes and testpits ranged from non-detectable to 230 part per million (ppm). The TOV concentrations from the boreholes and testpits ranged from non-detectable to 2 ppm. The COV and TOV concentrations headspace measurements are summarized in the borehole logs in **Appendix A**.

It is Amec Foster Wheeler's opinion that the results of the screening program suggest a low potential for the presence of significant combustible soil headspace vapour levels in the boreholes. Laboratory analysis is required to confirm and quantify these field screening results (details follow).

Visual or olfactory evidence of petroleum hydrocarbon impacts were not observed by Amec Foster Wheeler during the drilling or testpitting program.





No LNAPL or DNAPL was observed at the time of development or sampling of any of the monitoring wells.

## 6.6 Soil Quality

The results of the soil sample analyses and their respective Table 1 SCS are summarized in **Tables 2, 3 and 4**. The laboratory certificates of analysis are included in **Appendix E**.

In accordance with Schedule E of *O. Reg. 153/04 as amended*, **Table 5** lists the maximum concentration for each tested parameter on the soil samples, which also includes the location of each corresponding sample.

The soil analytical results of this Phase Two ESA are summarized below:

- Metals testing was completed on samples (depth of sample in brackets): BH/MW101-1-C (0.1-1.5 mbgs), BH/MW102-1A-C (0.1-0.6 mbgs), BH/MW103-1A-C (0.1-0.5 mbgs), BH/MW104-1-C (0.2-1.5), BH/MW105-1-C (0.2-1.5 mbgs), TP101-5D (2.5 mbgs), TP102-1 (0.5 mbgs), TP103-1 (0.5 mbgs), TP104-1 (0.5 mbgs), TP105-1 (0.5 mbgs), TP106-1 (0.5 mbgs), TP107-1 (0.5 mbgs), TP108-1 (0.5 mbgs), TP109-2 (1.0 mbgs), TP110-1C (0.5 mbgs), TP111-1 (0.5 mbgs), TP112-2D (1.0 mbgs), TP113-1 (0.5 mbgs), TP113-7 (3.5 mbgs), TP114-1 (0.5 mbgs), TP115-1 (0.5 mbgs), TP116-2 (1.0 mbgs), TP117-3 (1.5 mbgs), TP118-1 (0.5 mbgs), TP119-1C (0.5 mbgs), TP120-1 (0.5 mbgs), TP121-1 (0.5 mbgs) and TP121-5 (2.5 mbgs) and delineation testpits TP201 to TP223 from depths of 0.5 to 2.0 mbgs. Metals concentrations (**Table 2**) were reported below the Table 1 SCS at all locations tested with the following exceptions:
  - Antimony in TP103-1 (2.0 micrograms/gram [ $\mu\text{g/g}$ ]) versus the Table 1 SCS of 1.3  $\mu\text{g/g}$ . However, based on soil sample averaging with TP213 and TP214, this exceedance for antimony is no longer valid;
  - Molybdenum in TP109-2 (2.3  $\mu\text{g/g}$ ) versus the Table 1 SCS of 2  $\mu\text{g/g}$ . However, based on soil sample averaging with TP201 and TP202, this exceedance for molybdenum is no longer valid; and
  - Thallium in BH/MW101-1-C (1.2  $\mu\text{g/g}$ ), BH/MW103-1A-C (1.2  $\mu\text{g/g}$ ) and BH/MW104-1-C (1.3  $\mu\text{g/g}$ ) versus the Table 1 SCS of 1  $\mu\text{g/g}$ .
- Mercury and hexavalent chromium testing was completed on samples (depth of sample in brackets): TP112-2D (1.0 mbgs), TP113-7 (3.5 mbgs), TP119-8c (4.0 mbgs) and TP121-5 (2.5 mbgs). Mercury and hexavalent chromium concentrations (**Table 2**) were reported below the Table 1 SCS at all locations tested.
- Soil pH was determined for the following samples (depth of sample in brackets): BH/MW101-1-C (0.1-1.5 mbgs), BH/MW102-1A-C (0.1-0.4 mbgs), BH/MW103-1A-C (0.2-0.5 mbgs), TP101-5 (2.5 mbgs), TP114-1 (0.5 mbgs), TP117-3 (1.5 mbgs) and TP119-8C





(4.0 mbgs). Soil pH ranged from 7.7 to 7.8 for surficial soils and from 7.2 to 7.7 for subsurface soils (**Table 2**).

- EC testing was completed on samples (depth of sample in brackets): BH/MW101-1-C (0.1-1.5 mbgs), BH/MW102-1A-C (0.1-0.6 mbgs), BH/MW103-1A-C (0.1-0.5 mbgs), TP114-1 (0.5 mbgs), TP117-3 (1.5 mbgs) and TP119-8C (4.0 mbgs). In addition, delineation testpits TP224 to TP229 were sampled at 0.5 m intervals to a 2 m depth and analyzed for EC. EC (**Tables 2 and 2A**) was reported below the Table 1 SCS at all locations tested with the following exceptions:
  - TP117-3 (2,990 microSiemens per centimetre [ $\mu\text{S}/\text{cm}$ ]) and surrounding delineation testpits TP224 to TP229 (EC ranging from 772 to 3,040  $\mu\text{S}/\text{cm}$ ) versus the Table 1 SCS of 570  $\mu\text{S}/\text{cm}$ .
- SAR testing was completed on samples (depth of sample in brackets): BH/MW101-1-C (0.1-1.5 mbgs), BH/MW102-1A-C (0.1-0.6 mbgs), BH/MW103-1A-c (0.2-0.5 mbgs), TP114-1 (0.5 mbgs), TP117-3 (1.5 mbgs) and TP119-8C (4.0 mbgs). SAR (**Table 2**) was reported below the Table 1 SCS at all locations tested.
- VOC testing was completed on samples (depth of sample in brackets): BH/MW104-3-D (3.8 mbgs), BH/MW105-3-C (3.8 mbgs) and TP113-7 (3.5 mbgs), and BTEX testing was completed on samples BH/MW101-2A-D (1.5 mbgs), BH/MW102-3-D (3.8 mbgs), BH/MW103-3-D (3.8 mbgs), TP119-8D (4.0 mbgs) and TP121-5 (2.5 mbgs). All VOC/BTEX concentrations (**Table 3**) were reported as non-detectable and were therefore below the Table 1 SCS.
- PHC (F1 to F4) testing was completed on samples (depth of sample in brackets): BH/MW101-2A-D (1.5mbgs), BH/MW102-3-D (3.8 mbgs), BH/MW103-3-D (3.8 mbgs), BH/MW104-3-D (3.8 mbgs), BH/MW105-3-d (3.8 mbgs), TP113-7 (3.5 mbgs), TP119-8D (4.0 mbgs) and TP121-5 (2.5 mbgs). PHC concentrations (**Table 3**) were reported as non-detectable and were therefore below the Table 1 SCS.
- PAH testing was completed on samples (depth of sample in brackets): TP110-1C (0.5 mbgs), TP112-2D (1.0 mbgs), TP113-7 (3.5 mbgs) and TP121-5 (2.5 mbgs). PAH concentrations (**Table 4**) were reported as non-detectable and were therefore below the Table 1 SCS.

The sample locations and sample analyses are indicated on **Figure 6**. No chemical or biological transformations were noted in the analysis nor did the results indicate that the soil/fill at the Phase Two Property is a contaminant mass contributing to ground water impact. No LNAPL or DNAPL was suspected.



## 6.7 Ground Water Quality

The results of the ground water sample analyses collected from the newly installed monitoring wells, and their respective Table 1 SCS, are summarized in **Tables 6 and 7**. The laboratory certificates of analysis are included in **Appendix E**.

In accordance with Schedule E of *O. Reg. 153/04*, **Table 8** lists the maximum concentration for each tested parameter on the ground water samples including their location and the screened depth of the well for each corresponding sample.

The results of the ground water analyses are summarized below.

Ground water samples were collected from BH/MW101, BH/MW102, BH/MW103, BH/MW104, BH/MW201 and BH/MW202. MW202 was resampled on January 3, 2017. The ground water sample depth interval was 2.4 to 5.5 mbgs in BH/MW101, BH/MW102, BH/MW103 and BH/MW104, 3.0 to 6.1 mbgs in BH/MW201 and 3.0 to 4.6 mbgs in BH/MW202. The samples for metals analysis were field filtered. The ground water analytical results of this Phase Two ESA are summarized below:

- Metals concentrations (**Table 6**) were reported below the Table 1 SCS at all locations tested with the following exceptions:
  - Cobalt in BH/MW103 (5.0 micrograms/litre [ $\mu\text{g/L}$ ]) versus the Table 1 SCS of 3.8  $\mu\text{g/L}$ ;
  - Silver in BH/MW202 (0.5  $\mu\text{g/L}$ ) versus the Table 1 SCS of 0.3  $\mu\text{g/L}$ . During the resampling in January 2017, there was no exceedance of the Table 1 SCS for silver; and
  - Uranium in BH/MW103 (53.7  $\mu\text{g/L}$ ) and BH/MW104 (25.6  $\mu\text{g/L}$ ) versus the Table 1 SCS of 8.9  $\mu\text{g/L}$ .
- All VOC and PHC (F1-F4) concentrations (**Table 7**) were reported as non-detectable and were therefore below the Table 1 SCS.

The sample locations and sample analyses are indicated on **Figure 7**. No chemical or biological transformations were noted in the analysis nor did the results indicate that the soil/fill at the Phase Two Property is a contaminant mass contributing to ground water impact. No LNAPL or DNAPL was suspected.

## 6.8 Sediment Quality

Sediment was not assessed as part of the Phase Two ESA.



## 6.9 Quality Assurance and Quality Control Results

### Field QA/QC Program - Soil

The field QA/QC program consisted of analyzing two field duplicate soil/fill samples for each of the following parameters/parameter groups: pH, conductivity, SAR, and metals, and one field duplicate soil/fill sample for each of the following parameters/parameter groups: mercury, hexavalent chromium, PHCs, VOCs, and PAHs. Duplicate samples are analyzed in order to assess the precision of the field sampling and laboratory analytical processes. To accurately calculate a statistically valid relative percent difference (RPD) for the duplicate sample, the concentration of the analytes found in both the original and duplicate sample must be greater than five (5) times the MDL. The field duplicate samples are summarized as follows:

- The field borehole soil/fill sample duplicate Dup-A was a duplicate of sample TP114-1 for pH, conductivity, SAR, and metals, Dup-C was a duplicate of TP117-3 for pH, conductivity, SAR and metals, Dup-G was a duplicate of TP112-2D for mercury, hexavalent chromium and PAHs, DUP-1 was a duplicate sample of BH/MW105-3-C for PHC and VOCs, DUP AA was a duplicate sample of TP202-2 for metals and DUP AC was a duplicate of TP208-4 for metals. An assessment of the RPDs for the duplicate samples was completed (**Tables 2, 3 and 4**). The RPDs were either not calculable as both values were not greater than 5 times the MDL or were below the RPD limit (0.3 pH units, 10% for conductivity, 30% for metals, mercury and PHCs, 40% for PAHs, 35% for hexavalent chromium and 50% for BTEX/VOCs with the following exceptions:
  - Conductivity in TP117-3 and DUP-G (RPD of 80%).

It is noted that the RPD values in the Analytical Protocol are for duplicate samples collected at the laboratory and are used for comparison to the RPDs calculated for field duplicates.

### Field QA/QC Program – Ground Water

The field QA/QC program consisted of analyzing one (1) field duplicate ground water sample (Dup-A) for metals, VOCs and PHC (F1-F4). Duplicate samples are analyzed in order to assess the precision of the field sampling and laboratory analytical processes. The field duplicate samples are summarized as follows:

- The field ground water duplicate (Dup A) was a duplicate of sample BH/MW202 for metals, VOCs and PHCs. Dup A was a duplicate of BH/MW202 on January 3, 2017 for metals analysis. An assessment of the RPDs for the duplicate sample was completed (**Tables 6 and 7**). The RPDs were either not calculable as both values were not greater than 5 times the MDL or were below the RPD limit [20% for metals and 30% for VOC and PHCs]

It is noted that the RPD values in the Analytical Protocol are for duplicate samples collected at the laboratory and are used for comparison to the RPDs calculated for field duplicates.



A field blank sample was submitted for analysis of VOCs. Field blanks are samples of laboratory provided reverse osmosis deionized (RODI) water, which is poured into a set of sample bottles at the same time and in the same general area as the samples are collected. The field blank is used to determine if there is presence of contamination as a result of field handling. The field blank was non-detectable for all parameters analyzed indicating that the field activities did not bias the reported results.

A trip blank was submitted for analysis for VOCs. A trip blank is a sample of RODI water prepared and filled into the relevant sample bottles by the laboratory. The sample is sent with the bottle shipment, taken out to the field and then shipped back with the collected samples for analysis (not opened at any time by field staff). All parameters were found to be non-detectable in the trip blank.

A trip spike was submitted for analysis for VOCs. A trip spike is a sample of RODI water to which a known amount of analyte of interest and appropriate preservative has been added by the laboratory. This sample is also sent with the bottle shipment, taken out to the field and then shipped back with the collected samples for analysis (not opened at any time by field staff). The trip spike recoveries were considered acceptable.

#### Laboratory QA/QC Program - Soil

The laboratory results for soil samples obtained during Amec Foster Wheeler's investigation met the Acceptance Limits of the Analytical Protocol with the exception of laboratory qualifiers noted by the laboratory **Appendix E**. All samples were analyzed within laboratory hold times and preservation method, storage requirements and container type were utilized as the Analytical Protocol. No issues with the QA/QC that would impact the results of the assessment were noted. The results of the QA/QC analyses are included on the laboratory Certificates of Analyses presented in **Appendix E** and in **Tables 2, 3 and 4**.

#### Laboratory QA/QC Program – Ground Water

The laboratory results for soil and ground water samples obtained during Amec Foster Wheeler's investigation met the Acceptance Limits of the Analytical Protocol with the exception of laboratory qualifiers noted by the laboratory **Appendix E**. No issues with the QA/QC that would impact the results of the assessment were noted. All samples were analyzed within laboratory hold times and preservation method, storage requirements and container type were utilized as the Analytical Protocol. The results of the QA/QC analyses are included on the laboratory Certificates of Analyses presented in **Appendix E** and in **Tables 6 and 7**.

#### Certification of Analytical Results

Based on the review of the QA/QC results for soil, the Chain of Custody forms and the laboratory Certificates of Analysis, it is concluded that:

- All Certificates of Analysis received pursuant to Section 47(2) of *O. Reg. 153/04* complies with Section 47(3) of *O. Reg. 153/04*;



- A Certificate of Analysis has been received for each sample submitted for analysis; and
- Copies of all Certificates of Analysis are provided in **Appendix E** of this report.

No issues with the analytical results affected decision-making or prevented the overall objectives of the investigation from being met.

## 6.10 Phase Two Conceptual Site Model

The Phase Two CSM is provided below:

Regulatory Requirement	Phase Two Property Information
<p>i. Areas where potentially contaminating activity has occurred, areas of potential environmental concern and subsurface structures and utilities that may affect contaminant distribution and transport.</p>	<p>The location of the Phase One and Two Property is shown in <b>Figure 1</b>. Based on the findings of the Phase One ESA, APECs and PCAs associated with the Phase Two Property are as follows (<b>Figure 8</b>):</p> <ul style="list-style-type: none"> <li>- APEC #1 – Historic infilling along the southern portion of the Phase Two Property (PCA 30 - importation of fill material of unknown quality)</li> <li>- APEC #2 – Former Cyro Canada Inc located at 8100 Dorchester Road, adjacent to the northwestern portion of the Phase Two Property (PCA 8 – chemical manufacturing, processing and bulk storage);</li> <li>- APEC #3 – Chemtrade Logistics located at 6300 Oldfield Road, adjacent to the northeastern portion of the Phase Two Property (PCA 8 - chemical manufacturing, processing and bulk storage).</li> </ul> <p>There are no buildings or other structures present on the Phase Two Property. No active utilities are present on the Phase Two Property. Subsurface features that may affect contaminant distribution at the Phase Two Property include the infilling of the Phase Two Property with material from the former Welland River as depicted on <b>Figures 2a, 2b and 2c</b>.</p>
<p>ii. Description and figures illustrating the physical setting of the property including, stratigraphy, hydrogeological characteristics, depth to bedrock, depth to water table, aspect related to Section 41 or 43.1 that apply to the property, areas where soil has been brought onto the property, location of any proposed buildings.</p>	<p>The stratigraphy at the Phase Two Property is depicted on the cross sections (<b>Figures 3 and 4</b>) and in general, the subsurface conditions encountered at the Phase Two Property are described as follows: a layer of topsoil was present across the Phase Two Property ranging from 0 to 0.15 mbgs. Beneath the topsoil, a layer of fill was encountered in all boreholes (with the exception of BH/MW104 and BH/MW105) and testpits (with the exception of TP108, TP111, TP118 and TP120). The fill was generally dominated by reworked native silty clay material (BH/MW102, BH/MW103, BH/MW104, BH/MW105, TP102, TP103, TP104, TP105, TP106, TP107, TP109, TP110, TP112, TP113, TP114, TP115, TP116, TP117, and TP121) or layers of silty clay and silty sand (BH/MW101, TP101, and TP119) materials. The</p>



Regulatory Requirement	Phase Two Property Information
	<p>fill materials ranged in depth across the Phase Two Property from ground surface (TP108, TP111, TP118 and TP120) to 4.4 mbgs (BH/MW101). A native silty clay with traces of sand and fine to medium gravel was present beneath the fill materials in all boreholes and testpits. The silty clay extended to the termination depth of the boreholes. Trace slag was noted in TP221 (0.5 mbgs). Black and/or white seams were noted in the fill material in TP221, TP226, TP227 and TP228. The stratigraphy in the delineation testpits was consistent with the boreholes and testpits completed in 2015.</p> <p>Bedrock was not encountered at the maximum drilled depth of the boreholes (6.1 mbgs). The bedrock is anticipated to be of the Middle and Lower Silurian Age, consisting of sandstone, shale, dolostone and siltstone of the Lockport Formation. Bedrock is anticipated to be encountered at depths ranging from 20 to 25 mbgs. The results of the COV and TOV head space screening program suggest a low potential for the presence of significant combustible soil headspace vapour levels in the boreholes and testpits.</p> <p>On-Site vapour intrusion is not considered a concern at the Phase Two Property as no volatile COCs were identified on the property during the Phase Two ESA. There are no buildings on the Phase Two Property.</p> <p>The property was vacant at the time of the Phase Two ESA. The owner intends to develop the Phase Two Property for mixed residential, commercial and park land use.</p> <p>The regional ground water flow direction, based on topographic features and knowledge gained from other sites in the area, is expected to be to the southwest towards the Welland River in the southern portion of the Phase Two Property and towards the Queenston-Chippawa Power Canal in the northern portion of the Phase Two Property. Locally, however, the shallow ground water flow may be influenced by underground utility trenches, conduits, and structures, variations in soil type, and minor fluctuations in topography. As shown in <b>Figure 5b</b>, the interpreted ground water flow is southwest, based on water level readings taken March 1, 2016 at BH/MW101 (1.16 mbgs), BH/MW201 (0.17 mbgs) and BH/MW202 (0.61 mbgs).</p> <p>The Phase Two Property is located within or within 30 m of a waterbody and designated protected area based on mapping in the City of Niagara Falls Official Plan and the Region of Niagara Core Natural Heritage Map. These conditions would apply to the Phase Two Property under Section 41 (Environmentally Sensitive Areas).</p> <p>The depth to ground water measured from surface ranged from approximately 0.17 to 3.49 mbgs on March 1, 2016 which corresponds to arbitrary elevations ranging from 171.80 to 179.62 mASL. The geodetic ground water elevations ranged from 179.00 to 179.62 mASL as seen on <b>Figure 5a</b>. Using the three point method, the horizontal ground water flow was calculated to be south towards the Welland River with a gradient of approximately 0.002 metres/metre (m/m). The vertical hydraulic gradient was not measured as only one geologic unit was investigated.</p> <p>Based on falling head tests, the estimated hydraulic conductivities are as follows:</p> <ul style="list-style-type: none"> <li>• 5.7 x 10<sup>-8</sup> m/s (BH/MW01);</li> <li>• 3.6 x 10<sup>-10</sup> m/s (BH/MW103);</li> <li>• 4.2 x 10<sup>-10</sup> m/s (BH/MW104); and</li> <li>• 4.8 x 10<sup>-7</sup> m/s (BH/MW202).</li> </ul> <p>Fill materials were present beneath the topsoil at all borehole and testpit locations across the Phase Two Property (with the exception of TP108, TP111, TP118 and TP120). The fill extended as deep as 4.4 mbgs and it is believed to be associated with infilling of former Welland River.</p>



Regulatory Requirement	Phase Two Property Information
	<p>The standards used for the identification of COCs were Table 1 SCS for use in a residential/parkland/institutional/industrial/commercial/community and medium and fine textured soils.</p>
<p>iii. Contaminants on the Site</p>	<p>The contaminants located on the Phase Two Property and their origin are as follows:</p> <ul style="list-style-type: none"> <li>• Thallium in fill materials at BH/MW101, BH/MW103 and BH/MW104;</li> <li>• Conductivity in fill materials at TP117;</li> <li>• Cobalt in ground water at BH/MW103;</li> <li>• Silver in ground water at BH/MW202. It is noted that an additional round of sampling indicated non-detectable concentrations of silver; and</li> <li>• Uranium in ground water at BH/MW103 and BH/MW104.</li> </ul> <p>The location of these boreholes and testpits are indicated on Figures 2a, 2b and 2cs and 6. The concentrations of metals and EC are attributed to the historical in-filling on-Site with fill material of unknown quality. The migration of the contaminants away from any APEC via a preferential pathway is not likely as the contaminants of concern are not considered mobile. However, it is noted that metals exceedances were noted in the ground water samples in 2015. Resampling of one monitoring well MW202 was conducted in January 2017 and no Table 1 exceedances were noted. The remaining two wells (MW103 and MW104) could not be resampled in January 2017 due to insufficient water or being damaged beyond repair. There were no exceedances of the Table 1 SCS for VOCs and PHCs noted in ground water in the Phase Two ESA, however metals exceedances were found in the ground water on the Phase Two Property. In addition, no Light Non-Aqueous Phase Liquids (LNAPL) were observed at the time of development, purging or sampling in any of the monitoring wells. There are no contaminants discharging to the natural environment.</p> <p>No exceedances of the Table 1 SCS for mercury, hexavalent chromium, SAR, PHCs or BTEX/VOCs were noted in soil in the Phase Two ESA.</p> <p>Contaminants that exceeded the Table 1 SCS on the Phase Two Property in soil are depicted on <b>Figure 6</b>. The COCs in soil are likely attributed to the historical infilling of the former Welland River on the Phase Two property. The estimated horizontal and vertical distribution of the contaminants in each area is indicated on <b>Figures 6</b>.</p> <p>The transport of these COCs in the surface would not be likely to be influenced by seasonal fluctuations in ground water elevation.</p>





Regulatory Requirement	Phase Two Property Information
	<p>As there are impacts above the Ministry's standards in the soil at the Phase Two Property, a RSC could not be filed at this time. The contaminants would need to be addressed using one of or a combination of the following techniques before an RSC could be filed:</p> <ul style="list-style-type: none"> <li>• Soil Remediation – the impacted materials would be removed for off-Site disposal at a licensed landfill; or</li> <li>• Site Specific Risk Assessment – impacted materials can remain in place if they are below site specific criteria that would be generated for the Phase Two Property.</li> </ul> <p><b>Figure 11</b> outlines the estimated areas of soil impacted above the Table 1 SCS for metals and EC.</p>
<p>iv. Cross-Sections and distribution of contaminants, depth to water, stratigraphy, subsurface structures or utilities affecting distribution.</p> <p>For areas of contamination, release mechanisms, transport pathways, receptors, exposure points and routes of exposure.</p>	<p>The cross-sections provided on <b>Figures 3 and 4</b> identify the depth to water on March 1, 2016 (ranged from 0.17 to 3.49 mbgs), stratigraphy (fill over native silty clay) and that there are no significant subsurface features that affect distribution of contaminants. The horizontal and vertical distribution of contaminants is indicated in <b>Figures 3, 4, 6 and 7</b>.</p> <p>Fill materials were present beneath the topsoil at all borehole and testpit locations across the Phase Two Property (with the exception of TP108, TP111, TP118 and TP120). The fill extended as deep as 4.4 mbgs and it is believed to be associated with infilling of former Welland River.</p> <p><b>Figures 9 and 10</b> illustrate the Human Health and Ecological Exposure Conceptual Models. The models are described as follows:</p> <p><u>Source:</u></p> <p>The source of the COCs at the Phase Two Property (metals, EC) is historical infilling on-Site.</p> <p><u>Potential Release Mechanism:</u></p> <ul style="list-style-type: none"> <li>• Wind Erosion</li> <li>• Uptake by Plants and Intake by Prey</li> </ul> <p><u>Contaminant Transport Pathways (exposure route):</u></p> <ul style="list-style-type: none"> <li>• Dermal Contact, Stem/Foliar Contact</li> <li>• Ingestion</li> <li>• Inhalation of airborne particles</li> <li>• Ingestion by Plants and Prey</li> </ul> <p><u>Human and Ecological Receptors:</u></p> <p>Potential human receptors include future residents and visitors and construction workers and potential ecological receptors include terrestrial plants, invertebrates, mammals and birds.</p> <p><u>Receptor Exposure Points:</u></p> <p>Human exposure (resident, visitor) to COCs in soil via dermal contact, ingestion, inhalation of airborne particles. No contaminants were found in ground water and no complete exposure pathway is present.</p> <p>Ecological exposure (terrestrial plants) anticipated through root uptake and inhalation via wind erosion. The exposure to COCs by terrestrial invertebrates is expected through soil ingestion and dermal contact. The exposure to COCs of terrestrial mammals and birds is expected through soil ingestion, dermal contact, ingestion of plants and prey and inhalation via wind erosion. Metals exceedances were found to be present in the ground water at the Phase Two Property.</p>





The Phase Two CSM is shown in **Figure 8**.



## 7.0 CONCLUSIONS

Amec Foster Wheeler was retained by GR (CAN) Investments Co., Ltd. to conduct a Phase Two ESA of the property known as the Thundering Waters Development, in Niagara Falls, Ontario (the Phase Two Property). The Phase Two Property does not have a current municipal address. The Client is considering developing the Phase Two Property for proposed mixed land use. A RSC, acknowledged by the MOECC, may be required as a condition of the planned redevelopment from vacant to mixed land use.

This Phase Two ESA was carried out in accordance with Amec Foster Wheeler's proposal dated October 16, 2015 and authorization to proceed, signed by the Client on November 15, 2015. A delineation testpitting and ground water sampling program was carried out in accordance with Amec Foster Wheeler's proposal dated December 2, 2016 and authorization to proceed, signed by the Client on December 3, 2016.

The primary findings of this Phase Two ESA are as follows:

- Amec Foster Wheeler drilled five boreholes, installed and monitored five monitoring wells, excavated 50 testpits, completed hydrogeological testing and an elevation survey between December 2, 2015 and January 3, 2017. The locations of the boreholes, monitoring wells and testpits were selected to address APECs and PCAs identified during the Phase I ESA.
- The subsurface conditions encountered at the Phase Two Property are described as follows: a layer of topsoil was present across the Phase Two Property ranging from 0 to 0.15 mbgs. Beneath the topsoil, a layer of fill was encountered in all boreholes (with the exception of BH/MW104 and BH/MW105) and testpits (with the exception of TP108, TP111, TP118 and TP120). The fill was generally dominated by reworked native silty clay material (BH/MW102, BH/MW103, BH/MW104, BH/MW105, TP102, TP103, TP104, TP105, TP106, TP107, TP109, TP110, TP112, TP113, TP114, TP115, TP116, TP117, and TP121) or layers of silty clay and silty sand (BH/MW101, TP101, and TP119) materials. The fill materials ranged in depth across the Phase Two Property from 0 (TP108, TP111, TP118 and TP120) to 4.4 mbgs (BH/MW101). A native silty clay with traces of sand and fine to medium gravel was present beneath the fill materials in all boreholes and testpits. The silty clay extended to the termination depth of the boreholes. Trace slag was noted in TP221 (0-0.5 mbgs). Black and/or white seams (inferred organics) were noted in the fill material in TP221, TP226, TP227 and TP228. The stratigraphy in the delineation testpits was consistent with the boreholes and testpits completed in 2015.
- Bedrock was not encountered at the maximum drilled depth of the boreholes (6.1 mbgs). The bedrock is anticipated to be of the Middle and Lower Silurian Age, consisting of sandstone, shale, dolostone and siltstone of the Lockport Formation. Bedrock is anticipated to be encountered at depths ranging from 20 to 25 mbgs.



- Visual or olfactory evidence of petroleum hydrocarbon impacts was not observed by Amec Foster Wheeler during the drilling or testpitting programs.
- It is Amec Foster Wheeler's opinion that the results of the COV and TOV head space screening program suggest a low potential for the presence of significant combustible soil headspace vapour levels in the boreholes and testpits.
- On March 1, 2016 following completion of the hydraulic testing, the depth to ground water measured from surface ranged from approximately 0.17 to 3.49 mbgs at the Phase Two Property which corresponds to geodetic elevations ranging from 171.80 to 179.62 mASL. It is worth noting that BH/MW102 was not located, BH/MW105 and BH/MW200 were previously dry and were not recorded during this monitoring event. In the southern portion of the site, excluding BH/MW103 (which is located approximately 4-5 m lower than the other monitoring wells), BH/MW102 and BH/MW200 (which were not recorded), the geodetic ground water elevations ranged from 179.00 to 179.62 mASL. Using the three-point method, the horizontal ground water flow was calculated to be south towards the Welland River with a gradient of approximately 0.002 metres/metre (m/m). It is worth noting that the Phase Two Property is large, has significant changes in topography and has significant areas of fill while others are native. It is believed that generally the ground water flow direction would be towards the Welland River in the southern portion of the Phase Two Property and towards the Queenston-Chippawa Power Canal in the northern portion of the Phase Two Property.
- The assessment criteria applicable to the Phase Two Property, if a RSC was to be filed for the Phase Two Property are the Table 1 Full Depth Background Site Condition Standards for residential/parkland/institutional/industrial/commercial/community property use and medium and fine textured soils (Table 1 SCS).
- The results of the soil testing indicated exceedances of the Table 1 SCS, as follows:
  - Thallium in fill materials at BH/MW101, BH/MW103 and BH/MW104;
  - Conductivity in fill materials at TP117;
  - The remaining analyses were below the Table 1 SCS, including remaining metals, mercury, hexavalent chromium, SAR, BTEX/VOCs, PHCs and PAHs.
- The results of the ground water testing indicated exceedances of the Table 1 SCS, as follows:
  - Cobalt in ground water at BH/MW103;
  - Silver in ground water at BH/MW202. During the resampling in January 2017, there was no exceedance of the Table 1 SCS for silver; and
  - Uranium in ground water at BH/MW103 and BH/MW104.



The soil samples with impacts were all collected from the fill materials (silty sand or silty clay) which were found in all boreholes with the exception of thallium in BH/MW104 and molybdenum in TP109 which were in the native silty clay materials. The fill extended as deep as 4.4 mbgs and it is believed to be associated with the infilling of the former Welland River. Based on additional boreholes drilled during Amec Foster Wheeler's geotechnical investigation, fill material was encountered in a majority of the locations on-site.

The EC impact noted in the area of TP117 and TP224 to TP229 was noted at depths ranging from 0.5 to 2.0 m and possibly deeper. The EC impact may be attributed to former road salt storage or the stockpiling of snow (containing road salt). This area was not fully delineated during the delineation program.

As there are impacts above the Ministry's standards in the soil and ground water at the Phase Two Property, a RSC could not be filed at this time. Once the additional sampling has been completed, the contaminants would need to be addressed using one of or a combination of the following techniques before an RSC could be filed:

- Soil Remediation – the impacted materials would be removed for off-Site disposal at a licensed landfill; or
- Site Specific Risk Assessment – impacted materials can remain in place if they are below site specific criteria that would be generated for the Phase Two Property.

**Figure 11** outlines the estimated areas of impacted soil above the Table 1 SCS for various metals parameters and EC. Based on an average soil depth of 1 m, the estimated tonnage of impacted soil is 1,800 tonnes based on a bulking factor of 1.8 tonnes/cubic metres (m<sup>3</sup>). It is noted that the EC impact has not been fully delineated. The order of magnitude costing to remove this soil from the Phase Two Property is discussed in a separate letter.

The ground water results indicate metal impacts above the Table 1 SCS in MW202 based on the original ground water sampling in 2015. Two of the three wells (MW103 and MW104) could not be sampled in the January 2017 event due to damage or insufficient water. As a RSC may be required for the Phase Two Property, the Client should consider the reinstallation of monitoring wells to replace the previous wells.

Furthermore, if the applicable standards are revised to Table 3 SCS (i.e., if the wetland boundary is confirmed), there are no exceedances for metals in ground water. The concentration of thallium in soil would exceed the Table 3 SCS for residential/parkland/institutional property use but not industrial/commercial/community property use. However, the EC concentrations exceed the Table 3 SCS.

Once the ground water monitoring wells no longer be required, they must be maintained or abandoned in accordance with the requirements of Section 21(3) of Ontario Regulation 903 – Wells which states *“the well owner shall immediately abandon the well if it is not being used or maintained for future use as a well”*.



## 7.1 Signatures

The undersigned carried out the Phase Two ESA documented herein, including developed the Sampling and Analysis Plan, supervised all field activities, reviewing the resulting data and prepared this report, including the findings and conclusions presented herein, acting either as a Qualified Person or under the supervision of a Qualified Person. Any practice of geoscience documented within this report was undertaken by or under the supervision of a Professional Engineer or Professional Geoscientist licensed in the Province of Ontario.

This report was prepared for the exclusive use of GR (CAN) Investments Co., Ltd. and is intended to provide information regarding the property located east and north of Dorchester Road and west of Progress Street in Niagara Falls, Ontario at the time of the field work. Amec Foster Wheeler shall provide written confirmation to any third party identified by GR (CAN) Investments Co., Ltd. that such party may rely on any reports, documents and materials generated by Amec Foster Wheeler during this Project. Any use which an unauthorized third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of the third party. Should additional parties require reliance on this report, written authorization from Amec Foster Wheeler will be required.

The investigation undertaken by Amec Foster Wheeler with respect to this report and any conclusions or recommendations made in this report reflect Amec Foster Wheeler's judgment based on the site conditions observed at the time of the site inspection on the date(s) set out in this report and on information available at the time of preparation of this report. This report has been prepared for specific application to this site and it is based, in part, upon visual observation of the site, as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site, which were unavailable for direct investigation, which were not investigated directly. Amec Foster Wheeler has used its professional judgment in analyzing this information and formulating these conclusions.

Amec Foster Wheeler makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and change. Such interpretations and regulatory changes should be reviewed with legal counsel.

This Report is also subject to the further Standard Limitations attached in **Appendix F**.



We trust that the information presented in this report meets your current requirements. Should you have any questions or require further information, please contact the undersigned.

Yours truly,

**Amec Foster Wheeler Environment & Infrastructure,  
a Division of Amec Foster Wheeler Americas Limited.**

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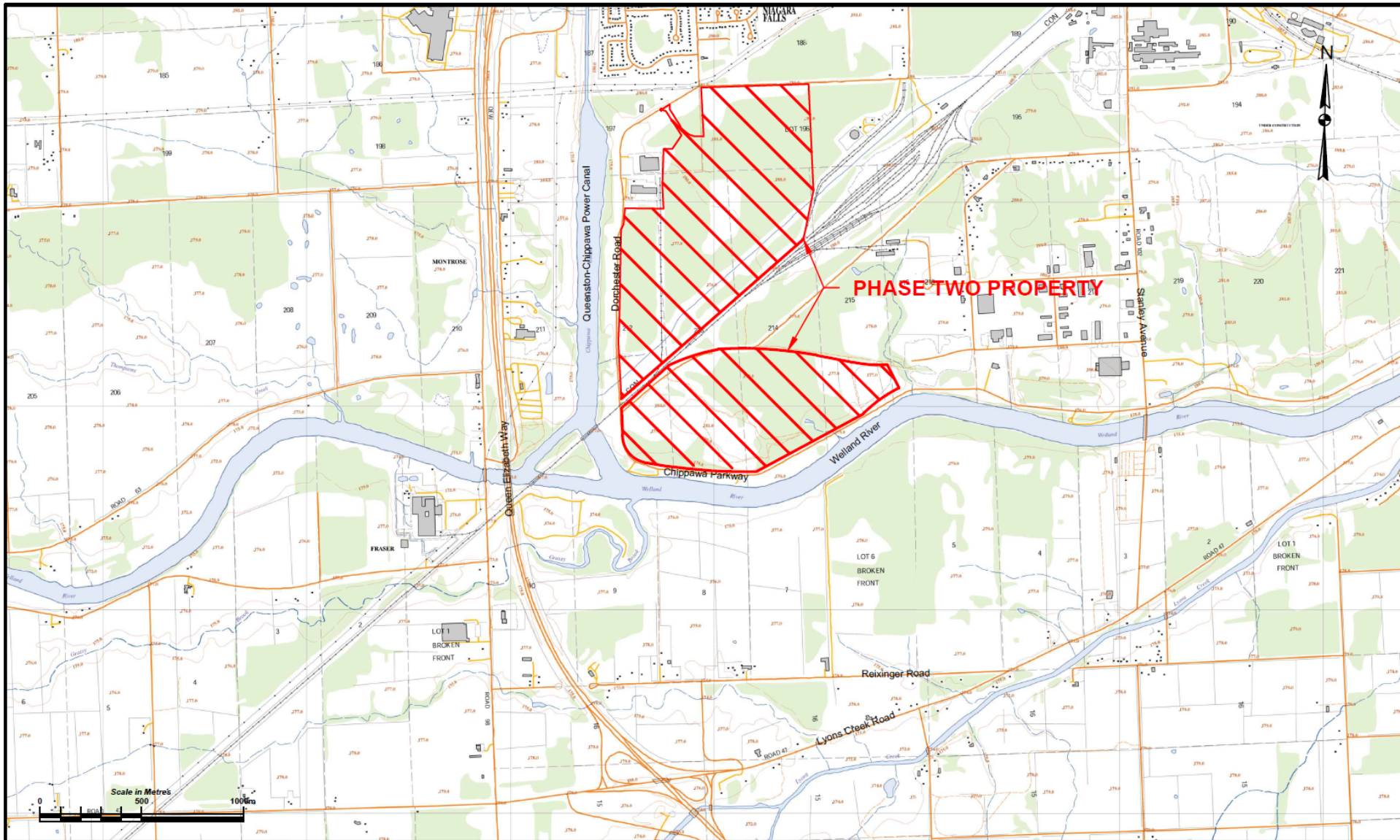
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## FIGURES



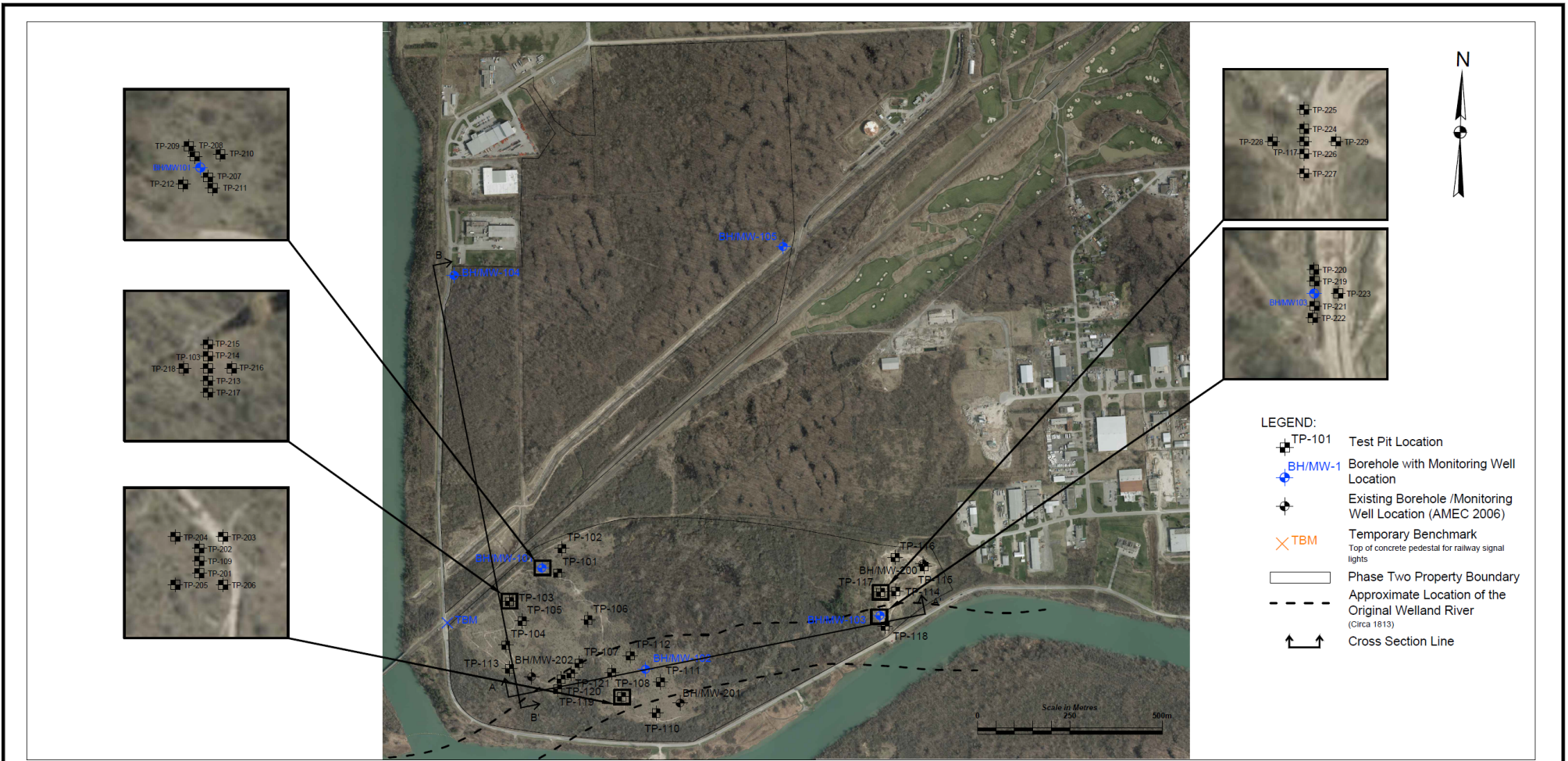


REFERENCE: Base plan provided by FIRST BASE SOLUTIONS.

FOR ILLUSTRATION PURPOSES ONLY, ALL LOCATIONS APPROXIMATE.

CLIENT: <b>GR (CAN) Investments Co., Ltd.</b>	LEGEND:  Phase Two Property Location	DWN BY: DN	PROJECT: <b>THUNDERING WATERS DEVELOPMENT</b> DORCHESTER ROAD NIAGARA FALLS, ONTARIO	REV. NO.: A
		CHK'D BY: PS		DATE: JANUARY 2017
Amec Foster Wheeler Environment & Infrastructure 3300 Merrittville Hwy, Unit 5 Thorold, Ontario 		DATUM: NAD83	TITLE: <b>PROPERTY LOCATION MAP</b>	PROJECT NO.: TG161164
		PROJECTION: UTM Zone 17		NO.:
		SCALE: As Shown		<b>FIGURE 1</b>





REFERENCE: Base plan provided by NIAGARA NAVIGATOR, <https://maps-beta.niagararegion.ca/Navigator/>

FOR ILLUSTRATION PURPOSES ONLY, ALL LOCATIONS APPROXIMATE.

CLIENT:  <b>GR (CAN) Investments Co., Ltd.</b>	DWN BY: DN	PROJECT:  <b>THUNDERING WATERS DEVELOPMENT DORCHESTER ROAD NIAGARA FALLS, ONTARIO</b>	REV. NO.: A
	CHK'D BY: PS		DATE: JANUARY 2017
Amec Foster Wheeler Environment & Infrastructure 3300 Merrittville Hwy, Unit 5 Thorold, Ontario	DATUM: NAD83	TITLE: <b>PHASE TWO PROPERTY LAYOUT, BOREHOLE/MONITORING WELL &amp; TESTPIT LOCATION PLAN</b>	PROJECT NO.: TG161164
	PROJECTION: UTM Zone 17		NO.: <b>FIGURE 2a</b>
	SCALE: As Shown		





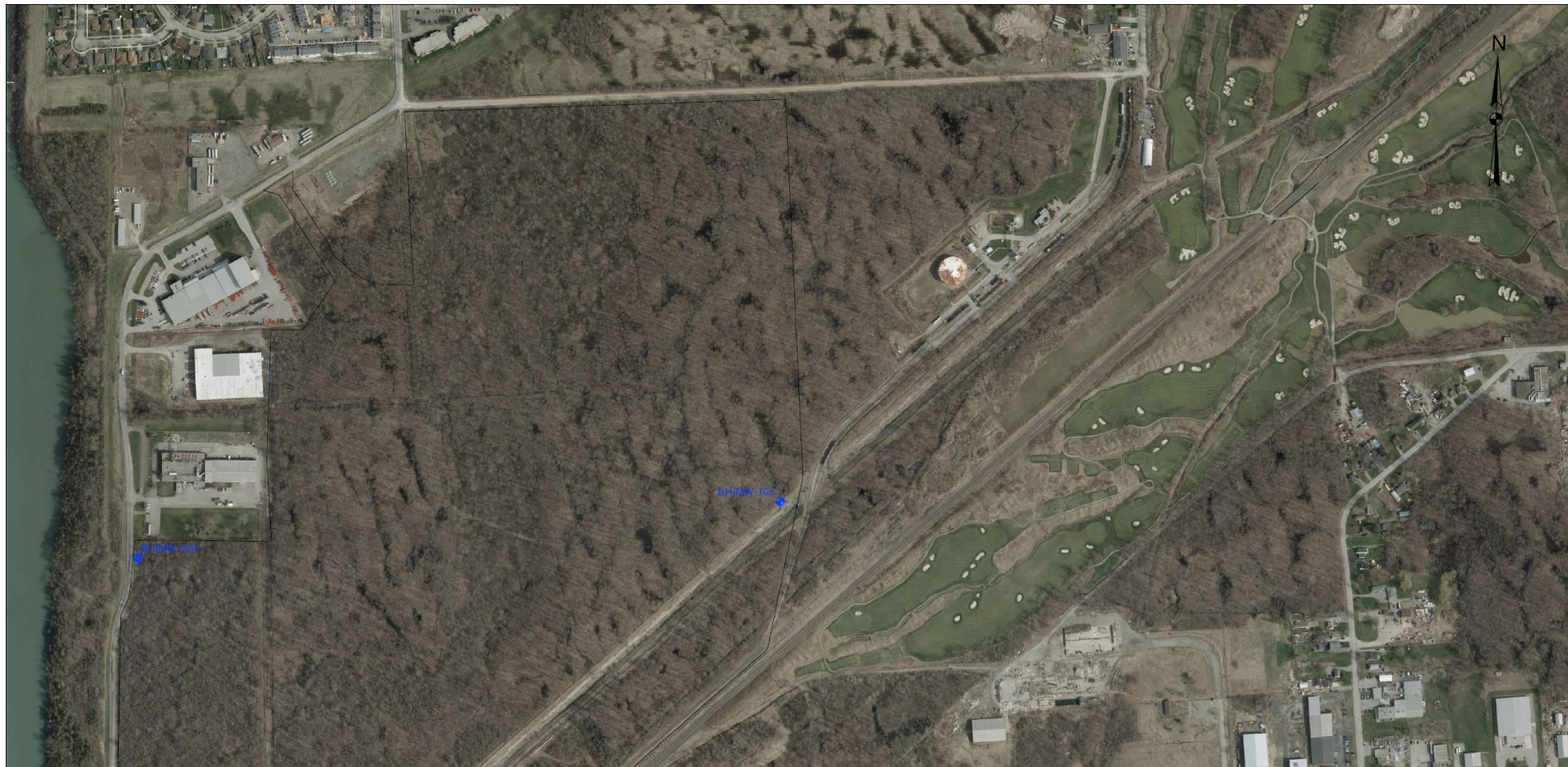


REFERENCE: Base plan provided by NIAGARA NAVIGATOR, <https://maps-beta.niagararegion.ca/Navigator/>

FOR ILLUSTRATION PURPOSES ONLY, ALL LOCATIONS APPROXIMATE.







CLIENT: <b>GR (CAN) Investments Co., Ltd.</b>	<b>LEGEND:</b> TP-101 Test Pit Location BH/MW-1 Borehole with Monitoring Well Location Existing Borehole /Monitoring Well Location (AMEC 2006) TBM Temporary Benchmark Top of concrete pedestal for railway signal lights Phase Two Property Boundary Approximate Location of the Original Welland River (Circa 1813)	DWN BY: DN	PROJECT: <b>THUNDERING WATERS DEVELOPMENT</b> DORCHESTER ROAD NIAGARA FALLS, ONTARIO	REV. NO.: A
		CHK'D BY: PS		DATE: JANUARY 2017
Amec Foster Wheeler Environment & Infrastructure 3300 Merrittville Hwy, Unit 5 Thorold, Ontario		DATUM: NAD83	TITLE: <b>PHASE TWO PROPERTY LAYOUT, BOREHOLE/MONITORING WELL &amp; TESTPIT LOCATION PLAN (SOUTHERN PORTION)</b>	PROJECT NO.: TG161164
		PROJECTION: UTM Zone 17		NO.: <b>FIGURE 2b</b>
		SCALE: As Shown		

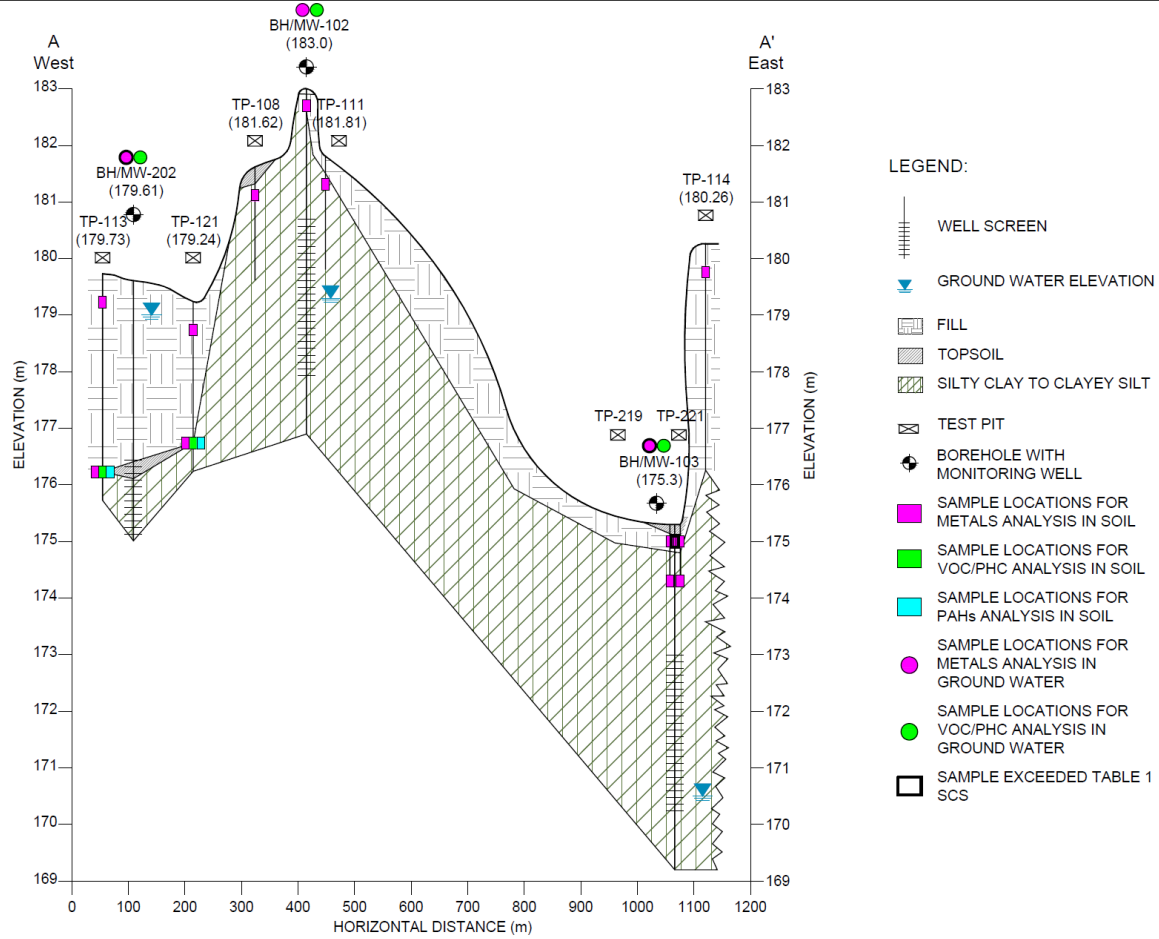




REFERENCE: Base plan provided by NIAGARA NAVIGATOR, <https://maps-beta.niagararegion.ca/Navigator/>

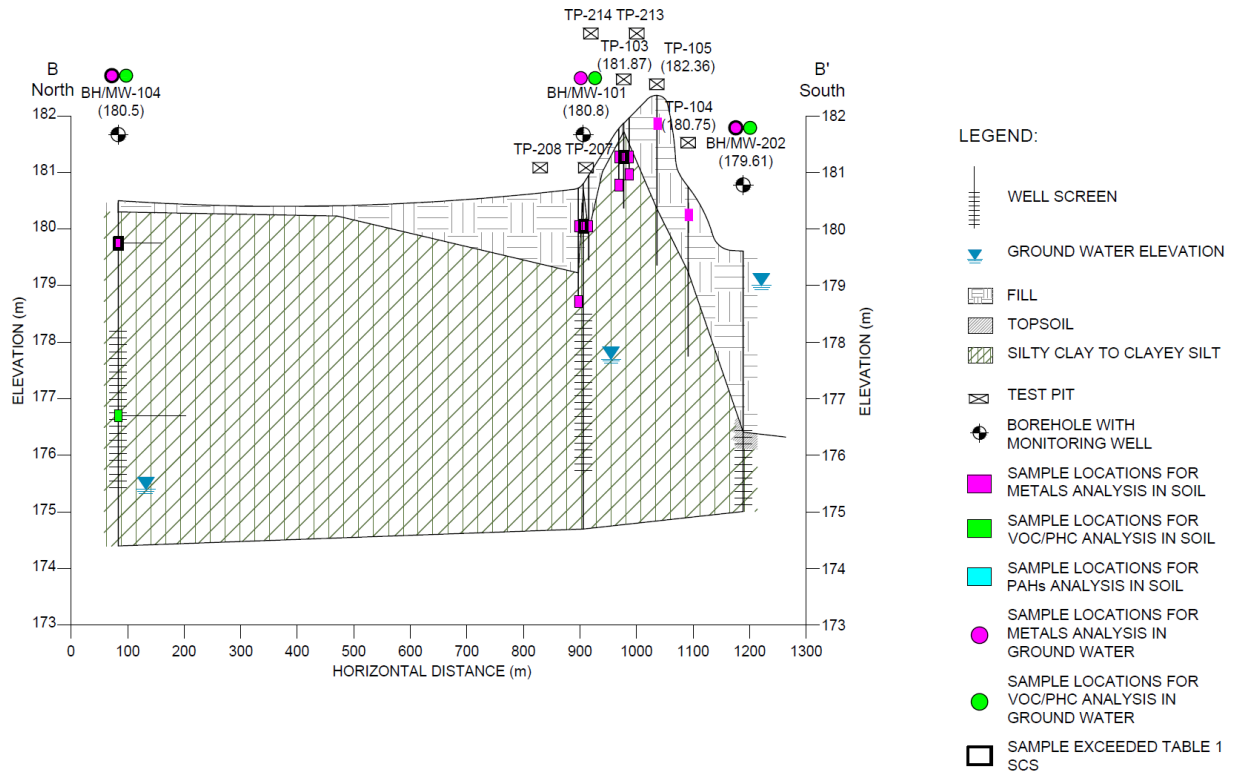
FOR ILLUSTRATION PURPOSES ONLY, ALL LOCATIONS APPROXIMATE.

CLIENT: <b>GR (CAN) Investments Co., Ltd.</b>		DWN BY: DN		PROJECT: <b>THUNDERING WATERS DEVELOPMENT DORCHESTER ROAD NIAGARA FALLS, ONTARIO</b>		REV. NO.: A	
<b>Amec Foster Wheeler</b> Environment & Infrastructure 3300 Merrittville Hwy, Unit 5 Thorold, Ontario 		CHK'D BY: PS		TITLE: <b>PHASE TWO PROPERTY LAYOUT, BOREHOLE/MONITORING WELL &amp; TESTPIT LOCATION PLAN (NORTHERN PORTION)</b>		DATE: JANUARY 2017	
		DATUM: NAD83				PROJECT NO.: TG161164	
		PROJECTION: UTM Zone 17				NO.: <b>FIGURE 2c</b>	
<b>LEGEND:</b> TP-101 Test Pit Location BH/MW-1 Borehole with Monitoring Well Location  Existing Borehole /Monitoring Well Location (AMEC 2006)  Temporary Benchmark  TBM  Phase Two Property Boundary  Approximate Location of the Original Welland River (Circa 1813)		SCALE: As Shown					



FOR ILLUSTRATION PURPOSES ONLY, ALL LOCATIONS APPROXIMATE.

CLIENT:  <b>GR (CAN) Investments Co., Ltd.</b>	DWN BY: DN	PROJECT:  <b>THUNDERING WATERS DEVELOPMENT DORCHESTER ROAD NIAGARA FALLS, ONTARIO</b>	REV. NO.: A
	CHK'D BY: PS		DATE: JANUARY 2017
Amec Foster Wheeler Environment & Infrastructure 3300 Merrittville Hwy, Unit 5 Thorold, Ontario	DATUM: NAD83	TITLE:  <b>GEOLOGICAL PROFILE A-A'</b>	PROJECT NO.: TG161164
	PROJECTION: UTM Zone 17		NO.:
	SCALE: As Shown		<b>FIGURE 3</b>



FOR ILLUSTRATION PURPOSES ONLY, ALL LOCATIONS APPROXIMATE.

CLIENT:  <b>GR (CAN) Investments Co., Ltd.</b>	DWN BY: DN	PROJECT:  <b>THUNDERING WATERS DEVELOPMENT DORCHESTER ROAD NIAGARA FALLS, ONTARIO</b>	REV. NO.: A
	CHK'D BY: PS		DATE: JANUARY 2017
Amec Foster Wheeler Environment & Infrastructure 3300 Merrittville Hwy, Unit 5 Thorold, Ontario	DATUM: NAD83	TITLE:  <b>GEOLOGICAL PROFILE A-A'</b>	PROJECT NO.: TG161164
	PROJECTION: UTM Zone 17		NO.:
	SCALE: As Shown		<b>FIGURE 4</b>





REFERENCE: Base plan provided by NIAGARA NAVIGATOR, <https://maps-beta.niagararegion.ca/Navigator/>

FOR ILLUSTRATION PURPOSES ONLY, ALL LOCATIONS APPROXIMATE.

CLIENT:  <b>GR (CAN) Investments Co., Ltd.</b>	DWN BY: DN	PROJECT:  <b>THUNDERING WATERS DEVELOPMENT DORCHESTER ROAD NIAGARA FALLS, ONTARIO</b>	REV. NO.: A
	CHK'D BY: PS		DATE: JANUARY 2017
Amec Foster Wheeler Environment & Infrastructure 3300 Merrittville Hwy, Unit 5 Thorold, Ontario	DATUM: NAD83	TITLE:  <b>DEPTH TO GROUNDWATER AND GROUNDWATER ELEVATION PLAN</b>	PROJECT NO.: TG161164
	PROJECTION: UTM Zone 17		NO.:
	SCALE: As Shown		<b>FIGURE 5a</b>







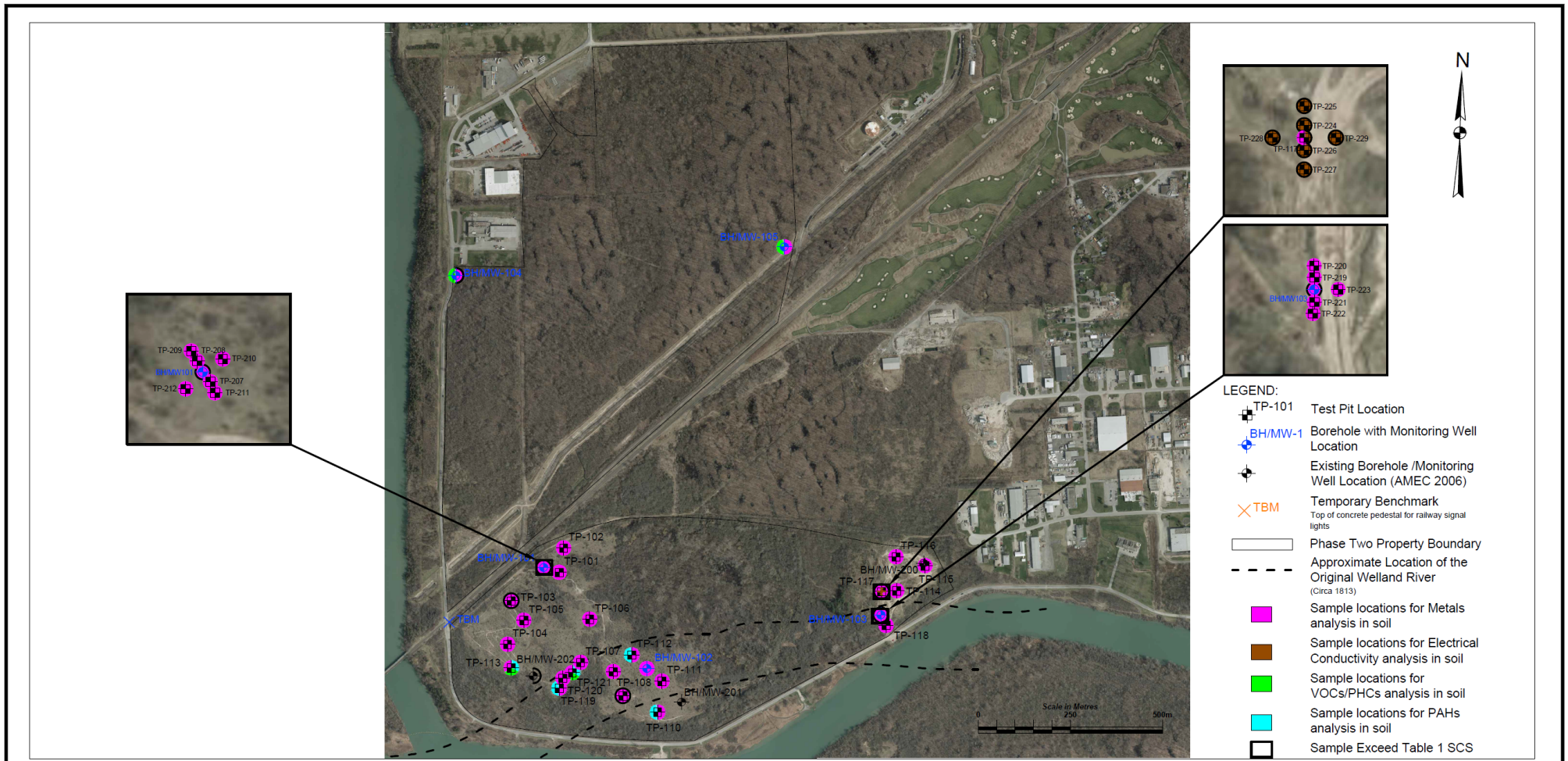
REFERENCE: Base plan provided by NIAGARA NAVIGATOR, <https://maps-beta.niagararegion.ca/Navigator/>

FOR ILLUSTRATION PURPOSES ONLY, ALL LOCATIONS APPROXIMATE.

CLIENT:  <b>GR (CAN) Investments Co., Ltd.</b>	DWN BY: DN	PROJECT:  THUNDERING WATERS DEVELOPMENT DORCHESTER ROAD NIAGARA FALLS, ONTARIO	REV. NO.: A
	CHK'D BY: PS		DATE: JANUARY 2017
Amec Foster Wheeler Environment & Infrastructure 3300 Merrittville Hwy, Unit 5 Thorold, Ontario	DATUM: NAD83	TITLE:  INTERPRETED GROUNDWATER FLOW PLAN, MARCH 1, 2016	PROJECT NO.: TG161164
	PROJECTION: UTM Zone 17		NO.:
	SCALE: As Shown		<b>FIGURE 5b</b>





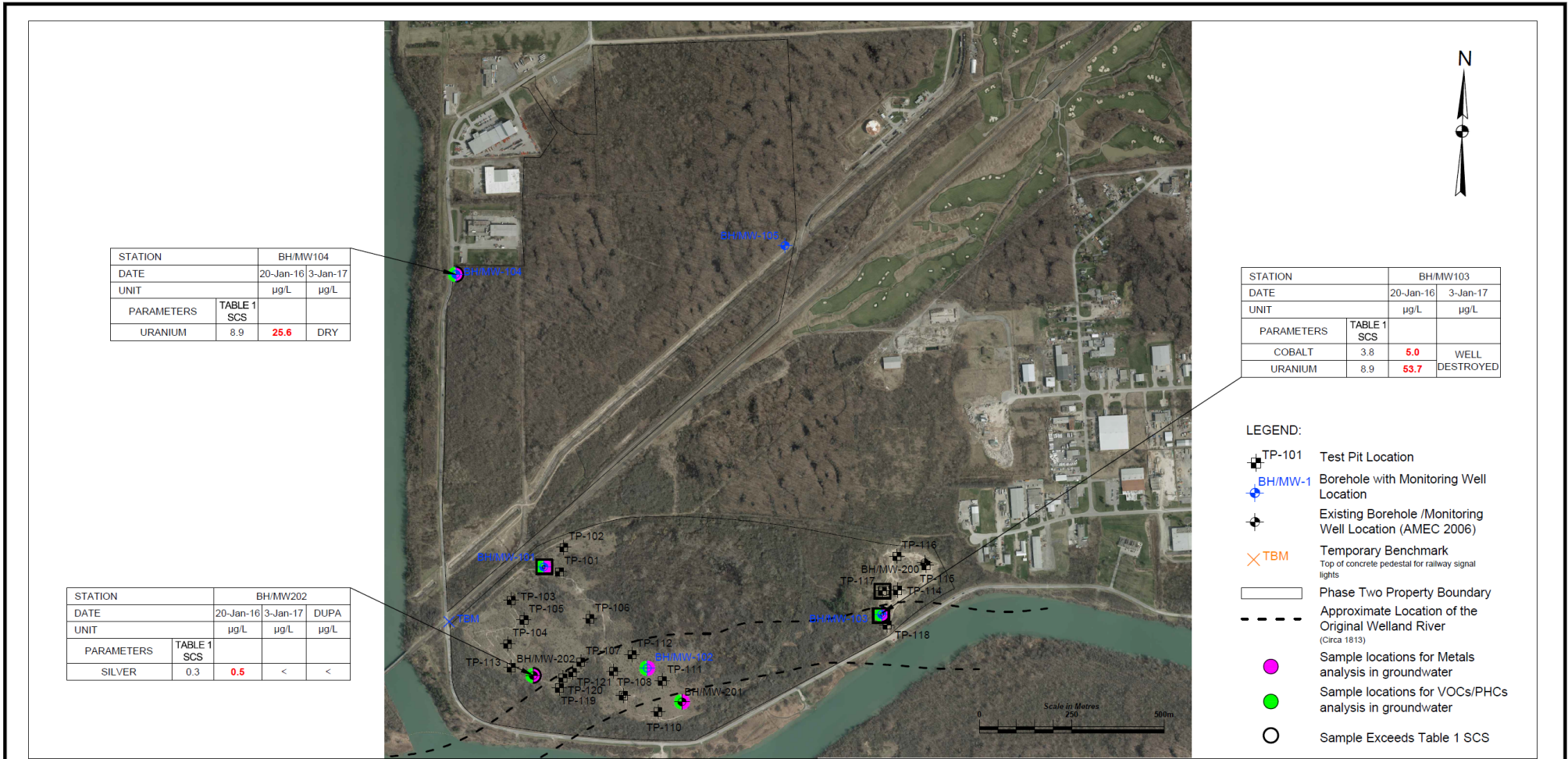


REFERENCE: Base plan provided by NIAGARA NAVIGATOR, <https://maps-beta.niagararegion.ca/Navigator/>

FOR ILLUSTRATION PURPOSES ONLY, ALL LOCATIONS APPROXIMATE.

CLIENT:  <b>GR (CAN) Investments Co., Ltd.</b>	DWN BY: DN	PROJECT:  <b>THUNDERING WATERS DEVELOPMENT DORCHESTER ROAD NIAGARA FALLS, ONTARIO</b>	REV. NO.: A
	CHK'D BY: PS		DATE: JANUARY 2017
Amec Foster Wheeler Environment & Infrastructure 3300 Merrittville Hwy, Unit 5 Thorold, Ontario	DATUM: NAD83	TITLE:  <b>SOIL SAMPLE LOCATIONS WITH TABLE 1 EXCEEDANCES</b>	PROJECT NO.: TG161164
	PROJECTION: UTM Zone 17		NO.:
	SCALE: As Shown		<b>FIGURE 6</b>





STATION	BH/MW104		
DATE	20-Jan-16	3-Jan-17	
UNIT	µg/L	µg/L	
PARAMETERS	TABLE 1 SCS		
URANIUM	8.9	25.6	DRY

STATION	BH/MW103		
DATE	20-Jan-16	3-Jan-17	
UNIT	µg/L	µg/L	
PARAMETERS	TABLE 1 SCS		
COBALT	3.8	5.0	WELL
URANIUM	8.9	53.7	DESTROYED

STATION	BH/MW202			
DATE	20-Jan-16	3-Jan-17	DUPA	
UNIT	µg/L	µg/L	µg/L	
PARAMETERS	TABLE 1 SCS			
SILVER	0.3	0.5	<	<

- LEGEND:**
- TP-101 Test Pit Location
  - BH/MW-1 Borehole with Monitoring Well Location
  - Existing Borehole /Monitoring Well Location (AMEC 2006)
  - TBM Temporary Benchmark  
Top of concrete pedestal for railway signal lights
  - Phase Two Property Boundary
  - Approximate Location of the Original Welland River (Circa 1813)
  - Sample locations for Metals analysis in groundwater
  - Sample locations for VOCs/PHCs analysis in groundwater
  - Sample Exceeds Table 1 SCS

REFERENCE: Base plan provided by NIAGARA NAVIGATOR, <https://maps-beta.niagararegion.ca/Navigator/>

FOR ILLUSTRATION PURPOSES ONLY, ALL LOCATIONS APPROXIMATE.

CLIENT:  <b>GR (CAN) Investments Co., Ltd.</b>	DWN BY: DN	PROJECT:  <b>THUNDERING WATERS DEVELOPMENT DORCHESTER ROAD NIAGARA FALLS, ONTARIO</b>	REV. NO.: A
	CHK'D BY: PS		DATE: JANUARY 2017
Amec Foster Wheeler Environment & Infrastructure 3300 Merrittville Hwy, Unit 5 Thorold, Ontario	DATUM: NAD83	TITLE: <b>GROUNDWATER SAMPLE LOCATIONS WITH TABLE 1 EXCEEDANCES</b>	PROJECT NO.: TG161164
	PROJECTION: UTM Zone 17		NO.:
	SCALE: As Shown		<b>FIGURE 7</b>



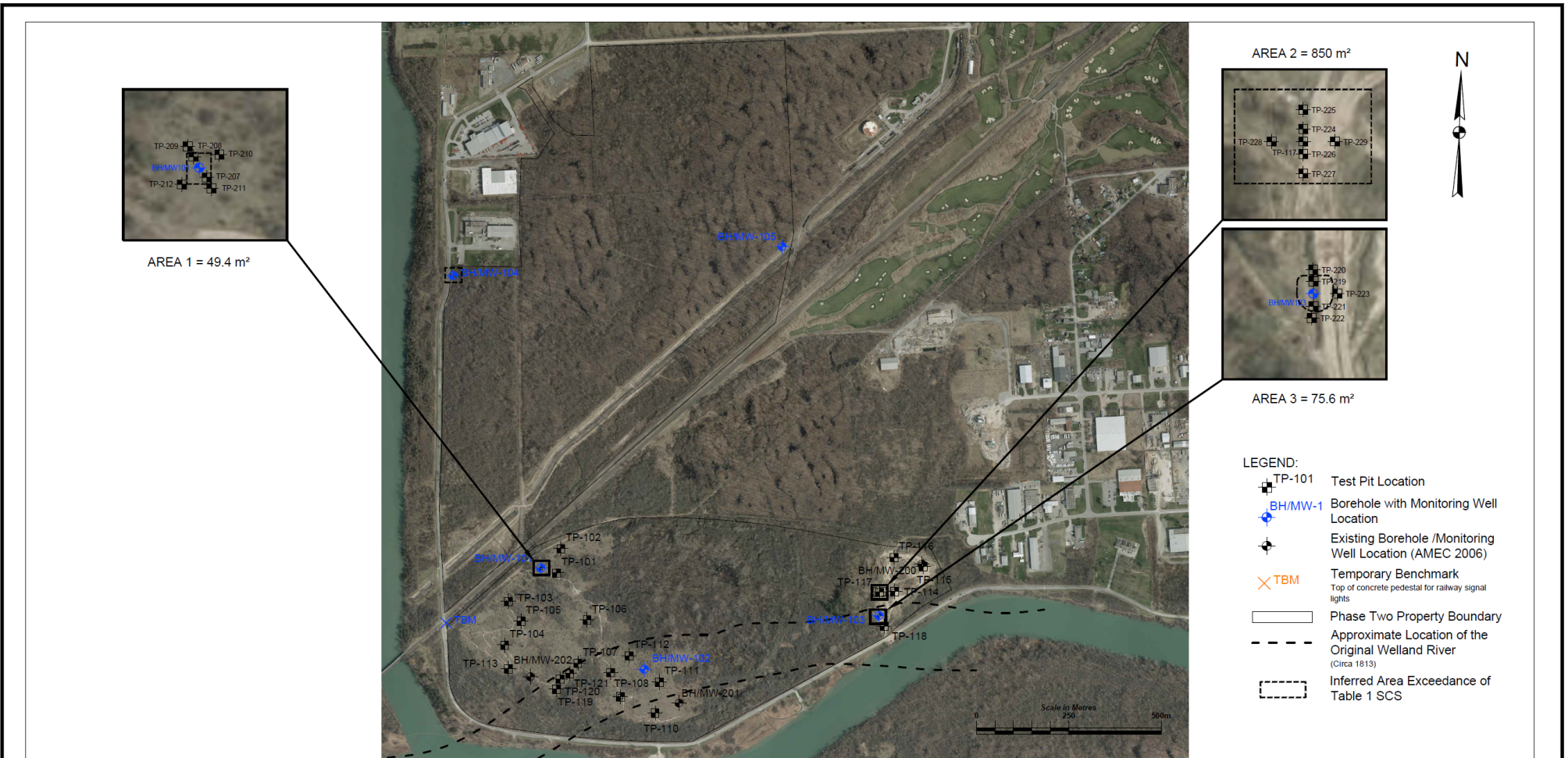




REFERENCE: Base plan provided by NIAGARA NAVIGATOR, <https://maps-beta.niagararegion.ca/Navigator/>


FOR ILLUSTRATION PURPOSES ONLY, ALL LOCATIONS APPROXIMATE.

CLIENT:  <b>GR (CAN) Investments Co., Ltd.</b>	DWN BY: DN	PROJECT:  <b>THUNDERING WATERS DEVELOPMENT DORCHESTER ROAD NIAGARA FALLS, ONTARIO</b>	REV. NO.: A
	CHK'D BY: PS		DATE: JANUARY 2017
Amec Foster Wheeler Environment & Infrastructure 3300 Merrittville Hwy, Unit 5 Thorold, Ontario	DATUM: NAD83	TITLE:  <b>CONCEPTUAL SITE MODEL</b>	PROJECT NO.: TG161164
	PROJECTION: UTM Zone 17		NO.:
	SCALE: As Shown		<b>FIGURE 8</b>

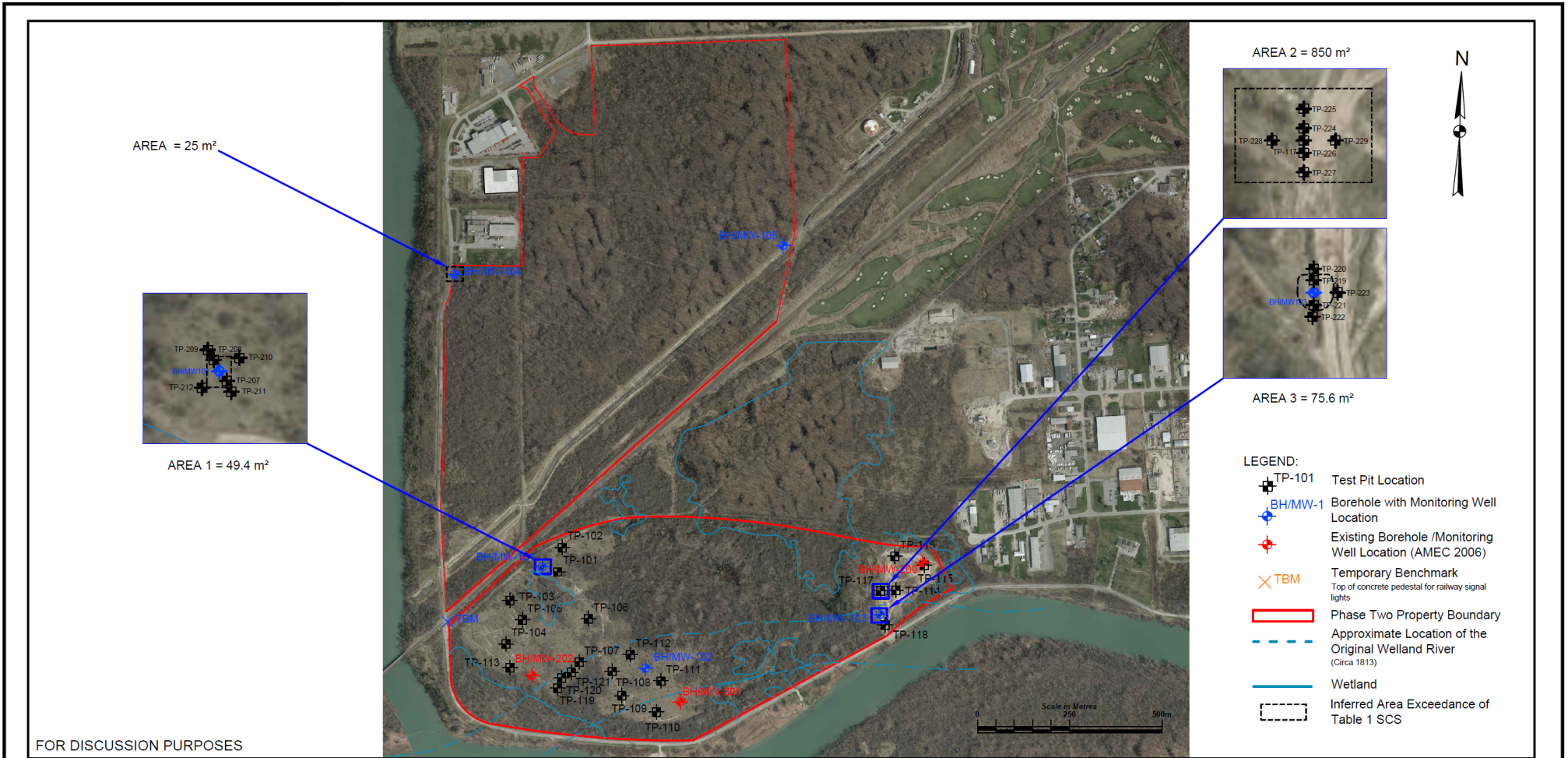


REFERENCE: Base plan provided by NIAGARA NAVIGATOR, <https://maps-beta.niagararegion.ca/Navigator/>

FOR ILLUSTRATION PURPOSES ONLY, ALL LOCATIONS APPROXIMATE.

CLIENT:	GR (CAN) Investments Co., Ltd.		DWN BY:	DN	PROJECT:	THUNDERING WATERS DEVELOPMENT DORCHESTER ROAD NIAGARA FALLS, ONTARIO		REV. NO.:	A
	Amec Foster Wheeler Environment & Infrastructure 3300 Merrittville Hwy, Unit 5 Thorold, Ontario		CHK'D BY:	PS		TITLE:	AREAS OF METALS AND EC IMPACTED SOIL ABOVE TABLE 1 SCS		DATE:
DATUM:			NAD83	PROJECT NO.:	TG161164				
PROJECTION:			UTM Zone 17	NO.:	FIGURE 9				
SCALE:			As Shown						





REFERENCE: Base plan provided by NIAGARA NAVIGATOR, <https://maps-beta.niagararegion.ca/Navigator/>

FOR ILLUSTRATION PURPOSES ONLY, ALL LOCATIONS APPROXIMATE.

CLIENT:  <b>GR (CAN) Investments Co., Ltd.</b>	DWN BY: DN	PROJECT:  THUNDERING WATERS DEVELOPMENT DORCHESTER ROAD NIAGARA FALLS, ONTARIO	REV. NO.: A
	CHK'D BY: PS		DATE: JANUARY 2017
Amec Foster Wheeler Environment & Infrastructure 3300 Merrittville Hwy, Unit 5 Thorold, Ontario	DATUM: NAD83	TITLE:  AREAS OF METALS AND EC IMPACTED SOIL ABOVE TABLE 1 & 3 SCS	PROJECT NO.: TG161164
	PROJECTION: UTM Zone 17		NO.:
	SCALE: As Shown		<b>FIGURE 11</b>





## **TABLES**

Table 1: Ground Water Elevation Data

Client: GR (CAN) Investments Co. Ltd.  
 Site: Proposed Thundering Waters Subdivision, Niagara Falls, Ontario  
 Project: TG151118



Well ID	Date Installed	Screen Length (m)	Top of screen (mbgs)	Bottom of Screen (mbgs)	Surface Elevation (mASL)	TOR Elevation (mASL)	Difference b/t surface and TOR	7-Dec-2015			8-Jan-2016			20-Jan-2016			3-Feb-2016			10-Feb-2016			18-Feb-2016			1-Mar-2016			3-Jan-2017		
								GW Level (mbTOR)	GW Level (mbgs)	GW Elevation (mASL)	GW Level (mbTOR)	GW Level (mbgs)	GW Elevation (mASL)	GW Level (mbTOR)	GW Level (mbgs)	GW Elevation (mASL)	GW Level (mbTOR)	GW Level (mbgs)	GW Elevation (mASL)	GW Level (mbTOR)	GW Level (mbgs)	GW Elevation (mASL)	GW Level (mbTOR)	GW Level (mbgs)	GW Elevation (mASL)	GW Level (mbTOR)	GW Level (mbgs)	GW Elevation (mASL)	GW Level (mbTOR)	GW Level (mbgs)	GW Elevation (mASL)
BH/MW101	03-Dec-15	3.05	2.44	5.49	180.78	181.69	0.91	2.27	1.36	179.42	2.25	1.34	179.44	3.07	2.16	178.62	2.20	1.29	179.49	-	-	-	-	-	-	2.07	1.16	179.62	-	-	-
BH/MW102	03-Dec-15	3.05	2.44	5.49	183.00	183.89	0.89	4.42	3.53	179.47	3.02	2.13	180.87	3.73	2.84	180.16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH/MW103	03-Dec-15	3.05	2.44	5.49	175.29	176.14	0.85	5.50	4.65	170.64	4.57	3.72	171.57	4.79	3.94	171.35	4.57	3.72	171.57	4.67	3.82	171.47	4.50	3.65	171.64	4.34	3.49	171.80	-	-	-
BH/MW104	03-Dec-15	3.05	2.44	5.49	180.47	181.39	0.92	6.13	5.21	175.26	5.04	4.12	176.35	5.06	4.14	176.33	-	-	-	-	-	-	4.44	3.52	176.95	4.20	3.28	177.19	-	-	-
BH/MW105	03-Dec-15	3.05	2.44	5.49	181.60	182.47	0.87	Dry	-	-	Dry	-	-	-	Dry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH/MW201	02-Feb-06	3.05	3.05	6.10	179.28	180.50	1.22	-	-	-	1.45	0.23	179.05	1.52	0.30	178.98	-	-	-	-	-	-	-	-	1.39	0.17	179.11	-	-	-	
BH/MW202	02-Feb-06	1.60	3.00	4.60	179.61	180.50	0.89	-	-	-	1.90	1.01	178.60	1.81	0.92	178.69	-	-	-	-	-	-	-	-	1.50	0.61	179.00	141.00	140.11	39.50	

Note: "m" means metres. "mbgs" means metres below ground surface. "TOR" means top of riser. "mbTOR" means metres below top of riser pipe. "mASL" means metres above sea level. "-" means not recorded. The benchmark is described as "the top of concrete pedestal for flashing lights at CN crossing at Dorchester Road". This TBM was assigned a geodetic elevation of 178.42 mASL.

Table 2: Summary of Soil Analyses for General Inorganics and Metals

Client: GR (CAN) Investments Co. Ltd.  
 Site: Proposed Thundering Waters Subdivision, Niagara Falls, Ontario  
 Project: TG151118



Sample ID	BH/MW101-1-C	BH/MW102-1A-C	BH/MW103-1A-C	BH/MW104-1-C	BH/MW105-1-C	TP101-5D	TP102-1	TP103-1	TP104-1	TP105-1	TP106-1	TP107-1	TP108-1	TP109-2	TP110-1C	TP111-1	TP112-2D	Dup-G	Duplicate Average	Relative Percent Difference	
Sample Depth (m)	0.1-1.5	0.1-0.6	0.1-0.5	0.2-1.5	0.2-1.5	2.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.0	0.5	0.5	1.0	(Field duplicate of TP112-2D)	(TP112-2D & Dup-G)	(TP112-2D & Dup-G)	
Date Collected	03-Dec-15	02-Dec-15	02-Dec-15	02-Dec-15	02-Dec-15	09-Dec-15	18-Dec-15	18-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15	
Laboratory ID	1550045-01	1550045-03	1550045-05	1550045-07	1550045-09	1550409-26	1552049-01	1552049-02	1550409-10	1550409-14	1550409-25	1550409-15	1550409-17	1550409-22	1550409-21	1550409-20	1550409-23	1550409-24	-	-	
Parameter	Units	MDL	Table 1 SCS*																		
Sodium Adsorption Ratio (SAR)	n/a	0.01	2.4	0.06	0.17	0.36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Conductivity	uS/cm	5	570	165	181	221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
pH	pH Units	0.05	+	7.7	7.7	7.8	-	-	7.7	-	-	-	-	-	-	-	-	-	-	-	
<b>Metals</b>																					
Chromium (VI)	µg/g	0.2	0.66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mercury	µg/g	0.1	0.27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Antimony	µg/g	1.0	1.3	<	<	<	<	<	2.0	<	<	<	<	<	<	<	<	<	<	<	
Arsenic	µg/g	1.0	18	5.6	4.6	6.2	5.8	5.1	1.9	5.9	4.4	5.0	4.8	4.2	4.9	3.7	5.3	4.9	4.3	-	
Barium	µg/g	1.0	220	106	101	96.2	126	130	47.4	102	99.9	112	110	91.6	116	114	105	107	83.6	110	
Beryllium	µg/g	1.0	2.5	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Boron (total)	µg/g	1.0	36	12.3	11.4	11.4	14.9	16.3	3.7	13.0	13.8	14.7	16.4	12.3	16.1	14.6	12.9	15.7	14.2	12.4	
Cadmium	µg/g	0.5	1.2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Chromium (total)	µg/g	1.0	70	20.7	20.3	22.4	24.7	26.7	5.2	22.2	21.3	21.0	22.4	19.4	20.2	20.5	19.2	20.8	19.1	19.0	
Cobalt	µg/g	1.0	21	12.1	11.7	12.1	13.8	13.5	3.2	11.3	11.2	11.9	11.6	10.4	10.1	10.7	10.0	10.7	9.5	10.0	
Copper	µg/g	1.0	92	23.1	26.3	27.1	27.6	26.8	8.3	22.8	20.4	21.4	21.0	21.4	19.8	20.1	19.6	21.2	18.3	20.5	
Lead	µg/g	1.0	120	11.1	11.2	11.5	13.0	12.9	10.2	12.2	11.1	9.2	10.1	9.9	12.8	11.8	9.9	10.3	9.9	11.2	
Molybdenum	µg/g	1.0	2	<	<	<	<	<	<	<	<	<	<	<	<	<	2.3	<	<	<	
Nickel	µg/g	1.0	82	18.9	20.9	21.1	25.7	25.2	3.9	19.3	18.4	21.2	22.0	20.9	19.2	20.6	19.6	19.8	19.1	19.4	
Selenium	µg/g	1.0	1.5	<	<	1.5	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Silver	µg/g	0.5	0.5	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Thallium	µg/g	1.0	1	1.2	<	1.2	1.3	<	<	<	<	<	<	<	<	<	<	<	<	<	
Uranium	µg/g	1.0	2.5	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	
Vanadium	µg/g	1.0	86	27.0	26.4	30.1	33.5	35.5	13.7	28.1	27.0	28.6	30.8	26.1	28.2	27.9	26.0	29.1	26.4	25.7	
Zinc	µg/g	1.0	290	63.0	112	48.1	50.1	53.7	96.1	52.6	53.9	47.3	60.0	47.3	74.2	52.2	49.0	48.2	50.9	58.9	

Notes:  
 \*a\* - Table 1: Full Depth Background Site Condition Standards, for Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use; established in "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", Ontario Ministry of the Environment, 15 April 2011 (MOE).  
**Bolded values exceed the Table 1 SCS.**  
 µg/g\* - micrograms per gram, parts per million.  
 MDL\* - method detection limit.  
 <\* - sample results less than the MDL.  
 \*\* - not applicable or parameter not analyzed.  
 \*Duplicate Average\* - average of results of sample and it's field duplicate; where parameter <MDL, MDL used to calculate average. Note: the duplicate average must exceed the SCS for there to be an exceedance.  
 \*RPD\* - relative percent difference.  
 \*NC\* - RPD not calculable as both values are not greater than 5x the MDL.  
**Bold** - means RPD outside of the sample duplicate value as outlined in the 2011 Analytical Protocol (Metals 30%, pH 0.3 pH units, EC 10%, Cr VI 35%, Hg 30%).  
 \*\* means as per O. Reg. 153/04 as amended, in order to apply the generic Site Condition Standards, pH for surface soil (<1.5 mbgs) should be between 5 and 9 and pH for subsurface soil (>1.5 mbgs) should be between 5 and 11.



Table 2: Summary of Soil Analyses for General Inorganics and Metals

Client: GR (CAN) Investments Co. Ltd.  
 Site: Proposed Thundering Waters Subdivision, Niagara Falls, Ontario  
 Project: TG151118



Sample ID	TP113-1	TP113-7	TP114-1	Dup -A	Duplicate Average	Relative Percent Difference	TP115-1	TP116-2	TP117-3	Dup C	Duplicate Average	Relative Percent Difference	TP-118-1	TP119-1c	TP119-8c	TP120-1	TP121-1	TP121-5	
Sample Depth (m)	0.5	3.5	0.5	0.5	-	-	0.5	1.0	1.5	1.5	-	-	0.5	0.5	4.0	0.5	0.5	2.5	
Date Collected	08-Dec-15	08-Dec-15	08-Dec-15	08-Dec-15	-	-	08-Dec-15	08-Dec-15	08-Dec-15	08-Dec-15	-	-	08-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15	
Laboratory ID	1550409-08	1550409-09	1550409-01	1550409-02	-	-	1550409-03	1550409-04	1550409-05	1550409-06	-	-	1550409-07	1550409-11	1550409-13	1550409-16	1550409-18	1550409-19	
Parameter	Units	MDL	Table 1 SCS <sup>a</sup>																
Sodium Adsorption Ratio (SAR)	n/a	0.01	2.4	-	-	0.56	0.72	0.64	25%	-	-	0.76	1.39	1.08	59%	-	-	0.48	-
Conductivity	uS/cm	5	570	-	-	230	254	242	10%	-	-	2990	1280	2410	80%	-	-	283	-
pH	pH Units	0.05	+	-	-	7.7	7.7	7.7	0%	-	-	7.8	7.8	7.80	0%	-	-	7.2	-
<b>Metals</b>																			
Chromium (VI)	µg/g	0.2	0.66	-	<	-	-	-	-	-	-	-	-	-	-	<	-	-	<
Mercury	µg/g	0.1	0.27	-	<	-	-	-	-	-	-	-	-	-	-	<	-	-	<
Antimony	µg/g	1.0	1.3	<	<	<	<	<	NC	<	<	<	<	<	NC	<	<	<	<
Arsenic	µg/g	1.0	18	3.4	3.0	3.2	2.8	3	NC	4.2	4.3	4.3	4.7	4.5	NC	5.3	6.0	3.0	5.0
Barium	µg/g	1.0	220	127	62.1	165	150	158	10%	179	101	127	166	147	27%	123	112	95.7	118
Beryllium	µg/g	1.0	2.5	<	<	<	<	<	NC	<	<	<	<	<	NC	<	<	<	<
Boron (total)	µg/g	1.0	36	15.4	4.3	21.4	22.8	22.1	6%	16.6	14.5	16.9	17.4	17.2	3%	17.3	14.7	4.3	15.5
Cadmium	µg/g	0.5	1.2	<	<	<	<	<	NC	<	<	<	<	<	NC	<	<	<	<
Chromium (total)	µg/g	1.0	70	18.3	17.4	23.9	25.2	24.5	5%	27.2	20.8	25.7	25.2	25.5	2%	27.8	21.9	14.5	21.0
Cobalt	µg/g	1.0	21	8.8	10.3	11.8	12.3	12.0	4%	13.9	10.1	13.7	14.2	14.0	4%	13.6	11.1	7.8	10.8
Copper	µg/g	1.0	92	20.6	5.2	21.2	21.8	21.5	3%	21.8	20.6	22.1	20.4	21.3	8%	21.1	22.2	7.2	20.3
Lead	µg/g	1.0	120	13.3	10.9	10.0	10.8	10.4	8%	12.9	9.1	11.9	10.5	11.2	13%	11.1	10.9	9.6	11.0
Molybdenum	µg/g	1.0	2	<	<	<	<	<	NC	<	<	<	<	<	NC	<	<	<	<
Nickel	µg/g	1.0	82	17.4	10.8	23.5	25.3	24.4	7%	28.6	19.7	24.9	26.2	25.6	5%	29.5	21.1	8.3	20.1
Selenium	µg/g	1.0	1.5	<	<	<	<	<	NC	<	<	<	<	<	NC	<	<	<	<
Silver	µg/g	0.5	0.5	<	<	<	<	<	NC	<	<	<	<	<	NC	<	<	<	<
Thallium	µg/g	1.0	1	<	<	<	<	<	NC	<	<	<	<	<	NC	<	<	<	<
Uranium	µg/g	1.0	2.5	<	<	<	<	<	NC	<	<	<	<	<	NC	<	<	<	<
Vanadium	µg/g	1.0	86	26.0	28.0	32.2	33.9	33.0	5%	36.6	28.7	34.8	33.9	34.4	3%	35.8	29.7	26.0	28.7
Zinc	µg/g	1.0	290	70.3	48.8	51.3	55.7	53.5	8%	60.8	45.1	51.8	49.1	50.5	5%	61.4	107	47.0	53.1

Notes:  
<sup>a</sup> - Table 1: Full Depth Background Site Condition Standards, for Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use, established in "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", Ontario Ministry of the Environment, 15 April 2011 (MOE).

**Bolded values exceed the Table 1 SCS.**

"µg/g" - micrograms per gram, parts per million.

"MDL" - method detection limit.

"<" - sample results less than the MDL.

"-" - not applicable or parameter not analyzed.

"Duplicate Average" - average of results of sample and its field duplicate; where parameter

<MDL, MDL used to calculate average. Note: the duplicate average must exceed the SCS for there to be an exceedance.

"RPD" - relative percent difference.

"NC" - RPD not calculable as both values are not greater than 5x the MDL.

**Bold** - means RPD outside of the sample duplicate value as outlined in the 2011 Analytical Protocol (Metals 30%, pH 0.3 pH units, EC 10%, Cr VI 35%, Hg 30%).

"+" means as per O. Reg. 153/04 as amended, in order to apply the generic Site Condition Standards, pH for surface soil (<1.5 mbgs) should be between 5 and 9 and pH for subsurface soil (>1.5 mbgs) should be between 5 and 11.

Table 2: Summary of Soil Analyses for Metals

Client: GR (CAN) Investments Co. Ltd  
 Site: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Project: TG161164



Sample ID	TP109-2 and Samples within 2 m																
	TP109-2	TP201-2	TP202-2	DUP AA (Field duplicate of TP202-2)	Duplicate Average	Relative Percent Difference	Average of TP109-2, TP201-2, TP202-2 and DUP AA	TP201-3	TP202-3	TP203-2	TP203-3	TP204-1	TP204-2	TP205-1	TP205-2	TP206-1	TP206-2
Sample Depth (m)	1.0	1.0	1.0	1.0	-	-	-	1.5	1.5	1.0	1.5	1.0	1.5	0.5	1.0	0.5	1.0
Date Collected	09-Dec-15	21-Dec-16	21-Dec-16	21-Dec-16	-	-	-	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16
Laboratory ID	1550409-22	1653030-01	1653030-03	1653030-36	-	-	-	1653030-02	1653030-04	1653030-05	1653030-06	1653030-07	1653030-08	1653030-09	1653030-10	1653030-11	1653030-12
Date Analyzed - Metals	-	30-Dec-16	30-Dec-16	30-Dec-16	-	-	-	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16
Parameter	Units	MDL	Table 1 SCS <sup>a</sup>														
<b>Metals</b>																	
Antimony	µg/g	1.0	1.3	<	<	<	<	<	NC	<	<	<	<	<	<	<	<
Arsenic	µg/g	1.0	18	3.7	<	<	<	<	NC	2.6	<	<	<	<	<	<	<
Barium	µg/g	1.0	220	105	112	119	116	118	3%	113	121	112	113	127	158	115	130
Beryllium	µg/g	1.0	2.5	<	<	<	<	<	NC	<	<	<	<	<	<	<	<
Boron	µg/g	1.0	36	12.9	19.5	19.5	20.0	19.8	3%	18.0	21.0	21.7	17.8	17.3	21.9	19.5	19.8
Cadmium	µg/g	0.5	1.2	<	<	<	<	<	NC	<	<	<	<	<	<	<	<
Chromium	µg/g	1.0	70	19.2	23.3	23.6	25.0	24.3	6%	22.8	25.3	25.6	24.2	21.1	28.3	23.8	24.0
Cobalt	µg/g	1.0	21	10.0	12.0	11.9	12.6	12.3	6%	11.6	12.6	12.7	12.3	10.9	14.1	12.1	12.1
Copper	µg/g	1.0	92	19.6	25.3	27.5	26.1	26.8	5%	24.6	26.9	26.9	29.9	22.6	29.6	27.6	26.5
Lead	µg/g	1.0	120	9.9	12.4	12.6	13.8	13.2	9%	12.2	13.1	14.0	13.1	12.4	13.0	13.6	14.7
Molybdenum	µg/g	1.0	2	<b>2.3</b>	<	<	<	<	NC	1.3	<	<	<	<	<	<	<
Nickel	µg/g	1.0	82	19.6	25.5	26.3	27.7	27.0	5%	24.8	26.8	28.4	26.6	23.5	30.8	26.8	26.3
Selenium	µg/g	1.0	1.5	<	<	<	<	<	NC	<	<	<	<	<	<	<	<
Silver	µg/g	0.5	0.5	<	<	<	<	<	NC	<	<	<	<	<	<	<	<
Thallium	µg/g	1.0	1	<	<	<	<	<	NC	<	<	<	<	<	<	<	<
Uranium	µg/g	1.0	2.5	<	<	<	<	<	NC	<	<	<	<	<	<	<	<
Vanadium	µg/g	1.0	86	26.0	36.2	36.3	37.8	37.1	4%	34.1	38.5	39.1	37.3	32.7	42.3	36.7	37.1
Zinc	µg/g	1.0	290	49.0	56.6	57.0	62.9	60.0	10%	56.4	64.8	60.2	66.4	53.3	62.5	58.1	60.7

Notes:

<sup>a</sup> - Table 1 Full Depth Background Site Condition Standards in a Potable Ground Water Condition, for Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use, established in "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", Ontario Ministry of the Environment, 15 April 2011 (MOE). SCS apply to medium and fine textured soils.

**Bolded** values exceed the Table 1 SCS.

"µg/g" - micrograms per gram, parts per million.

"MDL" - method detection limit.

"<" - sample results less than the MDL.

"-" - not applicable or parameter not analyzed.

"Duplicate Average" - average of results of sample and its field duplicate; where parameter <MDL, MDL used to calculate average. Note: the duplicate average must exceed the SCS for there to be an exceedance.

"RPD" - relative percent difference.

"NC" - RPD not calculable as both values are not greater than 5x the MDL.

**Bold** - means RPD outside of the sample duplicate value as outlined in the 2011 Analytical Protocol (Metals 30%).

Table 2: Summary of Soil Analyses for Metals

Client: GR (CAN) Investments Co. Ltd  
 Site: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Project: TG161164



Sample ID	BH/MW101-1-C and Samples within 2 m															
	BH/MW101-1-C	COMPOSITE TP207	COMPOSITE TP208	Average of BH/MW101-1-C, Composite TP207 and Composite 208	TP208-4	DUP AC (Field duplicate of TP208-4)	Duplicate Average	Relative Percent Difference	COMPOSITE TP209	TP209-4	COMPOSITE TP210	TP211-1	TP211-2	COMPOSITE TP212	TP212-4	
Sample Depth (m)	0.1-1.5	1.0-1.5	0.5-1.5		2.0	2.0	-	-	0.5-1.5	2.0	0.5-1.5	0.5	1.0	0.5-1.5	2.0	
Date Collected	03-Dec-15	21-Dec-16	21-Dec-16		21-Dec-16	21-Dec-16	-	-	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16	
Laboratory ID	1550045-01	1653030-13	1653030-14		1653030-15	1653030-37	-	-	1653030-16	1653030-17	1653030-18	1653030-19	1653030-20	1653030-21	1653030-22	
Date Analyzed - Metals	-	30-Dec-16	30-Dec-16		30-Dec-16	30-Dec-16	-	-	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	
Parameter	Units	MDL	Table 1 SCS <sup>a</sup>													
<b>Metals</b>																
Antimony	µg/g	1.0	1.3	<	<	<	<	<	<	<	NC	<	<	<	<	<
Arsenic	µg/g	1.0	18	5.6	<	<	2.5	<	<	<	NC	<	<	<	<	<
Barium	µg/g	1.0	220	106	130	106	114	91.2	91.9	91.6	1%	113	117	138	117	113
Beryllium	µg/g	1.0	2.5	<	<	<	<	<	<	<	NC	<	<	<	<	<
Boron	µg/g	1.0	36	12.3	20.9	11.5	14.9	6.1	6.0	6.1	2%	16.8	11.2	19.9	18.1	17.3
Cadmium	µg/g	0.5	1.2	<	<	<	<	<	<	<	NC	<	<	<	<	<
Chromium	µg/g	1.0	70	20.7	26.3	21.2	22.7	5.5	6.3	5.9	14%	20.5	15.1	25.2	24.9	20.8
Cobalt	µg/g	1.0	21	12.1	13.5	7.1	10.9	3.5	3.7	3.6	NC	11.6	9.3	13.2	12.5	10.4
Copper	µg/g	1.0	92	23.1	28.2	16.7	22.7	7.6	7.4	7.5	3%	26.2	15.9	27.8	27.8	21.2
Lead	µg/g	1.0	120	11.1	15.2	35.9	20.7	8.0	8.0	8.0	0%	31.7	7.5	13.0	11.5	9.0
Molybdenum	µg/g	1.0	2	<	<	<	<	<	<	<	NC	<	<	<	<	<
Nickel	µg/g	1.0	82	18.9	29.3	14.0	20.7	6.0	7.4	6.7	21%	23.9	16.8	28.8	27.7	23.4
Selenium	µg/g	1.0	1.5	<	<	<	<	<	<	<	NC	<	<	<	<	<
Silver	µg/g	0.5	0.5	<	<	<	<	<	<	<	NC	<	<	<	<	<
Thallium	µg/g	1.0	1	<b>1.2</b>	<	<	<b>1.1</b>	<	<	<	NC	<	<	<	<	<
Uranium	µg/g	1.0	2.5	<	<	<	<	<	<	<	NC	<	<	<	<	<
Vanadium	µg/g	1.0	86	27.0	40.0	21.9	29.6	11.8	13.1	12.5	10%	32.3	25.7	38.6	37.9	33.0
Zinc	µg/g	1.0	290	63.0	79.6	138	93.5	39.4	40.3	39.9	2%	71.2	35.1	62.8	57.2	47.6

Notes:

<sup>a</sup> - Table 1 Full Depth Background Site Condition Standards in a Potable Ground Water Condition, for Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use; established in "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", Ontario Ministry of the Environment, 15 April 2011 (MOE). SCS apply to medium and fine textured soils.

**Bolded** values exceed the Table 1 SCS.

"µg/g" - micrograms per gram, parts per million.

"MDL" - method detection limit.

"<" - sample results less than the MDL.

"-" - not applicable or parameter not analyzed.

"Duplicate Average" - average of results of sample and its field duplicate; where parameter <MDL, MDL used to calculate average. Note: the duplicate average must exceed the SCS for there to be an exceedance.

"RPD" - relative percent difference.

"NC" - RPD not calculable as both values are not greater than 5x the MDL.

**Bold** - means RPD outside of the sample duplicate value as outlined in the 2011 Analytical Protocol (Metals 30%).

Table 2: Summary of Soil Analyses for Metals

Client: GR (CAN) Investments Co. Ltd  
 Site: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Project: TG161164



Sample ID	TP103-1 and Samples within 2 m																
	TP103-1	TP213-1	TP214-1	Average of TP103-1, TP213-1 and TP214-1)	TP213-2	TP214-2	COMPOSITE TP215	TP215-3	TP216-1	TP216-2	TP217-1	TP217-2	TP218-1	TP218-2			
Sample Depth (m)	0.5	0.5	0.5		1.0	1.0	0.5-1.5	1.5	0.5	1.0	0.5	1.0	0.5	1.0			
Date Collected	18-Dec-15	21-Dec-16	21-Dec-16		21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16			
Laboratory ID	1552049-02	1653030-23	1653030-25		1653030-24	1653030-26	1653030-27	1653030-28	1653030-29	1653030-30	1653030-31	1653030-32	1653030-33	1653030-34			
Date Analyzed - Metals	-	30-Dec-16	30-Dec-16		30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16			
Parameter	Units	MDL	Table 1 SCS*														
<b>Metals</b>																	
Antimony	µg/g	1.0	1.3	<b>2.0</b>	<	<	1.3	<	<	<	<	<	<	<	<	<	<
Arsenic	µg/g	1.0	18	5.9	<	<	2.6	<	<	<	<	<	<	<	<	<	<
Barium	µg/g	1.0	220	99.9	130	110	113	111	125	118	123	124	115	111	112	121	118
Beryllium	µg/g	1.0	2.5	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Boron	µg/g	1.0	36	13.8	23.4	17.3	18.2	18.3	17.9	19.7	19.2	20.0	17.1	18.2	20.0	19.3	20.1
Cadmium	µg/g	0.5	1.2	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chromium	µg/g	1.0	70	21.3	28.2	22.3	23.9	23.0	25.3	24.3	23.8	25.4	23.8	25.6	23.5	24.6	25.0
Cobalt	µg/g	1.0	21	11.2	13.5	11.6	12.1	11.9	12.8	12.4	12.5	12.9	12.1	12.7	11.6	12.4	12.5
Copper	µg/g	1.0	92	20.4	26.0	24.1	23.5	25.2	27.1	25.1	24.8	27.0	24.0	26.3	23.4	27.0	25.4
Lead	µg/g	1.0	120	11.1	21.3	12.1	14.8	11.2	12.7	11.8	13.2	14.3	13.4	11.4	13.0	20.5	13.6
Molybdenum	µg/g	1.0	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Nickel	µg/g	1.0	82	18.4	30.0	25.6	24.7	25.8	28.1	26.1	27.0	28.5	26.2	27.4	25.7	26.1	27.2
Selenium	µg/g	1.0	1.5	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Silver	µg/g	0.5	0.5	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Thallium	µg/g	1.0	1	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Uranium	µg/g	1.0	2.5	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Vanadium	µg/g	1.0	86	27.0	41.7	33.8	34.2	35.2	37.8	37.1	36.5	39.0	35.0	38.9	36.6	37.3	38.1
Zinc	µg/g	1.0	290	53.9	57.0	58.4	56.4	60.0	62.9	55.8	56.4	73.8	61.6	53.5	67.2	59.3	61.2

Notes:

\*a - Table 1 Full Depth Background Site Condition Standards in a Potable Ground Water Condition, for Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use; established in "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", Ontario Ministry of the Environment, 15 April 2011 (MOE). SCS apply to medium and fine textured soils.

**Bolded** values exceed the Table 1 SCS.

\*µg/g\* - micrograms per gram, parts per million.

\*MDL\* - method detection limit.

\*< - sample results less than the MDL.

\*- - not applicable or parameter not analyzed.

\*Duplicate Average\* - average of results of sample and it's field duplicate, where parameter <MDL, MDL used to calculate average. Note: the duplicate average must exceed the SCS for there to be an exceedance.

\*RPD\* - relative percent difference.

\*NC\* - RPD not calculable as both values are not greater than 5x the MDL.

**Bold** - means RPD outside of the sample duplicate value as outlined in the 2011 Analytical Protocol (Metals 30%).

Table 2: Summary of Soil Analyses for Metals

Client: GR (CAN) Investments Co. Ltd  
 Site: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Project: TG161164



Sample ID	BH/MW103-1A-C and Samples within 2 m												
	BH/MW103-1A-C	TP219-1	TP221-1	Average of BH/MW103-1A-C, TP219-1 and TP221-1)	TP219-2	TP220-1	TP220-2	TP221-2	TP222-1	TP222-2	TP223-1	TP223-2	
Sample Depth (m)	0.1-0.5	0.5	0.5		1.0	0.5	1.0	1.0	0.5	1.0	0.5	1.0	
Date Collected	02-Dec-15	22-Dec-16	22-Dec-16		22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16	
Laboratory ID	1550045-05	1653032-01	1653032-05		1653032-02	1653032-03	1653032-04	1653032-06	1653032-07	1653032-08	1653032-09	1653032-10	
Date Analyzed - Metals		30-Dec-16	30-Dec-16		30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	30-Dec-16	
Parameter	Units	MDL	Table 1 SCS <sup>a</sup>										
<b>Metals</b>													
Antimony	µg/g	1.0	1.3	<	<	<	<	<	<	<	<	<	
Arsenic	µg/g	1.0	18	6.2	<	<	2.7	<	<	<	<	<	
Barium	µg/g	1.0	220	96.2	114	109	106	138	136	119	121	128	
Beryllium	µg/g	1.0	2.5	<	<	<	<	<	<	<	<	<	
Boron	µg/g	1.0	36	11.4	1.57	15.7	9.6	15.6	19.7	17.0	16.6	16.3	
Cadmium	µg/g	0.5	1.2	<	<	<	<	<	<	<	<	<	
Chromium	µg/g	1.0	70	22.4	22.8	50.9	32.0	23.7	25.2	24.0	25.0	26.1	
Cobalt	µg/g	1.0	21	12.1	11.8	12.9	12.3	12.7	13.3	12.5	13.4	12.9	
Copper	µg/g	1.0	92	27.1	26.0	29.4	27.5	26.7	24.2	24.6	24.9	26.0	
Lead	µg/g	1.0	120	11.5	11.6	14.3	12.5	11.5	14.1	11.3	11.4	13.4	
Molybdenum	µg/g	1.0	2	<	<	<	<	<	<	<	<	<	
Nickel	µg/g	1.0	82	21.1	26.6	36.9	28.2	26.3	28.9	25.9	29.3	29.1	
Selenium	µg/g	1.0	1.5	1.5	<	<	<	<	<	<	<	<	
Silver	µg/g	0.5	0.5	<	<	<	<	<	<	<	<	<	
Thallium	µg/g	1.0	1	<b>1.2</b>	<	<	<b>1.1</b>	<	<	<	<	<	
Uranium	µg/g	1.0	2.5	<	<	<	<	<	<	<	<	<	
Vanadium	µg/g	1.0	86	30.1	35.6	39.0	34.9	36.9	39.2	36.7	36.9	38.5	
Zinc	µg/g	1.0	290	48.1	52.5	68.8	56.5	53.0	55.3	53.4	56.7	61.9	

Notes:

<sup>a</sup> - Table 1 Full Depth Background Site Condition Standards in a Potable Ground Water Condition, for Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use; established in "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", Ontario Ministry of the Environment, 15 April 2011 (MOE). SCS apply to medium and fine textured soils.

**Bolded** values exceed the Table 1 SCS.

"µg/g" - micrograms per gram, parts per million.

"MDL" - method detection limit.

"<" - sample results less than the MDL.

"-" - not applicable or parameter not analyzed.

"Duplicate Average" - average of results of sample and its field duplicate; where parameter <MDL, MDL used to calculate average. Note: the duplicate average must exceed the SCS for there to be an exceedance.

"RPD" - relative percent difference.

"NC" - RPD not calculable as both values are not greater than 5x the MDL.

**Bold** - means RPD outside of the sample duplicate value as outlined in the 2011 Analytical Protocol (Metals 30%).

**Table 2A: Summary of Soil Analyses for EC**

**Client:** GR (CAN) Investments Co. Ltd.  
**Site:** Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
**Project:** TG161164



Sample ID	TP224-1	TP224-2	TP224-4	TP225-1	TP225-2	TP225-4	TP226-1	TP226-2	TP226-4	TP227-1	TP227-2	TP227-3	TP228-1	DUP A3  (Field duplicate of TP228-1)	Duplicate Average	Relative Percent Difference	TP228-2	TP228-4	TP229-1	TP229-2	TP229-4			
Sample Depth (m)	0.5	1.0	2.0	0.5	1.0	2.0	0.5	1.0	2.0	0.5	1.0	1.5	0.5	0.5	-	-	1.0	2.0	0.5	1.0	2.0			
Date Collected	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16	-	-	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16			
Laboratory ID	1653032-11	1653032-12	1701133-01	1653032-13	1653032-14	1701133-02	1653032-15	1653032-16	1701133-03	1653032-20	1653032-21	1701133-04	1653032-22	1653032-19	-	-	1653032-23	1701133-05	1653032-17	1653032-18	1701133-06			
Date Analyzed - PAHs	03-Jan-17	03-Jan-17	05-Jan-17	03-Jan-17	03-Jan-17	05-Jan-17	03-Jan-17	03-Jan-17	05-Jan-17	03-Jan-17	03-Jan-17	05-Jan-17	03-Jan-17	03-Jan-17	-	-	03-Jan-17	05-Jan-17	03-Jan-17	03-Jan-17	05-Jan-17			
Parameter	Units	MDL	Table 1 SCS <sup>a</sup>																					
Electrical Conductivity																								
EC	µS/cm	5	570	1160	1170	1150	1340	1600	1110	738	2820	2940	1930	3040	2940	1270	1260	1265	1%	2230	1310	772	3040	2810

Notes:

<sup>a</sup> - Table 1: Full Depth Background Site Condition Standards in a Non-Potable Ground Water Condition, for Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use; established in "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", Ontario Ministry of the Environment, 15 April 2011 (MOE). SCS apply to medium and fine textured soils.

**Bolded values exceed the Table 1 SCS.**

\*µS/cm\* - microSiemens per centimetre.  
 \*MDL\* - method detection limit.  
 \*c\* - sample results less than the MDL.  
 \*n\* - not applicable or parameter not analyzed.

"Duplicate Average" - average of results of sample and it's field duplicate; where parameter <MDL, MDL used to calculate average. Note: the duplicate average must exceed the SCS for there to be an exceedance.

\*RPD\* - relative percent difference.

\*NC\* - RPD not calculable as both values are not greater than 5x the MDL.  
**Bold** - means RPD outside of the sample duplicate value as outlined in the 2011 Analytical Protocol (EC 10%).

**Table 3: Summary of Soil Analyses for VOCs/BTEX and PHCs**

**Client:** GR (CAN) Investments Co. Ltd.  
**Site:** Proposed Thundering Waters Subdivision, Niagara Falls, Ontario  
**Project:** TG151118



Sample ID	BH/MW101-2A-D	BH/MW102-3-D	BH/MW103-3-D	BH/MW104-3-D	BH/MW105-3-C	Dup 1	Duplicate Average	Relative Percent Difference	TP113-7	TP-119-8d	TP121-5
Sample Depth (m)	1.6	3.8	3.8	3.8	3.8	3.8	-	-	3.5	4.0	2.5
Date Collected	03-Dec-15	02-Dec-15	02-Dec-15	02-Dec-15	02-Dec-15	02-Dec-15	-	-	08-Dec-15	09-Dec-15	09-Dec-15
Laboratory ID	1550045-02	1550045-04	1550045-06	1550045-08	1550045-10	1550045-11	-	-	1550409-09	1550409-12	1550409-19
Parameter	Units	MDL	Table 1 SCS <sup>a</sup>								
<b>Volatile Organic Compounds</b>											
Acetone	ug/g	0.50	0.5	-	-	-	<	<	NC	<	-
Benzene	ug/g	0.02	0.02	-	-	-	<	<	NC	<	-
Bromodichloromethane	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
Bromoform	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
Bromomethane	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
Carbon Tetrachloride	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
Chlorobenzene	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
Chloroform	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
Dibromochloromethane	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
Dichlorodifluoromethane	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
1,2-Dichlorobenzene	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
1,3-Dichlorobenzene	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
1,4-Dichlorobenzene	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
1,1-Dichloroethane	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
1,2-Dichloroethane	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
1,1-Dichloroethylene	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
cis-1,2-Dichloroethylene	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
trans-1,2-Dichloroethylene	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
1,2-Dichloropropane	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
cis-1,3-Dichloropropylene	ug/g	0.05	NV	-	-	-	<	<	NC	<	-
trans-1,3-Dichloropropylene	ug/g	0.05	NV	-	-	-	<	<	NC	<	-
1,3-Dichloropropene, total	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
Ethylbenzene	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
Ethylene dibromide (dibromoethane, 1,2-	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
Hexane	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
Methyl Ethyl Ketone (2-Butanone)	ug/g	0.50	0.5	-	-	-	<	<	NC	<	-
Methyl isobutyl ketone	ug/g	0.50	0.5	-	-	-	<	<	NC	<	-
Methyl tert-butyl ether	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
Methylene Chloride	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
Styrene	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
1,1,1,2-Tetrachloroethane	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
1,1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
Tetrachloroethylene	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
Toluene	ug/g	0.05	0.2	-	-	-	<	<	NC	<	-
1,1,1-Trichloroethane	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
1,1,2-Trichloroethane	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
Trichloroethylene	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
Trichlorofluoromethane	ug/g	0.05	0.25	-	-	-	<	<	NC	<	-
Vinyl Chloride	ug/g	0.02	0.02	-	-	-	<	<	NC	<	-
m/p-Xylene	ug/g	0.05	NV	-	-	-	<	<	NC	<	-
o-Xylene	ug/g	0.05	NV	-	-	-	<	<	NC	<	-
Xylenes, total	ug/g	0.05	0.05	-	-	-	<	<	NC	<	-
Benzene	ug/g	0.02	0.02	<	<	<	<	<	<	<	<
Ethylbenzene	ug/g	0.05	0.05	<	<	<	<	<	<	<	<
Toluene	ug/g	0.05	0.2	<	<	<	<	<	<	<	<
m/p-Xylene	ug/g	0.05	NV	<	<	<	<	<	<	<	<
o-Xylene	ug/g	0.05	NV	<	<	<	<	<	<	<	<
Xylenes, total	ug/g	0.05	0.05	<	<	<	<	<	<	<	<
<b>Hydrocarbons</b>											
F1 PHCs (C6-C10)	ug/g	7	25	<	<	<	<	<	NC	<	<
F2 PHCs (C10-C16)	ug/g	4	10	<	<	<	<	<	NC	<	<
F3 PHCs (C16-C24)	ug/g	8	240	<	<	<	<	<	NC	<	<
F4 PHCs (C34-C50)	ug/g	6	120	<	<	<	<	<	NC	<	<

<sup>a</sup> - Table 1: Full Depth Background Site Condition Standards, for Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use, established in "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", Ontario Ministry of the Environment, 15 April 2011 (MOE).

**Bolded values exceed the Table 1 SCS.**

"NV" - no value in Table 1 SCS  
 "ug/g" - micrograms per gram, parts per million.  
 "MDL" - method detection limit.

<- sample results less than the MDL  
 - - not applicable or parameter not analyzed.

"Duplicate Average" - average of results of sample and it's field duplicate; where parameter <MDL MDL used to calculate average. Note: the duplicate average must exceed the SCS for there to be an exceedance.  
 "RPD" - relative percent difference.

"NC" - RPD not calculable as both values are not greater than 5x the MDL.

Bold - means RPD outside of the sample duplicate value as outlined in the 2011 Analytical Protocol (VOCs 50% and PHCs 30%).

Table 4: Summary of Soil Analyses for PAHs

Client: GR (CAN) Investments Co. Ltd.  
 Site: Proposed Thundering Waters Subdivision, Niagara Falls, Ontario  
 Project: TG151118



Sample ID				TP110-1c	TP112-2d	Dup-G	Duplicate Average	Relative Percent Difference	TP113-7	TP121-5
Sample Depth (m)				0.5	1.0	1.0	-	-	3.5	2.5
Date Collected				09-Dec-15	09-Dec-15	09-Dec-15	-	-	08-Dec-15	09-Dec-15
Laboratory ID				1550409-21	1550409-23	1550409-24	-	-	1550409-09	1550409-19
Parameter	Units	MDL	Table 1 SCS <sup>a</sup>							
<b>Polycyclic Aromatic Hydrocarbons</b>										
Acenaphthene	ug/g	0.02	0.072	<	<	<	<	NC	<	<
Acenaphthylene	ug/g	0.02	0.093	<	<	<	<	NC	<	<
Anthracene	ug/g	0.02	0.16	<	<	<	<	NC	<	<
Benzo[a]anthracene	ug/g	0.02	0.36	<	<	<	<	NC	<	<
Benzo[a]pyrene	ug/g	0.02	0.3	<	<	<	<	NC	<	<
Benzo[b]fluoranthene	ug/g	0.02	0.47	<	<	<	<	NC	<	<
Benzo[g,h,i]perylene	ug/g	0.02	0.68	<	<	<	<	NC	<	<
Benzo[k]fluoranthene	ug/g	0.02	0.48	<	<	<	<	NC	<	<
Chrysene	ug/g	0.02	2.8	<	<	<	<	NC	<	<
Dibenzo[a,h]anthracene	ug/g	0.02	0.1	<	<	<	<	NC	<	<
Fluoranthene	ug/g	0.02	0.56	<	<	<	<	NC	<	<
Fluorene	ug/g	0.02	0.12	<	<	<	<	NC	<	<
Indeno[1,2,3-cd]pyrene	ug/g	0.02	0.23	<	<	<	<	NC	<	<
1-Methylnaphthalene	ug/g	0.02	0.59	<	<	<	<	NC	<	<
2-Methylnaphthalene	ug/g	0.02	0.59	<	<	<	<	NC	<	<
Methylnaphthalene (1&2)	ug/g	0.04	0.59	<	<	<	<	NC	<	<
Naphthalene	ug/g	0.01	0.09	<	<	<	<	NC	<	<
Phenanthrene	ug/g	0.02	0.69	<	<	<	<	NC	<	<
Pyrene	ug/g	0.02	1	<	<	<	<	NC	<	<

"a" - Table 1: Full Depth Background Site Condition Standards, for Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use; established in "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", Ontario Ministry of the Environment, 15 April 2011 (MOE).

**Bolded** values exceed the Table 1 SCS.

"ug/g" - micrograms per gram, parts per million.

"MDL" - method detection limit.

"<" - sample results less than the MDL.

"-" - not applicable or parameter not analyzed.

"Duplicate Average" - average of results of sample and it's field duplicate; where parameter <MDL, MDL used to calculate average. Note: the duplicate average must exceed the SCS for there to be an exceedance.

"RPD" - relative percent difference.

"NC" - RPD not calculable as both values are not greater than 5x the MDL.

**Bold** - means RPD outside of the sample duplicate value as outlined in the 2011 Analytical Protocol (PAHs 40%).



**Table 5: Maximum Concentrations for Analytical Results for Soil**

**Client:** GR (CAN) Investments Co. Ltd.  
**Site:** Proposed Thundering Waters Subdivision, Niagara Falls, Ontario  
**Project:** TG151118



Parameter	Sample ID	Location	Maximum Concentration (µg/g)
<b>General Inorganics</b>			
Conductivity	TP117-3	southeast portion of Phase Two Property	3040 mS/cm
<b>Metals</b>			
Chromium (VI)	all sample locations	throughout Phase Two Property	<0.2
Mercury	all sample locations	throughout Phase Two Property	<0.1
Antimony	TP103-1	southwestern portion of Phase Two Property	1.3
Arsenic	BH/MW103-1A-C	southeast portion of Phase Two Property	6.2
Barium	TP115-1	southeast portion of Phase Two Property	179
Beryllium	all sample locations	throughout Phase Two Property	<1.0
Boron	TP213-1	southwestern portion of Phase Two Property	23.4
Cadmium	all sample locations	throughout Phase Two Property	<0.5
Chromium	TP115-1	southeastern portion of Phase Two Property	27.2
Cobalt	TP117-3	southeastern portion of Phase Two Property	14.0
Copper	BH/MW104-1-C	northwestern portion of Phase Two Property	27.6
Lead	TP113-1	southwestern portion of Phase Two Property	13.3
Molybdenum	TP109-2	southwestern portion of Phase Two Property	1.3
Nickel	TP118-1	southeastern portion of Phase Two Property	29.5
Selenium	BH/MW103-1A-C	southeastern portion of Phase Two Property	1.5
Silver	all sample locations	throughout Phase Two Property	<0.5
Thallium	BH/MW104-1-C	northwestern portion of Phase Two Property	1.3
Uranium	all sample locations	throughout Phase Two Property	<1.0
Vanadium	TP115-1	southeastern portion of Phase Two Property	36.6
Zinc	BH/MW102-1A-C	southwestern portion of Phase Two Property	112
<b>Petroleum Hydrocarbons</b>			
F1 PHCs (C6-C10)	all sample locations	throughout Phase Two Property	<7
F2 PHCs (C10-C16)	all sample locations	throughout Phase Two Property	<4
F3 PHCs (C16-C34)	all sample locations	throughout Phase Two Property	<8
F4 PHCs (C34-C50)	all sample locations	throughout Phase Two Property	<6
<b>Volatile Organic Compounds</b>			
Acetone	all sample locations	throughout Phase Two Property	<0.50
Benzene	all sample locations	throughout Phase Two Property	<0.02
Bromodichloromethane	all sample locations	throughout Phase Two Property	<0.05
Bromoform	all sample locations	throughout Phase Two Property	<0.05
Bromomethane	all sample locations	throughout Phase Two Property	<0.05
Carbon Tetrachloride	all sample locations	throughout Phase Two Property	<0.05
Chlorobenzene	all sample locations	throughout Phase Two Property	<0.05
Chloroform	all sample locations	throughout Phase Two Property	<0.05
Dibromochloromethane	all sample locations	throughout Phase Two Property	<0.05
Dichlorodifluoromethane	all sample locations	throughout Phase Two Property	<0.05
1,2-Dichlorobenzene	all sample locations	throughout Phase Two Property	<0.05
1,3-Dichlorobenzene	all sample locations	throughout Phase Two Property	<0.05
1,4-Dichlorobenzene	all sample locations	throughout Phase Two Property	<0.05
1,1-Dichloroethane	all sample locations	throughout Phase Two Property	<0.05
1,2-Dichloroethane	all sample locations	throughout Phase Two Property	<0.05
1,1-Dichloroethylene	all sample locations	throughout Phase Two Property	<0.05
cis-1,2-Dichloroethylene	all sample locations	throughout Phase Two Property	<0.05
trans-1,2-Dichloroethylene	all sample locations	throughout Phase Two Property	<0.05
1,2-Dichloropropane	all sample locations	throughout Phase Two Property	<0.05
cis-1,3-Dichloropropylene	all sample locations	throughout Phase Two Property	<0.05
trans-1,3-Dichloropropylene	all sample locations	throughout Phase Two Property	<0.05
1,3-Dichloropropene, total	all sample locations	throughout Phase Two Property	<0.05
1,2-Dibromoethane	all sample locations	throughout Phase Two Property	<0.05
Ethylbenzene	all sample locations	throughout Phase Two Property	<0.05
Hexane	all sample locations	throughout Phase Two Property	<0.05
Methyl Ethyl Ketone (2-Butanone)	all sample locations	throughout Phase Two Property	<0.50
Methyl Isobutyl Ketone	all sample locations	throughout Phase Two Property	<0.50
Methyl tert-butyl ether	all sample locations	throughout Phase Two Property	<0.05
Methylene Chloride	all sample locations	throughout Phase Two Property	<0.05
Styrene	all sample locations	throughout Phase Two Property	<0.05
1,1,1,2-Tetrachloroethane	all sample locations	throughout Phase Two Property	<0.05
1,1,2,2-Tetrachloroethane	all sample locations	throughout Phase Two Property	<0.05
Tetrachloroethylene	all sample locations	throughout Phase Two Property	<0.05
Toluene	all sample locations	throughout Phase Two Property	<0.05
1,1,1-Trichloroethane	all sample locations	throughout Phase Two Property	<0.05
1,1,2-Trichloroethane	all sample locations	throughout Phase Two Property	<0.05
Trichloroethylene	all sample locations	throughout Phase Two Property	<0.05
Trichlorofluoromethane	all sample locations	throughout Phase Two Property	<0.05
Vinyl Chloride	all sample locations	throughout Phase Two Property	<0.02
m/p-Xylene	all sample locations	throughout Phase Two Property	<0.05
o-Xylene	all sample locations	throughout Phase Two Property	<0.05
Xylenes, total	all sample locations	throughout Phase Two Property	<0.05
<b>Polycyclic Aromatic Hydrocarbons</b>			
Acenaphthene	all sample locations	throughout Phase Two Property	<0.02
Acenaphthylene	all sample locations	throughout Phase Two Property	<0.02
Anthracene	all sample locations	throughout Phase Two Property	<0.02
Benzo[a]anthracene	all sample locations	throughout Phase Two Property	<0.02
Benzo[a]pyrene	all sample locations	throughout Phase Two Property	<0.02
Benzo[b]fluoranthene	all sample locations	throughout Phase Two Property	<0.02
Benzo[g,h,i]perylene	all sample locations	throughout Phase Two Property	<0.02
Benzo[k]fluoranthene	all sample locations	throughout Phase Two Property	<0.02
Chrysene	all sample locations	throughout Phase Two Property	<0.02
Dibenzo[a,h]anthracene	all sample locations	throughout Phase Two Property	<0.02
Fluoranthene	all sample locations	throughout Phase Two Property	<0.02
Fluorene	all sample locations	throughout Phase Two Property	<0.02
Indeno[1,2,3-cd]pyrene	all sample locations	throughout Phase Two Property	<0.02
1-Methylnaphthalene	all sample locations	throughout Phase Two Property	<0.02
2-Methylnaphthalene	all sample locations	throughout Phase Two Property	<0.02
Methylnaphthalene (1&2)	all sample locations	throughout Phase Two Property	<0.04
Naphthalene	all sample locations	throughout Phase Two Property	<0.01
Phenanthrene	all sample locations	throughout Phase Two Property	<0.02
Pyrene	all sample locations	throughout Phase Two Property	<0.02

Notes:

**Exceeds Table 1 SCS**

**Table 6: Summary of Ground Water Analyses for Metals**

**Client:** GR (CAN) Investments Co. Ltd.  
**Site:** Proposed Thundering Waters Subdivision, Niagara Falls, Ontario  
**Project:** TG151118 TG161164



Sample ID				BH/MW101	BH/MW102	BH/MW103	BH/MW104	BH/MW201	BH/MW202	Dup A	Relative Percent Difference (BH/MW 202 & Dup A)	BH/MW202	Dup A	Relative Percent Difference (BH/MW 202 & Dup A)	
Date Collected				20-Jan-16	20-Jan-16	20-Jan-16	20-Jan-16	20-Jan-16	20-Jan-16	20-Jan-16	(Field duplicate of BH/MW 202)	03-Jan-17	03-Jan-17	(Field duplicate of BH/MW 202)	
Laboratory ID				1604330-05	1604330-04	1604330-07	1604330-06	1604330-03	1604330-01	1604330-02		1701115-01	1701115-02		
Parameter	Units	MDL	Table 1 SCS <sup>a</sup>												
<b>Metals</b>															
Antimony	µg/L	0.5	1.5	<	<	<	<	<	<	<	NC	<	<	<	NC
Arsenic	µg/L	1	13	<	<	<	1	<	<	<	NC	<	<	<	NC
Barium	µg/L	1	610	198	75	42	23	18	25	25	0%	25	25	0%	0%
Beryllium	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	<	<	<	NC
Boron (total)	µg/L	10	1700	114	385	369	299	92	124	115	8%	71	68	4%	4%
Cadmium	µg/L	0.1	0.5	<	<	<	<	<	<	<	NC	<	<	<	NC
Chromium (total)	µg/L	1	11	<	<	<	<	<	<	<	NC	<	<	<	NC
Cobalt	µg/L	0.5	3.8	0.7	0.6	<b>5.0</b>	1.7	<	<	<	NC	<	<	<	NC
Copper	µg/L	0.5	5	<	1.0	1.9	1.9	0.7	<	0.8	NC	<	<	<	NC
Lead	µg/L	0.1	1.9	<	<	<	<	<	<	<	NC	<	<	<	NC
Molybdenum	µg/L	0.5	23	0.7	7.6	4.5	5.6	<	0.6	<	NC	<	<	<	NC
Nickel	µg/L	1	14	<	2	8	4	<	2	2	NC	1	1	<	NC
Selenium	µg/L	1	5	<	1	2	2	<	<	<	NC	1	<	<	NC
Silver	µg/L	0.1	0.3	<	<	<	<	<	<b>0.5</b>	<	NC	<	<	<	NC
Thallium	µg/L	0.1	0.5	<	<	<	<	<	<	<	NC	<	<	<	NC
Uranium	µg/L	0.1	8.9	0.5	6.1	<b>53.7</b>	<b>25.6</b>	5.5	8.5	8.5	0%	8.1	7.9	2%	2%
Vanadium	µg/L	0.5	3.9	<	0.6	1.2	0.9	<	<	<	NC	<	<	<	NC
Zinc	µg/L	5	160	<	<	8	6	12	<	<	NC	<	<	<	NC

**Notes:**

"a" - Table 1: Full Depth Background Site Condition Standards, for All Types of Property Use; established in "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", Ontario Ministry of the Environment, 15 April 2011 (MOE).

**Bolded** values exceed the Table 1 SCS.

"µg/L" - micrograms per Litre, parts per billion.

"MDL" - method detection limit.

"<" - sample results less than the MDL.

"-" - not applicable or parameter not analyzed.

"RPD" - relative percent difference.

"NC" - RPD not calculable as both values are not greater than 5x the MDL.

**Bold** - means RPD outside of the sample duplicate value as outlined in the 2011 Analytical Protocol (Metals 20%).

**Table 7: Summary of Ground Water Analyses for VOCs and PHCs**



**Client:** GR (CAN) Investments Co. Ltd.  
**Site:** Proposed Thundering Waters Subdivision, Niagara Falls, Ontario  
**Project:** TG151118

Sample ID				BH/MW 101	BH/MW 102	BH/MW103	BH/MW 104	BH/MW 201	BH/MW 202	Dup A (Field duplicate of BH/MW 202)	Relative Percent Difference (BH/MW 202 & Dup A)	Trip Spike	Trip Blank	Field Blank	
Date Collected				20-Jan-16	20-Jan-16	20-Jan-16	20-Jan-16	20-Jan-16	20-Jan-16	20-Jan-16		18-Jan-16	18-Jan-16	20-Jan-16	
Laboratory ID				1604330-05	1604330-04	1604330-07	1604330-06	1604330-03	1604330-01	1604330-02		1604330-09	1604330-08	1604330-10	
Parameter	Units	MDL	Table 1 SCS <sup>a</sup>												
<b>Volatile Organic Compounds</b>															
Acetone	µg/L	5.0	2700	<	<	<	<	<	<	<	NC	98.5	<	<	
Benzene	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	26.3	<	<	
Bromodichloromethane	µg/L	0.5	2	<	<	<	<	<	<	<	NC	30.0	<	<	
Bromoform	µg/L	0.5	5	<	<	<	<	<	<	<	NC	47.1	<	<	
Bromomethane	µg/L	0.5	0.89	<	<	<	<	<	<	<	NC	23.5	<	<	
Carbon Tetrachloride	µg/L	0.2	0.2	<	<	<	<	<	<	<	NC	33.8	<	<	
Chlorobenzene	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	38.0	<	<	
Chloroform	µg/L	0.5	2	<	<	<	<	<	<	<	NC	28.5	<	<	
Dibromochloromethane	µg/L	0.5	2	<	<	<	<	<	<	<	NC	48.1	<	<	
Dichlorodifluoromethane	µg/L	1.0	590	<	<	<	<	<	<	<	NC	21.7	<	<	
1,2-Dichlorobenzene	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	42.1	<	<	
1,3-Dichlorobenzene	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	39.6	<	<	
1,4-Dichlorobenzene	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	39.6	<	<	
1,1-Dichloroethane	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	32.5	<	<	
1,2-Dichloroethane	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	32.5	<	<	
1,1-Dichloroethylene	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	27.9	<	<	
cis-1,2-Dichloroethylene	µg/L	0.5	1.6	<	<	<	<	<	<	<	NC	31.8	<	<	
trans-1,2-Dichloroethylene	µg/L	0.5	1.6	<	<	<	<	<	<	<	NC	29.8	<	<	
1,2-Dichloropropane	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	27.1	<	<	
cis-1,3-Dichloropropylene	µg/L	0.5	-	<	<	<	<	<	<	<	NC	29.5	<	<	
trans-1,3-Dichloropropylene	µg/L	0.5	-	<	<	<	<	<	<	<	NC	29.0	<	<	
1,3-Dichloropropene, total	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	58.5	<	<	
Ethylbenzene	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	42.8	<	<	
Ethylene dibromide (dibromoethane)	µg/L	0.2	0.2	<	<	<	<	<	<	<	NC	39.1	<	<	
Hexane	µg/L	1.0	5	<	<	<	<	<	<	<	NC	27.8	<	<	
Methyl Ethyl Ketone (2-Butanone)	µg/L	5.0	400	<	<	<	<	<	<	<	NC	107	<	<	
Methyl Isobutyl Ketone	µg/L	5.0	640	<	<	<	<	<	<	<	NC	87.6	<	<	
Methyl tert-butyl ether	µg/L	2.0	15	<	<	<	<	<	<	<	NC	88.1	<	<	
Methylene Chloride	µg/L	5.0	5	<	<	<	<	<	<	<	NC	30.2	<	<	
Styrene	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	44.7	<	<	
1,1,1,2-Tetrachloroethane	µg/L	0.5	1.1	<	<	<	<	<	<	<	NC	45.5	<	<	
1,1,2,2-Tetrachloroethane	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	38.0	<	<	
Tetrachloroethylene	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	40.5	<	<	
Toluene	µg/L	0.5	0.8	<	<	<	<	<	<	<	NC	39.2	<	<	
1,1,1-Trichloroethane	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	32.5	<	<	
1,1,2-Trichloroethane	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	27.1	<	<	
Trichloroethylene	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	29.5	<	<	
Trichlorofluoromethane	µg/L	1.0	150	<	<	<	<	<	<	<	NC	28.4	<	<	
Vinyl Chloride	µg/L	0.5	0.5	<	<	<	<	<	<	<	NC	23.4	<	<	
m/p-Xylene	µg/L	0.5	-	<	<	<	<	<	<	<	NC	85.0	<	<	
o-Xylene	µg/L	0.5	-	<	<	<	<	<	<	<	NC	44.4	<	<	
Xylenes, total	µg/L	0.5	72	<	<	<	<	<	<	<	NC	129	<	<	
<b>Petroleum Hydrocarbons</b>															
F1 PHCs (C6-C10)	µg/L	25	420	<	<	<	<	<	<	<	NC	-	-	-	
F2 PHCs (C10-C16)	µg/L	100	150	<	<	<	<	<	<	<	NC	-	-	-	
F3 PHCs (C16-C34)	µg/L	100	500	<	<	<	<	<	<	<	NC	-	-	-	
F4 PHCs (C34-C50)	µg/L	100	500	<	<	<	<	<	<	<	NC	-	-	-	

Notes:  
<sup>a</sup> - Table 1: Full Depth Background Site Condition Standards, for All Types of Property Use; established in "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", Ontario Ministry of the Environment, 15 April 2011 (MOE).  
**Bolded** values exceed the Table 1 SCS.  
<sup>a</sup>µg/L<sup>b</sup> - micrograms per Litre, parts per billion.  
<sup>c</sup>MDL<sup>c</sup> - method detection limit.  
<sup>d</sup>< - sample results less than the MDL.  
<sup>e</sup>- - not applicable or parameter not analyzed.  
<sup>f</sup>RPD<sup>f</sup> - relative percent difference.  
<sup>g</sup>NC<sup>g</sup> - RPD not calculable as both values are not greater than 5x the MDL.  
**Bold** - means RPD outside of the sample duplicate value as outlined in the 2011 Analytical Protocol (VOCs 30% - PHCs 30%).  
 Trip Spike sample for VOCs prepared at 40 µg/L for all parameters except m/p-Xylene (80 µg/L for) and ketones (100 µg/L).

**Table 8: Maximum Concentrations for Analytical Results for Ground Water**

**Client:** GR (CAN) Investments Co. Ltd.  
**Site:** Proposed Thundering Waters Subdivision, Niagara Falls, Ontario  
**Project:** TG151118



Parameter	Sample ID	Location	Maximum Concentration (µg/L)
<b>Metals</b>			
Antimony	all sample locations	throughout Phase Two Property	<0.5
Arsenic	BH/MW104	northwestern portion of Phase Two Property	1
Barium	BH/MW101	southwestern portion of Phase Two Property	198
Beryllium	all sample locations	throughout Phase Two Property	<0.5
Boron	BH/MW102	southwestern portion of Phase Two Property	385
Cadmium	all sample locations	throughout Phase Two Property	<0.1
Chromium	all sample locations	throughout Phase Two Property	<1
Cobalt	BH/MW103	southeastern portion of Phase Two Property	<b>5.0</b>
Copper	BH/MW103 & BH/MW104	southeastern & northwestern portions of Phase Two Property	1.9
Lead	all sample locations	throughout Phase Two Property	<0.1
Molybdenum	BH/MW102	southwestern portion of Phase Two Property	7.6
Nickel	BH/MW103	southeastern portion of Phase Two Property	8
Selenium	BH/MW103 & BH/MW104	southeastern & northwestern portions of Phase Two Property	2
Silver	BH/MW202	southwestern portion of Phase Two Property	<b>0.5</b>
Thallium	all sample locations	throughout Phase Two Property	<0.1
Uranium	BH/MW103	southeastern portion of Phase Two Property	<b>53.7</b>
Vanadium	BH/MW103	southeastern portion of Phase Two Property	1.2
Zinc	BH/MW201	south central portion of Phase Two Property	12
<b>Petroleum Hydrocarbons</b>			
F1 PHCs (C6-C10)	all sample locations	throughout Phase Two Property	<25
F2 PHCs (C10-C16)	all sample locations	throughout Phase Two Property	<100
F3 PHCs (C16-C34)	all sample locations	throughout Phase Two Property	<100
F4 PHCs (C34-C50)	all sample locations	throughout Phase Two Property	<100
<b>Volatile Organic Compounds</b>			
Acetone	all sample locations	throughout Phase Two Property	<5.0
Benzene	all sample locations	throughout Phase Two Property	<0.5
Bromodichloromethane	all sample locations	throughout Phase Two Property	<0.5
Bromoform	all sample locations	throughout Phase Two Property	<0.5
Bromomethane	all sample locations	throughout Phase Two Property	<0.5
Carbon Tetrachloride	all sample locations	throughout Phase Two Property	<0.2
Chlorobenzene	all sample locations	throughout Phase Two Property	<0.5
Chloroform	all sample locations	throughout Phase Two Property	<0.5
Dibromochloromethane	all sample locations	throughout Phase Two Property	<0.5
Dichlorodifluoromethane	all sample locations	throughout Phase Two Property	<1.0
1,2-Dichlorobenzene	all sample locations	throughout Phase Two Property	<0.5
1,3-Dichlorobenzene	all sample locations	throughout Phase Two Property	<0.5
1,4-Dichlorobenzene	all sample locations	throughout Phase Two Property	<0.5
1,1-Dichloroethane	all sample locations	throughout Phase Two Property	<0.5
1,2-Dichloroethane	all sample locations	throughout Phase Two Property	<0.5
1,1-Dichloroethylene	all sample locations	throughout Phase Two Property	<0.5
cis-1,2-Dichloroethylene	all sample locations	throughout Phase Two Property	<0.5
trans-1,2-Dichloroethylene	all sample locations	throughout Phase Two Property	<0.5
1,2-Dichloropropane	all sample locations	throughout Phase Two Property	<0.5
cis-1,3-Dichloropropylene	all sample locations	throughout Phase Two Property	<0.5
trans-1,3-Dichloropropylene	all sample locations	throughout Phase Two Property	<0.5
1,3-Dichloropropene, total	all sample locations	throughout Phase Two Property	<0.5
1,2-Dibromoethane	all sample locations	throughout Phase Two Property	<0.2
Ethylbenzene	all sample locations	throughout Phase Two Property	<0.5
Hexane	all sample locations	throughout Phase Two Property	<1.0
Methyl Ethyl Ketone (2-Butanone)	all sample locations	throughout Phase Two Property	<5.0
Methyl Isobutyl Ketone	all sample locations	throughout Phase Two Property	<5.0
Methyl tert-butyl ether	all sample locations	throughout Phase Two Property	<2.0
Methylene Chloride	all sample locations	throughout Phase Two Property	<5.0
Styrene	all sample locations	throughout Phase Two Property	<0.5
1,1,1,2-Tetrachloroethane	all sample locations	throughout Phase Two Property	<0.5
1,1,2,2-Tetrachloroethane	all sample locations	throughout Phase Two Property	<0.5
Tetrachloroethylene	all sample locations	throughout Phase Two Property	<0.5
Toluene	all sample locations	throughout Phase Two Property	<0.5
1,1,1-Trichloroethane	all sample locations	throughout Phase Two Property	<0.5
1,1,2-Trichloroethane	all sample locations	throughout Phase Two Property	<0.5
Trichloroethylene	all sample locations	throughout Phase Two Property	<0.5
Trichlorofluoromethane	all sample locations	throughout Phase Two Property	<1.0
Vinyl Chloride	all sample locations	throughout Phase Two Property	<0.5
m/p-Xylene	all sample locations	throughout Phase Two Property	<0.5
o-Xylene	all sample locations	throughout Phase Two Property	<0.5
Xylenes, total	all sample locations	throughout Phase Two Property	<0.5

Notes:

**Exceeds Table 1 SCS**



**APPENDIX A**

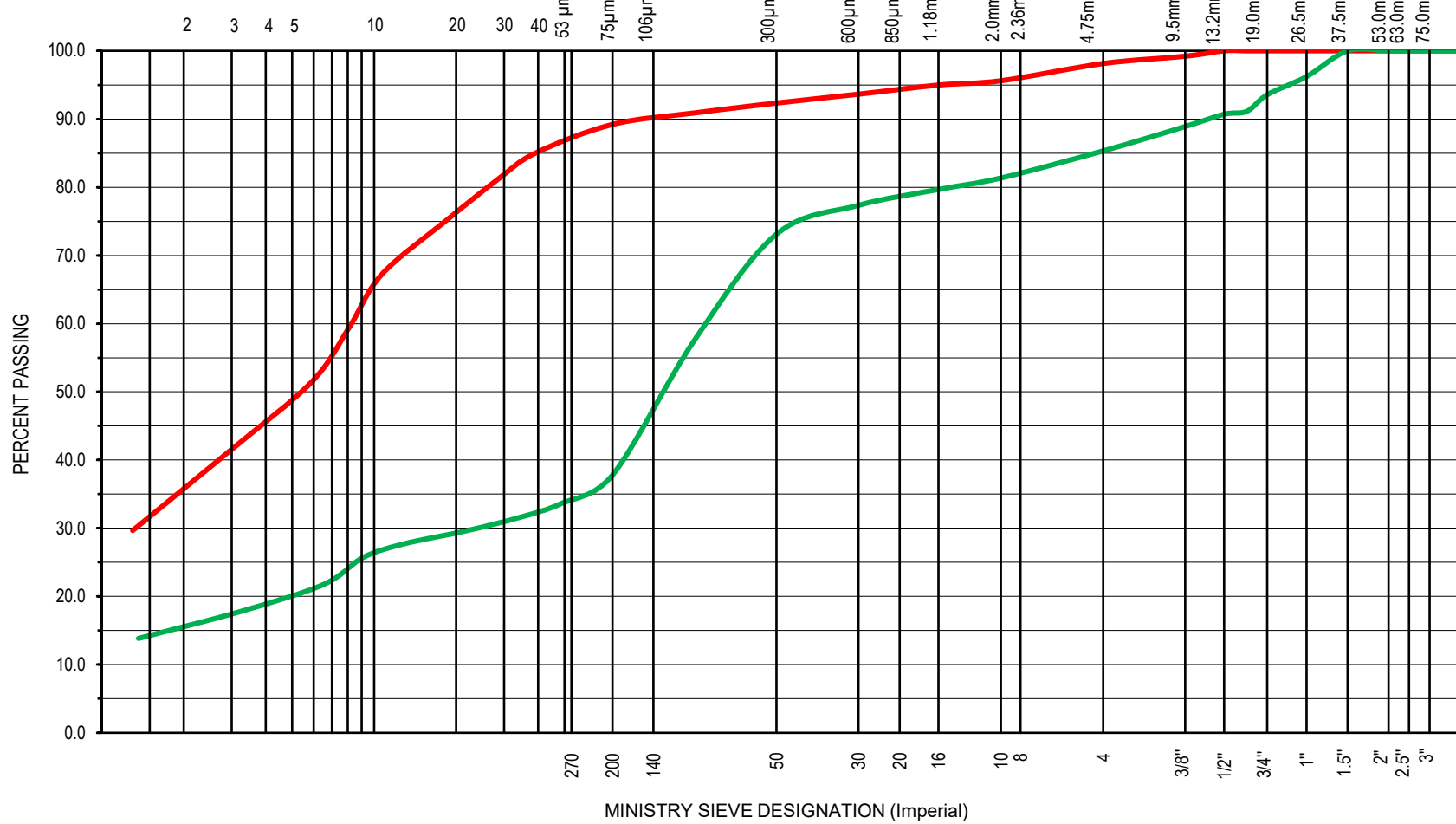
**GRAIN SIZE ANALYSIS,  
BOREHOLE/MONITORING WELL & TESTPIT LOGS**

# UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT	SAND			GRAVEL	
	Fine	Medium	Coarse	Fine	Coarse

MINISTRY SIEVE DESIGNATION (Metric)

GRAIN SIZE IN MICROMETERS



— TP 112-6 & 108-4

— TP 119-4 & 121-4

CLIENT <p style="text-align: center;"><b>GR (CAN) Investments Co. Ltd.</b></p>	PREPARED BY <p style="text-align: center;">AM</p>	PROJECT <p style="text-align: center;"><b>Thundering Waters Remaining Lands</b></p>	DATE <p style="text-align: center;">March 18, 2016</p>
Amec Foster Wheeler Environment & Infrastructure 3300 Merrittville Highway, Unit #5 Thorold, Ontario	CHECKED BY <p style="text-align: center;">PS</p>	TITLE <p style="text-align: center;">Grain Size Distribution</p>	PROJECT NO <p style="text-align: center;">TG151118</p>
			FIGURE NO

# RECORD OF MONITORING WELL No. **BH/MW-101**

Project Number: **TG151118** Drilling Method: **100 mm Direct Push**  
 Project Client: **GR (CAN) Investments Co. Ltd.** Drilling Machine: **Geoprobe 7822 DT**  
 Project Name: **Phase Two Environmental Site Assessment** Date Started: **3 Dec 15** Date Completed: **3 Dec 15**  
 Project Location: **Proposed Thundering Waters Subdivision** Logged by: **DN** Compiled by: **DN**  
 Drilling Location: **4768139N; 653800E** Reviewed by: **PS** Revision No.: **0, 22/3/16**



Lithology Plot	LITHOLOGY PROFILE		SOIL SAMPLING				FIELD TESTING		SOIL SCREENING				INSTRUMENTATION INSTALLATION	COMMENTS
	DESCRIPTION	DEPTH (m)	ELEVATION (m)	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	Penetration Testing ○ SPT ● DCPT	* Combustible Organic Vapour (ppm)	* Combustible Organic Vapour (%LEL)	△ Total Organic Vapour (ppm)			
	Local Ground Surface Elevation: 180.8 m													
	100 mm TOPSOIL	180.7												
	Brown SILTY CLAY FILL trace sand, gravel, rootlets dtp	0.1		SS	1	17	N/A							
		179.3												
	Brown SILTY SAND FILL saturated	1.5		SS	2A	100	N/A							
		179.1												
	Brown SILTY CLAY FILL trace sand seams	1.7												
		177.7												
	Brown SILTY SAND FILL saturated	3.0		SS	3A	100	N/A							
		176.4												
	Brown PEAT / ORGANICS trace rootlets saturated	4.4		SS	3B	100	N/A							
		176.2												
	Brown SILTY CLAY trace sand seams	4.6												
		174.7												
	BOREHOLE TERMINATED	6.1												

Sample BH/MW-101 SS1 submitted for laboratory analysis for metals and inorganics, pH, EC, and SAR.

Sample BH/MW-101 SS2A submitted for laboratory analysis for PHC (F1-F4) and BTEX.

Upon Completion: Borehole remained open and water level 5.18± mbgs.  
 Monitoring Well Installation: 3.2cm diameter schedule 40 pipe with 3.0m length #10 mil slotted screen, stick-up casing. No evidence of free flowing product.

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 Thorold, Ontario L2V 4Y6  
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 Fax: (905) 687-6620  
 www.amecfw.com

∇ Groundwater depth encountered on completion of drilling: **5.2 m.**  
 ∇ Groundwater depth observed on **01/20/2016** at a depth of: **3.1 m.**

Borehole details as presented, do not constitute a thorough understanding of all potential conditions present. Also, borehole information should be read in conjunction with the environmental report for which it was commissioned.



# RECORD OF MONITORING WELL No. **BH/MW-102**

Project Number: **TG151118** Drilling Method: **100 mm Direct Push**  
 Project Client: **GR (CAN) Investments Co. Ltd.** Drilling Machine: **Geoprobe 7822 DT**  
 Project Name: **Phase Two Environmental Site Assessment** Date Started: **2 Dec 15** Date Completed: **2 Dec 15**  
 Project Location: **Proposed Thundering Waters Subdivision** Logged by: **DN** Compiled by: **DN**  
 Drilling Location: **4767866N; 654080E** Reviewed by: **PS** Revision No.: **0, 22/3/16**



Lithology Plot	LITHOLOGY PROFILE		SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING				SOIL SCREENING				INSTRUMENTATION INSTALLATION	COMMENTS
	DESCRIPTION	Local Ground Surface Elevation: 183.0 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value			Penetration Testing	SPT	DCPT	Combusible Organic Vapour (ppm)	Combusible Organic Vapour (%LEL)	Total Organic Vapour (ppm)				
	100 mm TOPSOIL	182.9	SS	1A	100	N/A												
	Brown SILTY CLAY FILL trace gravel dtpl	182.6																
	Brown SILTY CLAY trace sand, gravel, shale pieces dtpl	182.4	SS	1B	78	N/A	1	182									Sample BH/MW-102 SS1A submitted for laboratory analysis for metals and inorganics, pH, EC, and SAR.	
	grey dtpl-apl	180.7	SS	2	57	N/A	2	181										
	apl-wtpl	180.0					3	180										
			SS	3	12	N/A	4	179									Sample BH/MW-102 SS3 submitted for laboratory analysis for PHC (F1-F4) and BTEX.	
							5	178										
			SS	4	12	N/A	6	177									Upon Completion: Borehole remained open and dry. Monitoring Well Installation: 3.2cm diameter schedule 40 pipe with 3.0m length #10 mil slotted screen, stick-up casing. No evidence of free flowing product.	
	BOREHOLE TERMINATED	176.9																
		6.1																

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∇ No freestanding groundwater measured in open borehole on completion of drilling.  
 ∇ Groundwater depth observed on 01/20/2016 at a depth of: 3.7 m.

Borehole details as presented, do not constitute a thorough understanding of all potential conditions present. Also, borehole information should be read in conjunction with the environmental report for which it was commissioned.

Scale: 1 : 36  
 Page: 1 of 1



# RECORD OF MONITORING WELL No. **BH/MW-103**

Project Number: **TG151118** Drilling Method: **100 mm Direct Push**  
 Project Client: **GR (CAN) Investments Co. Ltd.** Drilling Machine: **Geoprobe 7822 DT**  
 Project Name: **Phase Two Environmental Site Assessment** Date Started: **2 Dec 15** Date Completed: **2 Dec 15**  
 Project Location: **Proposed Thundering Waters Subdivision** Logged by: **DN** Compiled by: **DN**  
 Drilling Location: **4768013N; 654716E** Reviewed by: **PS** Revision No.: **0, 22/3/16**



**amec  
foster  
wheeler**

Lithology Plot	LITHOLOGY PROFILE		SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING				SOIL SCREENING				INSTRUMENTATION INSTALLATION	COMMENTS	
	DESCRIPTION	Local Ground Surface Elevation: 175.3 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value			Penetration Testing	* Combustible Organic Vapour (ppm)			* Combustible Organic Vapour (%LEL)			△ Total Organic Vapour (ppm)			
								○ SPT	● DCPT	20	40	60	80	100	200	300	400		
	150 mm TOPSOIL	175.1																	
	Brown SILTY SAND FILL trace rootlets dtpl	174.8	SS	1A	100	N/A	175												Sample BH/MW-103 SS1A submitted for laboratory analysis for metals and inorganics, pH, EC, and SAR.
	Brown SILTY CLAY trace sand, reddish grey seams dtpl	173.8	SS	1B	100	N/A	174												
	Reddish brown trace sand and gravel dtpl	172.2	SS	2	85	N/A	173												
	dtpl-apl	172.2					172												
			SS	3	100	N/A	171												Sample BH/MW-103 SS3 submitted for laboratory analysis for PHC (F1-F4) and BTEX.
	grey with brown seams apl-wtpl	169.8					170												
		169.2	SS	4	100	N/A													Upon Completion: Borehole remained open and dry. Monitoring Well Installation: 3.2cm diameter schedule 40 pipe with 3.0m length #10 mil slotted screen, stick-up casing. No evidence of free flowing product.
	BOREHOLE TERMINATED	169.2					6												

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 www.amecfw.com

∇ No freestanding groundwater measured in open borehole on completion of drilling.  
 ∇ Groundwater depth observed on 01/20/2016 at a depth of: 4.8 m.

Borehole details as presented, do not constitute a thorough understanding of all potential conditions present. Also, borehole information should be read in conjunction with the environmental report for which it was commissioned.

Scale: 1 : 36  
Page: 1 of 1

# RECORD OF MONITORING WELL No. **BH/MW-104**

Project Number: **TG151118** Drilling Method: **100 mm Direct Push**  
 Project Client: **GR (CAN) Investments Co. Ltd.** Drilling Machine: **Geoprobe 7822 DT**  
 Project Name: **Phase Two Environmental Site Assessment** Date Started: **2 Dec 15** Date Completed: **2 Dec 15**  
 Project Location: **Proposed Thundering Waters Subdivision** Logged by: **DN** Compiled by: **DN**  
 Drilling Location: **4768931N; 653562E** Reviewed by: **PS** Revision No.: **0, 22/3/16**



Lithology Plot	LITHOLOGY PROFILE		SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING				SOIL SCREENING				INSTRUMENTATION INSTALLATION	COMMENTS
	DESCRIPTION	Local Ground Surface Elevation: 180.5 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value			Penetration Testing	SPT	DCPT	Combusible Organic Vapour (ppm)	Combusible Organic Vapour (%LEL)	Total Organic Vapour (ppm)				
	150 mm TOPSOIL	180.3																
	Brown SILTY CLAY / CLAYEY SILT trace reddish grey seams trace rootlets dtpl	180.2	SS	1	100	N/A	1	180	0.0				130				Sample BH/MW-104 SS1 submitted for laboratory analysis for metals.	
							2	179					150					
			SS	2	92	N/A		178	0.0									
	Brown-reddish brown trace grey seams dtpl-apl	177.4					3	177					110				Sample BH/MW-104 SS3 submitted for laboratory analysis for VOC's and PHC (F1-F4).	
			SS	3	100	N/A		176	0.0									
							4											
							5											
	apl-wtpl	175.0	SS	4	100	N/A		175	0.0				20				Upon Completion: Borehole remained open to 5.49± mbgs and dry. Monitoring Well Installation: 3.2cm diameter schedule 40 pipe with 3.0m length #10 mil slotted screen, stick-up casing. No evidence of free flowing product.	
							6											
	BOREHOLE TERMINATED	174.4																
		6.1																

**Amec Foster Wheeler**  
**Environment & Infrastructure**  
 3300 Merrittville Hwy, Unit 5  
 Thorold, Ontario L2V 4Y6  
 Tel: (905) 687-6616  
 Fax: (905) 687-6620  
 www.amecfw.com

∇ No freestanding groundwater measured in open borehole on completion of drilling.    ▣ Cave in depth after removal of augers: **5.5 m.**  
 ∇ Groundwater depth observed on **01/20/2016** at a depth of: **5.1 m.**

Borehole details as presented, do not constitute a thorough understanding of all potential conditions present. Also, borehole information should be read in conjunction with the environmental report for which it was commissioned.

# RECORD OF MONITORING WELL No. **BH/MW-105**

Project Number: **TG151118** Drilling Method: **100 mm Direct Push**  
 Project Client: **GR (CAN) Investments Co. Ltd.** Drilling Machine: **Geoprobe 7822 DT**  
 Project Name: **Phase Two Environmental Site Assessment** Date Started: **2 Dec 15** Date Completed: **2 Dec 15**  
 Project Location: **Proposed Thundering Waters Subdivision** Logged by: **DN** Compiled by: **DN**  
 Drilling Location: **4769009N; 654453E** Reviewed by: **PS** Revision No.: **0, 22/3/16**



Lithology Profile	DESCRIPTION	SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING				SOIL SCREENING				INSTRUMENTATION INSTALLATION	COMMENTS
		Sample Type	Sample Number	Recovery (%)	SPT 'N' Value			Penetration Testing ○ SPT ● DCPT				* Combustible Organic Vapour (ppm) ◆ Combustible Organic Vapour (%LEL) △ Total Organic Vapour (ppm)					
	Local Ground Surface Elevation: 181.6 m																
	150 mm TOPSOIL 181.4																
	Brown SILTY CLAY trace sand, reddish seams, rootlets dtp1 181.0	SS	1	85	N/A	1	181.0									Sample BH/MW-105 SS1 submitted for laboratory analysis for metals.	
	reddish grey seams 179.3																
	2.3	SS	2	100	N/A	2	179.3										
	reddish brown-grey trace gravel, reddish grey layers apl-wpl 177.0																
	4.6																
	177.0	SS	3	100	N/A	3	177.0										
	reddish brown-grey trace gravel, reddish grey layers apl-wpl 175.5																
	4.6																
	175.5	SS	4	100	N/A	4	175.5										
	BOREHOLE TERMINATED 175.5																
	6.1																
	175.5																
	6.1																
	175.5																
	6.1																
	175.5																
	6.1																
	175.5																
	6.1																

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∞ No freestanding groundwater measured in open borehole on completion of drilling.

Borehole details as presented, do not constitute a thorough understanding of all potential conditions present. Also, borehole information should be read in conjunction with the environmental report for which it was commissioned.

Scale: 1 : 36  
 Page: 1 of 1

**RECORD OF BOREHOLE No BH/MW 4** 1 OF 1

PROJECT Environmental Phase II LOCATION (refer to Borehole location plan) ORIGINATED BY KS/RVH  
 CLIENT Mountainview Homes Niagara Ltd. COMPILED BY KS  
 JOB NO. TG51160 DATE February 2, 2006 EQUIPMENT \_\_\_\_\_ CHECKED BY RS

ELEV DEPTH	SOIL PROFILE DESCRIPTION	STRAT PLOT	SAMPLES			GROUND WATER CONDITIONS	DEPTH (m)	STANDARD PENETRATION TEST □ DYNAMIC PENETRATION TEST ■					▼ Total Organic Vapour % LEL				OBSERVATIONS & REMARKS	
			NUMBER	TYPE	"N" VALUES			20	40	60	80	100	20	40	60	80		
							SHEAR STRENGTH (kPa)					● Total Organic Vapour ppm						
							○ UNCONFINED	▲ FIELD VANE										
							● QUICK TRIAXIAL	◆ LAB VANE										
							20	40	60	80	100	100	200	300	400			
180.5 0.0	Grass overlying brown to red-brown FILL: Silty Clay to Clayey Silt, trace Sand and fine Gravel, sdtp/ to wtpl, firm.	[Hatched pattern]	1	SS	4	[Water level indicator]	□									20ppm		
			2	SS	6		□											0ppm
			3	SS	5		□											25ppm
			4	SS	8		□											400ppm
175.3 5.2	Brown to Red-brown SILTY CLAY TO CLAYEY SILT, with trace Sand, grey- fissures, red Clay pockets/zones, Sand seams, dtpl to swtpl, very stiff.	[Hatched pattern]	5	SS	16	[Water level indicator]	□									280ppm	Split Spoon wet upon retrieval.	
			6	SS	29		□											95ppm
173.8 6.7	Borehole Terminated.															Upon completion: Borehole open and water level at 1.0 mbgs.		

**RECORD OF BOREHOLE No BH/MW 5** 1 OF 1

PROJECT Environmental Phase II LOCATION (refer to Borehole location plan) ORIGINATED BY KS/RVH  
 CLIENT Mountainview Homes Niagara Ltd. COMPILED BY KS  
 JOB NO. TG51160 DATE January 31, 2006 EQUIPMENT \_\_\_\_\_ CHECKED BY RS

ELEV DEPTH	SOIL PROFILE DESCRIPTION	STRAT PLOT	SAMPLES			GROUND WATER CONDITIONS	DEPTH (m)	STANDARD PENETRATION TEST DYNAMIC PENETRATION TEST					Total Organic Vapour % LEL				OBSERVATIONS & REMARKS				
			NUMBER	TYPE	"N" VALUES			20	40	60	80	100	20	40	60	80					
177.2 0.0	<b>FILL:</b> Brown to red-brown Silty Clay to Clayey Silt, with trace of Gravel, fissures, silt seams, firm to stiff, dtpl to wtpl.		1	SS	7		0.0														
			2	SS	9		0.5														
			3	SS	5		1.5														
			4	SS	5		2.5														
174.0 3.2	<b>Black BURIED TOPSOIL,</b> clayey organics, rootlets, moist to wet.		5	SS	9		3.0												Split Spoon wet upon retrieval.		
173.7 3.5			6	SS	24		3.5														
172.6 4.6	<b>Borehole Terminated.</b>																		Upon completion: Borehole open and water level at 3.1 mbgs.		



Phase Two Environmental Site Assessment  
 Site Location: Thundering Waters, Niagara Falls, Ontario  
 Job Number: TG151118  
 Date: December 8, 9 & 18, 2015



**TESTPIT LOG: TP101**

**Ground Surface Elevation: 181.52 m**

**UTM Co-ordinates: 653842 E, 4768127 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
	0.5	100 / 0	No odours or staining.	0-0.15	Brown <b>Topsoil</b>
	1.0	90 / 0		0.15-1.0	<b>Fill:</b> Brown Silty Clay with organics
	1.5	70 / 0		1.0-2.0	<b>Fill:</b> Brown Silty Clay, trace sand and medium gravel with small medium cobbles
	2.0	65 / 1			
TP101-5 (Metals & pH)	2.5	85 / 0		2-2.5	<b>Fill:</b> Grey Silty Sand.
	3.0	70 / 0		2.5-3.0	Grey <b>Silty Clay</b> trace fine gravel, wtpl

Upon completion: Testpit open and dry @3.0m.

Testpits excavated with CAT 420F Backhoe

Originated & compiled by: MS  
 Checked By: PS

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million

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**TESTPIT LOG: TP102** **Ground Surface Elevation: 180.58 m** **UTM Co-ordinates: 653854 E, 4768193 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
TP102-1 (Metals)	0.5	--	No odours or staining.	0-0.0.5	Brown Silty Clay <b>Topsoil</b>
	1.0	--		0.5-1.0	<b>Fill:</b> Brown Silty Clay with organics, dtpl
	1.5	--		1.0-1.5	Brown <b>Silty Clay</b> with grey seams and trace fine/medium gravel, dtpl/apl

Upon completion: Testpit open and dry @1.5m.

**TESTPIT LOG: TP103** **Ground Surface Elevation: 181.87 m** **UTM Co-ordinates: 653712 E, 4768090 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
TP103-1 (Metals)	0.5	75 / 0	No odours or staining.	0-0.15	<b>Fill:</b> Brown Silty Clay Topsoil over brown Silty Clay, trace organics, dtpl
	1.0	30 / 0		0.15-1.5	Brown <b>Silty Clay</b> , trace fine gravel with grey seams, dtpl/apl
	1.5	35 / 0			

Upon completion: Testpit open and dry @1.5m.

Testpits excavated with CAT 420F Backhoe

Originated & compiled by: MS  
 Checked By: PS

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million

Phase Two Environmental Site Assessment  
 Site Location: Thundering Waters, Niagara Falls, Ontario  
 Job Number: TG151118  
 Date: December 8, 9 & 18, 2015



**TESTPIT LOG: TP104**

**Ground Surface Elevation: 180.75 m**

**UTM Co-ordinates: 653702 E, 4767932 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
TP104-1 (Metals)	0.5	95 / 0	No odours or staining.	0-0.1.5	<b>Fill:</b> Topsoil over brown Silty Clay with trace organics, trace fine gravel, dtpl
	1.0	90 / 1		1.5-2	Brown/Grey <b>Silty Clay</b> trace fine gravel, dtpl/apl
	1.5	75 / 1		2-2.5	Brown/Grey <b>Silty Clay</b> trace fine gravel, some greenish streaks at 2m, dtpl/apl
	2.0	95 / 1			
	2.5	80 / 0		2.5-3	Brown/Grey <b>Silty Clay</b> trace fine gravel, no streaks, dtpl/apl
	3.0	85 / 0			

Upon completion: Testpit open and dry @3.0m.

Testpits excavated with CAT 420F Backhoe

Originated & compiled by: MS  
 Checked By: PS

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million

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Phase Two Environmental Site Assessment  
 Site Location: Thundering Waters, Niagara Falls, Ontario  
 Job Number: TG151118  
 Date: December 8, 9 & 18, 2015



**TESTPIT LOG: TP105**

**Ground Surface Elevation: 182.36 m**

**UTM Co-ordinates: 653746 E, 4767997 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
TP105-1 (Metals)	0.5	125 / 0	No odours or staining.	0-2.0	<b>Fill:</b> Brown Silty Clay with medium gravel and rounded cobbles, dtpl/apl
	1.0	130 / 0		2.0-3.0	Brown <b>Silty Clay</b> with trace fine/medium gravel, dtpl/apl
	1.5	85 / 0			
	2.0	80 / 0			
	2.5	70 / 0			
	3.0	80 / 0			

Upon completion: Testpit open and dry @3.0m.

Testpits excavated with CAT 420F Backhoe

Originated & compiled by: MS  
 Checked By: PS

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million

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Phase Two Environmental Site Assessment  
 Site Location: Thundering Waters, Niagara Falls, Ontario  
 Job Number: TG151118  
 Date: December 8, 9 & 18, 2015



**TESTPIT LOG: TP106**

**Ground Surface Elevation: 183.38 m**

**UTM Co-ordinates: 653925 E, 4768000 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
TP106-1 (Metals)	0.5	45 / 0	No odours or staining.	0-0.3	<b>Topsoil</b>
	1.0	50 / 0		0.3-1.0	<b>Fill:</b> Brown Silty Clay with organics over brown Silty Clay with fine/medium gravel with organics, dtpl
	1.5	55 / 0		1.0-2.0	Brown/Grey <b>Silty Clay</b> trace fine gravel, dtpl
	2.0	20 / 0			

Upon completion: Testpit open and dry @2.0m.

**TESTPIT LOG: TP107**

**Ground Surface Elevation: 181.50 m**

**UTM Co-ordinates: 653900 E, 4767883 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
TP107-1 (Metals)	0.5	95 / 0	No odours or staining.	0-1.0	<b>Fill:</b> Silty Clay with fine/medium gravel, trace organics, rounded cobbles
	1.0	75 / 0		1.0-2.0	Brown <b>Silty Clay</b> trace fine/medium gravel
	1.5	80 / 0			
	2.0	75 / 0			

Upon completion: Testpit open and dry @2.0m.

Testpits excavated with CAT 420F Backhoe

Originated & compiled by: MS  
 Checked By: PS

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million

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Phase Two Environmental Site Assessment  
 Site Location: Thundering Waters, Niagara Falls, Ontario  
 Job Number: TG151118  
 Date: December 8, 9 & 18, 2015



**TESTPIT LOG: TP108**

**Ground Surface Elevation: 181.62 m**

**UTM Co-ordinates: 653989 E, 4767858 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
TP108-1 (Metals)	0.5	160 / 0	No odours or staining.	0-0.3	Topsoil
	1.0	175 / 0		0.3-2.0	Brown <b>Silty Clay</b> trace fine gravel, dtpl
	1.5	145 / 0			
	2.0	140 / 0			

Upon completion: Testpit open and dry @2.0m.

**TESTPIT LOG: TP109**

**Ground Surface Elevation: 180.65 m**

**UTM Co-ordinates: 654015 E, 4767792 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
	0.5	80 / 0	No odours or staining.	0-0.3	<b>Fill:</b> Brown Topsoil over brown Silty Clay with trace organics, trace fine/medium gravel
TP109-2 (Metals)	1.0	90 / 0		0.3-1.0	Brown <b>Silty Clay</b> , brown,, some aquatic shells between 0.5-1.0 m
	1.5	60 / 0		1.0-2.0	Brown <b>Silty Clay</b> , trace fine/medium sand, dtpl
	2.0	45 / 0			

Upon completion: Testpit open and dry @2.0m.

Testpits excavated with CAT 420F Backhoe

Originated & compiled by: MS  
 Checked By: PS

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million

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**TESTPIT LOG: TP110**

**Ground Surface Elevation: 180.65 m**

**UTM Co-ordinates: 654109 E, 4767748 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
TP110-1C (Metals & PAHs)	0.5	75 / 0	No odours or staining.	0-0.3	<b>Fill:</b> Topsoil, brown
	1.0	30 / 0		0.3-1.0	<b>Fill:</b> Silty Clay, brown, with trace medium sand, dtpl, some aquatic shells between 0.5-1.0 m
	1.5	35 / 0		1.0-2.0	Brown <b>Silty Clay</b> , trace fine/medium sand, dtpl
	2.0	5 / 0			

Upon completion: Testpit open and dry @2.0m.

**TESTPIT LOG: TP111**

**Ground Surface Elevation: 181.81 m**

**UTM Co-ordinates: 654121 E, 4767832 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
TP111-1 (Metals)	0.5	0 / 0	No odours or staining.	0-0.3	<b>Topsoil</b>
	1.0	50 / 0		0.3-2.0	Brown <b>Silty Clay</b> , trace fine/medium gravel, dtpl/apl
	1.5	45 / 0			
	2.0	20 / 0			

Upon completion: Testpit open and dry @2.0m.

Testpits excavated with CAT 420F Backhoe

Originated & compiled by: MS  
 Checked By: PS

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million

Phase Two Environmental Site Assessment  
 Site Location: Thundering Waters, Niagara Falls, Ontario  
 Job Number: TG151118  
 Date: December 8, 9 & 18, 2015



**TESTPIT LOG: TP112**

**Ground Surface Elevation: 183.40 m**

**UTM Co-ordinates: 654039 E, 4767903 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
	0.5	50 / 1	No odours or staining.	0-0.3	<b>Fill:</b> Brown Topsoil over Silty Clay with trace sand and gravel with cobbles, dtpl/apl
TP112-2D (Metals, PAHs, Hg & Cr VI) DUPG (PAHs, Hg & Cr VI)	1.0	35 / 0		0.3-2.5	<b>Fill:</b> Silty Clay with trace sand and gravel with cobbles, dtpl/apl
	1.5	45 / 0		2.5-3.0	Grey/Brown <b>Silty Clay</b> trace fine gravel, dtpl/apl
	2.0	50 / 0			
	2.5	40 / 0			
	3.0	35 / 0			

Upon completion: Testpit open and dry @3.0m.

Testpits excavated with CAT 420F Backhoe

Originated & compiled by: MS  
 Checked By: PS

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million

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Phase Two Environmental Site Assessment  
 Site Location: Thundering Waters, Niagara Falls, Ontario  
 Job Number: TG151118  
 Date: December 8, 9 & 18, 2015



**TESTPIT LOG: TP113**

**Ground Surface Elevation: 179.73 m**

**UTM Co-ordinates: 653712 E, 4767808 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
TP113-1 (Metals)	0.5	110 / 0	No odours or staining.	0-3.5	<b>Fill:</b> Brown, Silty Clay, some sand with medium loose gravel, large cobbles throughout, moist
	1.0	170 / 0			
	1.5	155 / 0			
	2.0	75 / 1			
	2.5	155 / 0			
	3.0	85 / 1			
TP113-7 (Metals, VOCs, PHCs, Hg, Cr VI & PAHs)	3.5	140 / 1		3.5-4.0	Grey <b>Silty Clay</b> dark organic layer
	4.0	75 / 0			

Upon completion: Testpit open with water in bottom @4.0m. (Hole is caving)

Testpits excavated with CAT 420F Backhoe

Originated & compiled by: MS  
 Checked By: PS

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million

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Phase Two Environmental Site Assessment  
 Site Location: Thundering Waters, Niagara Falls, Ontario  
 Job Number: TG151118  
 Date: December 8, 9 & 18, 2015



**TESTPIT LOG: TP114**

**Ground Surface Elevation: 180.26 m**

**UTM Co-ordinates: 654758 E, 4768071 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
TP114-1 & DUPA (Metals, pH, EC & SAR)	0.5	80 / 0	Gradual Moisture Increase w/Depth	0-1.5	Fill: Brown Silty Clay, trace organics, dtpl
	1.0	85 / 0			
	1.5	80 / 0		1.5-4.0	Fill: Brown Silty Clay, trace organics, trace fine gravel
	2.0	130 / 1			
	2.5	110 / 0			
	3.0	90 / 0			
	3.5	90 / 1			
	4.0	95 / 0			

Upon completion: Testpit open and dry @4.0m.

Testpits excavated with CAT 420F Backhoe

Originated & compiled by: MS  
 Checked By: PS

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million

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Phase Two Environmental Site Assessment  
 Site Location: Thundering Waters, Niagara Falls, Ontario  
 Job Number: TG151118  
 Date: December 8, 9 & 18, 2015



**TESTPIT LOG: TP115**

**Ground Surface Elevation: 181.68 m**

**UTM Co-ordinates: 654835 E, 4768145 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
TP115-1 (Metals)	0.5	80 / 0	Gradual Moisture Increase w/Depth	0-1.0	<b>Fill:</b> Brown Silty clay, trace organics, trace fine gravel, dtpl
	1.0	110 / 0		1.0-4.0	<b>Fill:</b> Brown/Grey Silty clay, trace organics, trace fine gravel, dtpl
	1.5	100 / 0			
	2.0	95 / 1			
	2.5	80 / 0			
	3.0	120 / 0			
	3.5	95 / 0			
	4.0	95 / 1			

Upon completion: Testpit open and dry @4.0m.

Testpits excavated with CAT 420F Backhoe

Originated & compiled by: MS  
 Checked By: PS

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million

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Phase Two Environmental Site Assessment  
 Site Location: Thundering Waters, Niagara Falls, Ontario  
 Job Number: TG151118  
 Date: December 8, 9 & 18, 2015



**TESTPIT LOG: TP116**

**Ground Surface Elevation: 182.05 m**

**UTM Co-ordinates: 654756 E, 4768169 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
	0.5	195 / 1	Slight Moisture	0-4.0	<b>Fill:</b> Brown Silty Clay with trace organics, and trace fine/medium gravel, dtpl
TP116-2 (Metals)	1.0	200 / 0			
	1.5	150 / 1			
	2.0	110 / 0			
	2.5	135 / 0			
	3.0	95 / 0			
	3.5	90 / 0			
	4.0	85 / 0			

Upon completion: Testpit open and dry @4.0m.

Testpits excavated with CAT 420F Backhoe

Originated & compiled by: MS  
 Checked By: PS

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million

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Phase Two Environmental Site Assessment  
 Site Location: Thundering Waters, Niagara Falls, Ontario  
 Job Number: TG151118  
 Date: December 8, 9 & 18, 2015



**TESTPIT LOG: TP117**

**Ground Surface Elevation: 176.78 m**

**UTM Co-ordinates: 654717 E, 4768075 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
	0.5	125 / 1	No odours or staining.	0-1.5	<b>Fill:</b> Brown Silty Clay with trace organics, trace fine/medium gravel, dtpl
	1.0	135 / 1			
TP117-3 & DUPC (Metals, pH, EC & SAR)	1.5	175 / 0		1.5-2.5	<b>Fill:</b> Brown Silty Clay, fissured with some grey seams
	2.0	135 / 1			
	2.5	115 / 1			
	3.0	100 / 1			
	3.5	135 / 0			
	4.0	85 / 0			
				2.5-4.0	Brown/Grey <b>Silty Clay</b> , trace fine gravel, dtpl

Upon completion: Testpit open and dry @4.0m.

Testpits excavated with CAT 420F Backhoe

Originated & compiled by: MS  
 Checked By: PS

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million

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Phase Two Environmental Site Assessment  
 Site Location: Thundering Waters, Niagara Falls, Ontario  
 Job Number: TG151118  
 Date: December 8, 9 & 18, 2015



**TESTPIT LOG: TP118**

**Ground Surface Elevation: 173.20 m**

**UTM Co-ordinates: 654729 E, 4767983 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
TP118-1 (Metals)	0.5	200 / 0	No odours or staining.	0-0.20	<b>Topsoil</b> over brown Silty Clay, trace fine gravel, dtpl
	1.0	190 / 0		0.20-3.0	Brown <b>Silty Clay</b> trace fine gravel
	1.5	95 / 0			
	2.0	60 / 1			
	2.5	115 / 1			
	3.0	190 / 1			

Upon completion: Testpit open and dry @3.0m.

Testpits excavated with CAT 420F Backhoe

Originated & compiled by: MS  
 Checked By: PS

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million

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Phase Two Environmental Site Assessment  
 Site Location: Thundering Waters, Niagara Falls, Ontario  
 Job Number: TG151118  
 Date: December 8, 9 & 18, 2015



**TESTPIT LOG: TP119**

**Ground Surface Elevation: 180.03 m**

**UTM Co-ordinates: 653842 E, 4767813 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
TP119-1C (Metals)	0.5	55 / 1	No odours or staining.	0-2.0	<b>Fill:</b> Brown Silty Clay with sand and gravel, and rounded cobbles, dtpl/apl
	1.0	30 / 1			
	1.5	30 / 2			
	2.0	60 / 0		2.0-3.5	<b>Fill:</b> Brown Silty Sand, saturated
	2.5	25 / 0			
	3.0	45 / 1			
	3.5	90 / 1		3.5-4.0	Brown/Green <b>Silty Clay</b> with trace sand and organics
TP119-8D (PHCs & BTEX) TP119-8C (Metals, pH, EC, SAR, Hg & Cr VI)	4.0	70 / 0			

Upon completion: Caving @ 4.0m (Terminated)

Testpits excavated with CAT 420F Backhoe

Originated & compiled by: MS  
 Checked By: PS

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million

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Phase Two Environmental Site Assessment  
 Site Location: Thundering Waters, Niagara Falls, Ontario  
 Job Number: TG151118  
 Date: December 8, 9 & 18, 2015



**TESTPIT LOG: TP120**

**Ground Surface Elevation: 180.19 m**

**UTM Co-ordinates: 653852 E, 4767840 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
TP120-1 (Metals)	0.5	60 / 1	No odours or staining.	0-0.30	<b>Topsoil</b> with organics, dtpl
	1.0	85 / 0		0.30-1.5	Brown <b>Silty Clay</b> trace fine gravel, dtpl
	1.5	80 / 0			

Upon completion: Testpit open and dry @1.5m.

Testpits excavated with CAT 420F Backhoe

Originated & compiled by: MS  
 Checked By: PS

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million

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Phase Two Environmental Site Assessment  
 Site Location: Thundering Waters, Niagara Falls, Ontario  
 Job Number: TG151118  
 Date: December 8, 9 & 18, 2015



**TESTPIT LOG: TP121**

**Ground Surface Elevation: 179.24 m**

**UTM Co-ordinates: 653878 E, 4767855 N**

Sample			Comments (odour, staining, moisture, etc.)	Stratigraphy	
Number & Lab Analyses	Depth (mbgs)	COV/TOV (ppm)		Depth (mbgs)	Material Description
TP121-1 (Metals)	0.5	175 / 0	No odours or staining.	0-2.5	<b>Fill:</b> Silty Clay, trace fine/medium gravel, organics, dtpl
	1.0	135 / 0			
	1.5	135 / 0			
	2.0	--			
TP121-5 (Metals, PHCs, BTEX, PAHs, Hg & Cr VI)	2.5	220 / 0		2.5-3.0	<b>Silty Clay</b> with occasional organic layer, dtpl/apl
	3.0	230 / 0			

Upon completion: Testpit open and dry @3.0m.

Testpits excavated with CAT 420F Backhoe

Originated & compiled by: MS  
 Checked By: PS

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million

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Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 21, 2016



**TESTPIT LOG: TP201**

**(654015, 4767794)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP201-2 (metals)	1.0	No odours or staining	-	0-1.0	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, DTPL
TP201-3 (metals)	1.5	No odours or staining	-	1.0-1.5	Brown, Silty Clay/Clayey Silt, Possible Native, DTPL

Upon completion: Open and dry at 1.5 mbgs.

**TESTPIT LOG: TP202**

**(654015, 4767797)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP202-2 + Dup AA (metals)	1.0	No odours or staining	-	0-1.0	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, DTPL/APL
TP202-3 (metals)	1.5	No odours or staining	-	1.0-1.5	Brown, Silty Clay/Clayey Silt, Possible Native, Trace Fine Gravel, DTPL

Upon completion: Open and dry at 1.5 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.

Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 21, 2016



**TESTPIT LOG: TP203**

**(654018, 4767796)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP203-2 (metals)	1.0	No odours or staining	-	0-1.0	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, DTPL
TP203-3 (metals)	1.5	No odours or staining	-	1.0-1.5	Brown, Silty Clay/Clayey Silt, Possible Native, Trace Fine Gravel, Mottled, DTPL

Upon completion: Open and dry at 1.5 mbgs.

**TESTPIT LOG: TP204**

**(654011, 4767797)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP204-1 (metals)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, Trace Fine Gravel, DTPL
TP204-2 (metals)	1.0	No odours or staining	-	0.5-1.0	Brown, Silty Clay/Clayey Silt, Possible Native, Trace Fine Gravel, DTPL

Upon completion: Open and dry at 1.0 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.

Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 21, 2016



**TESTPIT LOG: TP205**

**(654010, 4767789)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP205-1 (metals)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, DTPL
TP205-2 (metals)	1.0	No odours or staining	-	0.5-1.0	Brown, Silty Clay/Clayey Silt, Possible Native, Fissured, DTPL

Upon completion: Open and dry at 1.0 mbgs.

**TESTPIT LOG: TP206**

**(654020, 4767788)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP206-1 (metals)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, Trace Fine Gravel, DTPL
TP206-2 (metals)	1.0	No odours or staining.	-	0.5-1.0	Brown, Silty Clay/Clayey Silt, Possible Native, Trace Fine Gravel, DTPL

Upon completion: Open and dry at 1.0 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.

Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 21, 2016



**TESTPIT LOG: TP207**

**(653801, 4768142)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
-	-	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Sand, Trace Organics, DTPL
Composite TP207 (metals)	1.0	No odours or staining	-	0.5-1.0	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Fine Gravel, Trace Organics, DTPL
	1.5	No odours or staining	-	1.0-1.5	Brown, Silty Clay/Clayey Silt, Possible Native, Trace Fine Gravel, DTPL

Upon completion: Open and dry at 1.5 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.



Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 21, 2016



**TESTPIT LOG: TP208**

**(653799, 4768142)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
Composite TP208 (metals)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, Trace Sand, Some Medium Rounded Gravel, Medium Rounded Cobbles
	1.0	No odours or staining		0.5-1.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, Trace Sand, Some Medium Rounded Gravel, Medium Rounded Cobbles
	1.5	No odours or staining	-	1.0-1.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, Trace Sand, Some Medium Rounded Gravel, Medium Rounded Cobbles
TP208-4 + Dup AC (metals)	2.0	No odours or staining	-	1.5-2.0	Brown/Grey, Silty Clay/Clayey Silt, Possible Native, APL/WTPL

Upon completion: Open and dry at 2.0 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.

Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 21, 2016



**TESTPIT LOG: TP209**

**(653795, 4768140)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
Composite TP209 (metals)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, Trace Sand, Medium/Large Rounded Cobbles
	1.0	No odours or staining		0.5-1.0	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, Trace Sand, Medium/Large Rounded Cobbles
	1.5	No odours or staining	-	1.0-1.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, Trace Sand, Medium/Large Rounded Cobbles
TP209-4 (metals)	2.0	No odours or staining	-	1.5-2.0	Brown/Grey, Silty Clay/Clayey Silt, Possible Native, Trace Fine Gravel, APL/WTPL

Upon completion: Open and dry at 2.0 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.

Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 21, 2016



**TESTPIT LOG: TP210**

**(653799, 4768145)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
Composite TP210 (metals)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Fine Gravel, Trace Organics, DTPL
	1.0	No odours or staining	-	0.5-1.0	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, DTPL
	1.5	No odours or staining	-	1.0-1.5	Brown, Silty Clay/Clayey Silt, Possible Native, Trace Fine Gravel, DTPL

Upon completion: Open and dry at 1.5 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.

Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 21, 2016



**TESTPIT LOG: TP211**

**(653804, 4768143)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP211-1 (metals)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Fine Gravel, Trace Organics, DTPL
TP211-2 (metals)	1.0	No odours or staining	-	0.5-1.0	Brown Clayey Silt, Possible Native, Fissured, DTPL

Upon completion: Open and dry at 1.0 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.

Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 21, 2016



**TESTPIT LOG: TP212**

**(653800, 4768135)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
Composite TP212 (metals)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, Trace Sand, Medium Rounded Cobbles
	1.0	No odours or staining		0.5-1.0	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, Trace Sand, Medium/Large Rounded Cobbles
	1.5	No odours or staining	-	1.0-1.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, Trace Sand, Medium/Large Rounded Cobbles
TP212-4 (metals)	2.0	No odours or staining	-	1.5-2.0	Brown/Grey, Silty Clay/Clayey Silt, Possible Native, APL/WTPL

Upon completion: Open and dry at 2.0 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.

Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 21, 2016



**TESTPIT LOG: TP213**

**(653715, 4768089)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP213-1 (metals)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, DTPL
TP213-2 (metals)	1.0	No odours or staining	-	0.5-1.0	Brown, Silty Clay/Clayey Silt, Possible Native, Trace Fine Gravel, Mottled, DTPL

Upon completion: Open and dry at 1.0 mbgs.

**TESTPIT LOG: TP214**

**(653713, 4768092)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP214-1 (metals)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, DTPL
TP214-2 (metals)	1.0	No odours or staining	-	0.5-1.0	Brown, Silty Clay/Clayey Silt, Possible Native, Trace Fine Gravel, DTPL

Upon completion: Open and dry at 1.0 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.



Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 21, 2016



**TESTPIT LOG: TP215**

**(653711, 4768094)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
Composite TP215 (metals)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Rounded Gravel, Trace Organics, DTPL
	1.0	No odours or staining	-	0.5-1.0	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Rounded Gravel, Trace Organics, DTPL
TP215-3 (metals)	1.5	No odours or staining	-	1.0-1.5	Brown, Silty Clay/Clayey Silt, Possible Native, Mottled, DTPL

Upon completion: Open and dry at 1.5 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.

Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 21, 2016



**TESTPIT LOG: TP216**

**(653718, 4768092)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP216-1 (metals)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Fine/Medium Gravel, Trace Organics, DTPL
TP216-2 (metals)	1.0	No odours or staining	-	0.5-1.0	Brown, Silty Clay/Clayey Silt, Possible Native, Trace Fine Gravel, DTPL

Upon completion: Open and dry at 1.0 mbgs.

**TESTPIT LOG: TP217**

**(653716, 4768085)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP217-1 (metals)	0.5	No odours or staining	-	0-0.5	Reddish Brown, Silty Clay/Clayey Silt, Possible Native, Trace Fine/Medium Gravel, Trace Organics, DTPL
TP217-2 (metals)	1.0	No odours or staining	-	0.5-1.0	Reddish Brown, Silty Clay/Clayey Silt, Possible Native, Trace Fine/Medium Gravel, Trace Organics, DTPL

Upon completion: Open and dry at 1.0 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.

Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 21, 2016



**TESTPIT LOG: TP218**

**(653708, 4768088)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP218-1 (metals)	0.5	No odours or staining	-	0-0.5	Reddish Brown, Silty Clay/Clayey Silt, Fill Material, Trace Fine/Medium Gravel, Trace Organics, DTPL
TP218-2 (metals)	1.0	No odours or staining	-	0.5-1.0	Reddish Brown, Silty Clay/Clayey Silt, Possible Native, Trace Fine/Medium Gravel, Trace Organics, DTPL

Upon completion: Open and dry at 1.0 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.

Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 22, 2016



**TESTPIT LOG: TP219**

**(654715, 4768010)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP219-1 (metals)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, DTPL
TP219-2 (metals)	1.0	No odours or staining	-	0.5-1.0	Reddish Brown, Silty Clay/Clayey Silt, Possible Native, Trace Fine Gravel, DTPL

Upon completion: Open and dry at 1.0 mbgs.

**TESTPIT LOG: TP220**

**(654716, 4768015)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP220-1 (metals)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, DTPL
TP220-2 (metals)	1.0	No odours or staining	-	0.5-1.0	Reddish Brown, Silty Clay/Clayey Silt, Possible Native, Trace Fine Gravel, DTPL

Upon completion: Open and dry at 1.0 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.

Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 22, 2016



**TESTPIT LOG: TP221**

**(654715, 4768007)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP221-1 (metals)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, Trace Slag Material, DTPL
TP221-2 (metals)	1.0	No odours, some black seams	-	0.5-1.0	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, Some Black Seams, DTPL

Upon completion: Open and dry at 1.0 mbgs.

**TESTPIT LOG: TP222**

**(654716, 4768004)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP222-1 (metals)	0.5	No odours or staining	-	0-0.5	Reddish Brown, Silty Clay/Clayey Silt, Fill Material, Trace Fine Gravel, Trace Organics, Fissured, DTPL
TP222-2 (metals)	1.0	No odours or staining	-	0.5-1.0	Reddish Brown, Silty Clay/Clayey Silt, Possible Native, Trace Fine Gravel, DTPL

Upon completion: Open and dry at 1.0 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.

Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 22, 2016



**TESTPIT LOG: TP223**

**(654722, 4768009)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP223-1 (metals)	0.5	No odours or staining	-	0-0.5	Reddish Brown, Silty Clay/Clayey Silt, Fill Material, Trace Fine Gravel, Trace Organics, Fissured, DTPL
TP223-2 (metals)	1.0	No odours or staining	-	0.5-1.0	Reddish Brown, Silty Clay/Clayey Silt, Possible Native, Fissured, DTPL

Upon completion: Open and dry at 1.0 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.



Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 22, 2016



**TESTPIT LOG: TP224**

**(654714, 4768078)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP224-1 (electrical conductivity)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, DTPL
TP224-2 (electrical conductivity)	1.0	No odours or staining	-	0.5-1.0	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, DTPL
-	-	No odours or staining	-	1.0-1.5	Brown/Grey/Red, Silty Clay/Clayey Silt, Fill Material, Trace Fine Granular, Trace Organics, DTPL
TP224-4 (electrical conductivity)	2.0	No odours or staining	-	1.5-2.0	Grey/Red, Silty Clay, Possible Native, Trace Granular, Trace Organics, DTPL

Upon completion: Open and dry at 2.0 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.

Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 22, 2016



**TESTPIT LOG: TP225**

**(654717, 4768081)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP225-1 (electrical conductivity)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, APL/WTPL
TP225-2 (electrical conductivity)	1.0	No odours or staining	-	0.5-1.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, Trace Granular, APL/WTPL
TP225-4 (electrical conductivity)-	2.0	No odours or staining	-	1.5-2.0	Brown, Silty Clay/Clayey Silt, Possible Native, Trace Organics, Trace Granular, APL/WTPL

Upon completion: Open and dry at 2.0 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.

Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 22, 2016



**TESTPIT LOG: TP226**

**(654712, 4768075)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP226-1 (electrical conductivity)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Trace Organics, DTPL
TP226-2 (electrical conductivity)	1.0	No odours or staining	-	0.5-1.0	Brown, Silty Clay/Clayey Silt, Fill Material, White Seams, Trace Organics, Trace Fine Gravel, DTPL
TP226-4 (electrical conductivity)-	2.0	No odours or staining	-	1.0-2.0	Brown, Silty Clay/Clayey Silt, Fill Material, White/Black Seams, Trace Organics, Trace Fine Gravel, DTPL

Upon completion: Open and dry at 2.0 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.

Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 22, 2016



**TESTPIT LOG: TP227**

**(654712, 4768073)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP227-1 (electrical conductivity)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, White Seams, Trace Organics, DTPL
TP227-2 (electrical conductivity)	1.0	No odours or staining	-	0.5-2.0	Brown, Silty Clay/Clayey Silt, Fill Material, White Seams, Trace Organics, DTPL
TP227-3 (electrical conductivity)	1.5	No odours or staining	-		

Upon completion: Open and dry at 2.0 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.

Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 22, 2016



**TESTPIT LOG: TP228**

(654714 , 4768078)

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP228-1 + Dup A3 (electrical conductivity)	0.5	No odours or staining	-	0-0.5	Brown, Silty Clay/Clayey Silt, Fill Material, Fissured, Trace Organics, DTPL
TP228-2 (electrical conductivity)	1.0	No odours or staining	-	0.5-1.0	Brown, Silty Clay/Clayey Silt, Fill Material, White Seams, Trace Organics, DTPL
TP228-4 (electrical conductivity)	2.0	No odours or staining	-	1.0-2.0	Brown, Silty Clay/Clayey Silt, Fill Material, Black Seams, Trace Organics, DTPL

Upon completion: Open and dry at 2.0 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.

Delineation Testpitting & Ground Water Sampling Program  
 Site Location: Thundering Waters Development, Dorchester Road, Niagara Falls, Ontario  
 Job Number: TG161164  
 Date: Dec 22, 2016



**TESTPIT LOG: TP229**

**(654719, 4768075)**

Sample Number	Depth (mbgs)	Comments (odour, staining, etc.)	COV/TOV (ppm)	Stratigraphy	
				Depth (mbgs)	Material Description
TP229-1 (electrical conductivity)	0.5	No odours or staining	-	0-0.5	Reddish Brown/Grey, Silty Clay/Clayey Silt, Fill Material, Trace Fine Gravel, Trace Organics, DTPL
TP229-2 (electrical conductivity)	1.0	No odours or staining	-	0.5-1.0	Brown/Grey, Silty Clay/Clayey Silt, Fill Material, Trace Organics, DTPL
TP229-4 (electrical conductivity)	2.0	No odours or staining	-	1.0-2.0	Brown/Grey, Silty Clay/Clayey Silt, Possible Native, DTPL

Upon completion: Open and dry at 2.0 mbgs.

Equipment: Hitachi Zaxis 160 LC Excavator

Originated by: MS/KH  
 Compiled By: MS  
 Checked By: KP

Notes: "mbgs" means metres below ground surface. "COV" means Combustible Organic Vapour, "TOV" means Total Organic Vapour, "ppm" means parts per million. "PHCs" means fractionized Petroleum Hydrocarbons in the F1 to F4 ranges. "BTEX" means benzene, toluene, ethylbenzene and xylenes. "DTPL" means Drier Than Plastic Limit. "APL" means At Plastic Limit. "WTPL" means Wetter Than Plastic Limit.





## **APPENDIX B**

# **SAMPLING AND ANALYSIS PLAN**



# Memo

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**To:** Field Staff  
**From:** Patrick Shriner, P.Geo., QP<sub>ESA</sub>  
**cc:** Deanna Gemmell  
**Date:** December 1, 2015 and December 18, 2016  
**Re.** **Phase Two ESA Sampling and Quality Assurance Plan,  
Thundering Waters, Niagara Falls**

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## Scope of Sampling Program

The proposed number of boreholes, monitoring wells, testpits and the rationale for the location of each was determined by Amec Foster Wheeler. The soil/fill and ground water samples are to be analyzed for one or more of the following potential contaminants of concern (COCs): PAHs, PHCs, VOCs including BTEX and various metal (including mercury and hexavalent chromium) and inorganic parameters. The sample depths and parameters to be analyzed will be determined based on observations during the soil and ground water sampling programs and reviewed with the QP<sub>ESA</sub> prior to submission. Field observations may indicate a need for additional numbers or types of samples, e.g., vertical and horizontal delineation. If such field observations are made, contact Patrick Shriner (905-687-6616) and report the observations.

Any deviations from the planned scope of work and the rationale for the deviation(s) are to be approved by Patrick Shriner and are to be recorded in the field notes.

## Sampling Rationale and Procedures

Sampling locations have been assessed on the basis of areas of potential environmental concern (APECs) identified during the Phase I ESA.

The following Amec Foster Wheeler Standard Operating Procedures (SOPs) are to be followed during the Project and are incorporated herein by reference:

SOP No. 1 - Equipment Calibration and Maintenance, Rev. No. 0, October 8, 2013;

- SOP No. 2 - Equipment Decontamination, Rev. No. 0, October 8, 2013;
- SOP No. 3 – Sample Location Inspection and Monitoring, Rev.0, October 8, 2013;
- SOP No. 4 – Measurement of Field Parameters, Rev.0, October 8, 2013;
- SOP No. 8 - Subsurface Soil Sampling, Rev. No. 0, October 8, 2013;
- SOP No. 10 – Soil Vapour Headspace Screening, Rev. No. 0, October 8, 2013;
- SOP No. 13 – Borehole Drilling and Soil Sampling, Rev. No. 0, October 8, 2013;
- SOP No. 14 – Monitoring Well Design and Construction, Rev. No. 0. October 8, 2013;
- SOP No. 16 – Ground Water and Liquid Level Monitoring, Rev. No. 0, October 8, 2013;
- SOP No. 17 – Ground Water Purging and Sampling, Rev. No. 0, October 8, 2013;
- SOP No. 18 – Ground Water Low Flow Sampling, Rev. No. 0, October 8, 2013;
- SOP No. 19 - Handling of Volatile Samples, Rev. No. 0, October 8, 2013;
- SOP No. 20 - Chain of Custody Completion, Rev. No. 0, October 8, 2013; and
- SOP No. 21 – Aquifer Response Testing, Bail/Slug Testing, Rev. No. 0, October 8, 2013.

Specifications regarding sampling procedures, well installations, field note-taking, instrument calibration, field measurements, surveying, collection of blind duplicate samples, etc., are provided in the SOPs. The remainder of this Section provides a brief summary of sampling procedures that are to be followed, which does not supersede the requirements of the SOPs with the exception of changes in sample handling/collection practices required under the *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act*, March 2004, amended as of 01 July 2011, in order to document site-specific information (e.g., contact persons).

Soil/fill and ground water samples are to be collected as per *O. Reg. 153/04*. Soil samples are to be collected at standard sampling locations throughout the full vertical extent of each borehole. Ground water samples are to be collected after the well has been both developed and purged.

Soil samples shall be submitted for analysis of parameters outlined above, as well as on the basis of the presence of fill material, visual or olfactory evidence of contamination, field screening results [hydrocarbons and VOCs (BTEX)], proximity to the apparent water table (LNAPLs) or the vicinity of the interface with a lower confining layer (DNAPLs). In the absence of any other indicators of impact, soil samples to be analyzed shall be collected from fill materials with the exception that samples for VOCs (BTEX) may be collected from the vicinity of the water table or a lower confining layer and samples for PHC F1 – F4 may be collected from the vicinity of the water table. Any deviation from the sampling plan is to be approved by Patrick Shriner.

Continued...



Samples are to be submitted for analysis with the Chain of Custody clearly marked "O. Reg. 153/04" and with Table 1 and RSC selected as the applicable criteria. *Soil samples to be analyzed for VOCs must be analyzed as per the revised Analytical Protocol which indicates field preservation in methanol.*

Monitoring wells are to be installed with the screen extending approximately 1 m below the apparent water table (unless this would penetrate a confining layer in a potential DNAPL environment) and a minimum of 0.5 m above the high water table. If there is no indication of where the high water level is (e.g., a change from brown to grey), use an assumed value of 1 m (this is used in O. Reg. 511/09).

### **Quality Assurance Program**

The SOPs cited previously specify decontamination procedures, protocols for the collection of duplicate samples, the use of blank samples and instrument calibration checks, etc.

In the case of this Project, no non-dedicated sampling equipment, other than drilling equipment, is to be used.

Field duplicates will be collected at a ratio of 10 samples to 1 duplicate in soil and ground water samples and submitted for analysis for each analytical group/parameter in all media for which that testing is carried out at each site. One trip blank shall accompany all shipments of ground water samples submitted for analysis.

A handwritten signature in black ink, appearing to read "Patrick Shriner".

Patrick Shriner, P.Ge.  
Associate Geoscientist

[patrick.shriner@amecfw.com](mailto:patrick.shriner@amecfw.com)

### Deviations from Sampling and Analysis Plan:

Amec Foster Wheeler collected two (2) additional groundwater samples from the existing wells on the Phase Two Property which were installed by Amec Foster Wheeler in 2006.

Twenty-nine delineation testpits were completed in December 2016 and resampling of MW202 in January 2017.



## **APPENDIX C**

# **RESIDUE MANAGEMENT**



## **Residue Management**

The soil cuttings generated during the drilling investigation were placed in 205 L steel drums on-Site. The soil cuttings will be removed as part of the soil remediation program.

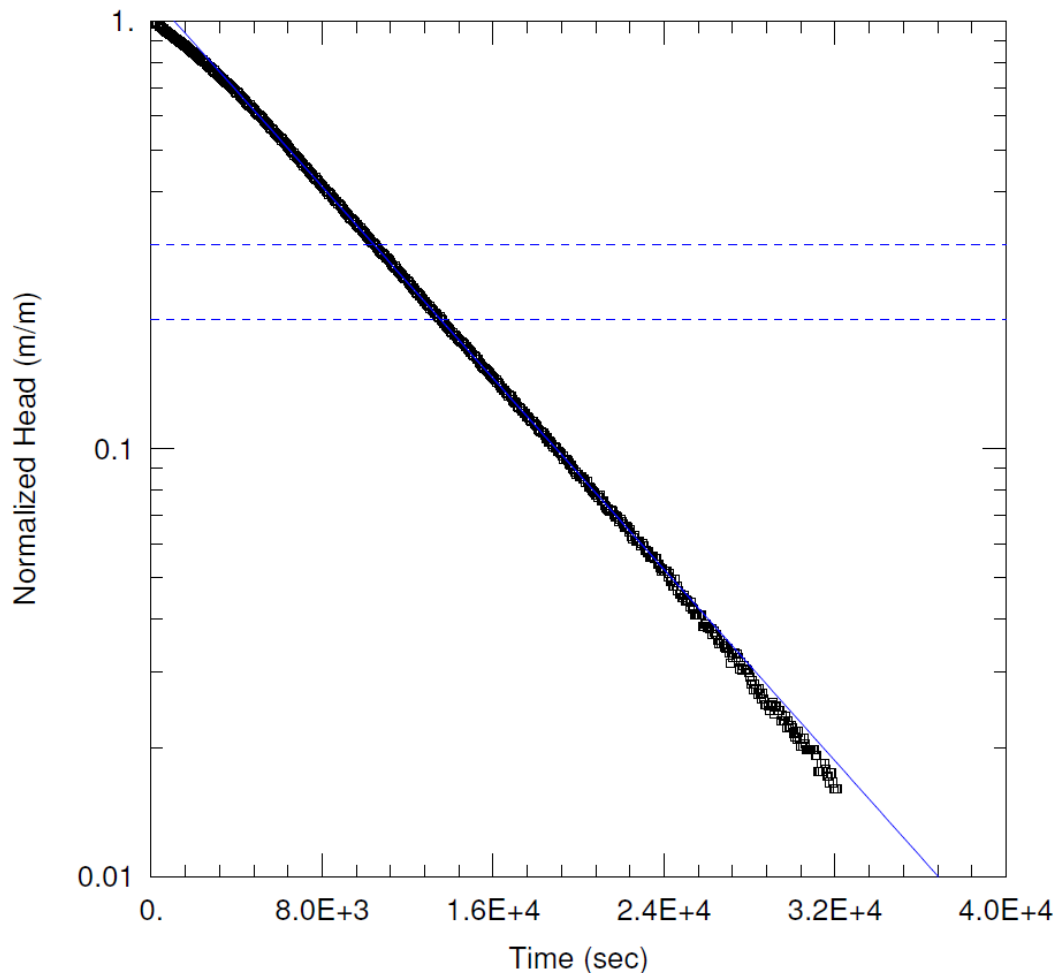
Liquid wastes generated during the investigation (well development and purge water) were stored in sealed 205 L drums. The containers will be disposed by an MOECC-licensed waste hauler upon completion of the Phase Two ESA.





## **APPENDIX D**

# **HYDRAULIC CONDUCTIVITY RESULTS**



### WELL TEST ANALYSIS

Data Set: P:\...\BHMW-101.aqt  
Date: 03/22/16

Time: 09:50:57

### PROJECT INFORMATION

Company: Amec Foster Wheeler  
Client: GR (CAN) Investments Co., Ltd  
Project: TG151118  
Location: Niagara Falls, ON  
Test Well: BH/MW-101  
Test Date: February 2 - 3, 2016

### AQUIFER DATA

Saturated Thickness: 4.8 m

Anisotropy Ratio ( $K_z/K_r$ ): 0.1

### WELL DATA (BH/MW-101)

Initial Displacement: 3.36 m  
Total Well Penetration Depth: 4.19 m  
Casing Radius: 0.026 m

Static Water Column Height: 4.19 m  
Screen Length: 3.05 m  
Well Radius: 0.05 m

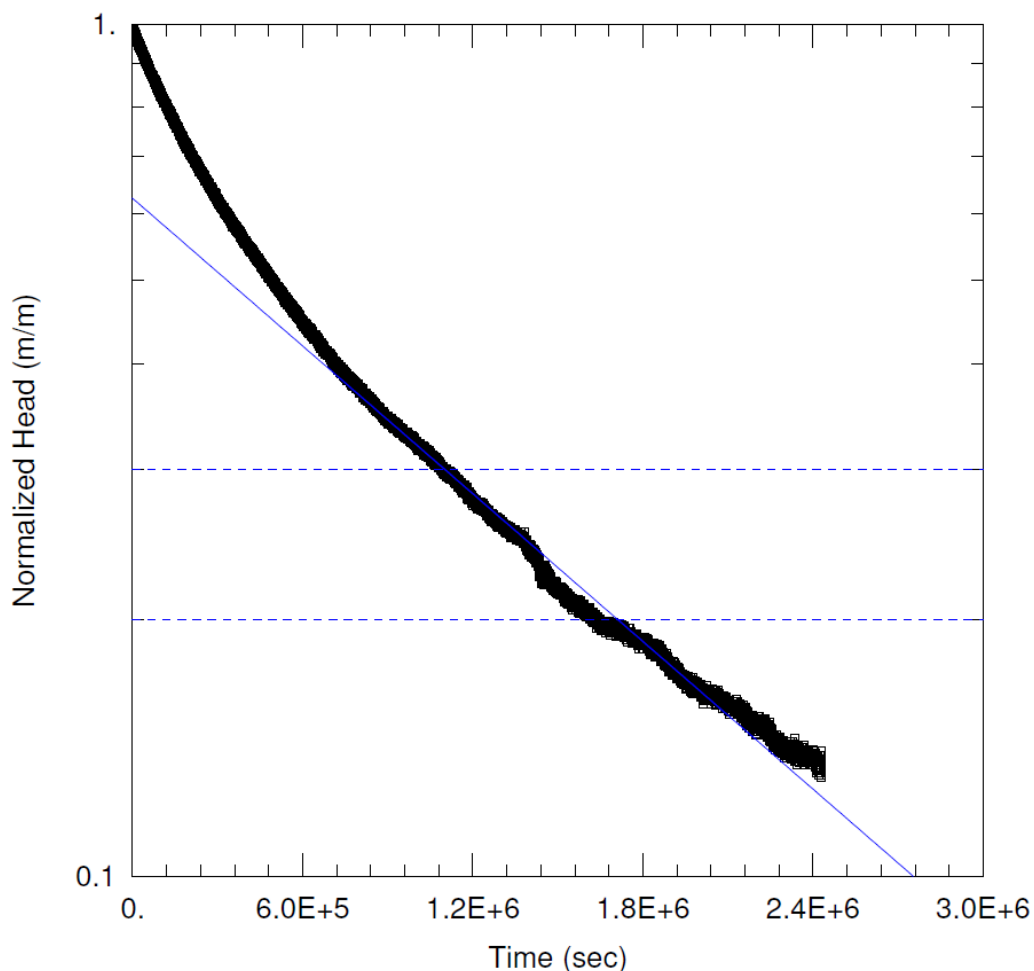
### SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

$K = 5.721E-8$  m/sec

$y_0 = 3.867$  m



### WELL TEST ANALYSIS

Data Set: P:\...\BHMW-103.aqt

Date: 03/22/16

Time: 09:51:09

### PROJECT INFORMATION

Company: Amec Foster Wheeler

Client: GR (CAN) Investments Co., Ltd

Project: TG151118

Location: Niagara Falls, ON

Test Well: BH/MW-103

Test Date: February 2 - March 1, 2016

### AQUIFER DATA

Saturated Thickness: 2.81 m

Anisotropy Ratio (Kz/Kr): 0.1

### WELL DATA (BH/MW-103)

Initial Displacement: 1.4 m

Static Water Column Height: 2.2 m

Total Well Penetration Depth: 2.2 m

Screen Length: 2.2 m

Casing Radius: 0.026 m

Well Radius: 0.05 m

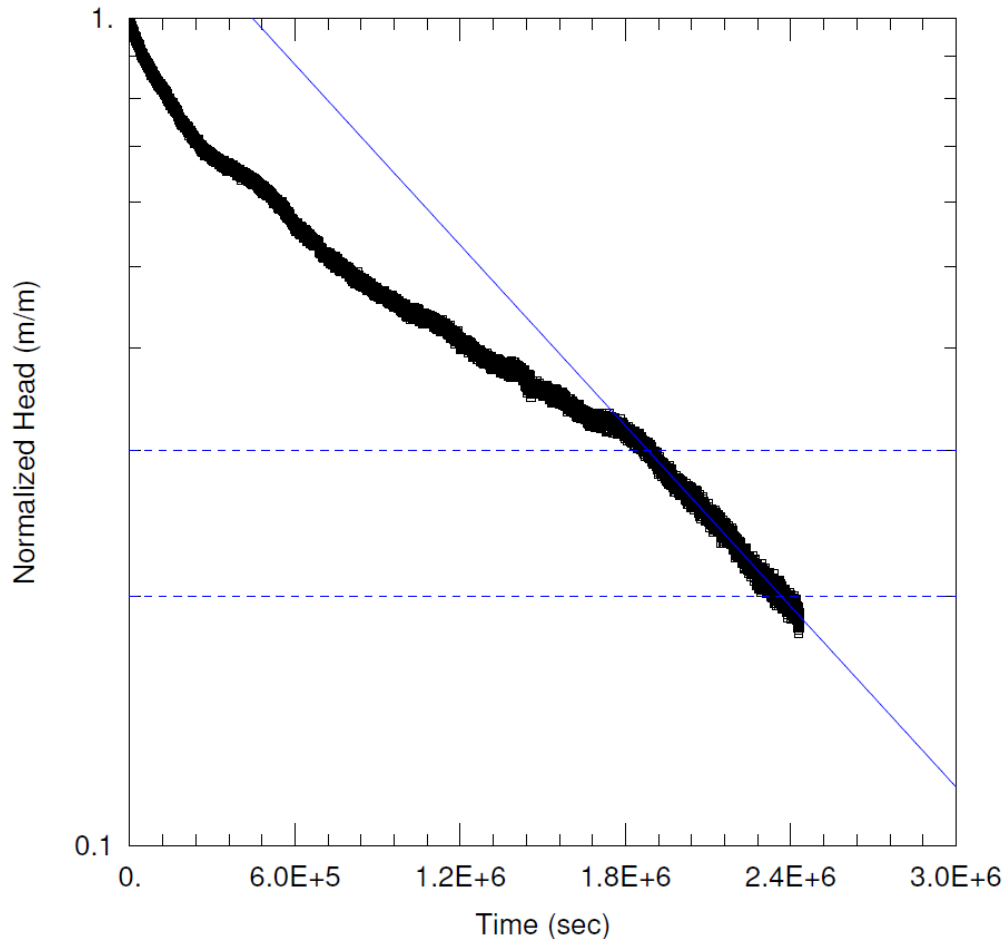
### SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 3.605E-10 m/sec

y0 = 0.875 m



### WELL TEST ANALYSIS

Data Set: P:\...\BHMW-104.aqt  
Date: 03/22/16

Time: 09:51:22

### PROJECT INFORMATION

Company: Amec Foster Wheeler  
Client: GR (CAN) Investments Co., Ltd  
Project: TG151118  
Location: Niagara Falls, ON  
Test Well: BH/MW-104  
Test Date: February 2 - March 1, 2016

### AQUIFER DATA

Saturated Thickness: 3.03 m

Anisotropy Ratio (Kz/Kr): 0.1

### WELL DATA (BH/MW-104)

Initial Displacement: 1.14 m  
Total Well Penetration Depth: 2.42 m  
Casing Radius: 0.026 m

Static Water Column Height: 2.42 m  
Screen Length: 2.42 m  
Well Radius: 0.05 m

### SOLUTION

Aquifer Model: Unconfined

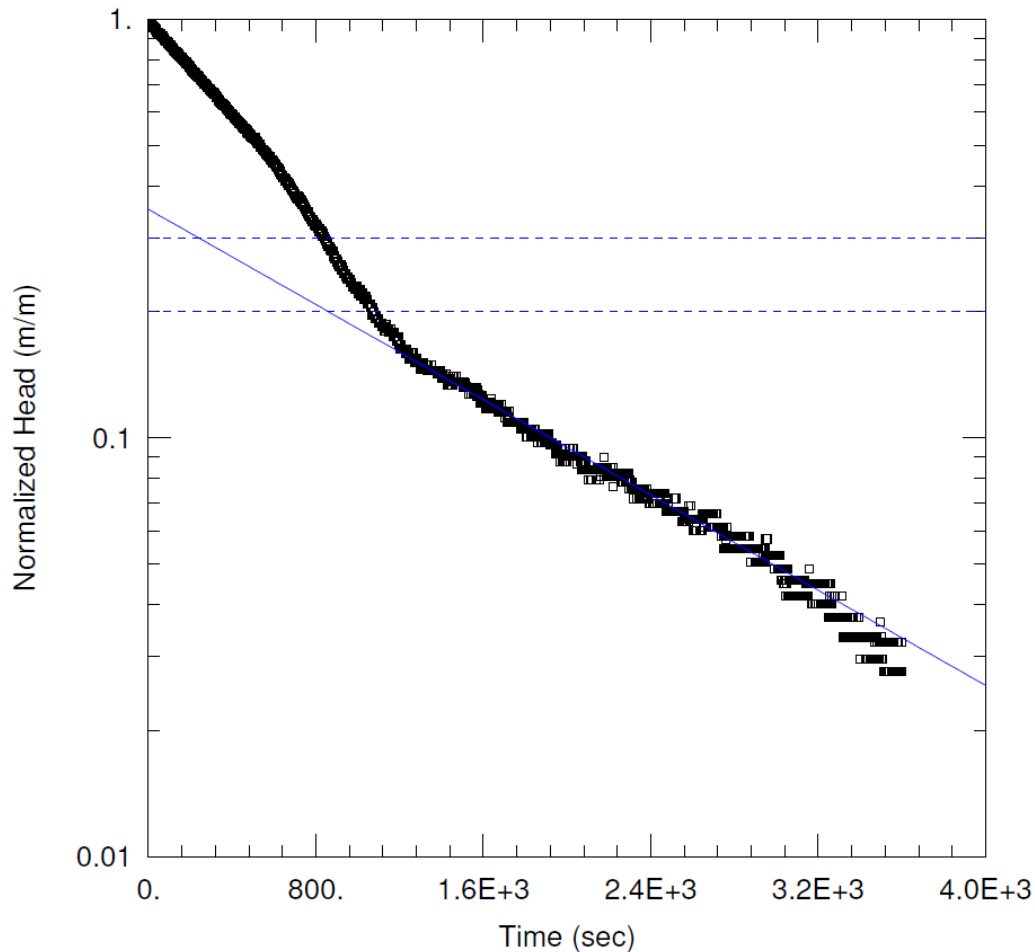
Solution Method: Bouwer-Rice

K = 4.225E-10 m/sec

y0 = 1.657 m



amec  
foster  
wheeler



### WELL TEST ANALYSIS

Data Set: P:\...\BHMW-202.aqt  
Date: 03/22/16

Time: 09:51:35

### PROJECT INFORMATION

Company: Amec Foster Wheeler  
Client: GR (CAN) Investments Co., Ltd  
Project: TG151118  
Location: Niagara Falls, ON  
Test Well: BH/MW-202  
Test Date: February 19, 2016

### AQUIFER DATA

Saturated Thickness: 3.18 m

Anisotropy Ratio ( $K_z/K_r$ ): 0.1

### WELL DATA (BH/MW-202)

Initial Displacement: 0.96 m  
Total Well Penetration Depth: 3.18 m  
Casing Radius: 0.0254 m

Static Water Column Height: 3.18 m  
Screen Length: 1.6 m  
Well Radius: 0.075 m

### SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

$K = 4.84E-7$  m/sec

$y_0 = 0.3377$  m



**APPENDIX E**  
**LABORATORY CERTIFICATES OF ANALYSIS**

**SOIL**

**PARACEL ORDER #'s**

**1550045**  
**1550409**  
**1552049**  
**1653030**  
**1653032**  
**1701133**

**GROUND WATER**

**PARACEL ORDER #'s**

**1604330**  
**1701115**



## Certificate of Analysis

### Amec Foster Wheeler (Thorold)

3300 Merrittville Hwy, Unit 5  
Thorold, ON L2V 4Y6  
Attn: Pat Shriner

Client PO:  
Project: TG151118  
Custody: 22687/688/690/691/692

Report Date: 11-Dec-2015  
Order Date: 7-Dec-2015

**Order #: 1550045**

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Parcel ID	Client ID
1550045-01	BH 101-1-C
1550045-02	BH 101-2A-D
1550045-03	BH 102-1A-C
1550045-04	BH 102-3-D
1550045-05	BH 103-1A-C
1550045-06	BH 103-3-D
1550045-07	BH 104-1-C
1550045-08	BH 104-3-D
1550045-09	BH 105-1-C
1550045-10	BH 105-3-C
1550045-11	Dup 1

Approved By:



Mark Foto, M.Sc.  
Lab Supervisor

**Certificate of Analysis**

Report Date: 11-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 7-Dec-2015

Client PO:

**Project Description: TG151118**
**Analysis Summary Table**

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	8-Dec-15	9-Dec-15
Conductivity	MOE E3138 - probe @25 °C, water ext	10-Dec-15	10-Dec-15
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	8-Dec-15	8-Dec-15
PHC F1	CWS Tier 1 - P&T GC-FID	8-Dec-15	9-Dec-15
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	8-Dec-15	9-Dec-15
REG 153: Metals by ICP/OES, soil	based on MOE E3470, ICP-OES	11-Dec-15	11-Dec-15
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	8-Dec-15	10-Dec-15
SAR	Calculation	11-Dec-15	11-Dec-15
Solids, %	Gravimetric, calculation	8-Dec-15	8-Dec-15

**Certificate of Analysis**

Report Date: 11-Dec-2015

Client: Amec Foster Wheeler (Thorold)

Order Date: 7-Dec-2015

Client PO:

**Project Description: TG151118**

<b>Client ID:</b>	BH 101-1-C	BH 101-2A-D	BH 102-1A-C	BH 102-3-D
<b>Sample Date:</b>	03-Dec-15	03-Dec-15	02-Dec-15	02-Dec-15
<b>Sample ID:</b>	1550045-01	1550045-02	1550045-03	1550045-04
<b>MDL/Units</b>	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	83.1	84.0	86.2	80.9
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**General Inorganics**

SAR	0.01 N/A	0.06	-	0.17	-
Conductivity	5 uS/cm	165	-	181	-
pH	0.05 pH Units	7.67	-	7.73	-

**Metals**

Antimony	1.0 ug/g dry	<1.0	-	<1.0	-
Arsenic	1.0 ug/g dry	5.6	-	4.6	-
Barium	1.0 ug/g dry	106	-	101	-
Beryllium	1.0 ug/g dry	<1.0	-	<1.0	-
Boron	1.0 ug/g dry	12.3	-	11.4	-
Cadmium	0.5 ug/g dry	<0.5	-	<0.5	-
Chromium	1.0 ug/g dry	20.7	-	20.3	-
Cobalt	1.0 ug/g dry	12.1	-	11.7	-
Copper	1.0 ug/g dry	23.1	-	26.3	-
Lead	1.0 ug/g dry	11.1	-	11.2	-
Molybdenum	1.0 ug/g dry	<1.0	-	<1.0	-
Nickel	1.0 ug/g dry	18.9	-	20.9	-
Selenium	1.0 ug/g dry	<1.0	-	<1.0	-
Silver	0.5 ug/g dry	<0.5	-	<0.5	-
Thallium	1.0 ug/g dry	1.2	-	<1.0	-
Uranium	1.0 ug/g dry	<1.0	-	<1.0	-
Vanadium	1.0 ug/g dry	27.0	-	26.4	-
Zinc	1.0 ug/g dry	63.0	-	112	-

**Volatiles**

Benzene	0.02 ug/g dry	-	<0.02	-	<0.02
Ethylbenzene	0.05 ug/g dry	-	<0.05	-	<0.05
Toluene	0.05 ug/g dry	-	<0.05	-	<0.05
m,p-Xylenes	0.05 ug/g dry	-	<0.05	-	<0.05
o-Xylene	0.05 ug/g dry	-	<0.05	-	<0.05
Xylenes, total	0.05 ug/g dry	-	<0.05	-	<0.05
Toluene-d8	Surrogate	-	105%	-	104%

**Hydrocarbons**

F1 PHCs (C6-C10)	7 ug/g dry	-	<7	-	<7
F2 PHCs (C10-C16)	4 ug/g dry	-	<4	-	<4
F3 PHCs (C16-C34)	8 ug/g dry	-	<8	-	<8

**Certificate of Analysis**

Report Date: 11-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 7-Dec-2015

Client PO:

**Project Description: TG151118**

	Client ID:	BH 101-1-C	BH 101-2A-D	BH 102-1A-C	BH 102-3-D
	Sample Date:	03-Dec-15	03-Dec-15	02-Dec-15	02-Dec-15
	Sample ID:	1550045-01	1550045-02	1550045-03	1550045-04
	MDL/Units	Soil	Soil	Soil	Soil
F4 PHCs (C34-C50)	6 ug/g dry	-	<6	-	<6

**Certificate of Analysis**

Report Date: 11-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 7-Dec-2015

Client PO:

**Project Description: TG151118**

Client ID:	BH 103-1A-C	BH 103-3-D	BH 104-1-C	BH 104-3-D
Sample Date:	02-Dec-15	02-Dec-15	02-Dec-15	02-Dec-15
Sample ID:	1550045-05	1550045-06	1550045-07	1550045-08
MDL/Units	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	83.8	78.2	81.7	79.1
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**General Inorganics**

SAR	0.01 N/A	0.36	-	-	-
Conductivity	5 uS/cm	221	-	-	-
pH	0.05 pH Units	7.84	-	-	-

**Metals**

Antimony	1.0 ug/g dry	<1.0	-	<1.0	-
Arsenic	1.0 ug/g dry	6.2	-	5.8	-
Barium	1.0 ug/g dry	96.2	-	126	-
Beryllium	1.0 ug/g dry	<1.0	-	<1.0	-
Boron	1.0 ug/g dry	11.4	-	14.9	-
Cadmium	0.5 ug/g dry	<0.5	-	<0.5	-
Chromium	1.0 ug/g dry	22.4	-	24.7	-
Cobalt	1.0 ug/g dry	12.1	-	13.8	-
Copper	1.0 ug/g dry	27.1	-	27.6	-
Lead	1.0 ug/g dry	11.5	-	13.0	-
Molybdenum	1.0 ug/g dry	<1.0	-	<1.0	-
Nickel	1.0 ug/g dry	21.1	-	25.7	-
Selenium	1.0 ug/g dry	1.5	-	<1.0	-
Silver	0.5 ug/g dry	<0.5	-	<0.5	-
Thallium	1.0 ug/g dry	1.2	-	1.3	-
Uranium	1.0 ug/g dry	<1.0	-	<1.0	-
Vanadium	1.0 ug/g dry	30.1	-	33.5	-
Zinc	1.0 ug/g dry	48.1	-	50.1	-

**Volatiles**

Acetone	0.50 ug/g dry	-	-	-	<0.50
Benzene	0.02 ug/g dry	-	-	-	<0.02
Bromodichloromethane	0.05 ug/g dry	-	-	-	<0.05
Bromoform	0.05 ug/g dry	-	-	-	<0.05
Bromomethane	0.05 ug/g dry	-	-	-	<0.05
Carbon Tetrachloride	0.05 ug/g dry	-	-	-	<0.05
Chlorobenzene	0.05 ug/g dry	-	-	-	<0.05
Chloroform	0.05 ug/g dry	-	-	-	<0.05
Dibromochloromethane	0.05 ug/g dry	-	-	-	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	-	-	-	<0.05

**Certificate of Analysis**

Report Date: 11-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 7-Dec-2015

Client PO:

**Project Description: TG151118**

	Client ID:	BH 103-1A-C	BH 103-3-D	BH 104-1-C	BH 104-3-D
	Sample Date:	02-Dec-15	02-Dec-15	02-Dec-15	02-Dec-15
	Sample ID:	1550045-05	1550045-06	1550045-07	1550045-08
	MDL/Units	Soil	Soil	Soil	Soil
1,2-Dichlorobenzene	0.05 ug/g dry	-	-	-	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	-	-	-	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	-	-	-	<0.05
1,1-Dichloroethane	0.05 ug/g dry	-	-	-	<0.05
1,2-Dichloroethane	0.05 ug/g dry	-	-	-	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	-	-	-	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	-	-	-	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	-	-	-	<0.05
1,2-Dichloropropane	0.05 ug/g dry	-	-	-	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	-	-	-	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	-	-	-	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	-	-	-	<0.05
Ethylbenzene	0.05 ug/g dry	-	-	-	<0.05
Ethylene dibromide (dibromoethar	0.05 ug/g dry	-	-	-	<0.05
Hexane	0.05 ug/g dry	-	-	-	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	-	-	-	<0.50
Methyl Isobutyl Ketone	0.50 ug/g dry	-	-	-	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	-	-	-	<0.05
Methylene Chloride	0.05 ug/g dry	-	-	-	<0.05
Styrene	0.05 ug/g dry	-	-	-	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	-	-	-	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	-	-	-	<0.05
Tetrachloroethylene	0.05 ug/g dry	-	-	-	<0.05
Toluene	0.05 ug/g dry	-	-	-	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	-	-	-	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	-	-	-	<0.05
Trichloroethylene	0.05 ug/g dry	-	-	-	<0.05
Trichlorofluoromethane	0.05 ug/g dry	-	-	-	<0.05
Vinyl chloride	0.02 ug/g dry	-	-	-	<0.02
m,p-Xylenes	0.05 ug/g dry	-	-	-	<0.05
o-Xylene	0.05 ug/g dry	-	-	-	<0.05
Xylenes, total	0.05 ug/g dry	-	-	-	<0.05
4-Bromofluorobenzene	Surrogate	-	-	-	107%
Dibromofluoromethane	Surrogate	-	-	-	98.7%
Toluene-d8	Surrogate	-	-	-	107%

**Certificate of Analysis**

Report Date: 11-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 7-Dec-2015

Client PO:

**Project Description: TG151118**

	<b>Client ID:</b>	BH 103-1A-C	BH 103-3-D	BH 104-1-C	BH 104-3-D
	<b>Sample Date:</b>	02-Dec-15	02-Dec-15	02-Dec-15	02-Dec-15
	<b>Sample ID:</b>	1550045-05	1550045-06	1550045-07	1550045-08
	<b>MDL/Units</b>	Soil	Soil	Soil	Soil
Benzene	0.02 ug/g dry	-	<0.02	-	-
Ethylbenzene	0.05 ug/g dry	-	<0.05	-	-
Toluene	0.05 ug/g dry	-	<0.05	-	-
m,p-Xylenes	0.05 ug/g dry	-	<0.05	-	-
o-Xylene	0.05 ug/g dry	-	<0.05	-	-
Xylenes, total	0.05 ug/g dry	-	<0.05	-	-
Toluene-d8	Surrogate	-	102%	-	-

**Hydrocarbons**

F1 PHCs (C6-C10)	7 ug/g dry	-	<7	-	<7
F2 PHCs (C10-C16)	4 ug/g dry	-	<4	-	<4
F3 PHCs (C16-C34)	8 ug/g dry	-	<8	-	<8
F4 PHCs (C34-C50)	6 ug/g dry	-	<6	-	<6



**Certificate of Analysis**

Report Date: 11-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 7-Dec-2015

Client PO:

**Project Description: TG151118**

<b>Client ID:</b>	BH 105-1-C	BH 105-3-C	Dup 1	-
<b>Sample Date:</b>	02-Dec-15	02-Dec-15	02-Dec-15	-
<b>Sample ID:</b>	1550045-09	1550045-10	1550045-11	-
<b>MDL/Units</b>	Soil	Soil	Soil	-

**Physical Characteristics**

% Solids	0.1 % by Wt.	83.4	83.7	80.2	-
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**Metals**

Antimony	1.0 ug/g dry	<1.0	-	-	-
Arsenic	1.0 ug/g dry	5.1	-	-	-
Barium	1.0 ug/g dry	130	-	-	-
Beryllium	1.0 ug/g dry	<1.0	-	-	-
Boron	1.0 ug/g dry	16.3	-	-	-
Cadmium	0.5 ug/g dry	<0.5	-	-	-
Chromium	1.0 ug/g dry	26.7	-	-	-
Cobalt	1.0 ug/g dry	13.5	-	-	-
Copper	1.0 ug/g dry	26.8	-	-	-
Lead	1.0 ug/g dry	12.9	-	-	-
Molybdenum	1.0 ug/g dry	<1.0	-	-	-
Nickel	1.0 ug/g dry	25.2	-	-	-
Selenium	1.0 ug/g dry	<1.0	-	-	-
Silver	0.5 ug/g dry	<0.5	-	-	-
Thallium	1.0 ug/g dry	<1.0	-	-	-
Uranium	1.0 ug/g dry	<1.0	-	-	-
Vanadium	1.0 ug/g dry	35.5	-	-	-
Zinc	1.0 ug/g dry	53.7	-	-	-

**Volatiles**

Acetone	0.50 ug/g dry	-	<0.50	<0.50	-
Benzene	0.02 ug/g dry	-	<0.02	<0.02	-
Bromodichloromethane	0.05 ug/g dry	-	<0.05	<0.05	-
Bromoform	0.05 ug/g dry	-	<0.05	<0.05	-
Bromomethane	0.05 ug/g dry	-	<0.05	<0.05	-
Carbon Tetrachloride	0.05 ug/g dry	-	<0.05	<0.05	-
Chlorobenzene	0.05 ug/g dry	-	<0.05	<0.05	-
Chloroform	0.05 ug/g dry	-	<0.05	<0.05	-
Dibromochloromethane	0.05 ug/g dry	-	<0.05	<0.05	-
Dichlorodifluoromethane	0.05 ug/g dry	-	<0.05	<0.05	-
1,2-Dichlorobenzene	0.05 ug/g dry	-	<0.05	<0.05	-
1,3-Dichlorobenzene	0.05 ug/g dry	-	<0.05	<0.05	-
1,4-Dichlorobenzene	0.05 ug/g dry	-	<0.05	<0.05	-
1,1-Dichloroethane	0.05 ug/g dry	-	<0.05	<0.05	-

**Certificate of Analysis**

Report Date: 11-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 7-Dec-2015

Client PO:

**Project Description: TG151118**

	Client ID: Sample Date: Sample ID:	BH 105-1-C 02-Dec-15 1550045-09 Soil	BH 105-3-C 02-Dec-15 1550045-10 Soil	Dup 1 02-Dec-15 1550045-11 Soil	- - - -
	MDL/Units				
1,2-Dichloroethane	0.05 ug/g dry	-	<0.05	<0.05	-
1,1-Dichloroethylene	0.05 ug/g dry	-	<0.05	<0.05	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	-	<0.05	<0.05	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	-	<0.05	<0.05	-
1,2-Dichloropropane	0.05 ug/g dry	-	<0.05	<0.05	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	-	<0.05	<0.05	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	-	<0.05	<0.05	-
1,3-Dichloropropene, total	0.05 ug/g dry	-	<0.05	<0.05	-
Ethylbenzene	0.05 ug/g dry	-	<0.05	<0.05	-
Ethylene dibromide (dibromoethar	0.05 ug/g dry	-	<0.05	<0.05	-
Hexane	0.05 ug/g dry	-	<0.05	<0.05	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	-	<0.50	<0.50	-
Methyl Isobutyl Ketone	0.50 ug/g dry	-	<0.50	<0.50	-
Methyl tert-butyl ether	0.05 ug/g dry	-	<0.05	<0.05	-
Methylene Chloride	0.05 ug/g dry	-	<0.05	<0.05	-
Styrene	0.05 ug/g dry	-	<0.05	<0.05	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	-	<0.05	<0.05	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	-	<0.05	<0.05	-
Tetrachloroethylene	0.05 ug/g dry	-	<0.05	<0.05	-
Toluene	0.05 ug/g dry	-	<0.05	<0.05	-
1,1,1-Trichloroethane	0.05 ug/g dry	-	<0.05	<0.05	-
1,1,2-Trichloroethane	0.05 ug/g dry	-	<0.05	<0.05	-
Trichloroethylene	0.05 ug/g dry	-	<0.05	<0.05	-
Trichlorofluoromethane	0.05 ug/g dry	-	<0.05	<0.05	-
Vinyl chloride	0.02 ug/g dry	-	<0.02	<0.02	-
m,p-Xylenes	0.05 ug/g dry	-	<0.05	<0.05	-
o-Xylene	0.05 ug/g dry	-	<0.05	<0.05	-
Xylenes, total	0.05 ug/g dry	-	<0.05	<0.05	-
4-Bromofluorobenzene	Surrogate	-	109%	106%	-
Dibromofluoromethane	Surrogate	-	98.3%	101%	-
Toluene-d8	Surrogate	-	105%	108%	-

**Hydrocarbons**

F1 PHCs (C6-C10)	7 ug/g dry	-	<7	<7	-
F2 PHCs (C10-C16)	4 ug/g dry	-	<4	<4	-
F3 PHCs (C16-C34)	8 ug/g dry	-	<8	<8	-
F4 PHCs (C34-C50)	6 ug/g dry	-	<6	<6	-

**Certificate of Analysis**

Report Date: 11-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 7-Dec-2015

Client PO:

**Project Description: TG151118**
**Method Quality Control: Blank**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>General Inorganics</b>									
Conductivity	ND	5	uS/cm						
<b>Hydrocarbons</b>									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
<b>Metals</b>									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	1.0	ug/g						
Boron	ND	1.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	1.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	1.0	ug/g						
Lead	ND	1.0	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	1.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.5	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	1.0	ug/g						
Zinc	ND	1.0	ug/g						
<b>Volatiles</b>									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane)	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						

**Certificate of Analysis**

Report Date: 11-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 7-Dec-2015

Client PO:

**Project Description: TG151118**
**Method Quality Control: Blank**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>8.41</i>		<i>ug/g</i>		<i>105</i>	<i>50-140</i>			
<i>Surrogate: Dibromofluoromethane</i>	<i>7.58</i>		<i>ug/g</i>		<i>94.8</i>	<i>50-140</i>			
<i>Surrogate: Toluene-d8</i>	<i>8.02</i>		<i>ug/g</i>		<i>100</i>	<i>50-140</i>			
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
<i>Surrogate: Toluene-d8</i>	<i>8.02</i>		<i>ug/g</i>		<i>100</i>	<i>50-140</i>			

**Certificate of Analysis**

Report Date: 11-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 7-Dec-2015

Client PO:

**Project Description: TG151118**
**Method Quality Control: Duplicate**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>General Inorganics</b>									
SAR	1.04	0.01	N/A	1.04			0.0	200	
Conductivity	167	5	uS/cm	165			1.4	6.2	
pH	7.68	0.05	pH Units	7.67			0.1	10	
<b>Hydrocarbons</b>									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND				30	
F3 PHCs (C16-C34)	ND	8	ug/g dry	ND				30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND				30	
<b>Metals</b>									
Antimony	3.05	1.0	ug/g dry	2.42			23.1	30	
Arsenic	6.73	1.0	ug/g dry	5.44			21.2	30	
Barium	106	1.0	ug/g dry	109			3.0	30	
Beryllium	ND	1.0	ug/g dry	ND			0.0	30	
Boron	11.7	1.0	ug/g dry	12.3			5.1	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium	25.4	1.0	ug/g dry	25.6			0.8	30	
Cobalt	9.07	1.0	ug/g dry	8.87			2.2	30	
Copper	36.7	1.0	ug/g dry	36.3			0.9	30	
Lead	64.7	1.0	ug/g dry	54.8			16.6	30	
Molybdenum	1.76	1.0	ug/g dry	1.31			29.3	30	
Nickel	19.0	1.0	ug/g dry	19.2			0.9	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.5	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	ND				30	
Vanadium	26.1	1.0	ug/g dry	26.5			1.7	30	
Zinc	110	1.0	ug/g dry	111			0.9	30	
<b>Physical Characteristics</b>									
% Solids	89.7	0.1	% by Wt.	88.7			1.1	25	
<b>Volatiles</b>									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	
Bromodichloromethane	ND	0.05	ug/g dry	ND				50	
Bromoform	ND	0.05	ug/g dry	ND				50	
Bromomethane	ND	0.05	ug/g dry	ND				50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND				50	
Chlorobenzene	ND	0.05	ug/g dry	ND				50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Dibromochloromethane	ND	0.05	ug/g dry	ND				50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND				50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND			0.0	50	
Ethylene dibromide (dibromoethane)	ND	0.05	ug/g dry	ND				50	
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND				50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND				50	

**Certificate of Analysis**

Report Date: 11-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 7-Dec-2015

Client PO:

**Project Description: TG151118**
**Method Quality Control: Duplicate**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Methylene Chloride	ND	0.05	ug/g dry	ND				50	
Styrene	ND	0.05	ug/g dry	ND				50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	0.067	0.05	ug/g dry	0.073			8.8	50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND				50	
Trichloroethylene	ND	0.05	ug/g dry	ND				50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND				50	
Vinyl chloride	ND	0.02	ug/g dry	ND				50	
m,p-Xylenes	0.092	0.05	ug/g dry	0.103			11.5	50	
o-Xylene	0.058	0.05	ug/g dry	0.060			4.7	50	
<i>Surrogate: 4-Bromofluorobenzene</i>	6.03		<i>ug/g dry</i>	<i>ND</i>	108	50-140			
<i>Surrogate: Dibromofluoromethane</i>	5.81		<i>ug/g dry</i>	<i>ND</i>	104	50-140			
<i>Surrogate: Toluene-d8</i>	5.76		<i>ug/g dry</i>	<i>ND</i>	103	50-140			
Benzene	ND	0.02	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND			0.0	50	
Toluene	0.067	0.05	ug/g dry	0.073			8.8	50	
m,p-Xylenes	0.092	0.05	ug/g dry	0.103			11.5	50	
o-Xylene	0.058	0.05	ug/g dry	0.060			4.7	50	
<i>Surrogate: Toluene-d8</i>	5.76		<i>ug/g dry</i>	<i>ND</i>	103	50-140			

**Certificate of Analysis**

Report Date: 11-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 7-Dec-2015

Client PO:

**Project Description: TG151118**
**Method Quality Control: Spike**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Hydrocarbons</b>									
F1 PHCs (C6-C10)	185	7	ug/g	ND	92.3	80-120			
F2 PHCs (C10-C16)	82	4	ug/g	ND	90.6	80-120			
F3 PHCs (C16-C34)	191	8	ug/g	ND	103	80-120			
F4 PHCs (C34-C50)	132	6	ug/g	ND	106	80-120			
<b>Metals</b>									
Antimony	282		ug/L	48.3	93.5	70-130			
Arsenic	377		ug/L	109	107	70-130			
Barium	2370		ug/L	2180	74.1	70-130			
Beryllium	258		ug/L	1.15	103	70-130			
Boron	479		ug/L	246	93.0	70-130			
Cadmium	256		ug/L	ND	102	70-130			
Chromium	723		ug/L	513	84.0	70-130			
Cobalt	388		ug/L	177	84.4	70-130			
Copper	958		ug/L	727	92.6	70-130			
Lead	1300		ug/L	1100	83.0	70-130			
Molybdenum	247		ug/L	26.3	88.2	70-130			
Nickel	568		ug/L	384	73.5	70-130			
Selenium	221		ug/L	8.54	85.0	70-130			
Silver	221		ug/L	1.45	87.8	70-130			
Thallium	237		ug/L	18.8	87.2	70-130			
Uranium	239		ug/L	ND	95.4	70-130			
Vanadium	735		ug/L	531	81.9	70-130			
Zinc	302		ug/L	115	74.8	70-130			
<b>Volatiles</b>									
Acetone	9.17	0.50	ug/g	ND	91.7	50-140			
Benzene	3.90	0.02	ug/g	ND	97.4	60-130			
Bromodichloromethane	3.24	0.05	ug/g	ND	81.1	60-130			
Bromoform	3.94	0.05	ug/g	ND	98.4	60-130			
Bromomethane	2.93	0.05	ug/g	ND	73.2	50-140			
Carbon Tetrachloride	3.46	0.05	ug/g	ND	86.6	60-130			
Chlorobenzene	3.40	0.05	ug/g	ND	85.0	60-130			
Chloroform	4.02	0.05	ug/g	ND	101	60-130			
Dibromochloromethane	3.80	0.05	ug/g	ND	94.9	60-130			
Dichlorodifluoromethane	2.86	0.05	ug/g	ND	71.5	50-140			
1,2-Dichlorobenzene	4.99	0.05	ug/g	ND	125	60-130			
1,3-Dichlorobenzene	4.56	0.05	ug/g	ND	114	60-130			
1,4-Dichlorobenzene	4.34	0.05	ug/g	ND	108	60-130			
1,1-Dichloroethane	3.28	0.05	ug/g	ND	82.1	60-130			
1,2-Dichloroethane	3.66	0.05	ug/g	ND	91.4	60-130			
1,1-Dichloroethylene	3.11	0.05	ug/g	ND	77.7	60-130			
cis-1,2-Dichloroethylene	4.18	0.05	ug/g	ND	105	60-130			
trans-1,2-Dichloroethylene	3.82	0.05	ug/g	ND	95.6	60-130			
1,2-Dichloropropane	3.49	0.05	ug/g	ND	87.1	60-130			
cis-1,3-Dichloropropylene	2.69	0.05	ug/g	ND	67.2	60-130			
trans-1,3-Dichloropropylene	2.65	0.05	ug/g	ND	66.1	60-130			
Ethylbenzene	2.70	0.05	ug/g	ND	67.4	60-130			
Ethylene dibromide (dibromoethane)	4.79	0.05	ug/g	ND	120	60-130			
Hexane	3.40	0.05	ug/g	ND	85.1	60-130			
Methyl Ethyl Ketone (2-Butanone)	8.64	0.50	ug/g	ND	86.4	50-140			
Methyl Isobutyl Ketone	8.84	0.50	ug/g	ND	88.4	50-140			
Methyl tert-butyl ether	8.69	0.05	ug/g	ND	86.9	50-140			



**Certificate of Analysis**

Report Date: 11-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 7-Dec-2015

Client PO:

**Project Description: TG151118**
**Method Quality Control: Spike**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Methylene Chloride	4.15	0.05	ug/g	ND	104	60-130			
Styrene	2.48	0.05	ug/g	ND	62.0	60-130			
1,1,1,2-Tetrachloroethane	3.74	0.05	ug/g	ND	93.6	60-130			
1,1,2,2-Tetrachloroethane	4.41	0.05	ug/g	ND	110	60-130			
Tetrachloroethylene	4.80	0.05	ug/g	ND	120	60-130			
Toluene	3.80	0.05	ug/g	ND	95.1	60-130			
1,1,1-Trichloroethane	3.76	0.05	ug/g	ND	93.9	60-130			
1,1,2-Trichloroethane	3.18	0.05	ug/g	ND	79.6	60-130			
Trichloroethylene	3.70	0.05	ug/g	ND	92.6	60-130			
Trichlorofluoromethane	3.41	0.05	ug/g	ND	85.2	50-140			
Vinyl chloride	3.26	0.02	ug/g	ND	81.5	50-140			
m,p-Xylenes	5.30	0.05	ug/g	ND	66.3	60-130			
o-Xylene	2.97	0.05	ug/g	ND	74.3	60-130			
<i>Surrogate: 4-Bromofluorobenzene</i>	7.62		<i>ug/g</i>		95.3	50-140			
Benzene	3.90	0.02	ug/g	ND	97.4	60-130			
Ethylbenzene	2.70	0.05	ug/g	ND	67.4	60-130			
Toluene	3.80	0.05	ug/g	ND	95.1	60-130			
m,p-Xylenes	5.30	0.05	ug/g	ND	66.3	60-130			
o-Xylene	2.97	0.05	ug/g	ND	74.3	60-130			

Certificate of Analysis

Client: **Amec Foster Wheeler (Thorold)**

Client PO:

Report Date: 11-Dec-2015

Order Date: 7-Dec-2015

**Project Description: TG151118**

**Qualifier Notes:**

***Login Qualifiers :***

Sample - F1/BTEX/VOCs (soil) not submitted according to Reg. 153/04, Amended 2011 - not field preserved

*Applies to samples: BH 105-3-C, Dup 1*

**Sample Data Revisions**

None

**Work Order Revisions / Comments:**

None

**Other Report Notes:**

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.

Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

***CCME PHC additional information:***

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.

Client Name: <u>Amee Foster Wheeler</u>	Project Reference: <u>TC-151118</u>	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: <u>Patrick Shiner</u>	Quote # <u>15-03</u>	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: <u>3300 Merriville Hwy, Unit 5 Thornhill, ON L2H 4K6</u>	PO #	Date Required: _____
Telephone: <u>905-887-6616</u>	Email Address: <u>patrick.shiner@ameefw.com</u>	

Criteria:  O. Reg. 153/04 (As Amended) Table  RSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: <u>1550045</u>		Matrix	Air Volume	# of Containers	Sample Taken		PHC(F <sub>1</sub> -F <sub>4</sub> )	BTEX	PAHS	ICP METALS	PH	EC	SAR			
Sample ID/Location Name					Date	Time										
1	BH101-1-C	S		1	Dec 3/15	8:00am				X	X	X	X			250mL
2	BH101-1-D	S		2		8:00am										
3	BH101-2A-D	S		2		8:05am	X	X								250mL + 1 vial
4	BH101-2B-D	S		2		8:05am										
5	BH101-2-C	S		1		8:05am										
6	BH101-3A-D	S		2		8:10am										
7	BH101-3B-D	S		2		8:10am										
8	BH101-3-C	S		1		8:10am										
9	BH101-4-D	S		2		8:15am										
10	BH101-4-C	S		1		8:15am										

Comments: GOVERNED BY THE TERMS + CONDITIONS OF THE AGREEMENT #SMA07-003  
- HOLD REMAINING SAMPLES

Method of Delivery: cup

Relinquished By (Sign):	Received by Driver/Depot: <u>Niyana Bhomejick</u>	Received at Lab:	Verified By:
Relinquished By (Print): <u>PAT SHINER</u>	Date/Time: <u>Dec 15 12:00</u>	Date/Time: <u>Dec 8/15 9:45</u>	Date/Time: <u>Dec 8/15 10:00</u>
Date/Time: <u>Dec 7/15 11:30AM</u>	Temperature: <u>9.8 °C</u>	Temperature: <u>11.2 °C</u>	pH Verified <input checked="" type="checkbox"/> By: <u>WA</u>

Client Name: <u>Anee Foster Wheeler</u>	Project Reference: <u>TG151118</u>	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: <u>Patrick Shriner</u>	Quote # <u>15-03</u>	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: <u>3300 Merriville Hwy, Unit 5 Thorold, ON L2V 4V6</u>	PO #	Date Required: _____
Telephone: <u>905-687-6616</u>	Email Address: <u>patrick.shriner@amafw.com</u>	

Criteria:  O. Reg. 153/04 (As Amended) Table  MRSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)				Required Analyses											
Paracel Order Number: <u>1550045</u>				Matrix	Air Volume	# of Containers	Sample Taken		PH (A-F <sub>1</sub> )	BTEX	PAHS	ICP METALS	PH	EC	SAR
Sample ID/Location Name		Date	Time												
1	<u>DUP 2</u>		<u>S</u>		<u>2</u>	<u>Dec 2/15</u>	<del>3:50</del>								
2	<u>BH 102-1A-D</u>		<u>S</u>		<u>2</u>		<u>3:50</u>								
3	<u>BH 102-1B-D</u>		<u>S</u>		<u>2</u>		<u>3:50</u>								
4	<u>BH 102-1A-C</u>		<u>S</u>		<u>1</u>		<u>3:50</u>				<u>X</u>	<u>X</u>	<u>X</u>	<u>250mL</u>	
5	<u>BH 102-1B-C</u>		<u>S</u>		<u>1</u>		<u>3:50</u>								
6	<u>BH 102-2-C</u>		<u>S</u>		<u>1</u>		<u>3:50</u>								
7	<u>BH 102-3-D</u>		<u>S</u>		<u>2</u>		<u>4:00</u>	<u>X</u>	<u>X</u>				<u>250mL + 1vial</u>		
8	<u>BH 102-3-C</u>		<u>S</u>		<u>1</u>		<u>4:00</u>								
9	<u>BH 102-4-C</u>		<u>S</u>		<u>1</u>	<u>↓</u>	<u>4:05</u>								
10															

Comments: SEE NOTES PG. 1 Method of Delivery: P.U.P

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot: <u>Niagara Blumenthal</u>	Received at Lab: <u>[Signature]</u>	Verified By: <u>[Signature]</u>
Relinquished By (Print): <u>PAT SHRINER</u>	Date/Time: <u>7 Dec 15</u>	Date/Time: <u>Dec 8 15 9:45</u>	Date/Time: <u>Dec 8 15 10</u>
Date/Time: <u>Dec 7 15 11:30am</u>	Temperature: <u>9.8 °C</u>	Temperature: <u>11.2 °C</u>	pH Verified By: <u>NA</u>

Client Name: <u>Amece Foster Wheeler</u>	Project Reference: <u>TC-151118</u>	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> [ ] 3 Day
Contact Name: <u>Patrick Shimer</u>	Quote #	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: <u>3300 Merriville Hwy, Unit 5 Thorold, ON L2V 4K6</u>	PO #	Date Required: _____
Telephone: <u>905-687-6616</u>	Email Address: <u>patrick.shimer@amecefw.com</u>	

Criteria:  O. Reg. 153/04 (As Amended) Table  RSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: <u>1550045</u>		Matrix	Air Volume	# of Containers	Sample Taken		PHC(+,-)	BTEX	PAHs	ICP METALS	PH	EC	SAR			
Sample ID/Location Name					Date	Time										
1	BH 103-1A-D	S		2	Dec 2/15	10:30am										
2	BH 103-1B-D	S		2		10:30am										
3	<del>BH 103-1A-C</del>	<del>S</del>		<del>2</del>												
4	BH 103-1A-C	S		1		10:30am				X	X	X		250 mL		
5	BH 103-1A-C	S		1		10:30am										
6	BH 103-2-C	S		1		10:35am										
7	BH 103-3-D	S		2		10:40am	X	X						250 mL + 1 vial.		
8	BH 103-3-C	S		1		10:40am										
9	BH 103-4-C	S		4		10:45am										
10																

Comments: SEE NOTES PG. 1 Method of Delivery: P. UP

Relinquished By (Sign):	Received by Driver/Depot: <u>Niagara</u> <u>Blumenfeld</u>	Received at Lab:	Verified By:
Relinquished By (Print): <u>PKT SHIMER</u>	Date/Time: <u>Dec 15</u>	Date/Time: <u>Dec 8/15 9:45</u>	Date/Time: <u>Dec 8, 15 10:00</u>
Date/Time: <u>DEC 7 15 11:30 AM</u>	Temperature: <u>9.8 °C</u>	Temperature: <u>12 °C</u>	pH Verified <input checked="" type="checkbox"/> By: <u>NA</u>

Client Name: <u>Ameo Foster Wheeler</u>	Project Reference: <u>TC15118</u>	TAT: <input checked="" type="checkbox"/> Regular [ ] 3 Day
Contact Name: <u>Patrick Shyman</u>	Quote #	[ ] 2 Day [ ] 1 Day
Address: <u>3300 Merriville Hwy, Unit 5 Thorold, ON L2V 4Y6</u>	PO #	Date Required: _____
Telephone: <u>905-687-6616</u>	Email Address: <u>patrick.shyman@ameofw.com</u>	

Criteria:  O. Reg. 153/04 (As Amended) Table  MRSC Filing [ ] O. Reg. 558/00 [ ] PWQO [ ] CCME [ ] SUB (Storm) [ ] SUB (Sanitary) Municipality: \_\_\_\_\_ [ ] Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other) Required Analyses

Parcel Order Number: <u>1550045</u>		Matrix	Air Volume	# of Containers	Sample Taken		VOCs	PHC(F,F <sub>4</sub> )	ICP METALS							
Sample ID/Location Name					Date	Time										
1	BH104-1-D	S		2	Dec 2/15	8:30am										
2	BH104-1-C	S		1		8:30am		X			250mL					
3	BH104-2-D	S		2		8:40am										
4	BH104-2-C	S		1		8:40am										
5	BH104-3-D	S		2		8:50am	X	X			250mL + Nial.					
6	BH104-3-C	S		1		8:50am										
7	BH104-4-D	S		2		9:00am										
8	BH104-4-C	S		1		9:00am										
9																
10																

Comments: SEE NOTES PG. 1 Method of Delivery: PUP

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot: <u>Niagara</u> <u>B Hamerik</u>	Received at Lab: <u>[Signature]</u>	Verified By: <u>[Signature]</u>
Relinquished By (Print): <u>PAT SHYMAN</u>	Date/Time: <u>7 Dec '15</u>	Date/Time: <u>Dec 8/15 9:45</u>	Date/Time: <u>Dec 8, 15 10</u>
Date/Time: <u>Dec 7/15 11:30am</u>	Temperature: <u>9.8 °C</u>	Temperature: <u>11.2 °C</u>	pH Verified <input checked="" type="checkbox"/> By: <u>NA</u>



Client Name: <u>Amece Foster Wheeler</u>	Project Reference: <u>76-15118</u>	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: <u>Patrick Shriner</u>	Quote # <u>15-03</u>	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: <u>3300 Herringtonville Hwy, Units 5 Thorold, ON L2V 4Y6</u>	PO #	Date Required: _____
Telephone: <u>905-687-6616</u>	Email Address: <u>patrick.shriner@amecefw.com</u>	

Criteria:  O. Reg. 153/04 (As Amended) Table  RSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: <u>1550045</u>		Matrix	Air Volume	# of Containers	Sample Taken		VOC	PHC (F, T, U)	ICP METALS							
Sample ID/Location Name					Date	Time										
1	BH105-1-D	S		2	Dec 2/15	1:35 pm										
2	BH105-1-C	S		1		1:35 pm		X								250 mL
3	BH105-2-C	S		1		1:40 pm										
4	BH105-3-D	S		2		1:45 pm										
5	<sup>missing vial(?)</sup> BH105-3-C	S		1		1:45 pm	X	X								250 mL
6	BH105-4-D	S		2		1:50 pm										
7	BH105-4-C	S		1		1:50 pm										
8																
9	<del>DUPLICATE</del>															
10	DUP 1	S		2	V		X	X								250 mL + 1 vial.

Comments: SEE NOTES PG. 1 BH105-3-C No vial submitted to the lab.

Method of Delivery: PUP

Relinquished By (Sign):	Received by Driver/Depot: <u>Niagara B Homewick</u>	Received at Lab: <u>[Signature]</u>	Verified By: <u>[Signature]</u>
Relinquished By (Print):	Date/Time: <u>7 Dec 15</u>	Date/Time: <u>Dec 8 15 9:45</u>	Date/Time: <u>Dec 8 15 10:00</u>
Date/Time:	Temperature: <u>9.8 °C</u>	Temperature: <u>11.2 °C</u>	pH Verified By: <u>NA</u>



# Certificate of Analysis

**Amec Foster Wheeler (Thorold)**

3300 Merrittville Hwy, Unit 5  
Thorold, ON L2V 4Y6  
Attn: Pat Shriner

Client PO:  
Project: TG151118  
Custody: 26598-26608/24778/779

Report Date: 17-Dec-2015  
Order Date: 11-Dec-2015

**Order #: 1550409**

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

<b>Parcel ID</b>	<b>Client ID</b>
1550409-01	TP114-1
1550409-02	Dup-A
1550409-03	TP115-1
1550409-04	TP116-2
1550409-05	TP117-3
1550409-06	Dup C
1550409-07	TP118-1
1550409-08	TP113-1
1550409-09	TP113-7
1550409-10	TP104-1
1550409-11	TP119-1c
1550409-12	TP119-8d
1550409-13	TP119-8c
1550409-14	TP105-1
1550409-15	TP107-1
1550409-16	TP120-1
1550409-17	TP108-1
1550409-18	TP121-1
1550409-19	TP121-5
1550409-20	TP111-1
1550409-21	TP110-1c
1550409-22	TP109-2
1550409-23	TP112-2d
1550409-24	Dup-G
1550409-25	TP106-1
1550409-26	TP101-5d

Approved By:



Mark Foto, M.Sc.  
Lab Supervisor

Certificate of Analysis

Report Date: 17-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 11-Dec-2015

Client PO:

**Project Description: TG151118**
**Analysis Summary Table**

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	15-Dec-15	15-Dec-15
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	14-Dec-15	15-Dec-15
Conductivity	MOE E3138 - probe @25 °C, water ext	16-Dec-15	16-Dec-15
Mercury by CVAA	EPA 7471B - CVAA, digestion	16-Dec-15	16-Dec-15
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	15-Dec-15	15-Dec-15
PHC F1	CWS Tier 1 - P&T GC-FID	15-Dec-15	15-Dec-15
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	15-Dec-15	15-Dec-15
REG 153: Metals by ICP/OES, soil	based on MOE E3470, ICP-OES	16-Dec-15	16-Dec-15
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	14-Dec-15	15-Dec-15
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	15-Dec-15	15-Dec-15
SAR	Calculation	16-Dec-15	17-Dec-15
Solids, %	Gravimetric, calculation	14-Dec-15	14-Dec-15

**Certificate of Analysis**

Report Date: 17-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 11-Dec-2015

Client PO:

**Project Description: TG151118**

<b>Client ID:</b>	TP114-1	Dup-A	TP115-1	TP116-2
<b>Sample Date:</b>	08-Dec-15	08-Dec-15	08-Dec-15	08-Dec-15
<b>Sample ID:</b>	1550409-01	1550409-02	1550409-03	1550409-04
<b>MDL/Units</b>	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	81.0	82.4	81.6	81.6
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**General Inorganics**

SAR	0.01 N/A	0.56	0.72	-	-
Conductivity	5 uS/cm	230	254	-	-
pH	0.05 pH Units	7.72	7.66	-	-

**Metals**

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	3.2	2.8	4.2	4.3
Barium	1.0 ug/g dry	165	150	179	101
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	21.4	22.8	16.6	14.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	23.9	25.2	27.2	20.8
Cobalt	1.0 ug/g dry	11.8	12.3	13.9	10.1
Copper	1.0 ug/g dry	21.2	21.8	21.8	20.6
Lead	1.0 ug/g dry	10.0	10.8	12.9	9.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	23.5	25.3	28.6	19.7
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	32.2	33.9	36.6	28.7
Zinc	1.0 ug/g dry	51.3	55.7	60.8	45.1

**Certificate of Analysis**

Report Date: 17-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 11-Dec-2015

Client PO:

**Project Description: TG151118**

<b>Client ID:</b>	TP117-3	Dup C	TP118-1	TP113-1
<b>Sample Date:</b>	08-Dec-15	08-Dec-15	08-Dec-15	08-Dec-15
<b>Sample ID:</b>	1550409-05	1550409-06	1550409-07	1550409-08
<b>MDL/Units</b>	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	80.9	79.2	82.7	86.0
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**General Inorganics**

SAR	0.01 N/A	0.76	1.39	-	-
Conductivity	5 uS/cm	2990	1280	-	-
pH	0.05 pH Units	7.77	7.76	-	-

**Metals**

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	4.3	4.7	5.3	3.4
Barium	1.0 ug/g dry	127	166	123	127
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	16.9	17.4	17.3	15.4
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	25.7	25.2	27.8	18.3
Cobalt	1.0 ug/g dry	13.7	14.2	13.6	8.8
Copper	1.0 ug/g dry	22.1	20.4	21.1	20.6
Lead	1.0 ug/g dry	11.9	10.5	11.1	13.3
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	24.9	26.2	29.5	17.4
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	34.8	33.9	35.8	26.0
Zinc	1.0 ug/g dry	51.8	49.1	61.4	70.3

**Certificate of Analysis**

Report Date: 17-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 11-Dec-2015

Client PO:

**Project Description: TG151118**

Client ID:	TP113-7	TP104-1	TP119-1c	TP119-8d
Sample Date:	08-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15
Sample ID:	1550409-09	1550409-10	1550409-11	1550409-12
MDL/Units	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	80.9	78.9	81.2	74.2
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**Metals**

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Arsenic	1.0 ug/g dry	3.0	4.4	6.0	-
Barium	1.0 ug/g dry	62.1	112	112	-
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Boron	1.0 ug/g dry	4.3	14.7	14.7	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Chromium	1.0 ug/g dry	17.4	21.0	21.9	-
Chromium (VI)	0.2 ug/g dry	<0.2	-	-	-
Cobalt	1.0 ug/g dry	10.3	11.9	11.1	-
Copper	1.0 ug/g dry	5.2	21.4	22.2	-
Lead	1.0 ug/g dry	10.9	9.2	10.9	-
Mercury	0.1 ug/g dry	<0.1	-	-	-
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Nickel	1.0 ug/g dry	10.8	21.2	21.1	-
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Vanadium	1.0 ug/g dry	28.0	28.6	29.7	-
Zinc	1.0 ug/g dry	48.8	47.3	107	-

**Volatiles**

Acetone	0.50 ug/g dry	<0.50	-	-	-
Benzene	0.02 ug/g dry	<0.02	-	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	-	-	-
Bromoform	0.05 ug/g dry	<0.05	-	-	-
Bromomethane	0.05 ug/g dry	<0.05	-	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	-	-	-
Chlorobenzene	0.05 ug/g dry	<0.05	-	-	-
Chloroform	0.05 ug/g dry	<0.05	-	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	-	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-

**Certificate of Analysis**

Report Date: 17-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 11-Dec-2015

Client PO:

**Project Description: TG151118**

	Client ID:	TP113-7	TP104-1	TP119-1c	TP119-8d
	Sample Date:	08-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15
	Sample ID:	1550409-09	1550409-10	1550409-11	1550409-12
	MDL/Units	Soil	Soil	Soil	Soil
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	-	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	-	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	-	-	-
Ethylene dibromide (dibromoethane)	0.05 ug/g dry	<0.05	-	-	-
Hexane	0.05 ug/g dry	<0.05	-	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	-	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	-	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	-	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	-	-	-
Styrene	0.05 ug/g dry	<0.05	-	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	-	-	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	-	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	-	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	-	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
4-Bromofluorobenzene	Surrogate	96.8%	-	-	-
Dibromofluoromethane	Surrogate	95.1%	-	-	-
Toluene-d8	Surrogate	105%	-	-	-
Benzene	0.02 ug/g dry	-	-	-	<0.02
Ethylbenzene	0.05 ug/g dry	-	-	-	<0.05

**Certificate of Analysis**

Report Date: 17-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 11-Dec-2015

Client PO:

**Project Description: TG151118**

	Client ID: Sample Date: Sample ID:	TP113-7 08-Dec-15 1550409-09 Soil	TP104-1 09-Dec-15 1550409-10 Soil	TP119-1c 09-Dec-15 1550409-11 Soil	TP119-8d 09-Dec-15 1550409-12 Soil
	MDL/Units				
Toluene	0.05 ug/g dry	-	-	-	<0.05
m,p-Xylenes	0.05 ug/g dry	-	-	-	<0.05
o-Xylene	0.05 ug/g dry	-	-	-	<0.05
Xylenes, total	0.05 ug/g dry	-	-	-	<0.05
Toluene-d8	Surrogate	-	-	-	108%

**Hydrocarbons**

F1 PHCs (C6-C10)	7 ug/g dry	<7	-	-	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	-	-	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	-	-	<8
F4 PHCs (C34-C50)	6 ug/g dry	<6	-	-	<6

**Semi-Volatiles**

Acenaphthene	0.02 ug/g dry	<0.02	-	-	-
Acenaphthylene	0.02 ug/g dry	<0.02	-	-	-
Anthracene	0.02 ug/g dry	<0.02	-	-	-
Benzo [a] anthracene	0.02 ug/g dry	<0.02	-	-	-
Benzo [a] pyrene	0.02 ug/g dry	<0.02	-	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	-	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	-	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	-	-	-
Chrysene	0.02 ug/g dry	<0.02	-	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	-	-	-
Fluoranthene	0.02 ug/g dry	<0.02	-	-	-
Fluorene	0.02 ug/g dry	<0.02	-	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	-	-	-
1-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	-
2-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	-	-	-
Naphthalene	0.01 ug/g dry	<0.01	-	-	-
Phenanthrene	0.02 ug/g dry	<0.02	-	-	-
Pyrene	0.02 ug/g dry	<0.02	-	-	-
2-Fluorobiphenyl	Surrogate	54.2%	-	-	-
Terphenyl-d14	Surrogate	84.0%	-	-	-



**Certificate of Analysis**

Report Date: 17-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 11-Dec-2015

Client PO:

**Project Description: TG151118**

Client ID:	TP119-8c	TP105-1	TP107-1	TP120-1
Sample Date:	08-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15
Sample ID:	1550409-13	1550409-14	1550409-15	1550409-16
MDL/Units	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	77.0	81.3	88.6	83.8
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**General Inorganics**

SAR	0.01 N/A	0.48	-	-	-
Conductivity	5 uS/cm	283	-	-	-
pH	0.05 pH Units	7.18	-	-	-

**Metals**

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	3.0	5.0	4.2	5.0
Barium	1.0 ug/g dry	95.7	110	116	118
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	4.3	16.4	16.1	15.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	14.5	22.4	20.2	21.0
Chromium (VI)	0.2 ug/g dry	<0.2	-	-	-
Cobalt	1.0 ug/g dry	7.8	11.6	10.1	10.8
Copper	1.0 ug/g dry	7.2	21.0	19.8	20.3
Lead	1.0 ug/g dry	9.6	10.1	12.8	11.0
Mercury	0.1 ug/g dry	<0.1	-	-	-
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	8.3	22.0	19.2	20.1
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	26.0	30.8	28.2	28.7
Zinc	1.0 ug/g dry	47.0	60.0	74.2	53.1

**Certificate of Analysis**

Report Date: 17-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 11-Dec-2015

Client PO:

**Project Description: TG151118**

Client ID:	TP108-1	TP121-1	TP121-5	TP111-1
Sample Date:	09-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15
Sample ID:	1550409-17	1550409-18	1550409-19	1550409-20
MDL/Units	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	83.9	83.2	81.4	84.7
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**Metals**

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	4.9	4.8	4.2	4.9
Barium	1.0 ug/g dry	114	102	106	83.6
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	14.6	13.5	11.6	14.2
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	20.5	20.9	20.8	19.1
Chromium (VI)	0.2 ug/g dry	-	-	<0.2	-
Cobalt	1.0 ug/g dry	10.7	10.7	10.5	9.5
Copper	1.0 ug/g dry	20.1	20.4	17.3	18.3
Lead	1.0 ug/g dry	11.8	11.7	9.7	9.9
Mercury	0.1 ug/g dry	-	-	<0.1	-
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	20.6	21.0	18.1	19.1
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	27.9	28.2	30.2	26.4
Zinc	1.0 ug/g dry	52.2	52.6	45.2	50.9

**Volatiles**

Benzene	0.02 ug/g dry	-	-	<0.02	-
Ethylbenzene	0.05 ug/g dry	-	-	<0.05	-
Toluene	0.05 ug/g dry	-	-	<0.05	-
m,p-Xylenes	0.05 ug/g dry	-	-	<0.05	-
o-Xylene	0.05 ug/g dry	-	-	<0.05	-
Xylenes, total	0.05 ug/g dry	-	-	<0.05	-
Toluene-d8	Surrogate	-	-	107%	-

**Hydrocarbons**

F1 PHCs (C6-C10)	7 ug/g dry	-	-	<7	-
F2 PHCs (C10-C16)	4 ug/g dry	-	-	<4	-
F3 PHCs (C16-C34)	8 ug/g dry	-	-	<8	-
F4 PHCs (C34-C50)	6 ug/g dry	-	-	<6	-

**Certificate of Analysis**

Report Date: 17-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 11-Dec-2015

Client PO:

**Project Description: TG151118**

Client ID:	TP108-1	TP121-1	TP121-5	TP111-1
Sample Date:	09-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15
Sample ID:	1550409-17	1550409-18	1550409-19	1550409-20
MDL/Units	Soil	Soil	Soil	Soil

**Semi-Volatiles**

Compound	MDL/Units	TP108-1	TP121-1	TP121-5	TP111-1
Acenaphthene	0.02 ug/g dry	-	-	<0.02	-
Acenaphthylene	0.02 ug/g dry	-	-	<0.02	-
Anthracene	0.02 ug/g dry	-	-	<0.02	-
Benzo [a] anthracene	0.02 ug/g dry	-	-	<0.02	-
Benzo [a] pyrene	0.02 ug/g dry	-	-	<0.02	-
Benzo [b] fluoranthene	0.02 ug/g dry	-	-	<0.02	-
Benzo [g,h,i] perylene	0.02 ug/g dry	-	-	<0.02	-
Benzo [k] fluoranthene	0.02 ug/g dry	-	-	<0.02	-
Chrysene	0.02 ug/g dry	-	-	<0.02	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	-	-	<0.02	-
Fluoranthene	0.02 ug/g dry	-	-	<0.02	-
Fluorene	0.02 ug/g dry	-	-	<0.02	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	-	-	<0.02	-
1-Methylnaphthalene	0.02 ug/g dry	-	-	<0.02	-
2-Methylnaphthalene	0.02 ug/g dry	-	-	<0.02	-
Methylnaphthalene (1&2)	0.04 ug/g dry	-	-	<0.04	-
Naphthalene	0.01 ug/g dry	-	-	<0.01	-
Phenanthrene	0.02 ug/g dry	-	-	<0.02	-
Pyrene	0.02 ug/g dry	-	-	<0.02	-
2-Fluorobiphenyl	Surrogate	-	-	59.2%	-
Terphenyl-d14	Surrogate	-	-	98.0%	-

**Certificate of Analysis**

Report Date: 17-Dec-2015

Client: Amec Foster Wheeler (Thorold)

Order Date: 11-Dec-2015

Client PO:

**Project Description: TG151118**

Client ID:	TP110-1c	TP109-2	TP112-2d	Dup-G
Sample Date:	09-Dec-15	09-Dec-15	09-Dec-15	09-Dec-15
Sample ID:	1550409-21	1550409-22	1550409-23	1550409-24
MDL/Units	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	82.9	86.0	84.7	85.4
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**Metals**

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Arsenic	1.0 ug/g dry	5.3	3.7	4.3	-
Barium	1.0 ug/g dry	107	105	110	-
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Boron	1.0 ug/g dry	15.7	12.9	12.4	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Chromium	1.0 ug/g dry	20.8	19.2	19.0	-
Chromium (VI)	0.2 ug/g dry	-	-	<0.2	<0.2
Cobalt	1.0 ug/g dry	10.7	10.0	10.0	-
Copper	1.0 ug/g dry	21.2	19.6	20.5	-
Lead	1.0 ug/g dry	10.3	9.9	11.2	-
Mercury	0.1 ug/g dry	-	-	<0.1	<0.1
Molybdenum	1.0 ug/g dry	<1.0	2.3	<1.0	-
Nickel	1.0 ug/g dry	19.8	19.6	19.4	-
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Vanadium	1.0 ug/g dry	29.1	26.0	25.7	-
Zinc	1.0 ug/g dry	48.2	49.0	58.9	-

**Semi-Volatiles**

Acenaphthene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
Acenaphthylene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
Anthracene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
Benzo [a] anthracene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
Benzo [a] pyrene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
Chrysene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
Fluoranthene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
Fluorene	0.02 ug/g dry	<0.02	-	<0.02	<0.02

**Certificate of Analysis**

Report Date: 17-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 11-Dec-2015

Client PO:

**Project Description: TG151118**

	Client ID: Sample Date: Sample ID:	TP110-1c 09-Dec-15 1550409-21	TP109-2 09-Dec-15 1550409-22	TP112-2d 09-Dec-15 1550409-23	Dup-G 09-Dec-15 1550409-24
	MDL/Units	Soil	Soil	Soil	Soil
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
1-Methylnaphthalene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
2-Methylnaphthalene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	-	<0.04	<0.04
Naphthalene	0.01 ug/g dry	<0.01	-	<0.01	<0.01
Phenanthrene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
Pyrene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
2-Fluorobiphenyl	Surrogate	58.5%	-	61.2%	67.7%
Terphenyl-d14	Surrogate	97.3%	-	85.9%	97.3%

	Client ID: Sample Date: Sample ID:	TP106-1 09-Dec-15 1550409-25	TP101-5d 09-Dec-15 1550409-26	-	-
	MDL/Units	Soil	Soil	-	-

**Physical Characteristics**

% Solids	0.1 % by Wt.	85.3	81.9	-	-
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**General Inorganics**

pH	0.05 pH Units	-	7.68	-	-
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**Metals**

Antimony	1.0 ug/g dry	<1.0	<1.0	-	-
Arsenic	1.0 ug/g dry	4.8	1.9	-	-
Barium	1.0 ug/g dry	91.6	47.4	-	-
Beryllium	1.0 ug/g dry	<1.0	<1.0	-	-
Boron	1.0 ug/g dry	12.3	3.7	-	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	-	-
Chromium	1.0 ug/g dry	19.4	5.2	-	-
Cobalt	1.0 ug/g dry	10.4	3.2	-	-
Copper	1.0 ug/g dry	21.4	8.3	-	-
Lead	1.0 ug/g dry	9.9	10.2	-	-
Molybdenum	1.0 ug/g dry	<1.0	<1.0	-	-
Nickel	1.0 ug/g dry	20.9	3.9	-	-
Selenium	1.0 ug/g dry	<1.0	<1.0	-	-
Silver	0.5 ug/g dry	<0.5	<0.5	-	-
Thallium	1.0 ug/g dry	<1.0	<1.0	-	-
Uranium	1.0 ug/g dry	<1.0	<1.0	-	-
Vanadium	1.0 ug/g dry	26.1	13.7	-	-
Zinc	1.0 ug/g dry	47.3	96.1	-	-

**Certificate of Analysis**

Report Date: 17-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 11-Dec-2015

Client PO:

**Project Description: TG151118**
**Method Quality Control: Blank**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>General Inorganics</b>									
Conductivity	ND	5	uS/cm						
<b>Hydrocarbons</b>									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
<b>Metals</b>									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	1.0	ug/g						
Boron	ND	1.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	1.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	1.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	1.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.5	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	1.0	ug/g						
Zinc	ND	1.0	ug/g						
<b>Semi-Volatiles</b>									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	1.03		ug/g		77.0	50-140			
Surrogate: Terphenyl-d14	1.32		ug/g		98.7	50-140			
<b>Volatiles</b>									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						

**Certificate of Analysis**

Report Date: 17-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 11-Dec-2015

Client PO:

**Project Description: TG151118**
**Method Quality Control: Blank**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane)	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
<i>Surrogate: 4-Bromofluorobenzene</i>	7.82		ug/g		97.7	50-140			
<i>Surrogate: Dibromofluoromethane</i>	7.40		ug/g		92.4	50-140			
<i>Surrogate: Toluene-d8</i>	8.39		ug/g		105	50-140			
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
<i>Surrogate: Toluene-d8</i>	8.39		ug/g		105	50-140			



**Certificate of Analysis**

Report Date: 17-Dec-2015

Client: Amec Foster Wheeler (Thorold)

Order Date: 11-Dec-2015

Client PO:

**Project Description: TG151118**
**Method Quality Control: Duplicate**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>General Inorganics</b>									
Conductivity	289	5	uS/cm	283			2.1	6.2	
pH	7.68	0.05	pH Units	7.72			0.5	10	
<b>Hydrocarbons</b>									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND				30	
F3 PHCs (C16-C34)	136	8	ug/g dry	161			17.3	30	
F4 PHCs (C34-C50)	279	6	ug/g dry	296			5.9	30	
<b>Metals</b>									
Antimony	ND	1.0	ug/g dry	ND			0.0	30	
Arsenic	2.62	1.0	ug/g dry	3.03			14.4	30	
Barium	64.0	1.0	ug/g dry	62.1			3.1	30	
Beryllium	ND	1.0	ug/g dry	ND			0.0	30	
Boron	4.34	1.0	ug/g dry	4.30			0.9	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	18.0	1.0	ug/g dry	17.4			3.7	30	
Cobalt	10.6	1.0	ug/g dry	10.3			3.7	30	
Copper	5.27	1.0	ug/g dry	5.15			2.4	30	
Lead	10.8	1.0	ug/g dry	10.9			0.9	30	
Mercury	ND	0.1	ug/g dry	ND				35	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	10.6	1.0	ug/g dry	10.8			1.4	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.5	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND				30	
Uranium	1.40	1.0	ug/g dry	ND			0.0	30	
Vanadium	29.1	1.0	ug/g dry	28.0			3.8	30	
Zinc	50.2	1.0	ug/g dry	48.8			2.7	30	
<b>Physical Characteristics</b>									
% Solids	80.9	0.1	% by Wt.	81.0			0.2	25	
<b>Semi-Volatiles</b>									
Acenaphthene	ND	0.02	ug/g dry	ND				40	
Acenaphthylene	ND	0.02	ug/g dry	ND				40	
Anthracene	ND	0.02	ug/g dry	ND				40	
Benzo [a] anthracene	ND	0.02	ug/g dry	ND				40	
Benzo [a] pyrene	ND	0.02	ug/g dry	ND				40	
Benzo [b] fluoranthene	ND	0.02	ug/g dry	ND				40	
Benzo [g,h,i] perylene	ND	0.02	ug/g dry	ND				40	
Benzo [k] fluoranthene	ND	0.02	ug/g dry	ND				40	
Chrysene	ND	0.02	ug/g dry	ND				40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	ND				40	
Fluoranthene	ND	0.02	ug/g dry	ND				40	
Fluorene	ND	0.02	ug/g dry	ND				40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g dry	ND				40	
1-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
2-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
Naphthalene	ND	0.01	ug/g dry	ND				40	
Phenanthrene	ND	0.02	ug/g dry	ND				40	
Pyrene	ND	0.02	ug/g dry	ND				40	
Surrogate: 2-Fluorobiphenyl	0.497		ug/g dry	ND	30.1	50-140			S-04
Surrogate: Terphenyl-d14	1.38		ug/g dry	ND	83.7	50-140			
<b>Volatiles</b>									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	
Bromodichloromethane	ND	0.05	ug/g dry	ND				50	
Bromoform	ND	0.05	ug/g dry	ND				50	

**Certificate of Analysis**

Report Date: 17-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 11-Dec-2015

Client PO:

**Project Description: TG151118**
**Method Quality Control: Duplicate**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Bromomethane	ND	0.05	ug/g dry	ND				50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND				50	
Chlorobenzene	ND	0.05	ug/g dry	ND				50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Dibromochloromethane	ND	0.05	ug/g dry	ND				50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND				50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Ethylene dibromide (dibromoethane)	ND	0.05	ug/g dry	ND				50	
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND				50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND				50	
Methylene Chloride	ND	0.05	ug/g dry	ND				50	
Styrene	ND	0.05	ug/g dry	ND				50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND				50	
Trichloroethylene	ND	0.05	ug/g dry	ND				50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND				50	
Vinyl chloride	ND	0.02	ug/g dry	ND				50	
m,p-Xylenes	ND	0.05	ug/g dry	ND				50	
o-Xylene	ND	0.05	ug/g dry	ND				50	
Surrogate: 4-Bromofluorobenzene	5.91		ug/g dry	ND	98.3	50-140			
Surrogate: Dibromofluoromethane	5.82		ug/g dry	ND	96.8	50-140			
Surrogate: Toluene-d8	6.43		ug/g dry	ND	107	50-140			
Benzene	ND	0.02	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
m,p-Xylenes	ND	0.05	ug/g dry	ND				50	
o-Xylene	ND	0.05	ug/g dry	ND				50	
Surrogate: Toluene-d8	6.43		ug/g dry	ND	107	50-140			

**Certificate of Analysis**

Report Date: 17-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 11-Dec-2015

Client PO:

**Project Description: TG151118**
**Method Quality Control: Spike**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Hydrocarbons</b>									
F1 PHCs (C6-C10)	198	7	ug/g	ND	99.2	80-120			
F2 PHCs (C10-C16)	72	4	ug/g	ND	80.0	80-120			
F3 PHCs (C16-C34)	186	8	ug/g	ND	100	80-120			
F4 PHCs (C34-C50)	120	6	ug/g	ND	96.8	80-120			
<b>Metals</b>									
Antimony	224		ug/L	15.4	83.5	70-130			
Arsenic	295		ug/L	60.6	93.8	70-130			
Barium	1540		ug/L	1240	121	70-130			
Beryllium	220		ug/L	3.07	86.9	70-130			
Boron	300		ug/L	86.0	85.4	70-130			
Cadmium	209		ug/L	1.40	83.1	70-130			
Chromium (VI)	4.6	0.2	ug/g	ND	93.0	70-130			
Chromium	581		ug/L	348	93.1	70-130			
Cobalt	418		ug/L	205	85.2	70-130			
Copper	319		ug/L	103	86.4	70-130			
Lead	428		ug/L	218	84.2	70-130			
Mercury	1.63	0.1	ug/g	ND	109	72-128			
Molybdenum	211		ug/L	6.93	81.7	70-130			
Nickel	211		ug/L	ND	84.6	70-130			
Selenium	178		ug/L	ND	78.1	70-130			
Silver	181		ug/L	0.39	72.1	70-130			
Thallium	207		ug/L	ND	82.9	70-130			
Uranium	247		ug/L	ND	98.6	70-130			
Vanadium	800		ug/L	560	96.3	70-130			
Zinc	1220		ug/L	976	97.3	70-130			
<b>Semi-Volatiles</b>									
Acenaphthene	0.137	0.02	ug/g	ND	66.5	50-140			
Acenaphthylene	0.121	0.02	ug/g	ND	58.9	50-140			
Anthracene	0.149	0.02	ug/g	ND	72.5	50-140			
Benzo [a] anthracene	0.140	0.02	ug/g	ND	68.1	50-140			
Benzo [a] pyrene	0.164	0.02	ug/g	ND	79.5	50-140			
Benzo [b] fluoranthene	0.181	0.02	ug/g	ND	87.8	50-140			
Benzo [g,h,i] perylene	0.208	0.02	ug/g	ND	101	50-140			
Benzo [k] fluoranthene	0.167	0.02	ug/g	ND	81.1	50-140			
Chrysene	0.200	0.02	ug/g	ND	97.0	50-140			
Dibenzo [a,h] anthracene	0.178	0.02	ug/g	ND	86.6	50-140			
Fluoranthene	0.167	0.02	ug/g	ND	80.8	50-140			
Fluorene	0.143	0.02	ug/g	ND	69.2	50-140			
Indeno [1,2,3-cd] pyrene	0.185	0.02	ug/g	ND	89.8	50-140			
1-Methylnaphthalene	0.157	0.02	ug/g	ND	76.0	50-140			
2-Methylnaphthalene	0.213	0.02	ug/g	ND	103	50-140			
Naphthalene	0.142	0.01	ug/g	ND	68.9	50-140			
Phenanthrene	0.168	0.02	ug/g	ND	81.5	50-140			
Pyrene	0.176	0.02	ug/g	ND	85.3	50-140			
Surrogate: 2-Fluorobiphenyl	0.955		ug/g		58.0	50-140			
<b>Volatiles</b>									
Acetone	10.5	0.50	ug/g	ND	105	50-140			
Benzene	3.55	0.02	ug/g	ND	88.7	60-130			
Bromodichloromethane	3.86	0.05	ug/g	ND	96.5	60-130			
Bromoform	4.68	0.05	ug/g	ND	117	60-130			
Bromomethane	3.06	0.05	ug/g	ND	76.5	50-140			

**Certificate of Analysis**

Report Date: 17-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 11-Dec-2015

Client PO:

**Project Description: TG151118**
**Method Quality Control: Spike**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Carbon Tetrachloride	3.90	0.05	ug/g	ND	97.5	60-130			
Chlorobenzene	3.73	0.05	ug/g	ND	93.2	60-130			
Chloroform	4.28	0.05	ug/g	ND	107	60-130			
Dibromochloromethane	4.37	0.05	ug/g	ND	109	60-130			
Dichlorodifluoromethane	3.30	0.05	ug/g	ND	82.4	50-140			
1,2-Dichlorobenzene	4.56	0.05	ug/g	ND	114	60-130			
1,3-Dichlorobenzene	4.55	0.05	ug/g	ND	114	60-130			
1,4-Dichlorobenzene	4.38	0.05	ug/g	ND	110	60-130			
1,1-Dichloroethane	3.55	0.05	ug/g	ND	88.8	60-130			
1,2-Dichloroethane	3.81	0.05	ug/g	ND	95.3	60-130			
1,1-Dichloroethylene	4.47	0.05	ug/g	ND	112	60-130			
cis-1,2-Dichloroethylene	4.19	0.05	ug/g	ND	105	60-130			
trans-1,2-Dichloroethylene	3.94	0.05	ug/g	ND	98.6	60-130			
1,2-Dichloropropane	3.49	0.05	ug/g	ND	87.4	60-130			
cis-1,3-Dichloropropylene	3.89	0.05	ug/g	ND	97.2	60-130			
trans-1,3-Dichloropropylene	3.97	0.05	ug/g	ND	99.1	60-130			
Ethylbenzene	3.59	0.05	ug/g	ND	89.8	60-130			
Ethylene dibromide (dibromoethane)	4.35	0.05	ug/g	ND	109	60-130			
Hexane	2.94	0.05	ug/g	ND	73.6	60-130			
Methyl Ethyl Ketone (2-Butanone)	8.88	0.50	ug/g	ND	88.8	50-140			
Methyl Isobutyl Ketone	9.09	0.50	ug/g	ND	90.9	50-140			
Methyl tert-butyl ether	9.80	0.05	ug/g	ND	98.0	50-140			
Methylene Chloride	4.11	0.05	ug/g	ND	103	60-130			
Styrene	4.75	0.05	ug/g	ND	119	60-130			
1,1,1,2-Tetrachloroethane	4.12	0.05	ug/g	ND	103	60-130			
1,1,2,2-Tetrachloroethane	3.90	0.05	ug/g	ND	97.6	60-130			
Tetrachloroethylene	4.78	0.05	ug/g	ND	120	60-130			
Toluene	3.48	0.05	ug/g	ND	86.9	60-130			
1,1,1-Trichloroethane	3.64	0.05	ug/g	ND	90.9	60-130			
1,1,2-Trichloroethane	3.54	0.05	ug/g	ND	88.4	60-130			
Trichloroethylene	4.07	0.05	ug/g	ND	102	60-130			
Trichlorofluoromethane	3.75	0.05	ug/g	ND	93.7	50-140			
Vinyl chloride	3.65	0.02	ug/g	ND	91.3	50-140			
m,p-Xylenes	7.37	0.05	ug/g	ND	92.1	60-130			
o-Xylene	3.58	0.05	ug/g	ND	89.4	60-130			
Benzene	3.55	0.02	ug/g	ND	88.7	60-130			
Ethylbenzene	3.59	0.05	ug/g	ND	89.8	60-130			
Toluene	3.48	0.05	ug/g	ND	86.9	60-130			
m,p-Xylenes	7.37	0.05	ug/g	ND	92.1	60-130			
o-Xylene	3.58	0.05	ug/g	ND	89.4	60-130			

Certificate of Analysis

Client: Amec Foster Wheeler (Thorold)

Client PO:

Report Date: 17-Dec-2015

Order Date: 11-Dec-2015

Project Description: TG151118

**Qualifier Notes:**

**QC Qualifiers :**

S-04 : The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.

**Sample Data Revisions**

None

**Work Order Revisions / Comments:**

None

**Other Report Notes:**

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.

Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

*CCME PHC additional information:*

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.

Client Name: <i>Amec Flu</i>	Project Reference: <i>T6151118</i>	TAT: <input checked="" type="checkbox"/> Regular [ ] 3 Day
Contact Name: <i>Pat Shiner</i>	Quote # <i>15-031</i>	[ ] 2 Day [ ] 1 Day
Address: <i>5-3300 Merridale Hwy South of L2V 4K6</i>	PO #	Date Required: _____
Telephone: <i>605 687 6616</i>	Email Address: <i>patrick.shiner@amecfl.com</i>	

Criteria:  O. Reg. 153/04 (As Amended) Table 1  RSC Filing [ ] O. Reg. 558/00 [ ] PWQO [ ] CCME [ ] SUB (Storm) [ ] SUB (Sanitary) Municipality: \_\_\_\_\_ [ ] Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

**Required Analyses**

Parcel Order Number: <i>1550409</i>		Matrix	Air Volume	# of Containers	Sample Taken		VOCs	PHC (F <sub>1</sub> -F <sub>4</sub> )	ICP METALS	PH	SARL	EC						
Sample ID/Location Name					Date	Time												
1	<i>TP114-1</i>	<i>S</i>		<i>1</i>	<i>Dec 8/15</i>	<i>9:40</i>			<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>				<i>-250ml-</i>	<i>X</i>	
2	<i>114-2</i>			<i>1</i>		<i>9:45</i>												
3	<i>114-3</i>			<i>1</i>		<i>9:50</i>												
4	<i>114-4</i>			<i>1</i>		<i>9:55</i>												
5	<i>114-5</i>			<i>2</i>		<i>10:00</i>												
6	<i>114-6</i>			<i>1</i>		<i>10:00</i>												
7	<i>114-7</i>			<i>1</i>		<i>10:10</i>												
8	<i>114-8</i>			<i>1</i>		<i>10:10</i>												
9	<i>Depth</i>			<i>1</i>					<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>					<i>-250ml-</i>	<i>X</i>
10	<i>TP115-1</i>			<i>1</i>		<i>11:00</i>			<i>X</i>								<i>-250ml-</i>	<i>X</i>

Comments: *Covered by SNA 07-005* *Hold samples for future analysis.* Method of Delivery: *PUP*

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot: <i>B. Homenica</i>	Received at Lab: <i>Mike</i>	Verified By: <i>[Signature]</i>
Relinquished By (Print): <i>Paul Seibel</i>	Date/Time: <i>11 Dec 15 1500</i>	Date/Time: <i>12/12/2015 11:30</i>	Date/Time: <i>Dec 14/15 11:06</i>
Date/Time: <i>10-12-15</i>	Temperature: <i>2.3 °C</i>	Temperature: <i>10.9 °C</i>	pH Verified <input checked="" type="checkbox"/> By: <i>NA</i>



Client Name: <i>Amec FV</i>	Project Reference: <i>7615118</i>	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: <i>Pat Shiner</i>	Quote # <i>15-031</i>	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: <i>5-3300 Marchmont Hwy North ON L2V 4K6</i>	PO #	Date Required: _____
Telephone: <i>905 687 6666</i>	Email Address: <i>patrick.shiner@amec.com</i>	

Criteria:  O. Reg. 153/04 (As Amended) Table  RSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other) Required Analyses

Paracel Order Number: <i>1550409</i>		Matrix	Air Volume	# of Containers	Sample Taken		VOCs	PNC (F, Fe)	ICP METALS	pH	SAR	EC
Sample ID/Location Name					Date	Time						
1	<i>TP 115-2</i>	<i>S</i>		<i>1</i>	<i>Dec 8/15</i>	<i>11:00</i>						
2	<i>115-3</i>	<i>S</i>		<i>1</i>		<i>11:05</i>						
3	<i>115-4</i>	<i>S</i>		<i>1</i>		<i>11:05</i>						
4	<i>115-5</i>	<i>S</i>		<i>2</i>		<i>11:15</i>						
5	<i>115-6</i>	<i>S</i>		<i>1</i>		<i>11:15</i>						
6	<i>115-7</i>	<i>S</i>		<i>1</i>		<i>11:20</i>						
7	<i>115-8</i>	<i>S</i>		<i>1</i>		<i>11:20</i>						
8	<i>Rep B</i>	<i>S</i>		<i>1</i>								
9	<i>TP 116-1</i>	<i>S</i>		<i>1</i>		<i>12:00</i>						
10	<i>116-2</i>	<i>S</i>		<i>1</i>		<i>12:00</i>		<i>X</i>				<i>950ml</i>

Comments: *See pg 1* Method of Delivery: *PUP*

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot: <i>Niagara B Homonick</i>	Received at Lab: <i>M/R</i>	Verified By: <i>[Signature]</i>
Relinquished By (Print): <i>Mark Seebert</i>	Date/Time: <i>Dec 15</i>	Date/Time: <i>12/12/2015 11:35</i>	Date/Time: <i>Dec 14/15 11:06</i>
Date/Time: <i>10.12.16</i>	Temperature: <i>12.3 °C</i>	Temperature: <i>10.9 °C</i>	pH Verified <input checked="" type="checkbox"/> By: <i>NA</i>



Client Name: <u>Nice FL</u>	Project Reference: <u>T6151168</u>	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: <u>Pat Shimer</u>	Quote # <u>15-031</u>	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: <u>5-3300 Heronville Hwy Thred ON L2V 4Y6</u>	PO #	Date Required: _____
Telephone: <u>905 687 6616</u>	Email Address: <u>patrick.shimer@amech.com</u>	

Criteria:  O. Reg. 153/04 (As Amended) Table  RSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)					Required Analyses									
Paracel Order Number: <u>1550409</u>					Vocs	PHC(F <sub>1</sub> -F <sub>4</sub> )	ICP METALS	PH	SAR	EC				
Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken										
				Date	Time									
1			1	<u>Dec 8/15</u>	<u>12:05</u>									
2			1		<u>12:05</u>									
3			1		<u>12:10</u>									
4			1		<u>12:20</u>									
5			1		<u>12:20</u>									
6			2		<u>12:30</u>									
7			1		<u>12:50</u>									
8			1		<u>12:50</u>									
9			2		<u>12:55</u>		X	X	X	X				- <u>Sample with</u>
10			1		<u>12:55</u>									

Comments: \_\_\_\_\_ Method of Delivery: PUP

Relinquished By (Sign): _____	Received by Driver/Depot: <u>Niagara B. Homenick</u>	Received at Lab: <u>Mike</u>	Verified By: _____
Relinquished By (Print): _____	Date/Time: <u>11 Dec 15 1500</u>	Date/Time: <u>12/12/2015 11:35</u>	Date/Time: <u>Dec 14/15 11:06</u>
Date/Time: _____	Temperature: <u>12.3 °C</u>	Temperature: <u>10.9 °C</u>	pH Verified <input checked="" type="checkbox"/> By: <u>NA</u>

Client Name: <u>Amec</u>	Project Reference: <u>T6151116</u>	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: <u>Pat Sharma</u>	Quote # <u>15-031</u>	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: <u>5-3300 Merriville Way Thred ON L2V 4G6</u>	PO #	Date Required: _____
Telephone: <u>905 687 6616</u>	Email Address: <u>patrick.sharma@amec.ca</u>	

Criteria:  O. Reg. 153/04 (As Amended) Table  MRSC Filing  O. Reg. 558/00  PWQO  CCMB  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

**Required Analyses**

Paracel Order Number: <u>1550409</u>		Matrix	Air Volume	# of Containers	Sample Taken		Vocs	PNC (F <sub>1-4</sub> )	ICP METALS	PH	SAR	EC						
Sample ID/Location Name					Date	Time												
1	<u>TP117-5</u>	S		1	<u>Dec 8/15</u>	<u>1:00</u>												
2	<u>117-6</u>		1															
3	<u>117-7</u>		1															
4	<u>117-8</u>		1															
5	<u>Diag C</u>				2				X	X	X	X						<u>-950ml + 1ml -</u>
6	<u>TP118-1</u>				1		<u>1:45</u>		X									<u>-950ml -</u>
7	<u>118-2</u>				1		<u>1:45</u>											
8	<u>118-3</u>				1		<u>2:00</u>											
9	<u>118-4</u>				1		<u>2:00</u>											
10	<u>118-5</u>		C		2		<u>2:00</u>											

Comments: See pg 1

Method of Delivery: PUP

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot: <u>Niagara B. Tomeniuk</u>	Received at Lab: <u>M/R</u>	Verified By: <u>[Signature]</u>
Relinquished By (Print): <u>Mark Seibel</u>	Date/Time: <u>Dec 15</u>	Date/Time: <u>12/12/2015 11:35</u>	Date/Time: <u>Dec 14/15 11:06</u>
Date/Time: <u>Dec 10/15</u>	Temperature: <u>23 °C</u>	Temperature: <u>10 °C</u>	pH Verified <input checked="" type="checkbox"/> By: <u>NA</u>

Client Name: <i>Ame</i>	Project Reference: <i>76 151118</i>	TAT: <input checked="" type="checkbox"/> Regular [ ] 3 Day
Contact Name: <i>Pat Shiner</i>	Quote # <i>15-031</i>	[ ] 2 Day [ ] 1 Day
Address: <i>53300 Merrittville Dr, Sharnold ON</i>	PO #	Date Required: _____
Telephone: <i>905 687 6616</i>	Email Address: <i>pat@shiner@ame.com</i>	

Criteria:  O. Reg. 153/04 (As Amended) Table  RSC Filing [ ] O. Reg. 558/00 [ ] PWQO [ ] CCME [ ] SUB (Storm) [ ] SUB (Sanitary) Municipality: \_\_\_\_\_ [ ] Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other) Required Analyses

Paracel Order Number: <i>1550409</i>		Matrix	Air Volume	# of Containers	Sample Taken		VOCs	PHC (H <sub>2</sub> T <sub>2</sub> )	ICP METALS	PH	SAR	EC	Hg	C-VI	PAHS
Sample ID/Location Name	Date				Time										
1	<i>TP118-6</i>	<i>S</i>		<i>1</i>	<i>Dec 8/15</i>	<i>2:10</i>									
2	<i>TP113-1</i>	<i>S</i>		<i>1</i>		<i>3:05</i>		<i>X</i>							<i>-250mL</i>
3	<i>113-2</i>			<i>1</i>		<i>3:05</i>									
4	<i>113-3</i>			<i>1</i>		<i>3:10</i>									
5	<i>113-4</i>			<i>1</i>		<i>3:10</i>									
6	<i>113-5</i>			<i>1</i>		<i>3:20</i>									
7	<i>113-6</i>			<i>1</i>		<i>3:20</i>									
8	<i>113-7</i>			<i>2</i>		<i>3:56</i>	<i>X</i>	<i>X</i>	<i>X</i>			<i>X</i>	<i>X</i>	<i>X</i>	<i>-250mL</i>
9	<i>113-8</i>			<i>1</i>		<i>3:50</i>									
10	<i>Depth</i>	<i>S</i>		<i>1</i>											

Comments: *see notes pg 1* Method of Delivery: *Pup*

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot: <i>Niagara Bionerick</i>	Received at Lab: <i>Mile</i>	Verified By: <i>[Signature]</i>
Relinquished By (Print): <i>Mark Fedel</i>	Date/Time: <i>11 Dec 15</i>	Date/Time: <i>12/12/2015 11:35</i>	Date/Time: <i>Dec 14/15 11:00</i>
Date/Time: <i>10.17.15</i>	Temperature: <i>2.3°C</i>	Temperature: <i>10.9°C</i>	pH Verified By: <i>NA</i>

Client Name: <u>Amec</u>	Project Reference: <u>76B1118</u>	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: <u>Pet Sharma</u>	Quote # <u>15-031</u>	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: <u>5-3300 Merriville Hwy Thredon ON</u>	PO #	Date Required: _____
Telephone: <u>226 446</u>	Email Address: <u>pet@sharma-amec.com</u>	

Criteria:  O. Reg. 153/04 (As Amended) Table  RSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)				Required Analyses																	
Paracel Order Number: <u>1550409</u>				Matrix	Air Volume	# of Containers	Sample Taken		VOCs	PAC (F-Fa)	ICP METALS	P/N	SAR	EC							
Sample ID/Location Name		Date	Time																		
1	<u>TP104-1</u>	<u>S</u>	<u>1</u>	<u>1</u>	<u>Dec 9/15</u>	<u>7:52</u>			<u>X</u>											<u>250ml</u>	<u>✓</u>
2	<u>104-2</u>			<u>1</u>		<u>7:52</u>															
3	<u>104-3</u>			<u>1</u>		<u>8:00</u>															
4	<u>104-4</u>			<u>2</u>		<u>8:00</u>															
5	<u>104-5</u>			<u>1</u>		<u>8:05</u>															
6	<u>104-6</u>			<u>1</u>		<u>8:05</u>															
7	<u>Dup E</u>			<u>1</u>																	
8	<u>TD 119-1d</u>			<u>2</u>		<u>8:30</u>															
9	<u>119-1c</u>			<u>1</u>		<u>8:50</u>			<u>X</u>											<u>250ml</u>	<u>✓</u>
10	<u>119-2</u>	<u>C</u>		<u>1</u>	<u>✓</u>	<u>8:10</u>															

Comments: seeps 1 Method of Delivery: PUP

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot: <u>Niagara BHomeniek</u>	Received at Lab: <u>Mike</u>	Verified By: <u>[Signature]</u>
Relinquished By (Print): <u>Mal Seckel</u>	Date/Time: <u>Dec 15</u>	Date/Time: <u>12/12/2015 11:35</u>	Date/Time: <u>Dec 14/15 11:06</u>
Date/Time: <u>10/12/15</u>	Temperature: <u>23°C</u>	Temperature: <u>10.9°C</u>	pH Verified <input checked="" type="checkbox"/> By: <u>NA</u>

Client Name: <i>Bruce</i>	Project Reference: <i>T6151118</i>	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: <i>Pct Shiner</i>	Quote #: <i>15031</i>	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: <i>5-3360 Merritt Rd Hwy 104 ON</i>	PO #	Date Required: _____
Telephone: <i>905 687 6616</i>	Email Address: <i>potok.shiner@creditunion</i>	

Criteria:  O. Reg. 153/04 (As Amended) Table  RSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other) Required Analyses

Paracel Order Number: <i>1550409</i>		Matrix	Air Volume	# of Containers	Sample Taken		Vocs	PAC (F, T, T <sub>2</sub> )	ICP METALS	PH	SARL	EC	BTEX	Hg	CrVI
Sample ID/Location Name					Date	Time									
1	<i>TP119-3</i>	<i>S</i>		<i>1</i>	<i>Dec 9/15</i>	<i>8:40</i>									
2	<i>119-4</i>			<i>1</i>		<i>8:40</i>									
3	<i>119-5</i>			<i>1</i>		<i>8:56</i>									
4	<i>119-6</i>			<i>1</i>		<i>8:50</i>									
5	<i>119-7</i>			<i>1</i>		<i>8:50</i>									
6	<i>119-8d</i>			<i>2</i>		<i>9:00</i>	<i>X</i>					<i>X</i>		<i>-250ml - 4001-</i>	
7	<i>119-8c</i>			<i>1</i>		<i>9:00</i>		<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>		<i>X</i>	<i>X</i>	<i>-250ml -</i>
8	<i>TP105-1</i>			<i>1</i>		<i>9:25</i>		<i>X</i>							<i>-250ml -</i>
9	<i>105-2</i>			<i>1</i>		<i>9:25</i>									
10	<i>105-3</i>			<i>1</i>		<i>9:30</i>									

Comments: *seeps!* Method of Delivery: *PUP*

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot: <i>Niagara B. Hornet</i>	Received at Lab: <i>Mike</i>	Verified By: <i>[Signature]</i>
Relinquished By (Print): <i>Michael Seiler</i>	Date/Time: <i>11 Dec 15</i>	Date/Time: <i>12/12/2015 11:35</i>	Date/Time: <i>Dec 14/15 11:06</i>
Date/Time: <i>10.12.15</i>	Temperature: <i>12.3 °C</i>	Temperature: <i>10.9 °C</i>	pH Verified <input checked="" type="checkbox"/> By: <i>NA</i>

Client Name: <i>Anec</i>	Project Reference: <i>T6K118</i>	TAT: <input checked="" type="checkbox"/> Regular [ ] 3 Day
Contact Name: <i>Pet Shiner</i>	Quote # <i>15-031</i>	[ ] 2 Day [ ] 1 Day
Address: <i>5-3300 Merrivale Way West</i>	PO #	Date Required: _____
Telephone: <i>905 687 8666</i>	Email Address: <i>petshiner@anec.com</i>	

Criteria:  O. Reg. 153/04 (As Amended) Table  RSC Filing [ ] O. Reg. 558/00 [ ] PWQO [ ] CCME [ ] SUB (Storm) [ ] SUB (Sanitary) Municipality: \_\_\_\_\_ [ ] Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)					Required Analyses										
Parcel Order Number: <i>1550409</i>					Date	Time	Vocs	PAC (F-F)	ICP METALS	PH	SAR	EC	BTEX		
Sample ID/Location Name	Matrix	Air Volume	# of Containers												
1	<i>TP105-4</i>	<i>S</i>	<i>1</i>	<i>Dec 9/15</i>	<i>9:50</i>										
2	<i>105-5 (d)</i>	<i>1</i>	<i>2</i>	<i>1</i>	<i>9:45</i>										
3	<i>105-6</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>9:45</i>										
4	<i>TP107-1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>9:55</i>			<i>X</i>						<i>-250ml-</i>	<i>✓</i>
5	<i>107-2</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>9:55</i>										
6	<i>107-3 (no vial)</i>	<i>1</i>	<i>2</i>	<i>1</i>	<i>10:15</i>							<i>(no vial)</i>			
7	<i>107-4</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>10:15</i>										
8	<i>TP120-1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>11:00</i>			<i>X</i>						<i>-250ml-</i>	<i>✓</i>
9	<i>120-2</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>11:00</i>										
10	<i>120-3 (no vial)</i>	<i>1</i>	<i>2</i>	<i>1</i>	<i>11:15</i>										

Comments: *see pg 1* Method of Delivery: *Pup*

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot: <i>Niagara BNCmenex</i>	Received at Lab: <i>[Signature]</i>	Verified By: <i>[Signature]</i>
Relinquished By (Print): <i>Mark Scott</i>	Date/Time: <i>11 Dec 15</i>	Date/Time: <i>12/12/2015 11:35</i>	Date/Time: <i>Dec 14/15 11:06</i>
Date/Time: <i>10.12.15</i>	Temperature: <i>2.3 °C</i>	Temperature: <i>10.9 °C</i>	pH Verified <input checked="" type="checkbox"/> By: <i>NA</i>



Client Name: <u>Amec</u>	Project Reference: <u>76151118</u>	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: <u>Pat Shiner</u>	Quote # <u>15031</u>	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: <u>5-3300 Merrittville Hwy Shred ON</u>	PO #	Date Required: _____
Telephone: <u>905 687 6616</u>	Email Address: <u>patrick.shiner@amec.com</u>	

Criteria:  O. Reg. 153/04 (As Amended) Table  RSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

**Required Analyses**

Paracel Order Number: <u>1550409</u>		Matrix	Air Volume	# of Containers	Sample Taken		VOC	PHC (F, T, D)	ICP METALS	PH	SAR	EC	BTX	PAHS	Hg	Cr VI
Sample ID/Location Name	Date				Time											
1	<u>Dep F (no vial)</u>	<u>S</u>		<u>2</u>	<u>Dec 9/15</u>											
2	<u>TP108-1</u>			<u>1</u>		<u>12:20</u>		<u>X</u>						<u>250ml</u>		
3	<u>108-2</u>			<u>1</u>		<u>12:20</u>										
4	<u>108-3</u>			<u>1</u>		<u>12:25</u>										
5	<u>108-4</u>			<u>2</u>		<u>12:25</u>										
6	<u>TP121-1</u>			<u>1</u>		<u>11:20</u>		<u>X</u>						<u>250ml</u>		
7	<u>121-2</u>			<u>1</u>		<u>11:20</u>										
8	<u>121-3</u>			<u>1</u>		<u>11:30</u>										
9	<u>121-4</u>			<u>1</u>		<u>11:30</u>										
10	<u>121-5</u>	<u>S</u>		<u>2</u>	<u>Dec 9/15</u>	<u>11:40</u>	<u>X</u>	<u>X</u>					<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>

Comments: seeps 1

Method of Delivery: 250ml vial  
PUP

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot: <u>Niagara Bttomenier</u>	Received at Lab: <u>MoKe</u>	Verified By: <u>[Signature]</u>
Relinquished By (Print): <u>M.L. Smith</u>	Date/Time: <u>11 Dec 15</u>	Date/Time: <u>12/12/2015 11:35</u>	Date/Time: <u>Dec 14/15 11:06</u>
Date/Time: <u>10.12.15</u>	Temperature: <u>2.3 °C</u>	Temperature: <u>10.9 °C</u>	pH Verified <input checked="" type="checkbox"/> By: <u>NA</u>



Client Name: <u>Amec</u>	Project Reference: <u>T6151168</u>	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: <u>Pet Shores</u>	Quote #: <u>15-031</u>	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: <u>5-3300 Merrittville Hwy, Wood</u>	PO #	Date Required: _____
Telephone: <u>905 687 6616</u>	Email Address: <u>pet@shores.com</u>	

Criteria:  Q. Reg. 153/04 (As Amended) Table |  RSC Filing |  O. Reg. 558/00 |  PWQO |  CCME |  SUB (Storm) |  SUB (Sanitary) Municipality: \_\_\_\_\_ |  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)					Required Analyses												
Paracel Order Number: <u>1550409</u>		Matrix	Air Volume	# of Containers	Sample Taken		Voc	PHC (F-Fu)	ICP METALS	PH	SAR	EC	BTX	PAHs			
Sample ID/Location Name					Date	Time											
1	<u>TP121-6</u>	<u>S</u>		<u>1</u>	<u>Dec 9/15</u>	<u>11:40</u>											
2	<u>TP111-1</u>	<u>S</u>		<u>1</u>	<u>12:40</u>	<u>12:40</u>		<u>X</u>									
3	<u>111-2</u>	<u>S</u>		<u>2</u>	<u>12:40</u>	<u>12:40</u>											
4	<u>111-3</u>	<u>S</u>		<u>1</u>	<u>12:50</u>	<u>12:50</u>											
5	<u>111-4</u>	<u>S</u>		<u>1</u>	<u>12:50</u>	<u>12:50</u>											
6	<u>TP110-1d (missing val)</u>	<u>S</u>		<u>1</u>	<u>1:15</u>	<u>1:15</u>											
7	<u>110-2</u>	<u>S</u>		<u>1</u>	<u>1:20</u>	<u>1:20</u>											
8	<u>110-3</u>	<u>S</u>		<u>1</u>	<u>1:20</u>	<u>1:20</u>											
9	<u>110-4</u>	<u>S</u>		<u>1</u>	<u>1:25</u>	<u>1:25</u>											
10	<u>110-1c</u>	<u>S</u>		<u>1</u>	<u>1:15</u>	<u>1:15</u>		<u>X</u>						<u>X</u>	<u>-250ml-</u>		

Comments: See pg 1

Method of Delivery: PWP

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot: <u>Niagara B. Homenick</u>	Received at Lab: <u>[Signature]</u>	Verified By: <u>[Signature]</u>
Relinquished By (Print): <u>Mark Sehn</u>	Date/Time: <u>11 Dec 15</u>	Date/Time: <u>12/12/2015 11:35</u>	Date/Time: <u>Dec 14/15 11:06</u>
Date/Time: <u>10-12-15</u>	Temperature: <u>2.3 °C</u>	Temperature: <u>0.9 °C</u>	pH Verified <input checked="" type="checkbox"/> By: <u>NA</u>

Client Name: <i>Ame</i>	Project Reference: <i>76151118</i>	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: <i>Patricia</i>	Quote #: <i>15-051</i>	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: <i>53300 Merivale they should own</i>	PO #	Date Required: _____
Telephone: <i>905 687 6616</i>	Email Address: <i>patricia.dunne@amech.com</i>	

Criteria:  O. Reg. 153/04 (As Amended) Table  RSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

**Required Analyses**

Parcel Order Number: <i>1550409</i>		Matrix	Air Volume	# of Containers	Sample Taken		Voc	PHC (A, F)	METS	PH	SAR	EC	BTEX	PAHS	Hg	Cr VI
Sample ID/Location Name					Date	Time										
1	<i>TP109-1</i>	<i>S</i>		<i>1</i>	<i>Dec 9/15</i>	<i>2:00</i>										
2	<i>109-2</i>	<i>S</i>		<i>1</i>		<i>2:00</i>		<i>X</i>							<i>- 250ml -</i>	
3	<i>109-3</i>	<i>S</i>		<i>1</i>		<i>2:40</i>										
4	<i>109-4 (100 vial)</i>	<i>S</i>		<i>2</i>		<i>2:10</i>										
5	<i>TP112-1</i>	<i>S</i>		<i>1</i>		<i>2:35</i>										
6	<i>112-2c</i>	<i>S</i>		<i>1</i>		<i>2:35</i>									<i>- 250ml -</i>	
7	<i>112-2d</i>	<i>S</i>		<i>2</i>		<i>2:40</i>		<i>X</i>						<i>X</i>	<i>X</i>	<i>X</i>
8	<i>112-3</i>	<i>S</i>		<i>1</i>		<i>2:40</i>										
9	<i>112-4</i>	<i>S</i>		<i>1</i>		<i>2:50</i>										
10	<i>112-5</i>	<i>S</i>		<i>1</i>		<i>2:30</i>										

Comments: *see pg 1* Method of Delivery: *Pup*

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot: <i>Niagara B. Homeniek</i>	Received at Lab: <i>M/K</i>	Verified By: <i>[Signature]</i>
Relinquished By (Print): <i>[Signature]</i>	Date/Time: <i>11 Dec 15</i>	Date/Time: <i>12/12/2015 11:30</i>	Date/Time: <i>Dec 14/15 11:06</i>
Date/Time: <i>10/11/15</i>	Temperature: <i>12.3 °C</i>	Temperature: <i>10.9 °C</i>	pH Verified <input checked="" type="checkbox"/> By: <i>NA</i>

Client Name: <i>Apco</i>	Project Reference: <i>16151118</i>	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: <i>P. J. Sharma</i>	Quote # <i>15-031</i>	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: <i>5-3300 Merivale Dr. W.</i>	PO #	Date Required: _____
Telephone: <i>905 687 6616</i>	Email Address: <i>p.j.sharma@apco.com</i>	

Criteria:  O. Reg. 153/04 (As Amended) Table  RSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: <i>1550409</i>				Required Analyses											
Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken		VOCs	PNC (F1-F4)	ICP METALS	PH	SAR	EC	BTEX	PAHs	Hg	Cr VI
				Date	Time										
<i>TP112-6</i>	<i>S</i>		<i>1</i>	<i>Dec 9/15</i>	<i>2:55</i>										
<i>Dep 6</i>			<i>2</i>										<i>X</i>	<i>X</i>	<i>X</i>
<i>TP106-1</i>			<i>1</i>		<i>3:20</i>			<i>X</i>							<i>250ml</i>
<i>106-7</i>			<i>1</i>		<i>3:30</i>										
<i>106-3</i>			<i>1</i>		<i>3:35</i>										
<i>106-4</i>			<i>2</i>		<i>3:35</i>										
<i>TP101-1</i>			<i>1</i>		<i>4:00</i>										
<i>101-2</i>			<i>1</i>		<i>4:00</i>										
<i>101-3</i>			<i>2</i>		<i>4:10</i>										
<i>101-4</i>			<i>1</i>		<i>4:15</i>										

Comments: *see pg 1*

Method of Delivery: *PUP*

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot: <i>Niagara B Homencel</i>	Received at Lab: <i>Mike</i>	Verified By: <i>[Signature]</i>
Relinquished By (Print): <i>Mark Seel</i>	Date/Time: <i>1 Dec 15</i>	Date/Time: <i>12/12/2015 11:03</i>	Date/Time: <i>Dec 14/15 11:06</i>
Date/Time: <i>10.12.15</i>	Temperature: <i>2.3°C</i>	Temperature: <i>10.9°C</i>	pH Verified <input checked="" type="checkbox"/> By: <i>NA</i>

Client Name: *Anee* Project Reference: *76151118* TAT:  Regular  3 Day  
 Contact Name: *Pet. Shaw* Quote # *15-031*  2 Day  1 Day  
 Address: *5-3300 Marché de la Hwy, Verdun* PO # \_\_\_\_\_ Date Required: \_\_\_\_\_  
 Telephone: *905 687 6666* Email Address: *petrus.shaw@anee.com*

Criteria:  O. Reg. 153/04 (As Amended) Table 1  RSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil Sed.) GW (Ground Water) SW (Surface Water) SS (Storm Sanitary Sewer) P (Paint) A (Air) O (Other)					Required Analyses											
Paracel Order Number: <i>1550409</i>		Matrix	Air Volume	# of Containers	Sample Taken		Vocs	PNC(F-T)	IC METALS	PH	SAR	EC	BTEX	PAHs	Hg	Cd Pb
Sample ID/Location Name					Date	Time										
1	<i>TP101-5d</i>	<i>S</i>		<i>2</i>	<i>29-12-15</i>	<i>4:5</i>		<i>X</i>	<i>X</i>							<i>- 950ml + 200ml</i>
2	<i>101-6</i>	<i>L</i>		<i>2</i>		<i>4:15</i>										
3	<i>105-5c</i>	<i>L</i>		<i>1</i>												
4																
5																
6																
7																
8																
9																
10																

Comments: *see pg 1* Method of Delivery: *Pup*

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot: <i>Niagara B. Homenick</i>	Received at Lab: <i>M. Ke</i>	Verified By: <i>[Signature]</i>
Relinquished By (Print): <i>Mark Scott</i>	Date/Time: <i>Dec 15</i>	Date/Time: <i>12/12/2015 11:35</i>	Date/Time: <i>Dec 14/15 11:06</i>
Date/Time: <i>10-12-15</i>	Temperature: <i>12.3°C</i>	Temperature: <i>10.1°C</i>	pH Verified By: <i>NA</i>

## Certificate of Analysis

### Amec Foster Wheeler (Thorold)

3300 Merrittville Hwy, Unit 5  
Thorold, ON L2V 4Y6  
Attn: Pat Shriner

Client PO:  
Project: TG151118  
Custody: 23735

Report Date: 24-Dec-2015  
Order Date: 21-Dec-2015

**Order #: 1552049**

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Parcel ID	Client ID
1552049-01	TP102-1
1552049-02	TP103-1

Approved By:



Dale Robertson, BSc  
Laboratory Director

Certificate of Analysis

Report Date: 24-Dec-2015

Client: **Amec Foster Wheeler (Thorold)**

Order Date: 21-Dec-2015

Client PO:

**Project Description: TG151118**

### Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
REG 153: Metals by ICP/OES, soil	based on MOE E3470, ICP-OES	23-Dec-15	24-Dec-15
Solids, %	Gravimetric, calculation	22-Dec-15	22-Dec-15

**Certificate of Analysis**

Report Date: 24-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 21-Dec-2015

Client PO:

**Project Description: TG151118**

<b>Client ID:</b>	TP102-1	TP103-1	-	-
<b>Sample Date:</b>	18-Dec-15	18-Dec-15	-	-
<b>Sample ID:</b>	1552049-01	1552049-02	-	-
<b>MDL/Units</b>	Soil	Soil	-	-

**Physical Characteristics**

% Solids	0.1 % by Wt.	84.3	85.7	-	-
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**Metals**

Antimony	1.0 ug/g dry	<1.0	2.0	-	-
Arsenic	1.0 ug/g dry	5.9	5.9	-	-
Barium	1.0 ug/g dry	102	99.9	-	-
Beryllium	1.0 ug/g dry	<1.0	<1.0	-	-
Boron	1.0 ug/g dry	13.0	13.8	-	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	-	-
Chromium	1.0 ug/g dry	22.2	21.3	-	-
Cobalt	1.0 ug/g dry	11.3	11.2	-	-
Copper	1.0 ug/g dry	22.8	20.4	-	-
Lead	1.0 ug/g dry	12.2	11.1	-	-
Molybdenum	1.0 ug/g dry	<1.0	<1.0	-	-
Nickel	1.0 ug/g dry	19.3	18.4	-	-
Selenium	1.0 ug/g dry	<1.0	<1.0	-	-
Silver	0.5 ug/g dry	<0.5	<0.5	-	-
Thallium	1.0 ug/g dry	<1.0	<1.0	-	-
Uranium	1.0 ug/g dry	<1.0	<1.0	-	-
Vanadium	1.0 ug/g dry	28.1	27.0	-	-
Zinc	1.0 ug/g dry	52.6	53.9	-	-



**Certificate of Analysis**

Report Date: 24-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 21-Dec-2015

Client PO:

**Project Description: TG151118**
**Method Quality Control: Blank**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Metals</b>									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	1.0	ug/g						
Boron	ND	1.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	1.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	1.0	ug/g						
Lead	ND	1.0	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	1.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.5	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	1.0	ug/g						
Zinc	ND	1.0	ug/g						

**Certificate of Analysis**

Report Date: 24-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 21-Dec-2015

Client PO:

**Project Description: TG151118**
**Method Quality Control: Duplicate**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Metals</b>									
Antimony	ND	1.0	ug/g dry	ND			0.0	30	
Arsenic	ND	1.0	ug/g dry	1.78			0.0	30	
Barium	33.8	1.0	ug/g dry	34.0			0.8	30	
Beryllium	ND	1.0	ug/g dry	ND			0.0	30	
Boron	6.52	1.0	ug/g dry	7.07			8.1	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium	11.3	1.0	ug/g dry	10.7			5.9	30	
Cobalt	4.40	1.0	ug/g dry	4.15			5.7	30	
Copper	14.3	1.0	ug/g dry	12.7			11.8	30	
Lead	14.3	1.0	ug/g dry	12.9			10.5	30	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	5.95	1.0	ug/g dry	5.56			6.8	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.5	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	ND			0.0	30	
Vanadium	18.1	1.0	ug/g dry	17.9			1.1	30	
Zinc	33.5	1.0	ug/g dry	34.4			2.5	30	
<b>Physical Characteristics</b>									
% Solids	74.4	0.1	% by Wt.	74.2			0.3	25	

**Certificate of Analysis**

Report Date: 24-Dec-2015

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 21-Dec-2015

Client PO:

**Project Description: TG151118**
**Method Quality Control: Spike**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Metals</b>									
Antimony	264		ug/L	ND	106	70-130			
Arsenic	323		ug/L	35.7	115	70-130			
Barium	885		ug/L	681	81.8	70-130			
Beryllium	253		ug/L	3.85	99.8	70-130			
Boron	377		ug/L	141	94.1	70-130			
Cadmium	246		ug/L	1.81	97.8	70-130			
Chromium	423		ug/L	214	83.7	70-130			
Cobalt	298		ug/L	83.0	86.0	70-130			
Copper	469		ug/L	254	86.1	70-130			
Lead	468		ug/L	258	84.0	70-130			
Molybdenum	231		ug/L	9.55	88.6	70-130			
Nickel	287		ug/L	111	70.2	70-130			
Selenium	216		ug/L	18.7	78.9	70-130			
Silver	236		ug/L	0.07	94.6	70-130			
Thallium	206		ug/L	18.7	74.9	70-130			
Uranium	210		ug/L	18.8	76.5	70-130			
Vanadium	557		ug/L	358	79.9	70-130			
Zinc	863		ug/L	687	70.5	70-130			

Certificate of Analysis

Client: **Amec Foster Wheeler (Thorold)**

Client PO:

Report Date: 24-Dec-2015

Order Date: 21-Dec-2015

**Project Description: TG151118**

**Qualifier Notes:**

None

**Sample Data Revisions**

None

**Work Order Revisions / Comments:**

None

**Other Report Notes:**

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.

Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

Client Name: <i>Amey, FW</i>	Project Reference: <i>T6151118</i>	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Contact Name: <i>Pat Shiner</i>	Quote #: <i>15-031</i>	
Address: <i>5-3300 Merivale Hwy North ON L2V 4K6</i>	PO #	Date Required: _____
Telephone: <i>405 687 6611</i>	Email Address: <i>patrick.shiner@canadawater.com</i>	

Criteria:  O. Reg. 153/04 (As Amended) Table 1  TRSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Parcel Order Number:		Matrix	Air Volume	# of Containers	Sample Taken		ICP/MS Metals	Required Analyses									
1552049					Date	Time											
Sample ID/Location Name																	
1	<i>TP102-1</i>	<i>S</i>		<i>1</i>	<i>Dec 21/15</i>	<i>3:20</i>	<i>X</i>										
2	<i>102-2</i>	<i>S</i>		<i>1</i>	<i>Dec 21/15</i>	<i>3:25</i>											
3	<i>102-3</i>	<i>S</i>		<i>2</i>	<i>Dec 21/15</i>	<i>3:30</i>											
4	<i>TP103-1</i>	<i>S</i>		<i>1</i>	<i>Dec 21/15</i>	<i>3:43</i>	<i>X</i>										
5	<i>103-2</i>	<i>S</i>		<i>1</i>	<i>Dec 21/15</i>	<i>3:48</i>											
6	<i>103-3</i>	<i>S</i>		<i>2</i>	<i>Dec 21/15</i>	<i>3:55</i>											
7																	
8																	
9																	
10																	

Comments: *Ground by SNA 07-003 held for the analysis NO-Hg/Cr6 or HNE Boron.* Method of Delivery: *Pup*

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot: <i>Magara B Hommes</i>	Received at Lab: <i>[Signature]</i>	Verified By: <i>[Signature]</i>
Relinquished By (Print): <i>Mark Seckel</i>	Date/Time: <i>Dec 21/15 1300</i>	Date/Time: <i>Dec 22/15</i>	Date/Time: <i>Dec 22/15</i>
Date/Time: <i>Dec 21/15</i>	Temperature: <i>14 °C</i>	Temperature: <i>10.0 °C 9:28a</i>	pH Verified [ ] By: <i>NA</i>

*On Hold Samples held at depot. 9:28a*

# Certificate of Analysis

**Amec Foster Wheeler (Thorold)**

3300 Merrittville Hwy, Unit 5  
Thorold, ON L2V 4Y6  
Attn: Kelly Patterson

Client PO:  
Project: TG161164  
Custody: 110413/414/415/416/417/418

Report Date: 3-Jan-2017  
Order Date: 23-Dec-2016

**Order #: 1653030**

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

<b>Parcel ID</b>	<b>Client ID</b>
1653030-01	TP201-2
1653030-02	TP201-3
1653030-03	TP202-2
1653030-04	TP202-3
1653030-05	TP203-2
1653030-06	TP203-3
1653030-07	TP204-1
1653030-08	TP204-2
1653030-09	TP205-1
1653030-10	TP205-2
1653030-11	TP206-1
1653030-12	TP206-2
1653030-13	Composite TP207
1653030-14	Composite TP208
1653030-15	TP208-4
1653030-16	Composite TP209
1653030-17	TP209-4
1653030-18	Composite TP210
1653030-20	TP211-1
1653030-21	TP211-2
1653030-22	Composite TP212
1653030-23	TP212-4
1653030-24	TP213-1
1653030-25	TP213-2
1653030-26	TP214-1
1653030-27	TP214-2
1653030-28	Composite TP215
1653030-29	TP215-3
1653030-30	TP216-1
1653030-31	TP216-2

Approved By:



Mark Foto, M.Sc.  
Lab Supervisor

Certificate of Analysis  
**Client: Amec Foster Wheeler (Thorold)**  
**Client PO:**

Report Date: 03-Jan-2017  
Order Date: 23-Dec-2016  
**Project Description: TG161164**

1653030-32	TP217-1
1653030-33	TP217-2
1653030-34	TP218-1
1653030-35	TP218-2
1653030-36	Dup AA
1653030-37	Dup AC



Certificate of Analysis  
**Client: Amec Foster Wheeler (Thorold)**  
**Client PO:**

Report Date: 03-Jan-2017  
Order Date: 23-Dec-2016  
**Project Description: TG161164**

### Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
REG 153: Metals by ICP/OES, soil	based on MOE E3470, ICP-OES	30-Dec-16	30-Dec-16
Solids, %	Gravimetric, calculation	30-Dec-16	30-Dec-16

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 03-Jan-2017

Order Date: 23-Dec-2016

Project Description: TG161164

Client ID:	TP201-2	TP201-3	TP202-2	TP202-3
Sample Date:	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16
Sample ID:	1653030-01	1653030-02	1653030-03	1653030-04
MDL/Units	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	83.1	80.5	85.1	83.6
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**Metals**

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Barium	1.0 ug/g dry	112	121	119	112
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	19.5	21.0	19.5	21.7
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	23.3	25.3	23.6	25.6
Cobalt	1.0 ug/g dry	12.0	12.6	11.9	12.7
Copper	1.0 ug/g dry	25.3	26.9	27.5	26.9
Lead	1.0 ug/g dry	12.4	13.1	12.6	14.0
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	25.5	26.8	26.3	28.4
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	36.2	38.5	36.3	39.1
Zinc	1.0 ug/g dry	56.6	64.8	57.0	60.2

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 03-Jan-2017

Order Date: 23-Dec-2016

Project Description: TG161164

Client ID:	TP203-2	TP203-3	TP204-1	TP204-2
Sample Date:	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16
Sample ID:	1653030-05	1653030-06	1653030-07	1653030-08
MDL/Units	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	82.8	81.9	80.0	83.3
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**Metals**

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Barium	1.0 ug/g dry	113	127	158	115
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	17.8	17.3	21.9	19.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	24.2	21.1	28.3	23.8
Cobalt	1.0 ug/g dry	12.3	10.9	14.1	12.1
Copper	1.0 ug/g dry	29.9	22.6	29.6	27.6
Lead	1.0 ug/g dry	13.1	12.4	13.0	13.6
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	26.6	23.5	30.8	26.8
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	37.3	32.7	42.3	36.7
Zinc	1.0 ug/g dry	66.4	53.3	62.5	58.1

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 03-Jan-2017  
 Order Date: 23-Dec-2016  
 Project Description: TG161164

Client ID:	TP205-1	TP205-2	TP206-1	TP206-2
Sample Date:	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16
Sample ID:	1653030-09	1653030-10	1653030-11	1653030-12
MDL/Units	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	84.0	83.8	84.4	83.5
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**Metals**

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Barium	1.0 ug/g dry	130	124	117	122
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	19.8	19.8	20.0	20.0
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	24.0	24.1	24.3	24.8
Cobalt	1.0 ug/g dry	12.1	12.2	11.9	12.6
Copper	1.0 ug/g dry	26.5	26.2	25.3	26.5
Lead	1.0 ug/g dry	14.7	14.8	12.0	13.5
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	26.3	27.2	26.0	28.3
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	37.1	37.1	36.9	37.7
Zinc	1.0 ug/g dry	60.7	66.6	59.1	60.4

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 03-Jan-2017  
 Order Date: 23-Dec-2016  
 Project Description: TG161164

<b>Client ID:</b>	Composite TP207	Composite TP208	TP208-4	Composite TP209
<b>Sample Date:</b>	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16
<b>Sample ID:</b>	1653030-13	1653030-14	1653030-15	1653030-16
<b>MDL/Units</b>	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	77.9	85.1	81.2	83.5
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**Metals**

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Barium	1.0 ug/g dry	130	106	91.2	113
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	20.9	11.5	6.1	16.8
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	26.3	12.2	5.5	20.5
Cobalt	1.0 ug/g dry	13.5	7.1	3.5	11.6
Copper	1.0 ug/g dry	28.2	16.7	7.6	26.2
Lead	1.0 ug/g dry	15.2	35.9	8.0	31.7
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	29.3	14.0	6.0	23.9
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	40.0	21.9	11.8	32.3
Zinc	1.0 ug/g dry	79.6	138	39.4	71.2

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 03-Jan-2017  
 Order Date: 23-Dec-2016  
 Project Description: TG161164

<b>Client ID:</b>	TP209-4	Composite TP210	TP211-1	TP211-2
<b>Sample Date:</b>	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16
<b>Sample ID:</b>	1653030-17	1653030-18	1653030-20	1653030-21
<b>MDL/Units</b>	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	81.5	80.2	84.3	83.3
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**Metals**

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Barium	1.0 ug/g dry	117	138	117	113
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	11.2	19.9	18.1	17.3
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	15.1	25.2	24.9	20.8
Cobalt	1.0 ug/g dry	9.3	13.2	12.5	10.4
Copper	1.0 ug/g dry	15.9	27.8	27.8	21.2
Lead	1.0 ug/g dry	7.5	13.0	11.5	9.0
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	16.8	28.8	27.7	23.4
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	25.7	38.6	37.9	33.0
Zinc	1.0 ug/g dry	35.1	62.8	57.2	47.6

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 03-Jan-2017

Order Date: 23-Dec-2016

Project Description: TG161164

<b>Client ID:</b>	Composite TP212	TP212-4	TP213-1	TP213-2
<b>Sample Date:</b>	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16
<b>Sample ID:</b>	1653030-22	1653030-23	1653030-24	1653030-25
<b>MDL/Units</b>	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	82.6	77.8	79.2	84.9
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**Metals**

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Barium	1.0 ug/g dry	112	123	130	111
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	17.7	18.4	23.4	18.3
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	23.6	24.8	28.2	23.0
Cobalt	1.0 ug/g dry	12.3	12.8	13.5	11.9
Copper	1.0 ug/g dry	28.9	31.0	26.0	25.2
Lead	1.0 ug/g dry	14.9	13.1	12.3	11.2
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	26.7	27.3	30.0	25.8
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	36.8	38.8	41.7	35.2
Zinc	1.0 ug/g dry	78.2	82.1	57.0	60.0



Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 03-Jan-2017

Order Date: 23-Dec-2016

Project Description: TG161164

	Client ID:	TP214-1	TP214-2	Composite TP215	TP215-3
	Sample Date:	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16
	Sample ID:	1653030-26	1653030-27	1653030-28	1653030-29
	MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics					
% Solids	0.1 % by Wt.	85.5	80.9	83.3	82.3

Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Barium	1.0 ug/g dry	110	125	118	123
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	17.3	17.9	19.7	19.2
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	22.3	25.3	24.3	23.8
Cobalt	1.0 ug/g dry	11.6	12.8	12.4	12.5
Copper	1.0 ug/g dry	24.1	27.1	25.1	24.8
Lead	1.0 ug/g dry	12.1	12.7	11.8	13.2
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	25.6	28.1	26.1	27.0
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	33.8	37.8	37.1	36.5
Zinc	1.0 ug/g dry	58.4	62.9	55.8	56.4

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 03-Jan-2017

Order Date: 23-Dec-2016

Project Description: TG161164

Client ID:	TP216-1	TP216-2	TP217-1	TP217-2
Sample Date:	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16
Sample ID:	1653030-30	1653030-31	1653030-32	1653030-33
MDL/Units	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	84.6	83.6	78.6	84.3
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**Metals**

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Barium	1.0 ug/g dry	124	115	111	112
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	20.0	17.1	18.2	20.0
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	25.4	23.8	25.6	23.5
Cobalt	1.0 ug/g dry	12.9	12.1	12.7	11.6
Copper	1.0 ug/g dry	27.0	24.0	26.3	23.4
Lead	1.0 ug/g dry	14.3	13.4	11.4	13.0
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	28.5	26.2	27.4	25.7
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	39.0	35.0	38.9	36.6
Zinc	1.0 ug/g dry	73.8	61.6	53.5	67.2

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 03-Jan-2017

Order Date: 23-Dec-2016

Project Description: TG161164

Client ID:	TP218-1	TP218-2	Dup AA	Dup AC
Sample Date:	21-Dec-16	21-Dec-16	21-Dec-16	21-Dec-16
Sample ID:	1653030-34	1653030-35	1653030-36	1653030-37
MDL/Units	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	83.6	84.5	83.9	79.9
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**Metals**

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Barium	1.0 ug/g dry	121	118	116	91.9
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	19.3	20.1	20.0	6.0
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	24.6	25.0	25.0	6.3
Cobalt	1.0 ug/g dry	12.4	12.5	12.6	3.7
Copper	1.0 ug/g dry	27.0	25.4	26.1	7.4
Lead	1.0 ug/g dry	20.5	13.6	13.8	8.0
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	26.1	27.2	27.7	7.4
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	37.3	38.1	37.8	13.1
Zinc	1.0 ug/g dry	59.3	61.2	62.9	40.3

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 03-Jan-2017  
 Order Date: 23-Dec-2016  
 Project Description: TG161164

**Method Quality Control: Blank**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Metals</b>									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	1.0	ug/g						
Boron	ND	1.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	1.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	1.0	ug/g						
Lead	ND	1.0	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	1.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.5	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	1.0	ug/g						
Zinc	ND	1.0	ug/g						

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 03-Jan-2017  
 Order Date: 23-Dec-2016  
 Project Description: TG161164

**Method Quality Control: Duplicate**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Metals</b>									
Antimony	ND	1.0	ug/g dry	ND			0.0	30	
Arsenic	ND	1.0	ug/g dry	ND				30	
Barium	75.4	1.0	ug/g dry	75.1			0.5	30	
Beryllium	ND	1.0	ug/g dry	ND			0.0	30	
Boron	13.8	1.0	ug/g dry	13.1			5.0	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium	20.6	1.0	ug/g dry	22.6			9.5	30	
Cobalt	7.00	1.0	ug/g dry	7.00			0.1	30	
Copper	33.6	1.0	ug/g dry	35.7			6.3	30	
Lead	48.5	1.0	ug/g dry	48.8			0.5	30	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	13.8	1.0	ug/g dry	14.4			4.2	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.5	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	ND			0.0	30	
Vanadium	29.9	1.0	ug/g dry	28.6			4.4	30	
Zinc	75.0	1.0	ug/g dry	76.2			1.6	30	
<b>Physical Characteristics</b>									
% Solids	79.3	0.1	% by Wt.	80.2			1.1	25	

Certificate of Analysis  
**Client: Amec Foster Wheeler (Thorold)**  
**Client PO:**

Report Date: 03-Jan-2017  
 Order Date: 23-Dec-2016  
**Project Description: TG161164**

**Method Quality Control: Spike**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Metals</b>									
Antimony	324		ug/L	17.1	123	70-130			
Arsenic	363		ug/L	ND	145	70-130			
Barium	1710		ug/L	1500	84.0	70-130			
Beryllium	285		ug/L	ND	114	70-130			
Boron	542		ug/L	262	112	70-130			
Cadmium	291		ug/L	ND	116	70-130			
Chromium	666		ug/L	453	85.2	70-130			
Cobalt	368		ug/L	140	91.3	70-130			
Copper	1000		ug/L	715	114	70-130			
Lead	1210		ug/L	976	95.3	70-130			
Molybdenum	251		ug/L	14.1	94.8	70-130			
Nickel	504		ug/L	288	86.3	70-130			
Selenium	295		ug/L	ND	118	70-130			
Silver	274		ug/L	4.23	108	70-130			
Thallium	233		ug/L	4.75	91.4	70-130			
Uranium	275		ug/L	ND	110	70-130			
Vanadium	818		ug/L	572	98.5	70-130			
Zinc	1720		ug/L	1520	77.8	70-130			

Certificate of Analysis  
**Client: Amec Foster Wheeler (Thorold)**  
**Client PO:**

Report Date: 03-Jan-2017  
Order Date: 23-Dec-2016  
**Project Description: TG161164**

**Qualifier Notes:**

***Login Qualifiers :***

Container(s) - Bottle and COC sample ID don't match -  
*Applies to samples: TP211-1, TP211-2, Composite TP215, TP215-3, TP216-2*

**Sample Data Revisions**

None

**Work Order Revisions / Comments:**

None

**Other Report Notes:**

n/a: not applicable  
ND: Not Detected  
MDL: Method Detection Limit  
Source Result: Data used as source for matrix and duplicate samples  
%REC: Percent recovery.  
RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.  
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.





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**Chain of Custody**  
(Lab-Use Only)  
**No 110413**

Page 1 of 6

**Turnaround Time:**

1 Day  3 Day

2 Day  Regular

Date Required: \_\_\_\_\_

Client Name: Ance  
Contact Name: Kathy Patterson  
Address: 5-3300 Deseronto Hwy. Thred. ON L2W 4K6  
Telephone: 4056876616

Project Reference: TG161164  
Quote # Tier 2  
PO # \_\_\_\_\_  
Email Address: kathy.patterson@ance.com

Criteria:  O. Reg. 153/04 (As Amended) Table 1  RSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other) **Required Analyses**

Paracel Order Number: <u>1653030</u>		Matrix	Air Volume	# of Containers	Sample Taken		PHCS (P1-P4-BTEX)	VOCs	PAHs	Metals by ICP	Hg	CMT	B (HWS)	<del>Asbestos</del>	
Sample ID/Location Name	Date				Time										
1	<u>TP 201-1</u>	<u>S</u>		<u>1</u>	<u>Dec 21/16</u>	<u>915</u>									
2	<u>201-2</u>					<u>917</u>			<input checked="" type="checkbox"/>						
3	<u>201-3</u>					<u>920</u>			<input checked="" type="checkbox"/>						
4	<u>TP 202-1</u>					<u>930</u>									
5	<u>202-2</u>					<u>935</u>			<input checked="" type="checkbox"/>						
6	<u>202-3</u>					<u>940</u>			<input checked="" type="checkbox"/>						
7	<u>TP 203-1</u>					<u>945</u>									
8	<u>203-2</u>					<u>950</u>			<input checked="" type="checkbox"/>						
9	<u>203-3</u>					<u>955</u>			<input checked="" type="checkbox"/>						
10	<u>TP 204-1</u>					<u>1025</u>			<input checked="" type="checkbox"/>						

Comments: Generated by SWA 07003  
Hold for Fibre analysis  
Method of Delivery: \_\_\_\_\_

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot:	Received at Lab: <u>SUMEPARN DOK MM</u>	Verified By: <u>Rachel Subject</u>
Relinquished By (Print): <u>Matt Scott</u>	Date/Time:	Date/Time: <u>Dec 29, 2016 11:20</u>	Date/Time: <u>Dec 29/16</u>
Date/Time: <u>Dec 22/16</u>	Temperature: _____ °C	Temperature: <u>2.2</u> °C	pH Verified (X) By: <u>N/A</u> 11:22



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**Chain of Custody**  
(Lab Use Only)  
**No 110414**

Page 2 of 6

Client Name: Amec  
Contact Name: Kelly Patterson  
Address: 5-3800 Merivale Ave. Pointe Claire QC H9P 4K6  
Telephone: 468 687 6616

Project Reference: TP 161/164  
Quote #: Tier 2  
PO #  
Email Address: kelly.patterson@amec.ca

**Turnaround Time:**  
 1 Day     3 Day  
 2 Day     Regular  
Date Required: \_\_\_\_\_

Criteria:  O. Reg. 153/04 (As Amended) Table 1  RSC Filing  O. Reg. 558/00  PWQO  CGME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: <u>1653030</u>		Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4-BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)
Sample ID/Location Name	Date				Time								
1	<u>TP 204-2</u>	<u>S</u>		<u>1</u>	<u>Dec 21/16</u>	<u>1010</u>				<input checked="" type="checkbox"/>			
2	<u>TP 205-1</u>					<u>1015</u>				<input checked="" type="checkbox"/>			
3	<u>205-2</u>					<u>1020</u>				<input checked="" type="checkbox"/>			
4	<u>TP 206-1</u>					<u>1000</u>				<input checked="" type="checkbox"/>			
5	<u>206-2</u>					<u>1005</u>				<input checked="" type="checkbox"/>			
6													
7	<u>Composite TP 207-2</u>					<u>1230</u>				<input checked="" type="checkbox"/>			
8	<u>207-3</u>					<u>1235</u>				<input checked="" type="checkbox"/>			
9	<u>Composite TP 208-1</u>					<u>1202</u>				<input checked="" type="checkbox"/>			
10	<u>TP 208-2</u>					<u>1203</u>				<input checked="" type="checkbox"/>			

Comments: See page 1    include TP 208-3 in Composite TP 208    Method of Delivery: \_\_\_\_\_

Relinquished By (Sign): <u>Mark Seibel</u>	Received by Driver/Depot:	Received at Lab: <u>SUMMITRON</u> <u>1001 MM</u>	Verified By: <u>Rachel Subject</u>
Relinquished By (Print): <u>Mark Seibel</u>	Date/Time:	Date/Time: <u>DEC 29, 2016</u> <u>10:30</u>	Date/Time: <u>Dec 29 11:06</u>
Date/Time: <u>Dec 28/16</u>	Temperature: _____ °C	Temperature: <u>7.2</u> °C	pH Verified <input checked="" type="checkbox"/> By: <u>N/A</u> <u>11:27</u>



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300-2319 St. Laurent Blvd.  
Ottawa, Ontario K1G 4J8  
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e: paracel@paracellabs.com

Chain of Custody  
(Lab Use Only)  
No 110415

Page 3 of 6

Turnaround Time:

1 Day       3 Day  
 2 Day       Regular  
Date Required: \_\_\_\_\_

Client Name: *Anne*  
Contact Name: *Kelly Peterson*  
Address: *53900 Mainville Rd, Montreal QC  
126 446*  
Telephone: *405 687 6016*

Project Reference: *TG-161164*  
Quote #: *Tier 2*  
PO #:  
Email Address: *kelly.peterson@canstruction.com*

Criteria:  O. Reg. 153/04 (As Amended) Table 1  RSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Soil) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken		PHC: F1-F4-BTEX	VOCs	PAHs	Metals by ICP	Ilg	C+V1	B (HWS)							
				Date	Time														
<i>1 include 13 Composite TP208-3</i>	<i>S</i>		<i>1</i>	<i>Dec 21/16</i>	<i>1208</i>				<i>X</i>										
<i>2 208-4</i>					<i>1210</i>				<i>X</i>										
<i>3 TP209-1</i>					<i>1139</i>				<i>X</i>										
<i>4 Composite TP209-2</i>					<i>1102</i>				<i>X</i>										
<i>5 209-3</i>					<i>1143</i>				<i>X</i>										
<i>6 209-4</i>					<i>1150</i>				<i>X</i>										
<i>7 Composite TP210-1</i>					<i>1216</i>				<i>X</i>										
<i>8 210-2</i>					<i>1218</i>				<i>X</i>										
<i>9 210-3</i>					<i>1220</i>				<i>X</i>										
<i>10 210-4</i>					<i>1224</i>				<i>X</i>										

*- 950ml*

*Missing*

Comments: *see 1*

Method of Delivery: \_\_\_\_\_

Relinquished By (Sign): <i>Mark Seibel</i>	Received by Driver/Depot:	Received at Lab: <i>SUNAEPORN DOX MAI</i>	Verified By: <i>Rachel Subject</i>
Relinquished By (Print): <i>Mark Seibel</i>	Date/Time:	Date/Time: <i>Dec 29, 2016 10:30</i>	Date/Time: <i>Dec 29/16</i>
Date/Time: <i>Dec 22/16</i>	Temperature: _____ °C	Temperature: <i>5.2</i> °C	pH Verified <input checked="" type="checkbox"/> By: <i>N/A</i> <i>11:22</i>

Client Name: <u>Amec</u>	Project Reference: <u>TG161164</u>	<b>Turnaround Time:</b> <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular Date Required: _____
Contact Name: <u>Kelley Patterson</u>	Quote # <u>Tier 2</u>	
Address: <u>5-9200 Kennedy Rd. North on 220486</u>	PO # _____	
Telephone: <u>4056876616</u>	E-mail Address: <u>kelly.patterson@amec.com</u>	

Criteria:  O. Reg. 153/04 (As Amended) Table 1  RSC Filing  5800  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil Sed.) GW (Ground Water) SW (Surface Water) SS (Storm Sanitary Sewer) P (Paint) A (Air) O (Other) Required Analyses

Paracel Order Number: <u>1653030</u>		Matrix	Air Volume	# of Containers	Sample Taken		PHCS F1-F4-BTEX	VOCs	PAHs	Metals by ICP	Hg	CMI	B (HWS)
Sample ID/Location Name	Date				Time								
1	<u>TP 211-1</u>	<u>S</u>		<u>1</u>	<u>Dec 11/16</u>	<u>1248</u>				<input checked="" type="checkbox"/>			
2	<u>211-2</u>					<u>1250</u>				<input checked="" type="checkbox"/>			
3	<u>TP 212-1</u>					<u>1120</u>				<input checked="" type="checkbox"/>			
5	<u>Composite TP 212</u> <u>212-2</u>					<u>1125</u>				<input checked="" type="checkbox"/>			
						<u>1130</u>				<input checked="" type="checkbox"/>			
6	<u>212-4</u>					<u>1135</u>				<input checked="" type="checkbox"/>			
7	<u>TP 213-1</u>					<u>215</u>				<input checked="" type="checkbox"/>			
8	<u>213-2</u>					<u>220</u>				<input checked="" type="checkbox"/>			
9	<u>TP 214-1</u>					<u>157</u>				<input checked="" type="checkbox"/>			
10	<u>214-2</u>					<u>204</u>				<input checked="" type="checkbox"/>			

Comments: seeps Method of Delivery: \_\_\_\_\_

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot: _____	Received at Lab: <u>SUMEPORN DOM MAI</u>	Verified By: <u>Rachel Subject</u>
Relinquished By (Print): <u>Mark Seckel</u>	Date/Time: _____	Date/Time: <u>Dec 29, 2016 10:28</u>	Date/Time: <u>Dec 29 2016</u>
Date/Time: <u>Dec 22/16</u>	Temperature: _____ °C	Temperature: <u>5.2</u> °C	pH Verified By: <u>N/A</u> 11:22

Client Name: <i>Amey</i>	Project Reference: <i>1616164</i>	Turnaround Time: <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular Date Required: _____
Contact Name: <i>Kelley Johnson</i>	Quote # <i>Tier 2</i>	
Address: <i>5-5300 Monmouth Hwy, North Ottawa ON K1G 4J6</i>	PO #	
Telephone: <i>405 687 6616</i>	Email Address: <i>kelley.johnson@amey.com</i>	

Criteria:  O. Reg. 153/04 (As Amended) Table     RSC Filing     O. Reg. 558/00     PWQO     CCME     SUB (Storm)     SUB (Sanitary)    Municipality: \_\_\_\_\_     Other: \_\_\_\_\_

Matrix Type: S (Soil Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)    Required Analyses

Paracel Order Number: <b>1653030</b>		Matrix	Air Volume	# of Containers	Sample Taken		PHC: F1-F4 - BTEX	VOCs	PAHs	Metals by ICP	Hg	Cu/Pb	B (HWS)	
Sample ID/Location Name					Date	Time								
1	<i>Composite TP215</i> TP215-1	S		1	Dec 21/16	140							-250ml-	
2	215-2													145
3	215-3													150
4	TP216-1													168
5	216-2													130
6	TP217-1													225
7	217-2													230
8	TP218-1													235
9	218-2													240
10	<i>Rep AA</i>													

Comments: *Seeps*    Method of Delivery: \_\_\_\_\_

Relinquished By (Sign): <i>Mark Seckels</i>	Received by Driver/Depot:	Received at Lab: <i>SUMEPORN DOU MAI</i>	Verified By: <i>Rachel Subject</i>
Relinquished By (Print): <i>Mark Seckels</i>	Date/Time:	Date/Time: <i>DEC 29 2016 10:20</i>	Date/Time: <i>Dec 29/16</i>
Date/Time: <i>Dec 22/16</i>	Temperature: _____ °C	Temperature: <i>5.2 °C</i>	pH Verified <input checked="" type="checkbox"/> By: <i>N/A</i> <i>11:22</i>





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Chain of Custody  
(Lab Use Only)  
No 110418

Page 6 of 6

Turnaround Time:

1 Day       3 Day  
 2 Day       Regular  
Date Required:

Client Name: *Amec*  
Contact Name: *Kelly Johnson*  
Address: *8-3350 Merivale Drive, Mississauga, ON L4W 4G8*  
Telephone: *416-687-6616*

Project Reference: *T616184*  
Quote #: *Tier 2*  
PO #  
Email Address: *kelly.johnson@amec.com*

Criteria:  O. Reg. 153/04 (As Amended) Table 1  RSC/Filing  O. Reg. 558/00  PWQO  CGME  SUB (Storm)  SUB (Sanitary) Municipality:  Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number:		Matrix	Air Volume	# of Containers	Sample Taken		PHCS F1-F4+BTEX	VOCS	PAHs	Metals by ICP	Hg	C+V1	B (HWS)
1653030					Date	Time							
Sample ID/Location Name													
1	<i>One AB</i>	<i>S</i>		<i>1</i>	<i>Dec 27/16</i>								
2	<i>Two AC</i>	<i>L</i>		<i>1</i>					<i>X</i>				
3	<i>Three AD</i>	<i>L</i>		<i>1</i>									
4													
5													
6													
7													
8													
9													
10													

Comments: *See pg 1* Method of Delivery:

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot:	Received at Lab: <i>SUMMITERN DON MAI</i>	Verified By: <i>Rachel Subject</i>
Relinquished By (Print): <i>Mark Seckin</i>	Date/Time:	Date/Time: <i>DEC 29, 2016 11:20</i>	Date/Time: <i>Dec 29/16</i>
Date/Time: <i>Dec 29/16</i>	Temperature: _____ °C	Temperature: <i>5.2 °C</i>	pH Verified <input checked="" type="checkbox"/> By: <i>N/A 11:22</i>

Client Name: <i>Amey</i>	Project Reference: <i>TG161167</i>	<b>Turnaround Time:</b> <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day  <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular Date Required: _____
Contact Name: <i>Kelly Puffner</i>	Quote #: <i>Tier 2</i>	
Address: <i>5-3300 Beville Hwy South ON L2W 4K6</i>	PO #:	
Telephone: <i>905 887 6616</i>	Email Address: <i>kelly.puffner@amcfr.com</i>	

Criteria:  O. Reg. 153/04 (As Amended) Table 1  RSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other) **Required Analyses**

Parcel Order Number: <i>1653030</i>		Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	Other
Sample ID/Location Name	Date				Time									
1	<i>TP 201-1</i>	<i>S</i>		<i>1</i>	<i>Dec 21/16</i>	<i>915</i>								<i>250ml</i>
2	<i>201-2</i>					<i>917</i>								
3	<i>201-3</i>					<i>920</i>								
4	<i>TP 202-1</i>					<i>930</i>								
5	<i>202-2</i>					<i>935</i>								
6	<i>202-3</i>					<i>940</i>								
7	<i>TP 203-1</i>					<i>945</i>								
8	<i>203-2</i>					<i>950</i>								
9	<i>203-2</i>					<i>955</i>								
10	<i>TP 204-1</i>					<i>1025</i>								

Comments: *Generated by SAMP7003, revised CoC to be emailed. Hold for PCB analysis EXTRA SOD 2TP 202-3 = PROJECT REACT TO 161637*

Method of Delivery: *drop off*

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot: <i>Niagara B Homeniuk</i>	Received at Lab: <i>SUNDEEP RAN DUKMAI</i>	Verified By: <i>Rachel Subject</i>
Relinquished By (Print): <i>[Signature]</i>	Date/Time: <i>22 Dec 16 1645</i>	Date/Time: <i>DEC 29, 2016 10:20</i>	Date/Time: <i>Dec 29/16</i>
Date/Time: <i>Dec 22/16</i>	Temperature: _____ °C	Temperature: <i>5.2</i> °C	pH Verified [ ] By: <i>NA</i> <i>11:22</i>

~~ON Hold samples will be held at depot.~~ All samples shipped DEC. 28, 2016 @ 5°C DS



Client Name: <i>Anne Kelly Patterson</i>	Project Reference: <i>TP66/164</i>	Turnaround Time: <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular Date Required: _____
Contact Name: <i>Kelly Patterson</i>	Quote #: <i>Tier 2</i>	
Address: <i>5-3306 Merr. Park Dr. Unit W LW 446</i>	PO #	
Telephone: <i>403 687 6616</i>	Email Address: <i>kelly.patterson@cmech.ca</i>	

Criteria:  O. Reg. 153/04 (As Amended) Table 1  RSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other) Required Analyses

Parcel Order Number: <i>1653030</i>		Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	
Sample ID/Location Name					Date	Time								
1	<i>TP204-2</i>	<i>S</i>		<i>1</i>	<i>Dec 21/16</i>	<i>1010</i>								<i>- 250ml -</i>
2	<i>TP205-1</i>					<i>1015</i>								
3	<i>205-2</i>					<i>1020</i>								
4	<i>TP206-1</i>					<i>1000</i>								
5	<i>206-2</i>					<i>1005</i>								
6	<i>TP207-1</i>					<i>1226</i>								
7	<i>207-2</i>					<i>1230</i>								
8	<i>207-3</i>					<i>1235</i>								
9	<i>TP208-1</i>					<i>1202</i>								
10	<i>208-2</i>					<i>1203</i>								

Comments: *See page 1* Method of Delivery: *drop off*

Relinquished By (Sign): <i>Mark Seibel</i>	Received by Driver/Depot: <i>Niagara B Homener</i>	Received at Lab: <i>SUMNER DOWMA</i>	Verified By: <i>Rachel Subject</i>
Relinquished By (Print): <i>Mark Seibel</i>	Date/Time: <i>22 Dec 16 1645</i>	Date/Time: <i>DEC 29, 2016 10:30</i>	Date/Time: <i>Dec 29/16</i>
Date/Time: <i>Dec 22/16</i>	Temperature: _____ °C	Temperature: <i>9.2 °C</i>	pH Verified [ ] By: <i>N/A</i> 11:22

Client Name: <i>Amec</i>	Project Reference: <i>1616164</i>	<b>Turnaround Time:</b> <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day  <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular Date Required: _____
Contact Name: <i>Kelly Petersen</i>	Quote #: <i>Tier 2</i>	
Address: <i>3-3700 Mcintosh Hwy. Shoult ON L2C 4Y6</i>	PO #:	
Telephone: <i>905 687 6616</i>	Email Address: <i>kelly.petersen@amec.com</i>	

Criteria:  O. Reg. 153/04 (As Amended) Table L  RSC Filing  O. Reg. 558/00  PQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other) **Required Analyses**

Parcel Order Number: <i>1653030</i>		Matrix	Air Volume	# of Containers	Sample Taken		PHICs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)						
Sample ID/Location Name					Date	Time													
1	<i>SP208-3</i>	<i>S</i>		<i>1</i>	<i>Dec 21/16</i>	<i>1208</i>													
2	<i>208-4</i>					<i>1210</i>													
3	<i>SP209-1</i>					<i>1139</i>													
4	<i>209-2</i>					<i>1142</i>													
5	<i>209-3</i>					<i>1143</i>													
6	<i>209-4</i>					<i>1150</i>													
7	<i>SP210-1</i>					<i>1216</i>													
8	<i>210-2</i>					<i>1218</i>													
9	<i>210-3</i>					<i>1220</i>													
10	<i>210-4</i>					<i>1224</i>													

Comments: *see pg 1* Method of Delivery: *drop off*

Relinquished By (Sign): <i>Mick Seebach</i>	Received by Driver/Depot: <i>Niagara Blomenier</i>	Received at Lab: <i>OU MEERPN DOK MAI</i>	Verified By: <i>Rachel Subijed</i>
Relinquished By (Print): <i>Mick Seebach</i>	Date/Time: <i>22 Dec 16 1645</i>	Date/Time: <i>DEC 29 2016 11:20</i>	Date/Time: <i>Dec 29 16</i>
Date/Time: <i>Dec 22/16</i>	Temperature: _____ °C	Temperature: <i>5.2 °C</i>	pH Verified [ ] By: <i>NA</i> <i>11:22</i>

Client Name: <u>Amec</u>	Project Reference: <u>TG161164</u>	<b>Turnaround Time:</b> <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day  <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular Date Required: _____
Contact Name: <u>Kelly Paterson</u>	Quote #: <u>Tier 2</u>	
Address: <u>5-3200 Huronville Dr / Thurl. ON L2C 4K6</u>	PO #	
Telephone: <u>4056876616</u>	Email Address: <u>kelly.paterson@amec.com</u>	

Criteria:  O. Reg. 153/04 (As Amended) Table L  RSC Filing  O. Reg. 358/00  PWQ  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other) **Required Analyses**

Parcel Order Number: <u>1653030</u>		Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	Other
Sample ID/Location Name					Date	Time								
1	<u>TP 211-1</u>	<u>S</u>		<u>1</u>	<u>Dec 11/16</u>	<u>1248</u>								
2	<u>211-2</u>					<u>1250</u>								
3	<u>TP 212-1</u>					<u>1120</u>								
4	<u>212-2</u>					<u>1125</u>								
5	<u>212-3</u>					<u>1130</u>								
6	<u>212-4</u>					<u>1135</u>								
7	<u>TP 213-1</u>					<u>213</u>								
8	<u>213-2</u>					<u>220</u>								
9	<u>TP 214-1</u>					<u>157</u>								
10	<u>214-2</u>					<u>204</u>								

Comments: seeps Method of Delivery: drop box

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot: <u>Niagara B Homeniuk</u>	Received at Lab: <u>SUMPERON DOX MAI</u>	Verified By: <u>Rachel Subject</u>
Relinquished By (Print): <u>Mark Seckel</u>	Date/Time: <u>22 Dec 16 1645</u>	Date/Time: <u>DEC 29, 2016 10:20</u>	Date/Time: <u>Dec 29/16</u>
Date/Time: <u>Dec 22/16</u>	Temperature: _____ °C	Temperature: <u>5.2</u> °C	pH Verified [ ] By: <u>NA</u> <u>4.02</u>

Client Name: <i>Amc</i>	Project Reference: <i>T616164</i>	Turnaround Time: <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular Date Required: _____
Contact Name: <i>Kelly Patterson</i>	Quote #: <i>Tier 2</i>	
Address: <i>5-5300 Merriville Hwy Toronto or or 486</i>	PO #	
Telephone: <i>416 687 6616</i>	Email Address: <i>kelly.patterson@amc.com</i>	

Criteria:  O. Reg. 153/04 (As Amended) Table \_\_\_  RSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other) Required Analyses

Parcel Order Number: <i>1653030</i>		Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	Other
Sample ID/Location Name					Date	Time								
1	<i>TP 215-1</i>	<i>S</i>		<i>1</i>	<i>Dec 21/16</i>	<i>140</i>								<i>250ml</i>
2	<i>215-2</i>					<i>145</i>								<i>LABELLED TP 115-2 (?)</i>
3	<i>215-3</i>					<i>150</i>								<i>LABELLED TP 115-3 (?)</i>
4	<i>TP 216-1</i>					<i>168</i>								
5	<i>216-2</i>					<i>130</i>								<i>LABELLED TP 116-2 (?)</i>
6	<i>TP 217-1</i>					<i>225</i>								<i>BB</i>
7	<i>217-2</i>					<i>230</i>								
8	<i>TP 218-1</i>					<i>235</i>								<i>PROJECT READ = T6 161163. USE</i>
9	<i>218-2</i>					<i>240</i>								<i>COC project</i>
10	<i>Drop AA</i>													<i>AS PER DM-BS</i>

Comments: *See CS* Method of Delivery: *drop box*

Relinquished By (Sign): <i>Mary Seck</i>	Received by Driver/Depot: <i>Niagara Blomenier</i>	Received at Lab: <i>SUNPE PORN DOKMAI</i>	Verified By: <i>Rachel Subject</i>
Relinquished By (Print): <i>Mary Seck</i>	Date/Time: <i>22 Dec 16 1645</i>	Date/Time: <i>DEC 29 2016 10:20</i>	Date/Time: <i>Dec 29 16</i>
Date/Time: <i>Dec 22/16</i>	Temperature: _____ °C	Temperature: <i>5.2 °C</i>	pH Verified [ ] By: <i>NA</i> <span style="float: right;"><i>11:22</i></span>

Client Name: <u>Amce</u>	Project Reference: <u>76/61/64</u>	<b>Turnaround Time:</b> <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular Date Required: _____
Contact Name: <u>Kelly Johnson</u>	Quote #: <u>Tier 2</u>	
Address: <u>8-3360 Meriville Blvd, Unit 448 Ottawa ON K1W 4G8</u>	PO #:	
Telephone: <u>456 876616</u>	Email Address: <u>kelly.johnson@amce.ca</u>	

Criteria:  O. Reg. 153/04 (As Amended) Table 1  ASC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other) **Required Analyses**

Parcel Order Number: <u>1653030</u>		Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP			B (HWS)
Sample ID/Location Name	Date				Time	Hg				CrVI	B		
1	<u>Dup AB</u>	<u>S</u>		<u>1</u>	<u>Dec 27/16</u>								
2	<u>Dup AC</u>	<u>L</u>		<u>1</u>									
3	<u>Dup AD</u>	<u>L</u>		<u>1</u>									
4													
5													
6													
7													
8													
9													
10													

Comments: steps 1 Method of Delivery: drop box

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot: <u>Niagara B. Homenick</u>	Received at Lab: <u>JUNE PORN 2016 MAI</u>	Verified By: <u>Rachel Subject</u>
Relinquished By (Print): <u>Mark Seelich</u>	Date/Time: <u>22 Dec 16 1645</u>	Date/Time: <u>DEC 29, 2016 10:20</u>	Date/Time: <u>Dec 29/16</u>
Date/Time: <u>Dec 29/16</u>	Temperature: _____ °C	Temperature: <u>5.2 °C</u>	pH Verified [ ] By: <u>NA 11:22</u>



## Certificate of Analysis

### Amec Foster Wheeler (Thorold)

3300 Merrittville Hwy, Unit 5  
Thorold, ON L2V 4Y6  
Attn: Kelly Patterson

Client PO:  
Project: TG161164  
Custody: 110384/385/387/386

Report Date: 3-Jan-2017  
Order Date: 23-Dec-2016

**Order #: 1653032**

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Parcel ID	Client ID
1653032-01	TP219-1
1653032-02	TP219-2
1653032-03	TP220-1
1653032-04	TP220-2
1653032-05	TP221-1
1653032-06	TP221-2
1653032-07	TP222-1
1653032-08	TP222-2
1653032-09	TP223-1
1653032-10	TP223-2
1653032-11	TP224-1
1653032-12	TP224-2
1653032-13	TP225-1
1653032-14	TP225-2
1653032-15	TP226-1
1653032-16	TP226-2
1653032-17	TP229-1
1653032-18	TP229-2
1653032-19	Dup A3
1653032-20	TP227-1
1653032-21	TP227-2
1653032-22	TP228-1
1653032-23	TP228-2

Approved By:



Mark Foto, M.Sc.  
Lab Supervisor

Certificate of Analysis  
**Client: Amec Foster Wheeler (Thorold)**  
**Client PO:**

Report Date: 03-Jan-2017  
Order Date: 23-Dec-2016  
**Project Description: TG161164**

### Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Conductivity	MOE E3138 - probe @25 °C, water ext	3-Jan-17	3-Jan-17
REG 153: Metals by ICP/OES, soil	based on MOE E3470, ICP-OES	30-Dec-16	30-Dec-16
Solids, %	Gravimetric, calculation	30-Dec-16	30-Dec-16



Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 03-Jan-2017  
 Order Date: 23-Dec-2016  
 Project Description: TG161164

<b>Client ID:</b>	TP219-1	TP219-2	TP220-1	TP220-2
<b>Sample Date:</b>	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16
<b>Sample ID:</b>	1653032-01	1653032-02	1653032-03	1653032-04
<b>MDL/Units</b>	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	80.5	86.4	83.7	83.9
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**Metals**

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Barium	1.0 ug/g dry	114	138	136	119
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	15.7	15.6	19.7	17.0
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	22.8	23.7	25.2	24.0
Cobalt	1.0 ug/g dry	11.8	12.7	13.3	12.5
Copper	1.0 ug/g dry	26.0	26.7	24.2	24.6
Lead	1.0 ug/g dry	11.6	11.5	14.1	11.3
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	26.6	26.3	28.9	25.9
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	35.6	36.9	39.2	36.7
Zinc	1.0 ug/g dry	52.5	53.0	55.3	53.4

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 03-Jan-2017  
 Order Date: 23-Dec-2016  
 Project Description: TG161164

Client ID:	TP221-1	TP221-2	TP222-1	TP222-2
Sample Date:	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16
Sample ID:	1653032-05	1653032-06	1653032-07	1653032-08
MDL/Units	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	87.5	82.4	83.8	84.6
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**Metals**

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Barium	1.0 ug/g dry	109	121	128	129
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	15.7	16.6	16.3	14.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	50.9	25.0	26.1	24.0
Cobalt	1.0 ug/g dry	12.9	13.4	12.9	14.6
Copper	1.0 ug/g dry	29.4	24.9	26.0	27.9
Lead	1.0 ug/g dry	14.3	11.4	13.4	12.6
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	36.9	29.3	29.1	29.3
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	39.0	36.9	38.5	36.4
Zinc	1.0 ug/g dry	68.8	56.7	61.9	58.8

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 03-Jan-2017  
 Order Date: 23-Dec-2016  
 Project Description: TG161164

<b>Client ID:</b>	TP223-1	TP223-2	TP224-1	TP224-2
<b>Sample Date:</b>	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16
<b>Sample ID:</b>	1653032-09	1653032-10	1653032-11	1653032-12
<b>MDL/Units</b>	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	83.3	84.7	82.2	85.2
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**General Inorganics**

Conductivity	5 uS/cm	-	-	1160	1170
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**Metals**

Antimony	1.0 ug/g dry	<1.0	<1.0	-	-
Arsenic	1.0 ug/g dry	<1.0	<1.0	-	-
Barium	1.0 ug/g dry	140	125	-	-
Beryllium	1.0 ug/g dry	<1.0	<1.0	-	-
Boron	1.0 ug/g dry	18.2	14.9	-	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	-	-
Chromium	1.0 ug/g dry	28.5	24.6	-	-
Cobalt	1.0 ug/g dry	15.0	15.1	-	-
Copper	1.0 ug/g dry	28.2	28.0	-	-
Lead	1.0 ug/g dry	14.7	13.0	-	-
Molybdenum	1.0 ug/g dry	<1.0	<1.0	-	-
Nickel	1.0 ug/g dry	32.6	30.4	-	-
Selenium	1.0 ug/g dry	<1.0	<1.0	-	-
Silver	0.5 ug/g dry	<0.5	<0.5	-	-
Thallium	1.0 ug/g dry	<1.0	<1.0	-	-
Uranium	1.0 ug/g dry	<1.0	<1.0	-	-
Vanadium	1.0 ug/g dry	41.8	37.0	-	-
Zinc	1.0 ug/g dry	65.4	59.7	-	-

<b>Client ID:</b>	TP225-1	TP225-2	TP226-1	TP226-2
<b>Sample Date:</b>	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16
<b>Sample ID:</b>	1653032-13	1653032-14	1653032-15	1653032-16
<b>MDL/Units</b>	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	75.4	81.8	82.3	83.9
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**General Inorganics**

Conductivity	5 uS/cm	1340	1600	738	2820
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<b>Client ID:</b>	TP229-1	TP229-2	Dup A3	TP227-1
<b>Sample Date:</b>	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16
<b>Sample ID:</b>	1653032-17	1653032-18	1653032-19	1653032-20
<b>MDL/Units</b>	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	80.4	84.4	80.3	82.9
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**General Inorganics**

Conductivity	5 uS/cm	772	3040	1260	1930
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Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 03-Jan-2017

Order Date: 23-Dec-2016

Project Description: TG161164

<b>Client ID:</b>	TP227-2	TP228-1	TP228-2	-
<b>Sample Date:</b>	22-Dec-16	22-Dec-16	22-Dec-16	-
<b>Sample ID:</b>	1653032-21	1653032-22	1653032-23	-
<b>MDL/Units</b>	Soil	Soil	Soil	-

**Physical Characteristics**

% Solids	0.1 % by Wt.	83.8	80.4	81.4	-
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**General Inorganics**

Conductivity	5 uS/cm	3040	1270	2230	-
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Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 03-Jan-2017  
 Order Date: 23-Dec-2016  
 Project Description: TG161164

**Method Quality Control: Blank**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>General Inorganics</b>									
Conductivity	ND	5	uS/cm						
<b>Metals</b>									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	1.0	ug/g						
Boron	ND	1.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	1.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	1.0	ug/g						
Lead	ND	1.0	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	1.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.5	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	1.0	ug/g						
Zinc	ND	1.0	ug/g						

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 03-Jan-2017  
 Order Date: 23-Dec-2016  
 Project Description: TG161164

**Method Quality Control: Duplicate**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>General Inorganics</b>									
Conductivity	1170	5	uS/cm	1170			0.3	6.2	
<b>Metals</b>									
Antimony	ND	1.0	ug/g dry	ND				30	
Arsenic	ND	1.0	ug/g dry	ND				30	
Barium	109	1.0	ug/g dry	114			3.8	30	
Beryllium	ND	1.0	ug/g dry	ND			0.0	30	
Boron	15.4	1.0	ug/g dry	15.7			2.1	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium	22.6	1.0	ug/g dry	22.8			0.8	30	
Cobalt	12.0	1.0	ug/g dry	11.8			1.6	30	
Copper	26.2	1.0	ug/g dry	26.0			0.8	30	
Lead	11.5	1.0	ug/g dry	11.6			1.6	30	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	25.5	1.0	ug/g dry	26.6			4.4	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.5	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	ND				30	
Vanadium	35.2	1.0	ug/g dry	35.6			1.2	30	
Zinc	53.5	1.0	ug/g dry	52.5			2.0	30	
<b>Physical Characteristics</b>									
% Solids	79.3	0.1	% by Wt.	80.2			1.1	25	

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 03-Jan-2017  
 Order Date: 23-Dec-2016  
 Project Description: TG161164

**Method Quality Control: Spike**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Metals</b>									
Antimony	289		ug/L	ND	116	70-130			
Arsenic	244		ug/L		97.7	70-130			
Barium	2450		ug/L	2270	70.5	70-130			
Beryllium	249		ug/L	3.54	98.0	70-130			
Boron	556		ug/L	314	96.7	70-130			
Cadmium	249		ug/L	2.30	98.6	70-130			
Chromium	663		ug/L	457	82.6	70-130			
Cobalt	449		ug/L	236	85.3	70-130			
Copper	766		ug/L	520	98.3	70-130			
Lead	434		ug/L	233	80.6	70-130			
Molybdenum	233		ug/L	12.0	88.6	70-130			
Nickel	729		ug/L	533	78.4	70-130			
Selenium	223		ug/L	15.4	82.9	70-130			
Silver	247		ug/L	4.92	96.8	70-130			
Thallium	209		ug/L	14.0	78.0	70-130			
Uranium	295		ug/L	ND	118	70-130			
Vanadium	937		ug/L	712	89.9	70-130			
Zinc	1250		ug/L	1050	81.9	70-130			



Certificate of Analysis  
**Client: Amec Foster Wheeler (Thorold)**  
**Client PO:**

Report Date: 03-Jan-2017  
Order Date: 23-Dec-2016  
**Project Description: TG161164**

**Qualifier Notes:**

None

**Sample Data Revisions**

None

**Work Order Revisions / Comments:**

None

**Other Report Notes:**

n/a: not applicable  
ND: Not Detected  
MDL: Method Detection Limit  
Source Result: Data used as source for matrix and duplicate samples  
%REC: Percent recovery.  
RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.  
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

Client Name: <i>Ame Foster Wheeler</i>	Project Reference: <i>T#161164</i>	Turnaround Time: <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day  <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular Date Required: _____
Contact Name: <i>Kelly Patterson</i>	Quote #: <i>Tier 2</i>	
Address: <i>3300 Merrittville Hwy. Thorold, ON L2V 4Y6</i>	PO #	
Telephone: <i>905-687-6616</i>	Email Address: <i>kelly.patterson@amefw.com</i>	

Criteria:  O. Reg. 153/04 (As Amended) Table 1     RSC Filing     O. Reg. 558/00     PWQO     CCME     SUB (Storm)     SUB (Sanitary) Municipality: \_\_\_\_\_     Other: \_\_\_\_\_

Matrix Type:  (Soil/Sed) GW (Ground Water) SW (Surface Water) SS (Storm Sanitary Sewer) P (Paint) A (Air) O (Other)    Required Analyses

Paracel Order Number: <i>1653032</i>		Matrix	Air Volume	# of Containers	Sample Taken		PHCs F-F-B-TEX	VOCs	PAHs	Metals by ICP	Hg	C/VI	B (HWS)
Sample ID/Location Name					Date	Time							
1	<i>TP219-1</i>	<i>S</i>		<i>1</i>	<i>Dec 22/16</i>				<i>X</i>				
2	<i>TP219-2</i>	<i>S</i>		<i>1</i>					<i>X</i>				
3	<i>TP220-1</i>	<i>S</i>		<i>1</i>					<i>X</i>				
4	<i>TP220-2</i>	<i>S</i>		<i>1</i>					<i>X</i>				
5	<i>TP221-1</i>	<i>S</i>		<i>1</i>					<i>X</i>				
6	<i>TP221-2</i>	<i>S</i>		<i>1</i>					<i>X</i>				
7	<i>TP222-1</i>	<i>S</i>		<i>1</i>					<i>X</i>				
8	<i>TP222-2</i>	<i>S</i>		<i>1</i>					<i>X</i>				
9	<i>TP223-1</i>	<i>S</i>		<i>1</i>					<i>X</i>				
10	<i>TP223-2</i>	<i>S</i>		<i>1</i>					<i>X</i>				

Comments: *Governed by terms and conditions of agreement SNA07-003. Hold remaining samples for future analysis*    Method of Delivery: \_\_\_\_\_

Relinquished By (Sign): <i>Kevin Haines</i>	Received by Driver/Depot:	Received at Lab: <i>DUMETORN DOK MRI</i>	Verified By: <i>Rachel Subject</i>
Relinquished By (Print): <i>Kevin Haines</i>	Date/Time:	Date/Time: <i>DEC 29 2016 10:20</i>	Date/Time: <i>Dec 29/16</i>
Date/Time: <i>Dec. , 2016</i>	Temperature: _____ °C	Temperature: <i>5.2 °C</i>	pH Verified <input checked="" type="checkbox"/> By: <i>N/A</i> <i>11:00</i>

**Chain of Custody**  
(Lab Use Only)  
**No 110385**  
Page 2 of 2

Client Name: Amec Foster Wheeler Project Reference: TG161164  
 Contact Name: Kelly Patterson Quote #: Tier 2  
 Address: 3300 Merrittville Hwy, Thorold, ON L2V 4Y6 PO #  
 Telephone: Email Address: kelly.patterson@amecfw.com

Turnaround Time:  
 1 Day  3 Day  
 2 Day  Regular  
 Date Required: \_\_\_\_\_

Criteria:  O. Reg. 153/04 (As Amended) Table 1  RSC Filing  O. Reg. 558/00  PWQO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other: \_\_\_\_\_

Matrix Type:  Soil/Sed  GW (Ground Water)  SW (Surface Water)  SS (Storm/Sanitary Sewer)  P (Paint)  A (Air)  O (Other)

Paracel Order Number: <u>1653082</u>				Required Analyses												
Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken		PHICs	EL-P4	BIEN	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	EC	
				Date	Time											
1 TP224-1	S		1	Dec 22/16											X	- 250ml
2 TP224-2	S		1												X	
3 TP224-3	S		1													
4 TP224-4	S		1													
5 TP225-1	S		1												X	
6 TP225-2	S		1												X	
7 TP225-3	S		1													
8 TP225-4	S		1													
9 TP226-1	S		1												X	
10 TP226-2	S		1												X	

Comments: See notes on page 1. Method of Delivery: \_\_\_\_\_

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot:	Received at Lab: <u>SUNBEPORN DOKMAI</u>	Verified By: <u>Rachel Subject</u>
Relinquished By (Print): <u>Kevin Haines</u>	Date/Time:	Date/Time: <u>DEC 29, 2016 10:20</u>	Date/Time: <u>Dec 29/16</u>
Date/Time:	Temperature: _____ °C	Temperature: <u>5.2 °C</u>	pH Verified By: <u>N/A</u> 11:00

Client Name: <i>AmeC Foster Wheeler</i>	Project Reference: <i>TG161164</i>	Turnaround Time: <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular
Contact Name: <i>Kelly Patterson</i>	Quote #: <i>Tier 2</i>	
Address: <i>3300 Merrittville Hwy, Thorold, ON L2V 4Y6</i>	PO #	Date Required: _____
Telephone: <i>905-687-6616</i>	Email Address: <i>kelly.patterson@amec.fw.com</i>	

Criteria:  O. Reg. 53/04 (As Amended) Table 1     RSC Filing     O. Reg. 558/00     PWQO     CCME     SUB (Storm)     SUB (Sanitary)    Municipality: \_\_\_\_\_     Other: \_\_\_\_\_

Matrix Type:  S (Soil/Sec)     GW (Ground Water)     SW (Surface Water)     SS (Storm/Sanitary Sewer)     P (Paint)     A (Air)     O (Other)

Paracel Order Number: <i>1653032</i>				Required Analyses													
Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken		PHCS	PHE	BTEX	VOCs	PAHs	Metals by ICP	Hg	Cd/Pb	B (HAMS)	EC	EC	
				Date	Time												
1 <i>TP229-1</i>	<i>S</i>		<i>1</i>	<i>Dec 22/16</i>											<i>X</i>	<i>EC</i>	<i>250ml</i>
2 <i>TP229-2</i>	<i>S</i>		<i>1</i>												<i>X</i>		
3 <i>TP229-3</i>	<i>S</i>		<i>1</i>														
4 <i>TP229-4</i>	<i>S</i>		<i>1</i>														
5 <i>Dup A1</i>	<i>S</i>		<i>1</i>														
6 <i>Dup A2</i>	<i>S</i>		<i>1</i>												<del>X</del>		
7 <i>Dup A3</i>	<i>S</i>		<i>1</i>												<del>X</del>	<i>X</i>	
8 <i>Dup A4</i>	<i>S</i>		<i>1</i>														<i>✓</i>
9																	<del>✓</del>
10																	<del>✓</del>

Comments: *See notes on page 2.*    Method of Delivery: \_\_\_\_\_

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot:	Received at Lab: <i>SUNAPORN DOYMMI</i>	Verified By: <i>Rachel Subject</i>
Relinquished By (Print): <i>Kevin Haines</i>	Date/Time:	Date/Time: <i>Dec 29, 2016 10:30</i>	Date/Time: <i>Dec 29/16</i>
Date/Time:	Temperature: _____ °C	Temperature: <i>5.2 °C</i>	pH Verified <input checked="" type="checkbox"/> By: <i>N/A 11:00</i>

Client Name: <i>AmeC Foster Wheeler</i>	Project Reference: <i>TG161164</i>	Turnaround Time: <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular
Contact Name: <i>Kelly Patterson</i>	Quote #: <i>Tier 2</i>	
Address: <i>3300 Merriville Hwy, Thorold, ON L2V 4Y6</i>	PO #:	Date Required: _____
Telephone: <i>905-687-6616</i>	Email Address: <i>kelly.patterson@amecfw.com</i>	

Criteria:  O. Reg. 559/04 (As Amended) Table 1     RSC Piling     O. Reg. 558/00     PWQO     CCME     SU (Storm)     SU (Sanitary)    Municipality: \_\_\_\_\_     Other: \_\_\_\_\_

Matrix Type:  Soil/Sed     GW (Ground Water)     SW (Surface Water)     SS (Storm/Sanitary Sewer)     P (Paint)     A (Air)     O (Other)

Paracel Order Number: <i>1653032</i>		Matrix	Air Volume	# of Containers	Sample Taken		PHCS FI-FI-BTEX	VOC's	PAHs	Metals by ICP	Hg	C,VI	B (HWS)	EC					
Sample ID/Location Name					Date	Time													
1	<i>TP226-3</i>	<i>S</i>		<i>1</i>	<i>Dec 22/16</i>														<i>250mL</i>
2	<i>TP226-4</i>	<i>S</i>		<i>1</i>															
3	<i>TP227-1</i>	<i>S</i>		<i>1</i>										<i>X</i>					
4	<i>TP227-2</i>	<i>S</i>		<i>1</i>										<i>X</i>					
5	<i>TP227-3</i>	<i>S</i>		<i>1</i>															
6	<i>TP227-4</i>	<i>S</i>		<i>1</i>															
7	<i>TP228-1</i>	<i>S</i>		<i>1</i>										<i>X</i>					
8	<i>TP228-2</i>	<i>S</i>		<i>1</i>										<i>X</i>					
9	<i>TP228-3</i>	<i>S</i>		<i>1</i>															
10	<i>TP228-4</i>	<i>S</i>		<i>1</i>															

Comments: *see notes on page 1.* Method of Delivery: \_\_\_\_\_

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot:	Received at Lab: <i>SUMEPORN DONMM</i>	Verified By: <i>Rachel Subject</i>
Relinquished By (Print): <i>Kevin Hayes</i>	Date/Time:	Date/Time: <i>Dec 29, 2016 11:20</i>	Date/Time: <i>Dec 29/16</i>
Date/Time:	Temperature: _____ °C	Temperature: <i>5.2 °C</i>	pH Verified <input checked="" type="checkbox"/> By: <i>N/A</i> <i>11:00</i>

Client Name: <u>Amece Foster Wheeler</u>	Project Reference: <u>TG161164</u>	Turnaround Time: <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular Date Required: _____
Contact Name: <u>Kelly Patterson</u>	Quote # <u>Tier 2</u>	
Address: <u>3300 Merrittville Hwy, Thorold, ON, L2V4Y6</u>	PO #	
Telephone: <u>905-687-6616</u>	Email Address: <u>kelly.patterson@amecfw.com</u>	

Criteria:  O. Reg. 153/04 (As Amended) Table     RSC Filing     O. Reg. 558/00     PQWO     CCME     SUB (Storm)     SUB (Sanitary) Municipality: \_\_\_\_\_     Other: \_\_\_\_\_

Matrix Type:  (Soil/Sed) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)    Required Analyses

Paracel Order Number: <u>1653032</u>		Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)						
Sample ID/Location Name					Date	Time													
1	TP219-1	S		1	Dec 22/16														
2	TP219-2	S		1															
3	TP220-1	S		1															
4	TP220-2	S		1															
5	TP221-1	S		1															
6	TP221-2	S		1															
7	TP222-1	S		1															
8	TP222-2	S		1															
9	TP223-1	S		1															
10	TP223-2	S		1															

Comments: Governed by terms and conditions of agreement SNA07-003. revised COC to be emailed    Method of Delivery: drop off

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot: <u>Niagara B. J. Amernick</u>	Received at Lab: <u>SUMEE ARN DOX MAI</u>	Verified By: <u>Rachel subject</u>
Relinquished By (Print): <u>Kevin Hames</u>	Date/Time: <u>22 Dec 16 16:45</u>	Date/Time: <u>DEC 29, 2016 11:20</u>	Date/Time: <u>Dec 29/16</u>
Date/Time: <u>Dec. 1, 2016</u>	Temperature: _____ °C	Temperature: <u>5.2</u> °C	pH Verified [ ] By: <u>NA 11:00</u>

~~on hold samples held at depot~~    All samples shipped  
Dec. 28, 2016 @ 5°C    RB



Client Name: <b>Amec Foster Wheeler</b>	Project Reference: <b>TG161164</b>	<b>Turnaround Time:</b> <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular Date Required: _____
Contact Name: <b>Kelly Patterson</b>	Quote # <b>Tier 2</b>	
Address: <b>3300 Merrittville Hwy, Thorold, ON L2V4Y6</b>	PO #	
Telephone:	Email Address: <b>kelly.patterson@amecfw.com</b>	

Criteria:  O. Reg. 153/04 (As Amended) Table     RSC Filing     O. Reg. 558/00     PWQO     CCME     SUB (Storm)     SUB (Sanitary)    Municipality: \_\_\_\_\_     Other: \_\_\_\_\_

Matrix Type:  (Soil/Sed) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)      **Required Analyses**

Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)							
				Date	Time														
1 TP224-1	S		1	Dec 22/16															- 250ml
2 TP224-2	S		1																
3 TP224-3	S		1																
4 TP224-4	S		1																
5 TP225-1	S		1																
6 TP225-2	S		1																
7 TP225-3	S		1																
8 TP225-4	S		1																
9 TP226-1	S		1																
10 TP226-2	S		1																

Comments: **See notes on page 1.**      Method of Delivery: **drop off**

Relinquished By (Sign): <i>Kevin Heines</i>	Received by Driver/Depot: <b>Niagara Bhamenie</b>	Received at Lab: <b>SUNREPORN DOKMAI</b>	Verified By: <b>Rachel Subject</b>
Relinquished By (Print): <b>Kevin Heines</b>	Date/Time: <b>22 Dec 16 16:45</b>	Date/Time: <b>DEC 29 2016 10:20</b>	Date/Time: <b>Dec 29/16</b>
Date/Time:	Temperature: _____ °C	Temperature: <b>7.2 °C</b>	pH Verified [ ] By: <b>NA 11:00</b>



Client Name: <b>AmeC Foster Wheeler</b>	Project Reference: <b>TG161164</b>	<b>Turnaround Time:</b> <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular Date Required: _____
Contact Name: <b>Kelly Patterson</b>	Quote # <b>Tier 2</b>	
Address: <b>3300 Merrittville Hwy, Thorold, ON, L2V 4Y6</b>	PO #	
Telephone: <b>905-687-6616</b>	Email Address: <b>kelly.patterson@amecfw.com</b>	

Criteria:  O. Reg. 153/04 (As Amended) Table     RSC Filing     O. Reg. 558/00     PWQO     CCME     SUB (Storm)     SUB (Sanitary)    Municipality: \_\_\_\_\_     Other: \_\_\_\_\_

Matrix Type:  S (Soil/Sec)     GW (Ground Water)     SW (Surface Water)     SS (Storm/Sanitary Sewer)     P (Paint)     A (Air)     O (Other)

Paracel Order Number: <b>1053032</b>		Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)						
Sample ID/Location Name					Date	Time													
1	TP229-1	S		1	Dec. 22/16														
2	TP229-2	S		1															
3	TP229-3	S		1															
4	TP229-4	S		1															
5	Dup A1	S		1															
6	Dup A2	S		1															
7	Dup A3	S		1															
8	Dup A4	S		1															
9																			
10																			

Comments: **See notes on page 1.**      Method of Delivery: **drop box**

Relinquished By (Sign):	Received by Driver/Depot: <b>Niagara Bhtomenex</b>	Received at Lab: <b>DUPLICATE DOK MAI</b>	Verified By: <b>Rachel Subject</b>
Relinquished By (Print): <b>Kevin Haines</b>	Date/Time: <b>22 Dec 16 16:45</b>	Date/Time: <b>DEC 29 2016 16:20</b>	Date/Time: <b>Dec 29/16</b>
Date/Time:	Temperature: _____ °C	Temperature: <b>5.2 °C</b>	pH Verified [ ] By: <b>NA 11:00</b>

Client Name: <u>Amece Foster Wheeler</u>	Project Reference: <u>TG161164</u>	<b>Turnaround Time:</b> <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular Date Required: _____
Contact Name: <u>Kelly Patterson</u>	Quote #: <u>Tier 2</u>	
Address: <u>3300 Merrittville Hwy, Thordd, ON L2V 4Y6</u>	PO #	
Telephone: <u>905-687-6616</u>	Email Address: <u>Kelly.patterson@amecfw.com</u>	

Criteria:  O. Reg. 153/04 (As Amended) Table     RSC Filing     O. Reg. 558/00     PWQO     CCME     SUB (Storm)     SUB (Sanitary)    Municipality: \_\_\_\_\_     Other: \_\_\_\_\_

Matrix Type:  S (Soil/Sed)     GW (Ground Water)     SW (Surface Water)     SS (Storm/Sanitary Sewer)     P (Paint)     A (Air)     O (Other)

Paracel Order Number: <u>1653032</u>			Required Analyses																
Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP			B (HWS)							
				Date	Time				Hg	CrVI	B (HWS)								
1 TP226-3	S		1	Dec 22/16															- 250 mL -
2 TP226-4	S		1																
3 TP227-1	S		1																
4 TP227-2	S		1																
5 TP227-3	S		1																
6 TP227-4	S		1																
7 TP228-1	S		1																
8 TP228-2	S		1																
9 TP228-3	S		1																
10 TP228-4	S		1																

Comments: see notes on page 1.      Method of Delivery: drop box

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot: <u>Niagara B. Homenies</u>	Received at Lab: <u>SUNEE PORN DON MAI</u>	Verified By: <u>Rachel Subject</u>
Relinquished By (Print): <u>Kevin Haines</u>	Date/Time: <u>22 Dec 16 1645</u>	Date/Time: <u>Dec 29, 2016 11:20</u>	Date/Time: <u>Dec 29/16</u>
Date/Time:	Temperature: _____ °C	Temperature: <u>5.2 °C</u>	pH Verified [ ] By: <u>NA 11:00</u>

## Certificate of Analysis

### Amec Foster Wheeler (Thorold)

3300 Merrittville Hwy, Unit 5  
Thorold, ON L2V 4Y6  
Attn: Kelly Patterson

Client PO:  
Project: TG161164  
Custody: 110385/386/387

Report Date: 6-Jan-2017  
Order Date: 4-Jan-2017

**Order #: 1701133**

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Parcel ID	Client ID
1701133-01	TP224-4
1701133-02	TP225-4
1701133-03	TP226-4
1701133-04	TP227-3
1701133-05	TP228-4
1701133-06	TP229-4

Approved By:



Mark Foto, M.Sc.  
Lab Supervisor

Certificate of Analysis  
**Client: Amec Foster Wheeler (Thorold)**  
**Client PO:**

Report Date: 06-Jan-2017  
Order Date: 4-Jan-2017  
**Project Description: TG161164**

**Analysis Summary Table**

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Conductivity	MOE E3138 - probe @25 °C, water ext	5-Jan-17	5-Jan-17
Solids, %	Gravimetric, calculation	5-Jan-17	5-Jan-17

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 06-Jan-2017

Order Date: 4-Jan-2017

**Project Description: TG161164**

<b>Client ID:</b>	TP224-4	TP225-4	TP226-4	TP227-3
<b>Sample Date:</b>	22-Dec-16	22-Dec-16	22-Dec-16	22-Dec-16
<b>Sample ID:</b>	1701133-01	1701133-02	1701133-03	1701133-04
<b>MDL/Units</b>	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	79.4	81.5	82.5	84.8
----------	--------------	------	------	------	------

**General Inorganics**

Conductivity	5 uS/cm	1150	1110	2940	2940
--------------	---------	------	------	------	------

<b>Client ID:</b>	TP228-4	TP229-4	-	-
<b>Sample Date:</b>	22-Dec-16	22-Dec-16	-	-
<b>Sample ID:</b>	1701133-05	1701133-06	-	-
<b>MDL/Units</b>	Soil	Soil	-	-

**Physical Characteristics**

% Solids	0.1 % by Wt.	82.3	83.7	-	-
----------	--------------	------	------	---	---

**General Inorganics**

Conductivity	5 uS/cm	1310	2810	-	-
--------------	---------	------	------	---	---

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 06-Jan-2017  
 Order Date: 4-Jan-2017  
 Project Description: TG161164

**Method Quality Control: Blank**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>General Inorganics</b>									
Conductivity	ND	5	uS/cm						

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 06-Jan-2017  
 Order Date: 4-Jan-2017  
 Project Description: TG161164

**Method Quality Control: Duplicate**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>General Inorganics</b>									
Conductivity	396	5	uS/cm	397			0.2	6.2	
<b>Physical Characteristics</b>									
% Solids	68.8	0.1	% by Wt.	69.4			0.8	25	



Certificate of Analysis  
**Client: Amec Foster Wheeler (Thorold)**  
**Client PO:**

Report Date: 06-Jan-2017  
Order Date: 4-Jan-2017  
**Project Description: TG161164**

**Qualifier Notes:**

None

**Sample Data Revisions**

None

**Work Order Revisions / Comments:**

None

**Other Report Notes:**

n/a: not applicable  
ND: Not Detected  
MDL: Method Detection Limit  
Source Result: Data used as source for matrix and duplicate samples  
%REC: Percent recovery.  
RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.  
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

Client Name: Ameel Foster Wheeler Project Reference: T6161164  
 Contact Name: Kelly Patterson Quote #: Tier 2  
 Address: 3300 Merrittville Hwy, Thorold, ON L2V 4Y6 PO #  
 Telephone: Email Address: kelly.patterson@ameefw.com  
 Turnaround Time:  
 1 Day  3 Day  
 2 Day  **Regular**  
 Date Required: \_\_\_\_\_  
 Criteria:  O. Reg. 153/04 (As Amended) Table 1  RSC Filing  O. Reg. 558/00  PWO  CCME  SUB (Storm)  SUB (Sanitary) Municipality: \_\_\_\_\_  Other \_\_\_\_\_

Matrix Type:  S (Soil/Sed)  GW (Groundwater)  SW (Surface Water)  SS (Sewage/Sanitary Sewer)  P (Paint)  A (Air)  O (Other)

Paracel Order Number: <u>1701133</u> <u>1653082</u>		Matrix	Air Volume	# of Containers	Sample Taken		Required Analyses									
Sample ID/Location Name	Date				Time	PH	TEMP	DO	VOCs	PAHs	NITRATES	ICP	HE	COV	B (PFMS)	EC
1	TP 224-1	S		1	Dec 22/16										X	Revised Jan 4/17 -RS. - 250ml -
2	TP 224-2	S		1											X	
3	TP 224-3	S		1											X	
4	TP 224-4	S		1											X	
5	TP 225-1	S		1											X	
6	TP 225-2	S		1											X	
7	TP 225-3	S		1											X	
8	TP 225-4	S		1											X	
9	TP 226-1	S		1											X	
10	TP 226-2	S		1											X	

Comments: see notes on page 1. Method of Delivery: \_\_\_\_\_

Relinquished By (Sign): [Signature] Received by Driver/Depot: \_\_\_\_\_  
 Relinquished By (Print): Kevin Haines Date/Time: \_\_\_\_\_  
 Date/Time: \_\_\_\_\_ Temperature: \_\_\_\_\_ °C  
 Received at Lab: SUNDEPORN DEKMAN Verified By: Rachel Subject  
 Date/Time: DEC 29, 2016 10:20 Date/Time: Dec 29/16  
 Temperature: 5.2 °C Temperature: \_\_\_\_\_ °C  
 pH Verified By: N/A 11:00

Rachel Subject  
Jan 4/17. 4:25



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Ottawa, Ontario K1G 4J8  
t: 1-800-749-1847  
e: paracel@paracellabs.com

Chain of Custody  
(Lab Use Only)  
No 110386

Page 4 of 4

Client Name: <i>Anee Foster Wheeler</i>	Project Reference: <i>T6161164</i>	Turnaround Time: <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular
Contact Name: <i>Kelly Patterson</i>	Quote #: <i>Tier 2</i>	
Address: <i>3300 Merriville Hwy, Thedford, ON L2N 4Y6</i>	PO #:	
Telephone: <i>85-687-6616</i>	Email Address: <i>kelly.patterson@aneefw.com</i>	

Criteria:  Reg. 551/04 (As Amended) Table 1     RSC Filing     O. Reg. 558/00     PWQO     CCME     SU (Storm)     SU (Sanitary) Municipality: \_\_\_\_\_     Other: \_\_\_\_\_

Matrix Type:  Soil/Sed     GW (Ground Water)     SW (Surface Water)     SS (Storm/Sanitary Sewer)     P (Paint)     A (Air)     (Other)

Paracel Order Number: <i>1701133</i> <del><i>1653082</i></del>		Matrix	Air Volume	# of Containers	Sample Taken		PHCS (P-P4-01)EX	VOCs	PAHs	Metals by ICP	Hg	C/MV	B (UWS)	EC	
Sample ID/Location Name	Date				Time										
1	TP226-3	S		1	<i>Dec 22/16</i>										
2	TP226-4	S		1											
3	TP227-1	S		1											
4	TP227-2	S		1											
5	TP227-3	S		1											
6	TP227-4	S		1											
7	TP228-1	S		1											
8	TP228-2	S		1											
9	TP228-3	S		1											
10	TP228-4	S		1											

Comments: *see notes on page 1.*    Method of Delivery: \_\_\_\_\_

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot:	Received at Lab: <i>SUMEPORN DOMMM</i>	Verified By: <i>Rachel Subject</i>
Relinquished By (Print): <i>Kevin Haines</i>	Date/Time:	Date/Time: <i>Dec 29, 2016 11:20</i>	Date/Time: <i>Dec 29/16</i>
Date/Time:	Temperature: °C	Temperature: <i>5.2 °C</i>	pH Verified <input checked="" type="checkbox"/> By: <i>N/A</i> <i>11:00</i>

*Rachel Subject*  
*Jan 4/17. 4:25*

Client Name: <b>Ameo Foster Wheeler</b>	Project Reference: <b>TG161164</b>	Turnaround Time: <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> <b>Regular</b>
Contact Name: <b>Kelly Patterson</b>	Quote #: <b>Tier 2</b>	
Address: <b>3700 Merriville Hwy, Thorold, ON L2V 4Y6</b>	PO #	
Telephone: <b>905-637-6616</b>	Email Address: <b>kelly.patterson@ameo.fw.com</b>	Date Required:

Criteria:  O. Reg. 153/04 (As Amended) Table 1     RSC Filng     O. Reg. 558/00     PWQO     CCME     SUB (Storm)     SUB (Sanitary) Municipality: \_\_\_\_\_     Other: \_\_\_\_\_

Matrix Type:  Soil (Soil)     GW (Ground Water)     SW (Surface Water)     SS (Sanitary Sewer)     P (Part)     A (Air)     Other: \_\_\_\_\_

Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken		PHC (1,1,1,2,2,2)	VOCs	PAHs	Metals By ICP	Hg	Cu	Bi (UVS)	EC	EC
				Date	Time									
1 TP229-1	S		1	Dec 22/16									X	- 250mi -
2 TP229-2	S		1										X	
3 TP229-3	S		1											
4 TP229-4	S		1										X	
5 Dup A1	S		1											
6 Dup A2	S		1											
7 Dup A3	S		1										X	
8 Dup A4	S		1											
9														
10														

Comments: **See notes on page 2**    Method of Delivery: \_\_\_\_\_

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot:	Received at Lab: <b>UNAEPORN DOWNM</b>	Verified By: <b>Rachel Subject</b>
Relinquished By (Print): <b>Kevin Haines</b>	Date/Time:	Date/Time: <b>Dec 29 2016 10:30</b>	Date/Time: <b>Dec 29/16</b>
Date/Time:	Temperature: _____ °C	Temperature: <b>5.2 °C</b>	pH Verified <input checked="" type="checkbox"/> By: <b>N/A 11:00</b>

**Rachel Subject**  
**Jan 4/17 4:25**

## Certificate of Analysis

### Amec Foster Wheeler (Thorold)

3300 Merrittville Hwy, Unit 5  
Thorold, ON L2V 4Y6  
Attn: Pat Shriner

Client PO:  
Project: TG151118  
Custody: 26547

Report Date: 28-Jan-2016  
Order Date: 22-Jan-2016

**Order #: 1604330**

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Parcel ID	Client ID
1604330-01	BH/MW 202
1604330-02	Dup A
1604330-03	BH/MW 201
1604330-04	BH/MW 102
1604330-05	BH/MW 101
1604330-06	BH/MW 104
1604330-07	BH/MW 103
1604330-08	Trip Blank
1604330-09	Trip Spike
1604330-10	Field Blank

Approved By:



Tim McCooeye  
Senior Advisor

Certificate of Analysis

Client: Amec Foster Wheeler (Thorold)

Client PO:

Report Date: 28-Jan-2016

Order Date: 22-Jan-2016

Project Description: TG151118

**Analysis Summary Table**

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Metals, ICP-MS	EPA 200.8 - ICP-MS	26-Jan-16	26-Jan-16
PHC F1	CWS Tier 1 - P&T GC-FID	26-Jan-16	27-Jan-16
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	25-Jan-16	25-Jan-16
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	26-Jan-16	27-Jan-16

**Certificate of Analysis**

Report Date: 28-Jan-2016

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 22-Jan-2016

Client PO:

**Project Description: TG151118**

Client ID:	BH/MW 202	Dup A	BH/MW 201	BH/MW 102
Sample Date:	20-Jan-16	20-Jan-16	20-Jan-16	20-Jan-16
Sample ID:	1604330-01	1604330-02	1604330-03	1604330-04
MDL/Units	Water	Water	Water	Water

**Metals**

	MDL/Units	BH/MW 202	Dup A	BH/MW 201	BH/MW 102
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	<1	<1	<1	<1
Barium	1 ug/L	25	25	18	75
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	124	115	92	385
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	0.6
Copper	0.5 ug/L	<0.5	0.8	0.7	1.0
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Molybdenum	0.5 ug/L	0.6	<0.5	<0.5	7.6
Nickel	1 ug/L	2	2	<1	2
Selenium	1 ug/L	<1	<1	<1	1
Silver	0.1 ug/L	0.5	<0.1	<0.1	<0.1
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Uranium	0.1 ug/L	8.5	8.5	5.5	6.1
Vanadium	0.5 ug/L	<0.5	<0.5	<0.5	0.6
Zinc	5 ug/L	<5	<5	12	<5

**Volatiles**

	MDL/Units	BH/MW 202	Dup A	BH/MW 201	BH/MW 102
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5



**Certificate of Analysis**

Report Date: 28-Jan-2016

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 22-Jan-2016

Client PO:

**Project Description: TG151118**

	Client ID:	BH/MW 202	Dup A	BH/MW 201	BH/MW 102
	Sample Date:	20-Jan-16	20-Jan-16	20-Jan-16	20-Jan-16
	Sample ID:	1604330-01	1604330-02	1604330-03	1604330-04
	MDL/Units	Water	Water	Water	Water
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylene dibromide (dibromoethane)	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	108%	110%	108%	90.2%
Dibromofluoromethane	Surrogate	81.9%	81.8%	82.2%	82.8%
Toluene-d8	Surrogate	114%	111%	112%	114%

**Hydrocarbons**

F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	<25
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	<100
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	<100
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	<100
F1 + F2 PHCs	125 ug/L	<125	<125	<125	<125
F3 + F4 PHCs	200 ug/L	<200	<200	<200	<200

**Certificate of Analysis**

Report Date: 28-Jan-2016

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 22-Jan-2016

Client PO:

**Project Description: TG151118**

Client ID:	BH/MW 101	BH/MW 104	BH/MW 103	Trip Blank
Sample Date:	20-Jan-16	20-Jan-16	20-Jan-16	18-Jan-16
Sample ID:	1604330-05	1604330-06	1604330-07	1604330-08
MDL/Units	Water	Water	Water	Water

<b>Metals</b>					
	MDL/Units	BH/MW 101	BH/MW 104	BH/MW 103	Trip Blank
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	-
Arsenic	1 ug/L	<1	1	<1	-
Barium	1 ug/L	198	23	42	-
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	-
Boron	10 ug/L	114	299	369	-
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	-
Chromium	1 ug/L	<1	<1	<1	-
Cobalt	0.5 ug/L	0.7	1.7	5.0	-
Copper	0.5 ug/L	<0.5	1.9	1.9	-
Lead	0.1 ug/L	<0.1	<0.1	<0.1	-
Molybdenum	0.5 ug/L	0.7	5.6	4.5	-
Nickel	1 ug/L	<1	4	8	-
Selenium	1 ug/L	<1	2	2	-
Silver	0.1 ug/L	<0.1	<0.1	<0.1	-
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	-
Uranium	0.1 ug/L	0.5	25.6	53.7	-
Vanadium	0.5 ug/L	<0.5	0.9	1.2	-
Zinc	5 ug/L	<5	6	8	-

<b>Volatiles</b>					
	MDL/Units	BH/MW 101	BH/MW 104	BH/MW 103	Trip Blank
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0 [1]
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2 [1]
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0 [1]
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]

**Certificate of Analysis**

Report Date: 28-Jan-2016

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 22-Jan-2016

Client PO:

**Project Description: TG151118**

	Client ID: Sample Date: Sample ID:	BH/MW 101 20-Jan-16 1604330-05 Water	BH/MW 104 20-Jan-16 1604330-06 Water	BH/MW 103 20-Jan-16 1604330-07 Water	Trip Blank 18-Jan-16 1604330-08 Water
	MDL/Units				
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
Ethylene dibromide (dibromoethar	0.2 ug/L	<0.2	<0.2	<0.2	<0.2 [1]
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0 [1]
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0 [1]
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0 [1]
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0 [1]
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0 [1]
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0 [1]
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5 [1]
4-Bromofluorobenzene	Surrogate	107%	106%	103%	109% [1]
Dibromofluoromethane	Surrogate	83.4%	82.6%	83.0%	78.5% [1]
Toluene-d8	Surrogate	112%	112%	113%	116% [1]

**Hydrocarbons**

F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	-
F1 + F2 PHCs	125 ug/L	<125	<125	<125	-

**Certificate of Analysis**

Report Date: 28-Jan-2016

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 22-Jan-2016

Client PO:

**Project Description: TG151118**

	Client ID:	BH/MW 101	BH/MW 104	BH/MW 103	Trip Blank
	Sample Date:	20-Jan-16	20-Jan-16	20-Jan-16	18-Jan-16
	Sample ID:	1604330-05	1604330-06	1604330-07	1604330-08
	MDL/Units	Water	Water	Water	Water
F3 + F4 PHCs	200 ug/L	<200	<200	<200	-

**Certificate of Analysis**

Report Date: 28-Jan-2016

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 22-Jan-2016

Client PO:

**Project Description: TG151118**

<b>Client ID:</b>	Trip Spike	Field Blank	-	-
<b>Sample Date:</b>	18-Jan-16	20-Jan-16	-	-
<b>Sample ID:</b>	1604330-09	1604330-10	-	-
<b>MDL/Units</b>	Water	Water	-	-

**Volatiles**

	MDL/Units	Trip Spike	Field Blank		
Acetone	5.0 ug/L	98.5 [1] [3]	<5.0 [1]	-	-
Benzene	0.5 ug/L	26.3 [1] [3]	<0.5 [1]	-	-
Bromodichloromethane	0.5 ug/L	30.0 [1] [3]	<0.5 [1]	-	-
Bromoform	0.5 ug/L	47.1 [1] [3]	<0.5 [1]	-	-
Bromomethane	0.5 ug/L	23.5 [1] [3]	<0.5 [1]	-	-
Carbon Tetrachloride	0.2 ug/L	33.8 [1] [3]	<0.2 [1]	-	-
Chlorobenzene	0.5 ug/L	38.0 [1] [3]	<0.5 [1]	-	-
Chloroform	0.5 ug/L	28.5 [1] [3]	<0.5 [1]	-	-
Dibromochloromethane	0.5 ug/L	48.1 [1] [3]	<0.5 [1]	-	-
Dichlorodifluoromethane	1.0 ug/L	21.7 [1] [3]	<1.0 [1]	-	-
1,2-Dichlorobenzene	0.5 ug/L	42.1 [1] [3]	<0.5 [1]	-	-
1,3-Dichlorobenzene	0.5 ug/L	39.6 [1] [3]	<0.5 [1]	-	-
1,4-Dichlorobenzene	0.5 ug/L	39.6 [1] [3]	<0.5 [1]	-	-
1,1-Dichloroethane	0.5 ug/L	32.5 [1] [3]	<0.5 [1]	-	-
1,2-Dichloroethane	0.5 ug/L	32.5 [1] [3]	<0.5 [1]	-	-
1,1-Dichloroethylene	0.5 ug/L	27.9 [1] [3]	<0.5 [1]	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	31.8 [1] [3]	<0.5 [1]	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	29.8 [1] [3]	<0.5 [1]	-	-
1,2-Dichloropropane	0.5 ug/L	27.1 [1] [3]	<0.5 [1]	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	29.5 [1] [3]	<0.5 [1]	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	29.0 [1] [3]	<0.5 [1]	-	-
1,3-Dichloropropene, total	0.5 ug/L	58.5 [1] [3]	<0.5 [1]	-	-
Ethylbenzene	0.5 ug/L	42.8 [1] [3]	<0.5 [1]	-	-
Ethylene dibromide (dibromoethane)	0.2 ug/L	39.1 [1] [3]	<0.2 [1]	-	-
Hexane	1.0 ug/L	27.8 [1] [3]	<1.0 [1]	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	107 [1] [3]	<5.0 [1]	-	-
Methyl Isobutyl Ketone	5.0 ug/L	87.6 [1] [3]	<5.0 [1]	-	-
Methyl tert-butyl ether	2.0 ug/L	88.1 [1] [3]	<2.0 [1]	-	-
Methylene Chloride	5.0 ug/L	30.2 [1] [3]	<5.0 [1]	-	-
Styrene	0.5 ug/L	44.7 [1] [3]	<0.5 [1]	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	45.5 [1] [3]	<0.5 [1]	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	38.0 [1] [3]	<0.5 [1]	-	-
Tetrachloroethylene	0.5 ug/L	40.5 [1] [3]	<0.5 [1]	-	-
Toluene	0.5 ug/L	39.2 [1] [3]	<0.5 [1]	-	-
1,1,1-Trichloroethane	0.5 ug/L	32.5 [1] [3]	<0.5 [1]	-	-

**Certificate of Analysis**

Report Date: 28-Jan-2016

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 22-Jan-2016

Client PO:

**Project Description: TG151118**

		Client ID: Sample Date: Sample ID:	Trip Spike 18-Jan-16 1604330-09 Water	Field Blank 20-Jan-16 1604330-10 Water	-	-
	MDL/Units				-	-
1,1,2-Trichloroethane	0.5 ug/L		27.1 [1] [3]	<0.5 [1]	-	-
Trichloroethylene	0.5 ug/L		29.5 [1] [3]	<0.5 [1]	-	-
Trichlorofluoromethane	1.0 ug/L		28.4 [1] [3]	<1.0 [1]	-	-
Vinyl chloride	0.5 ug/L		23.4 [1] [3]	<0.5 [1]	-	-
m,p-Xylenes	0.5 ug/L		85.0 [1] [3]	<0.5 [1]	-	-
o-Xylene	0.5 ug/L		44.4 [1] [3]	<0.5 [1]	-	-
Xylenes, total	0.5 ug/L		129 [1] [3]	<0.5 [1]	-	-
4-Bromofluorobenzene	Surrogate		96.8% [1] [3]	107% [1]	-	-
Dibromofluoromethane	Surrogate		65.1% [1] [3]	86.5% [1]	-	-
Toluene-d8	Surrogate		95.9% [1] [3]	112% [1]	-	-

**Certificate of Analysis**

Report Date: 28-Jan-2016

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 22-Jan-2016

Client PO:

**Project Description: TG151118**
**Method Quality Control: Blank**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Hydrocarbons</b>									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
<b>Metals</b>									
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
<b>Volatiles</b>									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroform	ND	0.5	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Ethylene dibromide (dibromoethane)	ND	0.2	ug/L						
Hexane	ND	1.0	ug/L						
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L						
Methyl Isobutyl Ketone	ND	5.0	ug/L						
Methyl tert-butyl ether	ND	2.0	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Styrene	ND	0.5	ug/L						
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L						
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L						
Tetrachloroethylene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
1,1,1-Trichloroethane	ND	0.5	ug/L						



**Certificate of Analysis**

Report Date: 28-Jan-2016

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 22-Jan-2016

Client PO:

**Project Description: TG151118**
**Method Quality Control: Blank**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1,1,2-Trichloroethane	ND	0.5	ug/L						
Trichloroethylene	ND	0.5	ug/L						
Trichlorofluoromethane	ND	1.0	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: 4-Bromofluorobenzene	86.2		ug/L		108	50-140			
Surrogate: Dibromofluoromethane	53.1		ug/L		66.4	50-140			
Surrogate: Toluene-d8	82.4		ug/L		103	50-140			

**Certificate of Analysis**

Report Date: 28-Jan-2016

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 22-Jan-2016

Client PO:

**Project Description: TG151118**
**Method Quality Control: Duplicate**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Hydrocarbons</b>									
F1 PHCs (C6-C10)	ND	25	ug/L	ND				30	
<b>Metals</b>									
Antimony	ND	0.5	ug/L	ND			0.0	20	
Arsenic	ND	1	ug/L	ND			0.0	20	
Barium	24.8	1	ug/L	25.0			0.6	20	
Beryllium	ND	0.5	ug/L	ND			0.0	20	
Boron	127	10	ug/L	124			2.4	20	
Cadmium	ND	0.1	ug/L	ND			0.0	20	
Chromium	ND	1	ug/L	ND			0.0	20	
Cobalt	ND	0.5	ug/L	ND			0.0	20	
Copper	ND	0.5	ug/L	ND			0.0	20	
Lead	0.12	0.1	ug/L	ND			0.0	20	
Molybdenum	0.52	0.5	ug/L	0.57			8.1	20	
Nickel	2.0	1	ug/L	1.9			4.1	20	
Selenium	ND	1	ug/L	ND			0.0	20	
Silver	ND	0.1	ug/L	0.51			0.0	20	
Thallium	ND	0.1	ug/L	ND			0.0	20	
Uranium	8.7	0.1	ug/L	8.5			1.8	20	
Vanadium	ND	0.5	ug/L	ND			0.0	20	
Zinc	ND	5	ug/L	ND			0.0	20	
<b>Volatiles</b>									
Acetone	ND	5.0	ug/L	ND				30	
Benzene	ND	0.5	ug/L	ND				30	
Bromodichloromethane	ND	0.5	ug/L	ND				30	
Bromoform	ND	0.5	ug/L	ND				30	
Bromomethane	ND	0.5	ug/L	ND				30	
Carbon Tetrachloride	ND	0.2	ug/L	ND				30	
Chlorobenzene	ND	0.5	ug/L	ND				30	
Chloroform	ND	0.5	ug/L	ND				30	
Dibromochloromethane	ND	0.5	ug/L	ND				30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND				30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
1,2-Dichloroethane	ND	0.5	ug/L	ND				30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND				30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
1,2-Dichloropropane	ND	0.5	ug/L	ND				30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Ethylene dibromide (dibromoethane)	ND	0.2	ug/L	ND				30	
Hexane	ND	1.0	ug/L	ND				30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND				30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND				30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Styrene	ND	0.5	ug/L	ND				30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
1,1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
Tetrachloroethylene	ND	0.5	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND				30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND				30	
Trichloroethylene	ND	0.5	ug/L	ND				30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				30	

**Certificate of Analysis**

Report Date: 28-Jan-2016

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 22-Jan-2016

Client PO:

**Project Description: TG151118**
**Method Quality Control: Duplicate**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: 4-Bromofluorobenzene	85.1		ug/L	ND	106	50-140			
Surrogate: Dibromofluoromethane	64.1		ug/L	ND	80.1	50-140			
Surrogate: Toluene-d8	88.3		ug/L	ND	110	50-140			

**Certificate of Analysis**

Report Date: 28-Jan-2016

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 22-Jan-2016

Client PO:

**Project Description: TG151118**
**Method Quality Control: Spike**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Hydrocarbons</b>									
F1 PHCs (C6-C10)	2070	25	ug/L	ND	103	68-117			
F3 PHCs (C16-C34)	2940	100	ug/L	ND	79.0	60-140			
F4 PHCs (C34-C50)	2180	100	ug/L	ND	87.9	60-140			
<b>Metals</b>									
Antimony	48.3		ug/L	0.19	96.3	80-120			
Arsenic	52.8		ug/L	0.2	105	80-120			
Barium	72.2		ug/L	25.0	94.5	80-120			
Beryllium	43.0		ug/L	0.01	86.0	80-120			
Boron	156		ug/L	112	87.9	80-120			
Cadmium	45.6		ug/L	0.04	91.2	80-120			
Chromium	49.0		ug/L	0.3	97.3	80-120			
Cobalt	46.5		ug/L	0.11	92.7	80-120			
Copper	43.5		ug/L	0.17	86.7	80-120			
Lead	45.8		ug/L	0.08	91.4	80-120			
Molybdenum	48.0		ug/L	0.57	94.8	80-120			
Nickel	45.5		ug/L	1.9	87.3	80-120			
Selenium	55.3		ug/L	0.2	110	80-120			
Silver	43.8		ug/L	0.51	86.5	80-120			
Thallium	46.3		ug/L	0.03	92.5	80-120			
Uranium	56.1		ug/L	8.5	95.2	80-120			
Vanadium	50.5		ug/L	0.25	100	80-120			
Zinc	48		ug/L	2	90.5	80-120			
<b>Volatiles</b>									
Acetone	80.5	5.0	ug/L	ND	80.5	50-140			
Benzene	29.1	0.5	ug/L	ND	72.8	50-140			
Bromodichloromethane	27.3	0.5	ug/L	ND	68.2	50-140			
Bromoform	44.5	0.5	ug/L	ND	111	50-140			
Bromomethane	20.5	0.5	ug/L	ND	51.2	50-140			
Carbon Tetrachloride	34.9	0.2	ug/L	ND	87.4	50-140			
Chlorobenzene	33.7	0.5	ug/L	ND	84.2	50-140			
Chloroform	27.5	0.5	ug/L	ND	68.6	50-140			
Dibromochloromethane	47.3	0.5	ug/L	ND	118	50-140			
Dichlorodifluoromethane	18.7	1.0	ug/L	ND	46.7	50-140			QS-02
1,2-Dichlorobenzene	37.4	0.5	ug/L	ND	93.6	50-140			
1,3-Dichlorobenzene	35.3	0.5	ug/L	ND	88.4	50-140			
1,4-Dichlorobenzene	35.3	0.5	ug/L	ND	88.4	50-140			
1,1-Dichloroethane	28.8	0.5	ug/L	ND	72.0	50-140			
1,2-Dichloroethane	28.8	0.5	ug/L	ND	72.0	50-140			
1,1-Dichloroethylene	24.7	0.5	ug/L	ND	61.8	50-140			
cis-1,2-Dichloroethylene	29.7	0.5	ug/L	ND	74.2	50-140			
trans-1,2-Dichloroethylene	27.0	0.5	ug/L	ND	67.6	50-140			
1,2-Dichloropropane	24.5	0.5	ug/L	ND	61.4	50-140			
cis-1,3-Dichloropropylene	27.3	0.5	ug/L	ND	68.2	50-140			
trans-1,3-Dichloropropylene	26.6	0.5	ug/L	ND	66.4	50-140			
Ethylbenzene	21.1	0.5	ug/L	ND	52.8	50-140			
Ethylene dibromide (dibromoethane)	40.4	0.2	ug/L	ND	101	50-140			
Hexane	3.23	1.0	ug/L	ND	8.08	50-140			QS-02
Methyl Ethyl Ketone (2-Butanone)	80.8	5.0	ug/L	ND	80.8	50-140			
Methyl Isobutyl Ketone	103	5.0	ug/L	ND	103	50-140			
Methyl tert-butyl ether	95.6	2.0	ug/L	ND	95.6	50-140			
Methylene Chloride	23.5	5.0	ug/L	ND	58.7	50-140			

**Certificate of Analysis**

Report Date: 28-Jan-2016

 Client: **Amec Foster Wheeler (Thorold)**

Order Date: 22-Jan-2016

Client PO:

**Project Description: TG151118**
**Method Quality Control: Spike**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Styrene	34.8	0.5	ug/L	ND	87.1	50-140			
1,1,1,2-Tetrachloroethane	43.3	0.5	ug/L	ND	108	50-140			
1,1,2,2-Tetrachloroethane	38.1	0.5	ug/L	ND	95.2	50-140			
Tetrachloroethylene	43.7	0.5	ug/L	ND	109	50-140			
Toluene	42.7	0.5	ug/L	ND	107	50-140			
1,1,1-Trichloroethane	32.9	0.5	ug/L	ND	82.3	50-140			
1,1,2-Trichloroethane	27.0	0.5	ug/L	ND	67.4	50-140			
Trichloroethylene	24.8	0.5	ug/L	ND	62.1	50-140			
Trichlorofluoromethane	24.2	1.0	ug/L	ND	60.6	50-140			
Vinyl chloride	28.1	0.5	ug/L	ND	70.2	50-140			
m,p-Xylenes	55.2	0.5	ug/L	ND	69.0	50-140			
o-Xylene	38.5	0.5	ug/L	ND	96.3	50-140			
Surrogate: 4-Bromofluorobenzene	76.1		ug/L		95.1	50-140			

Certificate of Analysis

Client: **Amec Foster Wheeler (Thorold)**

Client PO:

Report Date: 28-Jan-2016

Order Date: 22-Jan-2016

**Project Description: TG151118**

**Qualifier Notes:**

***Sample Qualifiers :***

- 1 : Trip blank hold time based on preparation date for this QA sample and the associated analytical requirements. Hold time exceedances do not preclude the validity of the Trip Blank data.
- 3 : VOC Trip Spike prepared at 40 ug/L for all parameters, except for m/p-Xylene which is at 80 ug/L and ketones at 100 ug/L.

***QC Qualifiers :***

QS-02 : Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

**Sample Data Revisions**

None

**Work Order Revisions / Comments:**

None

**Other Report Notes:**

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

***CCME PHC additional information:***

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.

Client Name: <i>Amec FLW</i>	Project Reference: <i>T6151118</i>	TAT: <input checked="" type="checkbox"/> Regular [ ] 3 Day <input type="checkbox"/> 2 Day [ ] 1 Day Date Required: _____
Contact Name: <i>Pat Shiner</i>	Quote # <i>15-031</i>	
Address: <i>5-3300 Merriville Way Toronto ON L2W 4K6</i>	PO #	
Telephone: <i>905 687 6616</i>	Email Address: <i>patrick.shiner@amecflw.com</i>	

Criteria:  O. Reg. 153/04 (As Amended) Table 1  RSC Filing [ ] O. Reg. 558/00 [ ] PWQO [ ] CCME [ ] SUB (Storm) [ ] SUB (Sanitary) Municipality: \_\_\_\_\_ [ ] Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: <i>1604330</i>		Matrix	Air Volume	# of Containers	Sample Taken		ICP/MS Metals	PHCS	VOCs						
Sample ID/Location Name					Date	Time									
1	<i>BHMW 202</i>	<i>GW</i>		<i>4</i>	<i>Jan 20/16</i>	<i>9:35</i>	<i>X</i>	<i>X</i>	<i>X</i>						
2	<i>Dep A</i>						<i>X</i>	<i>X</i>	<i>X</i>						
3	<i>BHMW 201</i>					<i>10:45</i>	<i>X</i>	<i>X</i>	<i>X</i>						
4	<i>BHMW 102</i>					<i>11:50</i>	<i>X</i>	<i>X</i>	<i>X</i>						
5	<i>BHMW 101</i>					<i>1:00</i>	<i>X</i>	<i>X</i>	<i>X</i>						
6	<i>BHMW 104</i>					<i>2:00</i>	<i>X</i>	<i>X</i>	<i>X</i>						
7	<i>BHMW 103</i>					<i>3:05</i>	<i>X</i>	<i>X</i>	<i>X</i>						
8	<i>Trip Blank</i>			<i>1</i>	<i>18 km/16</i>				<i>X</i>						
9	<i>Trip Spike</i>			<i>1</i>	<i>18 km/16</i>				<i>X</i>						
10	<i>Field Blank</i>			<i>2</i>	<i>25 km/16</i>				<i>X</i>						

Comments: *Consolid by SNA 07:00s* Method of Delivery: *Pup.*

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot: <i>Niagara B. Homeniek</i>	Received at Lab: <i>[Signature]</i>	Verified By: <i>[Signature]</i>
Relinquished By (Print): <i>Mark Secht</i>	Date/Time: <i>22 Jan 16 10:10</i>	Date/Time: <i>Jan 23/16 @ 11:45</i>	Date/Time: <i>Jan 23/16 @ 11:55</i>
Date/Time: <i>21/01/16</i>	Temperature: <i>6.0 °C</i>	Temperature: <i>7.4 °C</i>	pH Verified by: <i>BWH</i>



## Certificate of Analysis

### Amec Foster Wheeler (Thorold)

3300 Merrittville Hwy, Unit 5  
Thorold, ON L2V 4Y6  
Attn: Kelly Patterson

Client PO:  
Project: TG161164  
Custody: 34705

Report Date: 9-Jan-2017  
Order Date: 4-Jan-2017

**Order #: 1701115**

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Parcel ID	Client ID
1701115-01	BH/MW 202
1701115-02	Dup A

Approved By:



Mark Foto, M.Sc.  
Lab Supervisor

Certificate of Analysis  
**Client: Amec Foster Wheeler (Thorold)**  
**Client PO:**

Report Date: 09-Jan-2017  
Order Date: 4-Jan-2017  
**Project Description: TG161164**

**Analysis Summary Table**

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Metals, ICP-MS	EPA 200.8 - ICP-MS	6-Jan-17	6-Jan-17

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 09-Jan-2017

Order Date: 4-Jan-2017

Project Description: TG161164

<b>Client ID:</b>	BH/MW 202	Dup A	-	-
<b>Sample Date:</b>	03-Jan-17	03-Jan-17	-	-
<b>Sample ID:</b>	1701115-01	1701115-02	-	-
<b>MDL/Units</b>	Water	Water	-	-

**Metals**

Antimony	0.5 ug/L	<0.5	<0.5	-	-
Arsenic	1 ug/L	<1	<1	-	-
Barium	1 ug/L	25	25	-	-
Beryllium	0.5 ug/L	<0.5	<0.5	-	-
Boron	10 ug/L	71	68	-	-
Cadmium	0.1 ug/L	<0.1	<0.1	-	-
Chromium	1 ug/L	<1	<1	-	-
Cobalt	0.5 ug/L	<0.5	<0.5	-	-
Copper	0.5 ug/L	<0.5	<0.5	-	-
Lead	0.1 ug/L	<0.1	<0.1	-	-
Molybdenum	0.5 ug/L	<0.5	<0.5	-	-
Nickel	1 ug/L	1	1	-	-
Selenium	1 ug/L	1	<1	-	-
Silver	0.1 ug/L	<0.1	<0.1	-	-
Thallium	0.1 ug/L	<0.1	<0.1	-	-
Uranium	0.1 ug/L	8.1	7.9	-	-
Vanadium	0.5 ug/L	<0.5	<0.5	-	-
Zinc	5 ug/L	<5	<5	-	-

Certificate of Analysis  
**Client: Amec Foster Wheeler (Thorold)**  
**Client PO:**

Report Date: 09-Jan-2017  
 Order Date: 4-Jan-2017  
**Project Description: TG161164**

**Method Quality Control: Blank**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Metals</b>									
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 09-Jan-2017

Order Date: 4-Jan-2017

Project Description: TG161164

**Method Quality Control: Duplicate**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Metals</b>									
Antimony	ND	0.5	ug/L	ND			0.0	20	
Arsenic	ND	1	ug/L	ND			0.0	20	
Barium	ND	1	ug/L	ND			0.0	20	
Beryllium	ND	0.5	ug/L	ND			0.0	20	
Boron	ND	10	ug/L	ND			0.0	20	
Cadmium	ND	0.1	ug/L	ND			0.0	20	
Chromium	ND	1	ug/L	ND			0.0	20	
Cobalt	ND	0.5	ug/L	ND			0.0	20	
Copper	ND	0.5	ug/L	ND				20	
Lead	ND	0.1	ug/L	ND			0.0	20	
Molybdenum	ND	0.5	ug/L	ND			0.0	20	
Nickel	ND	1	ug/L	ND				20	
Selenium	ND	1	ug/L	ND			0.0	20	
Silver	ND	0.1	ug/L	ND				20	
Sodium	ND	200	ug/L	ND			0.0	20	
Thallium	ND	0.1	ug/L	ND			0.0	20	
Uranium	ND	0.1	ug/L	ND			0.0	20	
Vanadium	ND	0.5	ug/L	ND			0.0	20	
Zinc	ND	5	ug/L	ND			0.0	20	

Certificate of Analysis  
 Client: Amec Foster Wheeler (Thorold)  
 Client PO:

Report Date: 09-Jan-2017  
 Order Date: 4-Jan-2017  
 Project Description: TG161164

### Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Metals</b>									
Antimony	46.8		ug/L	ND	93.5	80-120			
Arsenic	52.6		ug/L	ND	105	80-120			
Barium	52.5		ug/L	ND	105	80-120			
Beryllium	50.0		ug/L	ND	99.9	80-120			
Boron	48		ug/L	ND	85.5	80-120			
Cadmium	52.2		ug/L	ND	104	80-120			
Chromium	53.0		ug/L	ND	105	80-120			
Cobalt	51.6		ug/L	ND	103	80-120			
Copper	48.9		ug/L	ND	97.8	80-120			
Lead	48.8		ug/L	ND	97.6	80-120			
Molybdenum	45.8		ug/L	ND	91.4	80-120			
Nickel	51.0		ug/L	ND	102	80-120			
Selenium	51.2		ug/L	ND	102	80-120			
Silver	48.9		ug/L	ND	97.8	80-120			
Sodium	1060		ug/L	ND	104	80-120			
Thallium	49.6		ug/L	ND	99.1	80-120			
Uranium	51.6		ug/L	ND	103	80-120			
Vanadium	52.9		ug/L	ND	106	80-120			
Zinc	54		ug/L	ND	107	80-120			

Certificate of Analysis  
**Client: Amec Foster Wheeler (Thorold)**  
**Client PO:**

Report Date: 09-Jan-2017  
Order Date: 4-Jan-2017  
**Project Description: TG161164**

**Qualifier Notes:**

None

**Sample Data Revisions**

None

**Work Order Revisions / Comments:**

None

**Other Report Notes:**

n/a: not applicable  
ND: Not Detected  
MDL: Method Detection Limit  
Source Result: Data used as source for matrix and duplicate samples  
%REC: Percent recovery.  
RPD: Relative percent difference.



Client Name: <u>Amec Foster Wheeler</u>	Project Reference: <u>TG161164</u>	<b>Turnaround Time:</b> <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular Date Required: _____
Contact Name: <u>Kelly Patterson</u>	Quote # <u>Tier 2</u>	
Address: <u>3300 Merrittville Hwy, Thorold, ON L2V 4Y6</u>	PO # _____	
Telephone: <u>905-687-6616</u>	Email Address: <u>kelly.patterson@amecfw.com</u>	

Criteria:  O. Reg. 153/04 (As Amended) Table 1    RSC Filing    O. Reg. 558/00    PWQO    CCME    SUB (Storm)    SUB (Sanitary)   Municipality: \_\_\_\_\_    Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.)    GW (Ground Water)   SW (Surface Water)   SS (Storm/Sanitary Sewer)   P (Paint)   A (Air)   O (Other)

Paracel Order Number: <u>170115</u>		Matrix	Air Volume	# of Containers	Sample Taken		ICP/MS Metals	Required Analyses												
Sample ID/Location Name					Date	Time														
1	<u>BH/MW 202</u>	<u>GW</u>		<u>1</u>	<u>Jan. 3/17</u>	<u>1:30pm</u>	<u>X</u>													
2	<u>Dup A</u>	<u>GW</u>		<u>1</u>	<u>Jan 3/17</u>		<u>X</u>													
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Comments: Governed by SNA 07-003. Hold samples for future analysis.

Method of Delivery: walkin

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot: <u>Niagara Btkmeniek</u>	Received at Lab: <u>[Signature]</u>	Verified By: <u>Rachel Subject</u>
Relinquished By (Print): <u>Kevin Haines</u>	Date/Time: <u>4 Jan 17 14:40</u>	Date/Time: <u>Jan 5/17 @ 10:35</u>	Date/Time: <u>Jan 5/17</u>
Date/Time: <u>4 Jan 17</u>	Temperature: <u>7</u> °C	Temperature: <u>9.9</u> °C	pH Verified By: <u>Beut 12:32</u>



## **APPENDIX F**

## **LIMITATIONS**



### Limitations

1. The work performed in the preparation of this report and the conclusions presented are subject to the following:
  - (a) The Standard Terms and Conditions which form a part of Amec Foster Wheeler's proposal dated October 16, 2015 and signed by the Client on November 15, 2015 and proposal dated December 2, 2016 and authorization to proceed, signed by the Client on December 3, 2016;
  - (b) The Scope of Services;
  - (c) Time and Budgetary limitations as described in our Contract; and,
  - (d) The Limitations stated herein.
2. No other warranties or representations, either expressed or implied, are made as to the professional services provided under the terms of our Contract, or the conclusions presented.
3. The conclusions presented in this report were based, in part, on visual observations of the site and attendant structures. Our conclusions cannot and are not extended to include those portions of the site or structures which were not reasonably available, in Amec Foster Wheeler's opinion, for direct observation.
4. The environmental conditions at the site were assessed, within the limitations set out above, having due regard for applicable environmental regulations as of the date of the inspection. A review of compliance by past owners or occupants of the site with any applicable local, provincial or federal by-laws, orders-in-council, legislative enactments and regulations was not performed.
5. The site history research included obtaining information from third parties and employees or agents of the owner. No attempt has been made to verify the accuracy of any information provided, unless specifically noted in our report.
6. Where testing was performed, it was carried out in accordance with the terms of our contract providing for testing. Other substances, or different quantities of substances testing for, may be present on site and may be revealed by different of other testing not provided for in our contract.
7. Because of the limitations referred to above, different environmental conditions from those stated in our report may exist. Should such different conditions be encountered, Amec Foster Wheeler must be notified in order that it may determine if modifications to the conclusions in the report are necessary.
8. The utilization of Amec Foster Wheeler's services during the implementation of any remedial measures will allow Amec Foster Wheeler to observe compliance with the conclusions and recommendations contained in the report. Amec Foster Wheeler's involvement will also allow for changes to be made as necessary to suit field conditions as they are encountered.
9. This report is for the sole use of the party to whom it is addressed unless expressly stated otherwise in the report or contract. Any use which any third party makes of the report, in whole or in part, or any reliance thereon, or decisions made based on any information of conclusions in the report, is the sole responsibility of such third party. Amec Foster Wheeler accepts no responsibility whatsoever for damages or loss of any nature or kind suffered by any such third party as a result of actions taken or not taken or decisions made in reliance on the report or anything set out therein.
10. This report is not to be given over to any third party for any purpose whatsoever without the written permission of Amec Foster Wheeler.
11. Provided that the report is still reliable, and less than 12 months old, Amec Foster Wheeler will issue a third-party reliance letter to parties client identifies in writing, upon payment of the then current fee for such letters. All third parties relying on Amec Foster Wheeler's report, by such reliance agree to be bound by our proposal and Amec Foster Wheeler's standard reliance letter. Amec Foster Wheeler's standard reliance letter indicates that in no event shall Amec Foster Wheeler be liable for any damages, howsoever arising, relating to third-party reliance on Amec Foster Wheeler's report. No reliance by any party is permitted without such agreement.