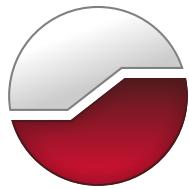


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**Phase II Environmental Site
Assessment
Proposed School Development
2405 and 2419 Mer Bleue Road
Ottawa, Ontario**



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www.gemtec.ca

Submitted to:

Conseil des Écoles Publiques de l'Est de L'Ontario
2445 Boulevard St.Laurent
Ottawa, Ontario
K1G 6C3

**Phase II Environmental Site Assessment
Proposed School Development
2405 and 2419 Mer Bleue Road
Ottawa, Ontario**

April 20, 2018
Project: 62721.07

EXECUTIVE SUMMARY

GEMTEC Consulting Engineers and Scientists Ltd. (GEMTEC) was retained by le Conseil des Écoles Publiques de l'Est de L'Ontario to carry out a Phase II Environmental Site Assessment (ESA) for the proposed school development located at 2405 and 2419 Mer Bleue Road in Ottawa, Ontario.

A Phase I ESA performed by GEMTEC in April 2018 entitled “Phase I Environmental Site Assessment, Proposed School Development, 2405 and 2419 Mer Bleue Road, Ottawa, Ontario” identified several areas of potentially contaminating activities on the property.

The objectives of the Phase II ESA are listed below:

- To document the presence or absence of contaminants in the soil or groundwater on, in or under the subject property, specifically within the areas of potential environmental concern;
- Assess if the soil and groundwater conditions at selected test locations satisfy the applicable Ministry of Environment and Climate Change (MOECC) site condition standards (SCS) for the site; and,
- Assess if the groundwater conditions at the selected test locations meet the City of Ottawa Sewer Use Guidelines.

The Phase II ESA field investigation included the following:

- Eight (8) environmental boreholes were advanced at the site to collect soil samples;
- Five (5) of the boreholes were instrumented with monitoring wells in order to collect groundwater samples and triangulate groundwater flow; and,
- A total of thirteen (13) soil samples (including one (1) duplicate) and five (5) groundwater samples were submitted to an accredited laboratory for laboratory analysis of contaminants of concern.

The following provides a summary of the results for the investigation:

Soil Results & Recommendations

Soil results were compared to MOECC Table 1 SCS (background concentrations in Ontario) and Table 2 SCS (applicable criteria, assuming potable condition in area). It is noted that the results and recommendations were the same when compared to MOECC Table 3 SCS (applicable criteria, assuming non-potable condition in area). The results and recommendations are summarized in the table below.

	MOECC Table 1 SCS Exceedances¹	MOECC Table 2 SCS Exceedances²
BH18-3 SA-3	<ul style="list-style-type: none"> SAR Chromium 	None
BH18-4 SA1	<ul style="list-style-type: none"> SAR Conductivity Petroleum Hydrocarbons (F4 range and F4, gravimetric) 	<ul style="list-style-type: none"> SAR Conductivity Available boron
BH18-5 SA1	<ul style="list-style-type: none"> SAR 	None
BH18-8 SA2	<ul style="list-style-type: none"> Chromium 	None

Notes:

1. If soil results exceed MOECC Table 1 SCS but meets MOECC Table 2 SCS, may have restrictions on soil movement
2. If soil results exceed MOECC Table 2 SCS, soil is considered impacted and may need to be disposed of off-site at an MOECC approved landfill or other approved receiver site

Based on the results of the current investigation, it is expected that impacted soil as defined by current MOECC regulations will be encountered during the proposed construction in the area of BH18-4. The SAR and conductivity exceedances are likely due to impacts from road salt. Due to the slight available boron exceedance, it is recommended additional soil samples in the vicinity of BH18-4 to confirm the available boron exceedance, if off-site disposal is required.

Based on the nature of the contaminants, impacted soil may pose a risk to vegetation in the vicinity of BH18-4. Soil may be reused on-site at a minimum of 1.5 metres below ground surface. Alternatively, the impacted soil may be delineated and removed at an MOECC licensed landfill or other receiver site, pending approval and additional analytical testing.

Groundwater Results & Recommendations

Groundwater results were compared to MOECC Table 2 SCS (applicable criteria, assuming potable condition in area), MOECC Table 3 SCS (applicable criteria, assuming non-potable condition in area), and the City of Ottawa Sewer Use Criteria.

	MOECC Table 2 SCS Exceedances ¹	MOECC Table 3 SCS Exceedances ²	City of Ottawa Sewer Use Criteria ³
BH18-3	<ul style="list-style-type: none"> • Chloride • Sodium • Benzo[a]pyrene • Chrysene • Fluoranthene 	<ul style="list-style-type: none"> • Chloride 	None
BH18-4	<ul style="list-style-type: none"> • Chloride • Sodium 	<ul style="list-style-type: none"> • Chloride 	None
BH18-6	<ul style="list-style-type: none"> • Chloride • Sodium 	<ul style="list-style-type: none"> None 	None
BH18-9	<ul style="list-style-type: none"> • Chloride 	None	None
BH18-10	<ul style="list-style-type: none"> • Chromium • Sodium 	None	None

The groundwater samples from BH18-3 exceeded the MOECC Table 2 SCS for chloride, sodium, benzo[a]pyrene, chrysene, and fluoranthene. Chloride and/or sodium exceedances were also identified in remaining groundwater samples. The following is recommended:

- To confirm that the properties within a 100-metres from the subject property do not use groundwater as their potable water source. A request can be made with the City of Ottawa. Should this be confirmed, MOECC Table 3 SCS can be applied;
- If MOECC Table 3 SCS (non-potable groundwater condition is applied), the groundwater samples from BH18-3 and BH18-4 exceeded for chloride. The exceedance is likely due to impacts from road salt application;
- If the subject property and/or properties within 100-metres use groundwater as their potable water source, additional well development and re-sampling should be conducted to confirm the exceedances.
- It is noted that the groundwater sample results met the City of Ottawa Sewer Use Criteria for the parameters analyzed. Should groundwater pumping and discharge be required during construction or operation of proposed buildings, the groundwater may be discharged into the sewer, pending additional testing and City of Ottawa approval

The statements made in this Executive Summary should be read in conjunction with the remainder of the report.

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1.0 INTRODUCTION

GEMTEC Consulting Engineers and Scientists Ltd. (GEMTEC) was retained by le Conseil des Écoles Publiques de l'Est de L'Ontario to carry out a Phase II Environmental Site Assessment (ESA) for the proposed school development located at 2405 and 2419 Mer Bleue Road in Ottawa, Ontario.

1.1 Site Description

The subject site is presently used as agricultural farmland, has some residential dwellings on-site, and has a total area of approximately 4.9 hectares (12 acres). Please refer to Figure 1, Key Plan, for an overview of the subject site and surrounding area.

The legal description for of 2405 and 2419 Mer Bleue Road are part of lot 4, concession 11, being part 1 on plan 4R-29146, formerly City of Cumberland PIN 14563-1816 and part of lot 4, concession 11, being plan 50R-6110, formerly City of Cumberland PIN14563-0513 respectively.

1.2 Background

A Phase I ESA performed by GEMTEC in April 2017 entitled “Phase I Environmental Site Assessment, Proposed School Development, 2405 and 2419 Mer Bleue Road, Ottawa, Ontario” identified several areas of potential environmental concern (APECs) on the property. The Phase I ESA identified the following potentially contaminating activities (PCAs) significant enough to warrant further investigation:

Table 1.1 – PCAs from Phase I ESA

PCA and Location	Description	Likelihood of Creating APEC	Rationale	Contaminants of Concern
Four (4) aboveground storage tanks on the subject property	Site reconnaissance identified three (3) active aboveground diesel storage tanks. One (1) of the tanks had a volume of 1,360 litres and the other two (2) had a volume of 2,200 litres each. The last tank was identified in the north area of the barn and was confirmed empty and not in use.	High	Based on the type of activity that is occurring on the subject site	<ul style="list-style-type: none">• PHCs¹• BTEX²• PAH³• Metals + Inorganics
Fill of unknown origin onsite	Both Mr. Bisson and Mr. Brûlé indicated that they imported fill onto the subject site. Mr. Bisson	Medium	Based on the type of activity that is occurring	<ul style="list-style-type: none">• PAH• Metals + Inorganics

PCA and Location	Description	Likelihood of Creating APEC	Rationale	Contaminants of Concern
	indicated that he brought in sand fill when he was building the structure at 2405 Mer Bleue Road. Mr. Brûlé indicated that he used fill material at the landscaping shop and also said that the fill he used would be full of interlocking brick and block material as well as other potential landscaping wastes at 2419 Mer Bleue Road.		on the subject site	
Landscaping garage on site used for personal vehicle and tractor maintenance and repair	Both Mr. Bisson and Mr. Brûlé indicated that while they did not personally complete vehicle maintenance on site, at times maintenance is completed on site by mobile mechanics. The mechanics are responsible to dispose of wastes.	Medium	Based on the type of activity that is occurring on the subject site	<ul style="list-style-type: none"> • PHCs • VOCs⁴ • Metals + Inorganics • PAHs
Fertilizer, pesticide and/or herbicide use on site	Mr. Bisson indicated in his interview that for years the COOP would take a sample of local soil and then recommended options for treating the soil prior to planting. He could not however identify what was used on his property.	Medium	Based on the type of activity that is occurring on the subject site	<ul style="list-style-type: none"> • OC Pesticides⁵ • PAH • Metals + Inorganics

1. PHCs – Petroleum Hydrocarbons
2. BTEX – Benzene, Toluene, Ethylbenzene, Xylene.
3. PAHs – Polycyclic Aromatic Hydrocarbon
4. VOCs – Volatile Organic Compounds
5. OC Pesticides – Organochlorine Pesticides

The Phase I ESA recommended that a Phase II ESA be carried out to investigate the potential presence of contaminants within the soil and groundwater on the subject site.

2.0 SCOPE OF INVESTIGATION

2.1 Objectives

The objectives of the Phase II ESA are listed below:

- To document the presence or absence of contaminants in the soil or groundwater on, in or under the subject property, specifically within the areas of potential concern;
- Assess if the soil and groundwater conditions at selected test locations satisfy the applicable Ministry of Environment and Climate Change (MOECC) site condition standards (SCS) for the site; and,
- Assess if the groundwater conditions at the selected test locations meet the City of Ottawa Sewer Use Guidelines.

The following tasks were completed during the Phase II ESA:

- A sampling and analysis plan was prepared;
- Eight (8) environmental boreholes were advanced at the site to collect soil samples;
- The five (5) boreholes advanced with full environmental sampling were instrumented with monitoring wells in order to collect groundwater samples and triangulate groundwater flow;
- A total of thirteen (13) soil samples (including one (1) duplicate) and five (5) groundwater samples were submitted to an accredited laboratory for laboratory analysis of contaminants of concern;
- The analytical results were compared with the applicable site condition standard; and,
- A Phase II Environmental Site Assessment report was prepared.

The locations of the boreholes/wells are shown on The Borehole Location Plan, Figure 2.

2.2 Media Investigated

This Phase II ESA included sampling and analysis of soil and groundwater. No sediment sampling was conducted. The rationale for sampling the soil and groundwater was to investigate the potential for contamination due to potentially contaminating activities identified in the Phase I ESA.

2.3 Deviations from Sampling and Analysis Plan

No deviation from the sampling plan occurred during this investigation.

3.0 INVESTIGATION METHODS

3.1 General

Ten (10) boreholes (numbered BH18-1 to BH18-10) were advanced from April 2 to 6, 2018. Soil samples from the eight (8) environmental boreholes were recovered at regular depth intervals and screened for combustible headspace gas concentrations and visual and olfactory indications of contamination. Well screens were installed in boreholes BH-18-3, BH18-4, BH18-6, BH18-9, and BH18-10. Soil and groundwater samples were collected from the boreholes and well screens and submitted to Paracel Laboratories for chemical analyses of selected parameters. The locations of the boreholes and monitoring wells are indicated on the Borehole Location Plan, Figure 2.

3.2 Borehole Drilling

The boreholes were advanced at the subject site from April 2 to 6, 2018, using a track mount 75 CME drill rig supplied and operated by George Downing Estate Drilling Ltd. of Grenville-sur-la Rouge, Quebec.

3.3 Soil Sampling

Soil samples were recovered at regular intervals during drilling using a 50-millimetre diameter split barrel sampler. The soil samples were collected following the Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario (MOECC, 1996). Clean gloves were worn and changed between each sample and the split barrel sampler was washed and rinsed between each sampling event. The soil samples were inspected in the field for visual, tactile and olfactory evidence of impact.

Following a period of equilibration to ambient temperature, the head spaces of the soil samples were screened using a combustible gas detector (RKI Eagle combustible gas detector calibrated to hexane standards, with methane elimination enabled). The results of the combustible vapour readings are provided on the Record of Borehole sheets in Appendix A.

Soil samples were selected based on the combustible headspace gas readings, visual, olfactory and tactile evidence of impact, fill material as well as the proximity to the groundwater table. A total of thirteen (13) soil samples, including one (1) duplicate sample, was submitted to Paracel Laboratories for analysis of selected parameters. The soil samples submitted for analyses and the selected parameters are summarized in the following table:

Table 3.1 – Soil Sample Analyses

Borehole	Sample	Depth Interval (m bgs ¹)	PHCs ² F1-F4	BTEX ³	VOC ⁴	Metals & Inorganics	OC Pesticides	PAHs ⁵
BH18-3	SA3	1.52 – 2.13	✓		✓	✓		✓
BH18-103 ⁶	SA3	1.52 – 2.13	✓	✓				
BH18-4	SA1	0.00 – 0.61	✓		✓	✓ ⁷		✓
BH18-5	SA1	0.00 – 0.61				✓	✓	✓
BH18-5	SA3	1.52 – 2.13	✓	✓				
BH18-6	SA1	0.00 – 0.61				✓	✓	✓
BH18-7	SA1	0.00 – 0.61				✓	✓	✓
BH18-8	SA2	0.76 – 1.37				✓		✓
BH18-8	SA3	1.52 – 2.13	✓	✓				
BH18-9	SA1	0.00 – 0.61				✓	✓	✓
BH18-9	SA2	0.76 – 1.37	✓	✓				
BH18-10	SA1	0.00 – 0.61	✓		✓	✓		✓
BH18-10	SA5	3.05 – 3.66	✓		✓			

Notes:

1. m bgs – metres below ground surface.
2. PHCs F1 to F4 - Petroleum Hydrocarbon Fractions in the F1 to F4 ranges.
3. BTEX – Benzene, Toluene, Ethylbenzene, Xylene.
4. VOC – Volatile Organic Compound.
5. PAHs – Polycyclic Aromatic Hydrocarbons.
6. BH18-103 is a duplicate of BH18-3.
7. Based on the analytical results provided by the laboratory, sample BH18-4 SA1 was reanalyzed for available boron.

Additional details on the soil samples recovered from the boreholes can be found on the Record of Borehole sheets provided in Appendix A.

3.4 Monitoring Wells

Well screens were installed in all boreholes to measure the groundwater level and carry out groundwater sampling. The monitoring wells were constructed of 50 mm diameter PVC screens and risers. The monitoring well locations are shown on Figure 2, and the monitoring well construction details are provided on the Record of Borehole sheets in Appendix A.

3.5 Groundwater Monitoring and Sampling

Static groundwater levels in monitoring wells were measured using a Heron Instruments oil/water interface meter.

Five (5) groundwater samples were collected, one (1) each from boreholes BH-18-3, BH18-4, BH18-6, BH18-9, and BH18-10. The samples were collected from the monitoring wells in laboratory supplied bottles using a Waterra Spectra Field-Pro peristaltic pump with disposable tubing. The groundwater samples were submitted to Paracel Laboratory for analysis and the selected parameters are summarized in the following table:

Table 3.2 – Groundwater Sample Analyses

Borehole / Monitoring Well	PHCs ¹ F1-F4	BTEX ²	VOC ³	Metals & Inorganics	OC Pesticides	PAHs ⁴
BH18-3	✓	✓		✓		✓
BH18-4	✓		✓	✓		✓
BH18-6				✓	✓	✓
BH18-9	✓	✓		✓	✓	✓
BH18-10	✓		✓	✓		✓

1. PHCs F1 to F4 - Petroleum Hydrocarbon Fractions in the F1 to F4 ranges.

2. BTEX – Benzene, Toluene, Ethylbenzene, Xylene.

3. VOC – Volatile Organic Compound.

4. PAHs – Polycyclic Aromatic Hydrocarbons.

4.0 RESULTS OF THE INVESTIGATION

4.1 Site Geology

Surficial geology at the subject property was interpreted from the stratigraphic information obtained during drilling at the specific test locations only. Detailed descriptions of soil conditions can be found on the Record of Borehole sheets in Appendix A.

The overview of the subsurface conditions encountered in the boreholes advanced on the subject property are provided in the following report:

- “Geotechnical Investigation, Proposed School Development, 2405 & 2419 Mer Bleue Road, Ottawa, Ontario” (in progress)”

4.2 Site Hydrogeology

The groundwater level measured in the monitoring wells are summarized in the following table:

Table 4.1 – Groundwater Depth and Elevation

Borehole	April 9, 2018		April 18, 2018	
	Groundwater Depth (metres below ground surface)	Groundwater Elevation (metres, geodetic datum)	Groundwater Depth Below PVC pipe monitoring point (metres)	Groundwater Elevation (metres, geodetic datum)
BH18-3	1.99	85.36	0.15	87.20
BH18-4	1.18	86.66	0.76	87.08
BH18-6	0.31	86.46	0.14	86.63
BH18-9	0.63	86.68	0.08	87.23
BH18-10	0.45	86.96	0.31	87.10

The water levels on April 9, 2018 were believed to have been measured prior to groundwater stabilization as a result of the silty clay in the area. As such, based on the measured water levels on April 18, 2018 and surrounding topography, shallow groundwater flow is east/ northeastwards. The anticipated flow direction was southwards, consistent with the topographic slope. However, localized groundwater flow may also be influenced by subsurface service trenches, such as storm sewers and public utility services.

4.3 Site Condition Standards

Site condition standards (SCS) were selected for this site in accordance with the requirements of Ontario Regulation 153/04, Record of Site Condition – Part XV.1 of the Environmental Protection Act (O. Reg. 153/04, Ministry of Environment and Climate Change, October 31, 2011).

The following information was considered in selecting the site condition standards:

- The most sensitive use of the property will be residential;
- It cannot be confirmed that all properties within 100 metres of the subject property use municipal water as their water source; and,
- The borehole drilling did not encounter bedrock at depths less than 2.0 metres below ground surface.

Based on the above information the MOECC Table 2 Full Depth Generic Site Condition Standards in a Potable Ground Water Condition (MOECC, April 15, 2011) was selected for the subject site. The results of the soil samples were also compared to Table 1 (Full Depth background SCS) in order to provide recommendations for off-site soil disposal, if required.

The groundwater sample results were also compared to The City of Ottawa Storm and Sanitary Sewer Use Guidelines to provide discharge recommendations, if required.

The soil and groundwater results were also compared to MOECC Table 3 (Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition) SCS. This standard would be applicable if it is confirmed that properties within 100 metres of the subject property do not use groundwater as their potable water source.

4.4 Soil Sample Results

The analytical results for the soil samples submitted for analyses and the selected MOECC SCS are presented in Table A1 following the text of the report. The laboratory Certificates of Analysis for the soil samples are provided in Appendix B.

The following provides a summary of the analytical results of the soil samples:

- The soil sample results satisfy the applicable MOECC Table 2 SCS for all parameters analysed with the exception of SAR, Conductivity, and available Boron at BH18-4 SA1.
 - BH18-4 SA1 resample results for Boron met the MOECC Table 2 SCS, however since the average of the two (2) sampling events were above the MOECC Table 2 SCS, Boron is considered to be exceeding MOECC Table 2 SCS at that location;
- The soil sample results exceed the applicable MOECC Table 1 SCS for:
 - SAR at BH18-3 SA3, BH18-4 SA1, and BH18-4 SA1;
 - Conductivity at BH18-4 SA1;
 - Chromium at BH18-3 SA3, and BH18-8 SA2; and,

- F4 PHCs (C34-C50), and F4G PHC (gravimetric) at BH18-4 SA1.

The results of the resample (1.4 µg/g) met the MOECC Table 2 SCS (1.5 µg/g), however since the average of the two (2) sampling events were above the SCS (1.55 µg/g), the sample result is considered as exceeding the applicable criteria.

4.5 Groundwater Sample Results

The analytical results for the groundwater samples and the associated MOECC SCS, and City of Ottawa Sewer use standards are presented in Table A2. The laboratory Certificate of Analysis for the groundwater sample is provided in Appendix C.

The following provides a summary of the analytical results of the groundwater samples:

- The groundwater sample results exceed the applicable MOECC Table 2 SCS for:
 - Chloride at BH18-3, BH18-4, BH18-6, BH18-9, and BH18-10;
 - Sodium at BH18-3, BH18-4, BH18-6, and BH18-10;
 - Benzo[a]pyrene at BH18-3;
 - Chrysene at BH18-3; and,
 - Fluoranthene at BH18-3.
- The groundwater sample results satisfy The City of Ottawa Sanitary/Combined Sewer Guidelines for all parameters analysed; and,
- The groundwater sample results satisfy The City of Ottawa Storm Sewer Guidelines for all parameters analysed.

If it is confirmed that properties within 100 metres of the subject property do not use groundwater as their potable water source, MOECC Table 3 SCS can be applied. The groundwater samples met MOECC Table 3 SCS with the following exceptions:

- Chloride at BH18-3 and BH18-4.

4.6 Quality Assurance/Quality Control

One (1) duplicate soil sample was submitted to Paracel Laboratories for analysis of selected parameters. The soil sample BH18-103 SA3 is a duplicate of sample BH18-3 SA3. The results of the duplicate soil sample were the same as the results of the original sample and no differences were noted.

The Laboratory QA/QC results for the soil and groundwater analyses are included with the soil and groundwater laboratory analytical data provided in Appendix B and C, respectively. Soil and groundwater sample holding times were met, and the majority of laboratory quality control blanks, duplicates and spikes, and surrogate compound recoveries met applicable industry criteria.

Based on the measures discussed above, sample collection and handling protocols are considered acceptable and associated analytical results reproducible. The quality of the data from

the investigation was sufficient in that decision making was not affected, and the overall objectives of the investigation and assessment were met.

5.0 SUMMARY AND CONCLUSIONS

GEMTEC Consulting Engineers and Scientists Ltd. (GEMTEC) was retained by le Conseil des Écoles Publiques de l'Est de L'Ontario to carry out a Phase II Environmental Site Assessment (ESA) for the proposed school development located at 2405 and 2419 Mer Bleue Road in Ottawa, Ontario.

A Phase I ESA performed by GEMTEC in April 2018 entitled “Phase I Environmental Site Assessment, Proposed School Development, 2405 and 2419 Mer Bleue Road, Ottawa, Ontario” identified several areas of potentially contaminating activities on the property.

The objectives of the Phase II ESA are listed below:

- To document the presence or absence of contaminants in the soil or groundwater on, in or under the subject property, specifically within the areas of potential environmental concern;
- Assess if the soil and groundwater conditions at selected test locations satisfy the applicable Ministry of Environment and Climate Change (MOECC) site condition standards (SCS) for the site; and,
- Assess if the groundwater conditions at the selected test locations meet the City of Ottawa Sewer Use Guidelines.

The Phase II ESA field investigation included the following:

- Eight (8) environmental boreholes were advanced at the site to collect soil samples;
- Five (5) of the boreholes were instrumented with monitoring wells in order to collect groundwater samples and triangulate groundwater flow; and,
- A total of thirteen (13) soil samples (including one (1) duplicate) and five (5) groundwater samples were submitted to an accredited laboratory for laboratory analysis of contaminants of concern.

The following provides a summary of the results for the investigation:

Soil Results & Recommendations

Soil results were compared to MOECC Table 1 SCS (background concentrations in Ontario) and Table 2 SCS (applicable criteria, assuming potable condition in area). It is noted that the results and recommendations were the same when compared to MOECC Table 3 SCS (applicable criteria, assuming non-potable condition in area). The results and recommendations are summarized in the table below.

	MOECC Table 1 SCS Exceedances¹	MOECC Table 2 SCS Exceedances²
BH18-3 SA-3	<ul style="list-style-type: none"> SAR Chromium 	None
BH18-4 SA1	<ul style="list-style-type: none"> SAR Conductivity Petroleum Hydrocarbons (F4 range and F4, gravimetric) 	<ul style="list-style-type: none"> SAR Conductivity Available boron
BH18-5 SA1	<ul style="list-style-type: none"> SAR 	None
BH18-8 SA2	<ul style="list-style-type: none"> Chromium 	None

Notes:

3. If soil results exceed MOECC Table 1 SCS but meets MOECC Table 2 SCS, may have restrictions on soil movement
4. If soil results exceed MOECC Table 2 SCS, soil is considered impacted and may need to be disposed of off-site at an MOECC approved landfill or other approved receiver site

Based on the results of the current investigation, it is expected that impacted soil as defined by current MOECC regulations will be encountered during the proposed construction in the area of BH18-4. The SAR and conductivity exceedances are likely due to impacts from road salt. Due to the slight available boron exceedance, it is recommended additional soil samples in the vicinity of BH18-4 to confirm the available boron exceedance, if off-site disposal is required.

Based on the nature of the contaminants, impacted soil may pose a risk to vegetation in the vicinity of BH18-4. Soil may be reused on-site at a minimum of 1.5 metres below ground surface. Alternatively, the impacted soil may be delineated and removed at an MOECC licensed landfill or other receiver site, pending approval and additional analytical testing.

Groundwater Results & Recommendations

Groundwater results were compared to MOECC Table 2 SCS (applicable criteria, assuming potable condition in area), MOECC Table 3 SCS (applicable criteria, assuming non-potable condition in area), and the City of Ottawa Sewer Use Criteria.

	MOECC Table 2 SCS Exceedances¹	MOECC Table 3 SCS Exceedances²	City of Ottawa Sewer Use Criteria³
BH18-3	<ul style="list-style-type: none"> • Chloride • Sodium • Benzo[a]pyrene • Chrysene • Fluoranthene 	<ul style="list-style-type: none"> • Chloride 	None
BH18-4	<ul style="list-style-type: none"> • Chloride • Sodium 	<ul style="list-style-type: none"> • Chloride 	None
BH18-6	<ul style="list-style-type: none"> • Chloride • Sodium 	None	None
BH18-9	<ul style="list-style-type: none"> • Chloride 	None	None
BH18-10	<ul style="list-style-type: none"> • Chromium • Sodium 	None	None

The groundwater samples from BH18-3 exceeded the MOECC Table 2 SCS for chloride, sodium, benzo[a]pyrene, chrysene, and fluoranthene. Chloride and/or sodium exceedances were also identified in remaining groundwater samples. The following is recommended:

- To confirm that the properties within a 100-metres from the subject property do not use groundwater as their potable water source. A request can be made with the City of Ottawa. Should this be confirmed, MOECC Table 3 SCS can be applied;
- If MOECC Table 3 SCS (non-potable groundwater condition), the groundwater samples from BH18-3 and BH18-4 exceeded for chloride. The exceedance is likely due to impacts from road salt application;
- If the subject property and/or properties within 100-metres use groundwater as their potable water source, additional well development and re-sampling should be conducted to confirm the exceedances;
- It is noted that the groundwater sample results met the City of Ottawa Sewer Use Criteria for the parameters analyzed. Should groundwater pumping and discharge be required during construction or operation of proposed buildings, the groundwater may be discharged into the sewer, pending additional testing and City of Ottawa approval.

6.0 LIMITATION OF LIABILITY

This report was prepared for and the work referred to within it has been undertaken by GEMTEC Consulting Engineers and Scientists Ltd (GEMTEC) for le Conseil des Écoles Publiques de l'Est de L'Ontario. It is intended for the exclusive use of le Conseil des Écoles Publiques de l'Est de L'Ontario. This report may not be relied upon by any other person or entity without the express written consent of GEMTEC and le Conseil des Écoles Publiques de l'Est de L'Ontario. Nothing in this report is intended to provide a legal opinion.

The investigation undertaken by GEMTEC with respect to this report and any conclusions or recommendations made in this report reflect the best judgements of GEMTEC based on the site conditions observed during the investigations undertaken at the dates identified in the report and on the information available at the time the report was prepared. This report has been prepared for the application noted and it is based, in part, on visual observations made at the site, subsurface investigations at discrete locations and depths and laboratory analyses of specific chemical parameters and material during a specific time interval, all as described in the report. Unless otherwise stated, the findings contained in this report cannot be extrapolated or extended to previous or future site conditions, portions of the site that were unavailable for direct investigation, subsurface locations on the site that were not investigated directly, or chemical parameters, materials or analysis which were not addressed. Chemical parameters other than those addressed by the investigation described in this report may exist in soil and groundwater elsewhere on the site, the chemical parameters addressed in the report may exist in soil and groundwater at other locations at the site that were not investigated and concentrations of the chemical parameters addressed which are different than those reported may exist at other locations on the site than those from where the samples were taken.

Should new information become available during future work, including excavations, borings or other studies, GEMTEC should be requested to review the information and, if necessary, re-assess the conclusions presented herein.

We trust this report provides sufficient information for your present purposes. If you have any questions concerning this report, please do not hesitate to contact our office.

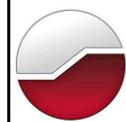
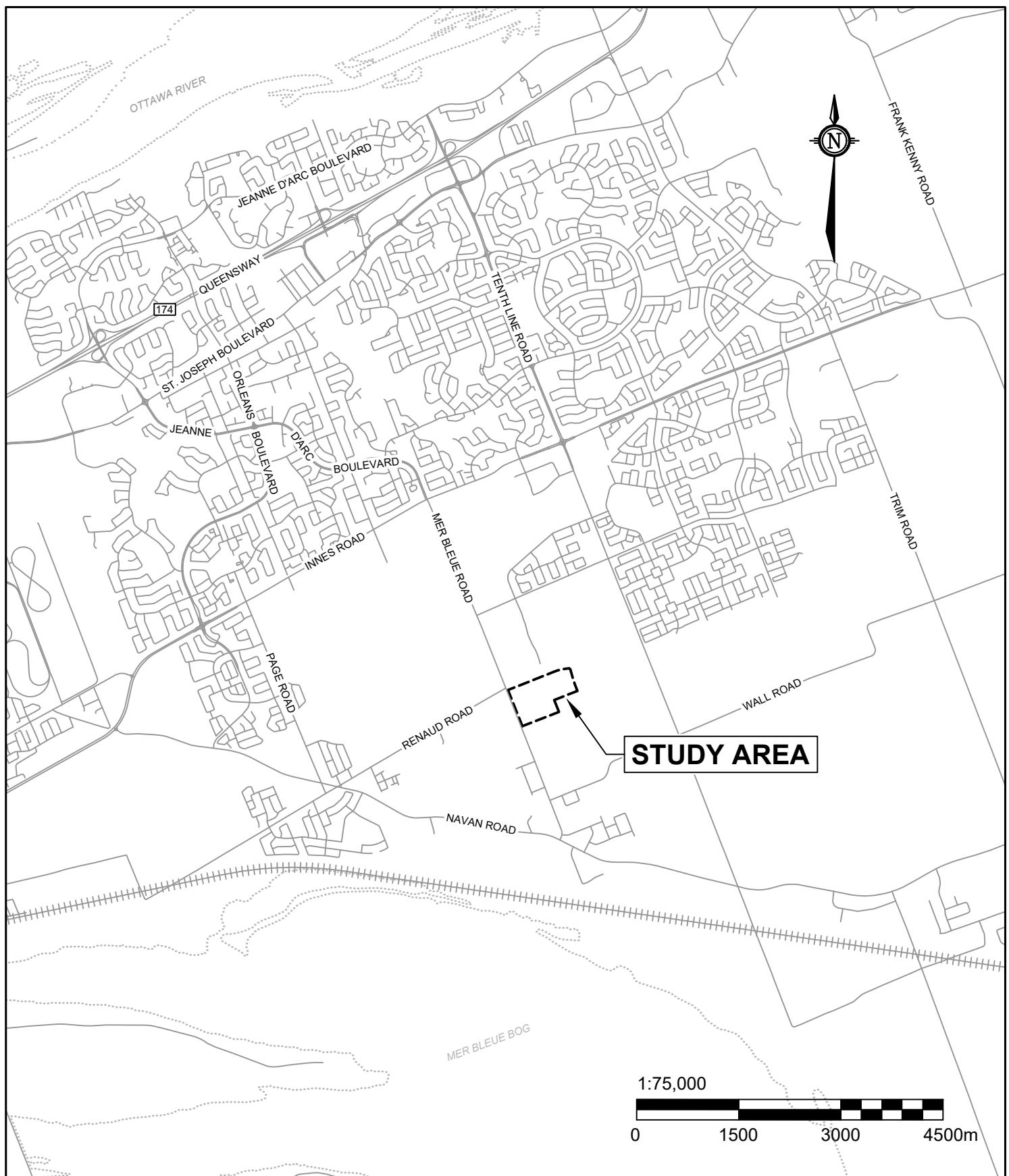


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Project GEOTECHNICAL & PHASE II ESA
MER-BLEUE SCHOOL
2405 & 2419 MER-BLEUE ROAD
OTTAWA, ONTARIO

Drawing

KEY PLAN

Drwn By S.L. Chkd By N.S. Date APRIL 2018

Project No. 62721.07

Revision No. 0

FIGURE 1

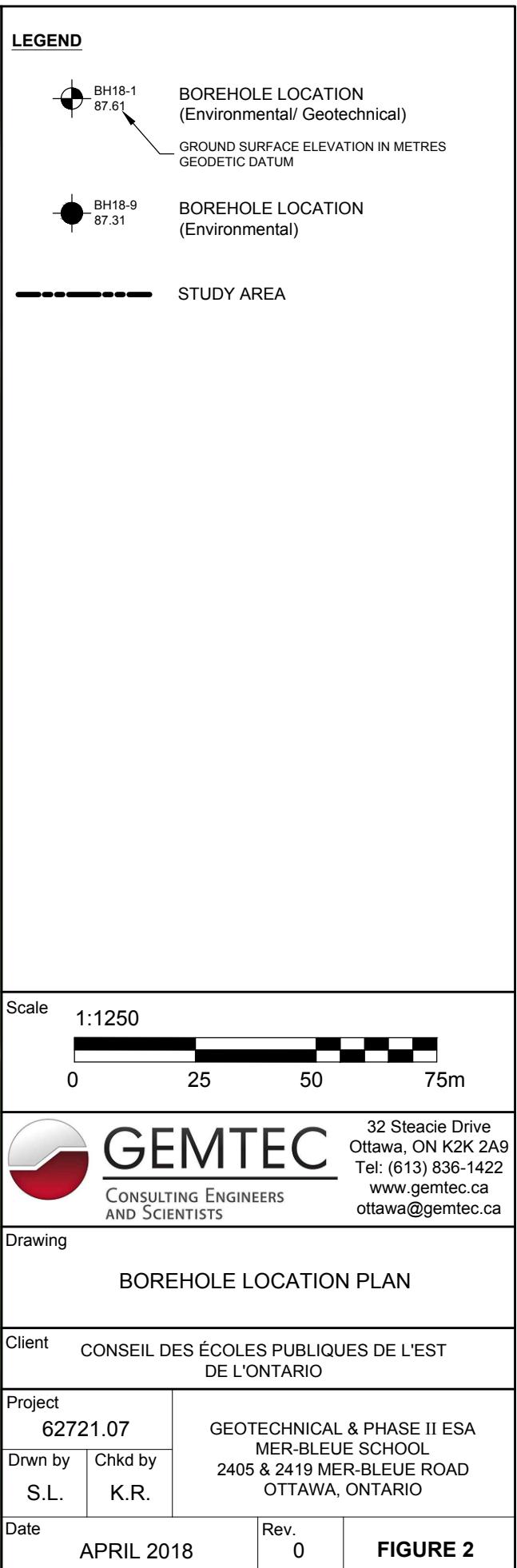


TABLE A1
SOIL ANALYTICAL RESULTS

Parameter	Units	RDL	Sample Location:			2405, 2419 Mer Bleue Road																													
			Sample ID: BH18-3 SA3 Laboratory Sample ID: 1815109-01 Date Sampled: 03/04/2018			BH18-103 SA3 1815109-02 03/04/2018			BH18-4 SA1 1816062-01 02/04/2018			BH18-5 SA1 1815109-04 02/04/2018			BH18-6 SA1 1815109-05 06/04/2018			BH18-7 SA1 1815109-06 06/04/2018			BH18-8 SA2 1815109-07 04/04/2018			BH18-8 SA3 1815109-09 04/04/2018			BH18-9 SA1 1815109-10 04/04/2018			BH18-9 SA2 1815109-11 02/04/2018			BH18-10 SA1 1815109-12 02/04/2018		
			MOECC Table 1*	MOECC Table 2**	MOECC Table 3***	MOECC Table 1*	MOECC Table 2**	MOECC Table 3***	MOECC Table 1*	MOECC Table 2**	MOECC Table 3***	MOECC Table 1*	MOECC Table 2**	MOECC Table 3***	MOECC Table 1*	MOECC Table 2**	MOECC Table 3***	MOECC Table 1*	MOECC Table 2**	MOECC Table 3***	MOECC Table 1*	MOECC Table 2**	MOECC Table 3***	MOECC Table 1*	MOECC Table 2**	MOECC Table 3***	MOECC Table 1*	MOECC Table 2**	MOECC Table 3***						
Physical Characteristics																																			
% Solids	% by Wt.	0.1	NS	NS	NS	68.8	69.6	83.9	N/A	72.5	71.7	69.8	70.7	75.4	70.9	79.7	71.3	61.5	55.8																
General Inorganics																																			
SAR	N/A	0.01	2.4 N/A	5 N/A	5 N/A	3.49	N/A	6.23	N/A	2.70	N/A	1.30	1.31	1.65	N/A	0.12	N/A	0.23	N/A																
Conductivity	uS/cm	5	570 uS/cm	700 uS/cm	mS/cm (700 uS/cm)	291	N/A	888	N/A	435	N/A	209	204	303	N/A	179	N/A	215	N/A																
Cyanide, free	ug/g dry	0.03	0.051 ug/g dry	0.051 ug/g dry	0.051 ug/g dry	ND (0.03)	N/A	ND (0.03)	N/A	ND (0.12)	N/A	ND (0.12)	ND (0.12)	ND (0.03)	N/A	ND (0.03)	N/A	ND (0.06)	N/A																
pH	pH Units	0.05	NS	NS	NS	7.76	N/A	8.91	N/A	7.94	N/A	6.89	7.23	7.55	N/A	8.13	N/A	7.35	N/A																
Metals																																			
Antimony	ug/g dry	1	1.3 ug/g dry	7.5 ug/g dry	7.5 ug/g dry	ND (1)	N/A	ND (1)	N/A	ND (1)	N/A	ND (1)	ND (1)	ND (1)	N/A	ND (1)	N/A	ND (1)	N/A																
Arsenic	ug/g dry	1	18 ug/g dry	18 ug/g dry	18 ug/g dry	2	N/A	1	N/A	1	N/A	ND (1)	ND (1)	1	N/A	1	N/A	1	N/A																
Barium	ug/g dry	1	220 ug/g dry	390 ug/g dry	390 ug/g dry	157	N/A	101	N/A	112	N/A	111	132	177	N/A	133	N/A	77	N/A																
Beryllium	ug/g dry	0.5	2.5 ug/g dry	4 ug/g dry	4 ug/g dry	1.1	N/A	ND (0.5)	N/A	0.6	N/A	0.7	0.7	0.8	N/A	0.6	N/A	ND (0.5)	N/A																
Boron, available	ug/g dry	0.5	NS	1.5 ug/g dry	1.5 ug/g dry	ND (0.5)	N/A	1.7	1.4	ND (0.5)	N/A	ND (0.5)	ND (0.5)	ND (0.5)	N/A	ND (0.5)	N/A	ND (0.5)	N/A																
Boron	ug/g dry	5.0	36 ug/g dry	120 ug/g dry	120 ug/g dry	20.8	N/A	14.7	N/A	12.0	N/A	10.7	10.8	11.1	N/A	11.2	N/A	8.0	N/A																
Cadmium	ug/g dry	0.5	1.2 ug/g dry	1.2 ug/g dry	1.2 ug/g dry	ND (0.5)	N/A	ND (0.5)	N/A	ND (0.5)	N/A	ND (0.5)	ND (0.5)	ND (0.5)	N/A	ND (0.5)	N/A	ND (0.5)	N/A																
Chromium	ug/g dry	5	70 ug/g dry	160 ug/g dry	160 ug/g dry	80	N/A	28	N/A	54	N/A	51	61	84	N/A	57	N/A	32	N/A																
Chromium (VI)	ug/g dry	0.2	0.66 ug/g dry	8 ug/g dry	8 ug/g dry	ND (0.2)	N/A	ND (0.2)	N/A	ND (0.2)	N/A	ND (0.2)	ND (0.2)	ND (0.2)	N/A	ND (0.2)	N/A	ND (0.2)	N/A																
Cobalt	ug/g dry	1	21 ug/g dry	22 ug/g dry	22 ug/g dry	16	N/A	7	N/A	9	N/A	9	12	16	N/A	11	N/A	7	N/A																
Copper	ug/g dry	5	92 ug/g dry	140 ug/g dry	140 ug/g dry	35	N/A	13	N/A	18	N/A	16	22	33	N/A	24	N/A	15	N/A																
Lead	ug/g dry	1	120 ug/g dry	120 ug/g dry	120 ug/g dry	10	N/A	11	N/A	10	N/A	10	9	9	N/A	15	N/A	18	N/A																
Mercury	ug/g dry	0.1	0.27 ug/g dry	0.27 ug/g dry	0.27 ug/g dry	ND (0.1)	N/A	ND (0.1)	N/A	ND (0.1)	N/A	ND (0.1)	ND (0.1)	ND (0.1)	N/A	ND (0.1)	N/A	ND (0.1)	N/A																
Molybdenum	ug/g dry	1	2 ug/g dry	6.9 ug/g dry	6.9 ug/g dry	ND (1)	N/A	ND (1)	N/A	ND (1)	N/A	ND (1)	ND (1)	ND (1)	N/A	ND (1)	N/A	ND (1)	N/A																
Nickel	ug/g dry	5	82 ug/g dry	100 ug/g dry	100 ug/g dry	48	N/A	17	N/A	26	N/A	25	32	47	N/A	33	N/A	19	N/A																
Selenium	ug/g dry	1	1.5 ug/g dry	2.4 ug/g dry	2.4 ug/g dry	ND (1)	N/A	ND (1)	N/A	ND (1)	N/A	ND (1)	ND (1)	ND (1)	N/A	ND (1)	N/A	ND (1)	N/A																
Silver	ug/g dry	0.3	0.5 ug/g dry	20 ug/g dry	20 ug/g dry	ND (0.3)	N/A	ND (0.3)	N/A																										

TABLE A1
SOIL ANALYTICAL RESULTS
CONTINUED

			Sample Location:			2405, 2419 Mer Bleue Road														
			Sample ID:	BH18-3 SA3	BH18-103 SA3	BH18-4 SA1	BH18-4 SA1	BH18-5 SA1	BH18-5 SA3	BH18-6 SA1	BH18-7 SA1	BH18-8 SA2	BH18-8 SA3	BH18-9 SA1	BH18-9 SA2	BH18-10 SA1	BH18-10 SA5			
			Laboratory Sample ID:	1815109-01	1815109-02	1815109-03	1816062-01	1815109-04	1815109-05	1815109-06	1815109-07	1815109-08	1815109-09	1815109-10	1815109-11	1815109-12	1815109-13			
			Date Sampled:	03/04/2018	03/04/2018	02/04/2018	02/04/2018	06/04/2018	06/04/2018	06/04/2018	04/04/2018	04/04/2018	04/04/2018	04/04/2018	02/04/2018	02/04/2018	02/04/2018	02/04/2018		
Parameter	Units	RDL	MOECC Table 1*	MOECC Table 2**	MOECC Table 3***	BH18-3 SA3	BH18-103 SA3	BH18-4 SA1	BH18-4 SA1	BH18-5 SA1	BH18-5 SA3	BH18-6 SA1	BH18-7 SA1	BH18-8 SA2	BH18-8 SA3	BH18-9 SA1	BH18-9 SA2	BH18-10 SA1	BH18-10 SA5	
Methyl Ethyl Ketone (2-Butanone)	ug/g dry	0.50	0.5 ug/g dry	16 ug/g dry	16 ug/g dry	ND (0.50)	N/A	ND (0.50)	N/A	N/A	ND (0.50)	ND (0.50)								
Methyl Isobutyl Ketone	ug/g dry	0.50	0.5 ug/g dry	1.7 ug/g dry	1.7 ug/g dry	ND (0.50)	N/A	ND (0.50)	N/A	N/A	ND (0.50)	ND (0.50)								
Methyl tert-butyl ether	ug/g dry	0.05	0.05 ug/g dry	0.75 ug/g dry	0.75 ug/g dry	ND (0.05)	N/A	ND (0.05)	N/A	N/A	ND (0.05)	ND (0.05)								
Methylene Chloride	ug/g dry	0.05	0.05 ug/g dry	0.1 ug/g dry	0.1 ug/g dry	ND (0.05)	N/A	ND (0.05)	N/A	N/A	ND (0.05)	ND (0.05)								
Styrene	ug/g dry	0.05	0.05 ug/g dry	0.7 ug/g dry	0.7 ug/g dry	ND (0.05)	N/A	ND (0.05)	N/A	N/A	ND (0.05)	ND (0.05)								
1,1,1,2-Tetrachloroethane	ug/g dry	0.05	0.05 ug/g dry	0.058 ug/g dry	0.058 ug/g dry	ND (0.05)	N/A	ND (0.05)	N/A	N/A	ND (0.05)	ND (0.05)								
1,1,2,2-Tetrachloroethane	ug/g dry	0.05	0.05 ug/g dry	0.05 ug/g dry	0.05 ug/g dry	ND (0.05)	N/A	ND (0.05)	N/A	N/A	ND (0.05)	ND (0.05)								
Tetrachloroethylene	ug/g dry	0.05	0.05 ug/g dry	0.28 ug/g dry	0.28 ug/g dry	ND (0.05)	N/A	ND (0.05)	N/A	N/A	ND (0.05)	ND (0.05)								
Toluene	ug/g dry	0.05	0.2 ug/g dry	2.3 ug/g dry	2.3 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	ND (0.05)	N/A	N/A	N/A	N/A	N/A	N/A	ND (0.05)	ND (0.05)	
1,1,1-Trichloroethane	ug/g dry	0.05	0.05 ug/g dry	0.38 ug/g dry	0.38 ug/g dry	ND (0.05)	N/A	ND (0.05)	N/A	N/A	ND (0.05)	ND (0.05)								
1,1,2-Trichloroethane	ug/g dry	0.05	0.05 ug/g dry	0.05 ug/g dry	0.05 ug/g dry	ND (0.05)	N/A	ND (0.05)	N/A	N/A	ND (0.05)	ND (0.05)								
Trichloroethylene	ug/g dry	0.05	0.05 ug/g dry	0.061 ug/g dry	0.061 ug/g dry	ND (0.05)	N/A	ND (0.05)	N/A	N/A	ND (0.05)	ND (0.05)								
Trichlorofluoromethane	ug/g dry	0.05	0.25 ug/g dry	4 ug/g dry	4 ug/g dry	ND (0.05)	N/A	ND (0.05)	N/A	N/A	ND (0.05)	ND (0.05)								
Vinyl Chloride	ug/g dry	0.02	0.02 ug/g dry	0.02 ug/g dry	0.02 ug/g dry	ND (0.02)	N/A	ND (0.02)	N/A	N/A	ND (0.02)	ND (0.02)								
m/p-Xylene	ug/g dry	0.05	NS	NS	NS	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	ND (0.05)	N/A	N/A	N/A	N/A	N/A	N/A	ND (0.05)	ND (0.05)	
o-Xylene	ug/g dry	0.05	NS	NS	NS	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	ND (0.05)	N/A	N/A	N/A	N/A	N/A	N/A	ND (0.05)	ND (0.05)	
Xylenes, total	ug/g dry	0.05	0.05 ug/g dry	3.1 ug/g dry	3.1 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	ND (0.05)	N/A	N/A	N/A	N/A	N/A	N/A	ND (0.05)	ND (0.05)	
Hydrocarbons																				
F1 PHCs (C6-C10)	ug/g dry	7	25 ug/g dry	55 ug/g dry	55 ug/g dry	ND (7)	ND (7)	ND (7)	N/A	N/A	ND (7)	N/A	N/A	N/A	N/A	N/A	ND (7)	ND (7)		
F2 PHCs (C10-C16)	ug/g dry	4	10 ug/g dry	98 ug/g dry	98 ug/g dry	ND (4)	ND (4)	ND (4)	N/A	N/A	ND (4)	N/A	N/A	N/A	ND (4)	N/A	ND (4)	ND (4)		
F3 PHCs (C16-C34)	ug/g dry	8	240 ug/g dry	300 ug/g dry	300 ug/g dry	ND (8)	ND (8)	66	N/A	N/A	ND (8)	N/A	N/A	N/A	ND (8)	N/A	ND (8)	ND (8)		
F4 PHCs (C34-C50)	ug/g dry	6	120 ug/g dry	2800 ug/g dry	2800 ug/g dry	ND (6)	ND (6)	180	N/A	N/A	ND (6)	N/A	N/A	N/A	ND (6)	N/A	ND (6)	ND (6)		
F4G PHCs (gravimetric)	ug/g dry	50	120 ug/g dry	2800 ug/g dry	2800 ug/g dry	N/A	N/A	1130	N/A	N/A	N/A									
Semi-Volatiles																				
Acenaphthene	ug/g dry	0.02	0.072 ug/g dry	7.9 ug/g dry	7.9 ug/g dry	ND (0.02)	N/A	0.02	N/A	ND (0.02)	N/A	ND (0.02)	ND (0.02)	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)		
Acenaphthylene	ug/g dry	0.02	0.093 ug/g dry	0.15 ug/g dry	0.15 ug/g dry	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)	ND (0.02)	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)		
Anthracene	ug/g dry	0.02	0.16 ug/g dry	0.67 ug/g dry	0.67 ug/g dry	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)	ND (0.02)	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)		
Benz[a]anthracene	ug/g dry	0.02	0.36 ug/g dry	0.5 ug/g dry	0.5 ug/g dry	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)	ND (0.02)	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)		
Benz[a]pyrene	ug/g dry	0.02	0.3 ug/g dry	0.3 ug/g dry	0.3 ug/g dry	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)	ND (0.02)	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)		
Benz[b]fluoranthene	ug/g dry	0.02	0.47 ug/g dry	0.78 ug/g dry	0.78 ug/g dry	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)	ND (0.02)	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)		
Benz[g,h,i]perylene	ug/g dry	0.02	0.68 ug/g dry	6.6 ug/g dry	6.6 ug/g dry	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)	ND (0.02)	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)		
Benz[k]fluoranthene	ug/g dry	0.02	0.48 ug/g dry	0.78 ug/g dry	0.78 ug/g dry	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)	ND (0.02)	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)		
Chrysene	ug/g dry	0.02	2.8 ug/g dry	7 ug/g dry	7 ug/g dry	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)	ND (0.02)	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)		
Dibenzo[a,h]anthracene	ug/g dry	0.02	0.1 ug/g dry	0.1 ug/g dry	0.1 ug/g dry	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)	ND (0.02)	ND (0.02)	N/A	ND (0.02)	N/A	ND (0.02)		
Fluoranthene	ug/g dry	0.02	0.56 ug/g dry	0.69 ug/g dry	0.69 ug/g dry	ND (0.02)</														

TABLE A1
SOIL ANALYTICAL RESULTS
CONTINUED

Sample Location:																			
2405, 2419 Mer Bleue Road																			
Sample ID: BH18-3 SA3 BH18-103 SA3 BH18-4 SA1 BH18-4 SA1 BH18-5 SA1 BH18-5 SA3 BH18-6 SA1 BH18-7 SA1 BH18-8 SA2 BH18-8 SA3 BH18-9 SA1 BH18-9 SA2 BH18-10 SA1 BH18-10 SA5																			
Laboratory Sample ID: 1815109-01 1815109-02 1815109-03 1816062-01 1815109-04 1815109-05 1815109-06 1815109-07 1815109-08 1815109-09 1815109-10 1815109-11 1815109-12 1815109-13																			
Date Sampled: 03/04/2018 03/04/2018 02/04/2018 02/04/2018 06/04/2018 06/04/2018 06/04/2018 06/04/2018 04/04/2018 04/04/2018 04/04/2018 04/04/2018 02/04/2018 02/04/2018 02/04/2018																			
Parameter	Units	RDL	MOECC Table 1*	MOECC Table 2**	MOECC Table 3***	BH18-3 SA3	BH18-103 SA3	BH18-4 SA1	BH18-4 SA1	BH18-5 SA1	BH18-5 SA3	BH18-6 SA1	BH18-7 SA1	BH18-8 SA2	BH18-8 SA3	BH18-9 SA1	BH18-9 SA2	BH18-10 SA1	BH18-10 SA5
Hexachloroethane	ug/g dry	-	0.01 ug/g dry	0.089 ug/g dry	0.089	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	<0.01	N/A	N/A	<0.01	N/A	N/A	N/A
Methoxychlor	ug/g dry	-	0.05 ug/g dry	0.13 ug/g dry	0.13	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	<0.01	N/A	N/A	<0.01	N/A	N/A	N/A
Mirex	ug/g dry	-	NS	NS	NS	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	<0.01	N/A	N/A	<0.01	N/A	N/A	N/A
Oxychlordane	ug/g dry	-	NS	NS	NS	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	<0.01	N/A	N/A	<0.01	N/A	N/A	N/A
β -BHC	ug/g dry	-	NS	NS	NS	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	<0.01	N/A	N/A	<0.01	N/A	N/A	N/A
α - Chlordane	ug/g dry	-	NS	NS	NS	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	<0.01	N/A	N/A	<0.01	N/A	N/A	N/A
$\alpha + \gamma$ - Chlordane	ug/g dry	-	0.05 ug/g dry	0.05 ug/g dry	0.05	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	<0.01	N/A	N/A	<0.01	N/A	N/A	N/A
α -BHC	ug/g dry	-	NS	NS	NS	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	<0.01	N/A	N/A	<0.01	N/A	N/A	N/A
γ - Chlordane	ug/g dry	-	NS	NS	NS	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	<0.01	N/A	N/A	<0.01	N/A	N/A	N/A
γ -BHC (Lindane)	ug/g dry	-	0.01 ug/g dry	0.056 ug/g dry	0.056	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	<0.01	N/A	N/A	<0.01	N/A	N/A	N/A
δ -BHC	ug/g dry	-	NS	NS	NS	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	<0.01	N/A	N/A	<0.01	N/A	N/A	N/A

Notes:

1 RDL - Reported Detection Limit

2 N/A - Not Analyzed

3 NS - No Standard

4 ND- Non-detect

5 * - Table 1: Full Depth Background Site Condition Standards (MOECC, April 15, 2011)

6 ** - Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition (MOECC, April 15, 2011)

7 *** - Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition (MOECC, April 15, 2011)

9 Underline - Exceeds MOECC Table 1 SCS

10 **Bold** - Exceeds MOECC Table 2 SCS

11 **Red** - Exceeds Table 3 SCS

12 *Italics* - Exceeds MOECC Table 4 SCS

TABLE A2
GROUNDWATER ANALYTICAL RESULTS

Parameter	Units	RDL			Sample Location:		2405, 2419 Mer Bleue Road				
			MOECC Table 2*	MOECC Table 3**	City of Ottawa Sanitary Sewer Guidelines***	City of Ottawa Storm Sewer Guidelines****	Sample ID:	BH 18-3	BH 18-4	BH 18-6	BH 18-9
							Laboratory Sample ID:	1815096-01	1815096-02	1815096-03	1815096-04
							Date Sampled:	4/9/2018	4/9/2018	4/9/2018	4/9/2018
General Inorganics											
Cyanide, free	ug/L	2	66 ug/L	66 ug/L	NS	NS	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
pH	pH Units	0.1	NS	NS	NS	NS	7.8	7.9	7.8	7.7	7.5
Anions											
Chloride	mg/L	1	790 mg/L	2300 mg/L	NS	NS	3540	2490	953	1830	2070
Metals											
Mercury	ug/L	0.1	0.29 ug/L	0.29 ug/L	1 ug/L	0.4 ug/L	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Antimony	ug/L	0.5	6 ug/L	20000 ug/L	5000 ug/L	NS	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Arsenic	ug/L	1	25 ug/L	1900 ug/L	1000 ug/L	20 ug/L	2	2	1	1	ND (1)
Barium	ug/L	1	1000 ug/L	29000 ug/L	NS	NS	112	151	72	131	211
Beryllium	ug/L	0.5	4 ug/L	67 ug/L	NS	NS	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Boron	ug/L	10	5000 ug/L	45000 ug/L	25000 ug/L	NS	381	720	237	320	216
Cadmium	ug/L	0.1	2.7 ug/L	2.7 ug/L	20 ug/L	8 ug/L	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.1
Chromium	ug/L	1	50 ug/L	810 ug/L	5000 ug/L	80 ug/L	ND (1)	2	ND (1)	ND (1)	ND (1)
Chromium (VI)	ug/L	10	25 ug/L	140 ug/L	NS	NS	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Cobalt	ug/L	0.5	3.8 ug/L	66 ug/L	5000 ug/L	NS	1.2	1.3	0.6	1.8	1.8
Copper	ug/L	0.5	87 ug/L	87 ug/L	3000 ug/L	40 ug/L	0.6	0.5	ND (0.5)	1.8	0.9
Lead	ug/L	0.1	10 ug/L	25 ug/L	5000 ug/L	120 ug/L	0.1	0.6	0.1	ND (0.1)	ND (0.1)
Molybdenum	ug/L	0.5	70 ug/L	9200 ug/L	5000 ug/L	NS	2.4	7.4	1.6	2.4	1.2
Nickel	ug/L	1	100 ug/L	490 ug/L	3000 ug/L	80 ug/L	4	2	1	4	5
Selenium	ug/L	1	10 ug/L	63 ug/L	5000 ug/L	20 ug/L	1	1	ND (1)	ND (1)	ND (1)
Silver	ug/L	0.1	1.5 ug/L	1.5 ug/L	5000 ug/L	120 ug/L	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Sodium	ug/L	200	490000 ug/L	2300000 ug/L	NS	NS	1900000	1650000	539000	ND (20000)	1100000
Thallium	ug/L	0.1	2 ug/L	510 ug/L	NS	NS	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Uranium	ug/L	0.1	20 ug/L	420 ug/L	NS	NS	4.7	0.4	1.8	4.9	4.3
Vanadium	ug/L	0.5	6.2 ug/L	250 ug/L	5000 ug/L	NS	3.4	2.7	1.2	1.2	0.8
Zinc	ug/L	5	1100 ug/L	1100 ug/L	3000 ug/L	40 ug/L	ND (5)	10	9	ND (5)	ND (5)
Volatiles											
Acetone	ug/L	5.0	2700 ug/L	130000 ug/L	NS	NS	N/A	ND (5.0)	N/A	N/A	9.4
Bromodichloromethane	ug/L	0.5	16 ug/L	85000 ug/L	350 ug/L	NS	N/A	ND (0.5)	N/A	N/A	ND (0.5)
Bromoform	ug/L	0.5	25 ug/L	380 ug/L	630 ug/L	NS	N/A	ND (0.5)	N/A	N/A	ND (0.5)
Bromomethane	ug/L	0.5	0.89 ug/L	5.6 ug/L	110 ug/L	NS	N/A	ND (0.5)	N/A	N/A	ND (0.5)
Carbon Tetrachloride	ug/L	0.2	0.79 ug/L	0.79 ug/L	57 ug/L	NS	N/A	ND (0.2)	N/A	N/A	ND (0.2)
Chlorobenzene	ug/L	0.5	30 ug/L	630 ug/L	57 ug/L	NS	N/A	ND (0.5)	N/A	N/A	ND (0.5)
Chloroform	ug/L	0.5	2.4 ug/L	2.4 ug/L	80 ug/L	2 ug/L	N/A	ND (0.5)	N/A	N/A	ND (0.5)
Dibromochloromethane	ug/L	0.5	25 ug/L	82000 ug/L	57 ug/L	NS	N/A	ND (0.5)	N/A	N/A	ND (0.5)
Dichlorodifluoromethane	ug/L	1.0	590 ug/L	4400 ug/L	NS	NS	N/A	ND (1.0)	N/A	N/A	ND (1.0)
1,2-Dichlorobenzene	ug/L	0.5	3 ug/L	4600 ug/L	88 ug/L	5.6 ug/L	N/A	ND (0.5)	N/A	N/A	ND (0.5)
1,3-Dichlorobenzene	ug/L	0.5	59 ug/L	9600 ug/L	36 ug/L	NS	N/A	ND (0.5)	N/A	N/A	ND (0.5)
1,4-Dichlorobenzene	ug/L	0.5	1 ug/L	8 ug/L	17 ug/L	6.8 ug/L	N/A	ND (0.5)	N/A	N/A	ND (0.5)
1,1-Dichloroethane	ug/L	0.5	5 ug/L	320 ug/L	200 ug/L	NS	N/A	ND (0.5)	N/A	N/A	ND (0.5)
1,2-Dichloroethane	ug/L	0.5	1.6 ug/L	1.6 ug/L	210 ug/L	NS	N/A	ND (0.5)	N/A	N/A	ND (0.5)
1,1-Dichloroethylene	ug/L	0.5	1.6 ug/L	1.6 ug/L	40 ug/L	NS	N/A	ND (0.5)	N/A	N/A	ND (0.5)
cis-1,2-Dichloroethylene	ug/L	0.5	1.6 ug/L	1.6 ug/L	200 ug/L	5.6 ug/L	N/A	ND (0.5)	N/A	N/A	ND (0.5)
trans-1,2-Dichloroethylene	ug/L	0.5	1.6 ug/L	1.6 ug/L	200 ug/L	NS	N/A	ND (0.5)	N/A	N/A	ND (0.5)
1,2-Dichloropropane	ug/L	0.5	5 ug/L	16 ug/L	850 ug/L	NS	N/A	ND (0.5)	N/A	N/A	ND (0.5)
cis-1,3-Dichloropropylene	ug/L	0.5	NS	NS	70 ug/L	NS	N/A	ND (0.5)	N/A	N/A	ND (0.5)
trans-1,3-Dichloropropylene	ug/L	0.5	NS	NS	70 ug/L	5.6 ug/L	N/A	ND (0.5)	N/A	N/A	ND (0.5)
1,3-Dichloropropene, total	ug/L	0.5	0.5 ug/L	5.2 ug/L	NS	NS	N/A	ND (0.5)	N/A	N/A	ND (0.5)

TABLE A2
GROUNDWATER ANALYTICAL RESULTS
CONTINUED

Parameter	Units	RDL			Sample Location:		2405, 2419 Mer Bleue Road					
			MOECC Table 2*	MOECC Table 3**	City of Ottawa Sanitary Sewer Guidelines***	City of Ottawa Storm Sewer Guidelines****	Sample ID:	BH 18-3	BH 18-4	BH 18-6	BH 18-9	BH 18-10
							Laboratory Sample ID:	1815096-01	1815096-02	1815096-03	1815096-04	1815096-05
							Date Sampled:	4/9/2018	4/9/2018	4/9/2018	4/9/2018	4/9/2018
Ethylene dibromide (dibromoethane, 1)	ug/L	0.2	0.2 ug/L	0.25 ug/L	28 ug/L	NS	N/A	ND (0.2)	N/A	N/A	ND (0.2)	
Hexane	ug/L	1.0	51 ug/L	51 ug/L	NS	NS	N/A	ND (1.0)	N/A	N/A	ND (1.0)	
Methyl Ethyl Ketone (2-Butanone)	ug/L	5.0	1800 ug/L	470000 ug/L	NS	NS	N/A	ND (5.0)	N/A	N/A	ND (5.0)	
Methyl Isobutyl Ketone	ug/L	5.0	640 ug/L	140000 ug/L	NS	NS	N/A	ND (5.0)	N/A	N/A	ND (5.0)	
Methyl tert-butyl ether	ug/L	2.0	15 ug/L	190 ug/L	NS	NS	N/A	ND (2.0)	N/A	N/A	ND (2.0)	
Methylene Chloride	ug/L	5.0	50 ug/L	610 ug/L	211 ug/L	5.2 ug/L	N/A	ND (5.0)	N/A	N/A	ND (5.0)	
Styrene	ug/L	0.5	5.4 ug/L	1300 ug/L	40 ug/L	NS	N/A	ND (0.5)	N/A	N/A	ND (0.5)	
1,1,1,2-Tetrachloroethane	ug/L	0.5	1.1 ug/L	3.3 ug/L	NS	NS	N/A	ND (0.5)	N/A	N/A	ND (0.5)	
1,1,2,2-Tetrachloroethane	ug/L	0.5	1 ug/L	3.2 ug/L	40 ug/L	17 ug/L	N/A	ND (0.5)	N/A	N/A	ND (0.5)	
Tetrachloroethylene	ug/L	0.5	1.6 ug/L	1.6 ug/L	50 ug/L	4.4 ug/L	N/A	ND (0.5)	N/A	N/A	ND (0.5)	
1,1,1-Trichloroethane	ug/L	0.5	200 ug/L	640 ug/L	54 ug/L	NS	N/A	ND (0.5)	N/A	N/A	ND (0.5)	
1,1,2-Trichloroethane	ug/L	0.5	4.7 ug/L	4.7 ug/L	800 ug/L	NS	N/A	ND (0.5)	N/A	N/A	ND (0.5)	
Trichloroethylene	ug/L	0.5	1.6 ug/L	1.6 ug/L	54 ug/L	7.6 ug/L	N/A	ND (0.5)	N/A	N/A	ND (0.5)	
Trichlorofluoromethane	ug/L	1.0	150 ug/L	2500 ug/L	20 ug/L	NS	N/A	ND (1.0)	N/A	N/A	ND (1.0)	
Vinyl Chloride	ug/L	0.5	0.5 ug/L	0.5 ug/L	400 ug/L	NS	N/A	ND (0.5)	N/A	N/A	ND (0.5)	
Benzene	ug/L	0.5	5 ug/L	44 ug/L	10 ug/L	2 ug/L	ND (0.5)	ND (0.5)	N/A	ND (0.5)	ND (0.5)	
Ethylbenzene	ug/L	0.5	2.4 ug/L	2300 ug/L	57 ug/L	2 ug/L	ND (0.5)	ND (0.5)	N/A	ND (0.5)	ND (0.5)	
Toluene	ug/L	0.5	24 ug/L	18000 ug/L	80 ug/L	2 ug/L	ND (0.5)	ND (0.5)	N/A	ND (0.5)	ND (0.5)	
m/p-Xylene	ug/L	0.5	NS	NS	NS	NS	ND (0.5)	ND (0.5)	N/A	ND (0.5)	ND (0.5)	
o-Xylene	ug/L	0.5	NS	NS	NS	NS	ND (0.5)	ND (0.5)	N/A	ND (0.5)	ND (0.5)	
Xylenes, total	ug/L	0.5	300 ug/L	4200 ug/L	320 ug/L	4.4 ug/L	ND (0.5)	ND (0.5)	N/A	ND (0.5)	ND (0.5)	
Hydrocarbons												
F1 PHCs (C6-C10)	ug/L	25	750 ug/L	750 ug/L	NS	NS	ND (25)	ND (25)	N/A	ND (25)	ND (25)	
F2 PHCs (C10-C16)	ug/L	100	150 ug/L	150 ug/L	NS	NS	ND (100)	ND (100)	N/A	ND (100)	ND (100)	
F3 PHCs (C16-C34)	ug/L	100	500 ug/L	500 ug/L	NS	NS	ND (100)	ND (100)	N/A	ND (100)	ND (100)	
F4 PHCs (C34-C50)	ug/L	100	500 ug/L	500 ug/L	NS	NS	ND (100)	ND (100)	N/A	ND (100)	ND (100)	
Semi-Volatiles												
Acenaphthene	ug/L	0.05	4.1 ug/L	600 ug/L	NS	NS	0.08	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	
Acenaphthylene	ug/L	0.05	1 ug/L	1.8 ug/L	NS	NS	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	
Anthracene	ug/L	0.01	2.4 ug/L	2.4 ug/L	NS	NS	0.13	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	
Benz[a]anthracene	ug/L	0.01	1 ug/L	4.7 ug/L	NS	NS	0.23	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	
Benzo[a]pyrene	ug/L	0.01	0.01 ug/L	0.81 ug/L	NS	NS	0.17	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	
Benzo[b]fluoranthene	ug/L	0.05	0.1 ug/L	0.75 ug/L	NS	NS	0.09	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	
Benzo[g,h,i]perylene	ug/L	0.05	0.2 ug/L	0.2 ug/L	NS	NS	0.12	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	
Benzo[k]fluoranthene	ug/L	0.05	0.1 ug/L	0.4 ug/L	NS	NS	0.06	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	
Chrysene	ug/L	0.05	0.1 ug/L	1 ug/L	NS	NS	0.36	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	
Dibenzo[a,h]anthracene	ug/L	0.05	0.2 ug/L	0.52 ug/L	NS	NS	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	
Fluoranthene	ug/L	0.01	0.41 ug/L	130 ug/L	NS	NS	0.99	ND (0.01)	ND (0.01)	0.10	ND (0.01)	
Fluorene	ug/L	0.05	120 ug/L	400 ug/L	59 ug/L	NS	0.09	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	
Indeno[1,2,3-cd]pyrene	ug/L	0.05	0.2 ug/L	0.2 ug/L	NS	NS	0.10	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	
1-Methylnaphthalene	ug/L	0.05	3.2 ug/L	1800 ug/L	32 ug/L	NS	0.09	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	
2-Methylnaphthalene	ug/L	0.05	3.2 ug/L	1800 ug/L	22 ug/L	NS	0.16	0.07	ND (0.05)	ND (0.05)	ND (0.05)	
Methylnaphthalene (1&2)	ug/L	0.10	3.2 ug/L	1800 ug/L	NS	NS	0.25	0.11	ND (0.10)	ND (0.10)	ND (0.10)	
Naphthalene	ug/L	0.05	11 ug/L	1400 ug/L	59 ug/L	6.4 ug/L	0.14	0.07	ND (0.05)	ND (0.05)	ND (0.05)	
Phenanthrene	ug/L	0.05	1 ug/L	580 ug/L	NS	NS	0.74	0.06	ND (0.05)	0.05	ND (0.05)	
Pyrene	ug/L	0.01	4.1 ug/L	68 ug/L	NS	NS	0.71	ND (0.01)	ND (0.01)	0.06	ND (0.01)	
OC Pesticides												
Aldrin	ug/L	0.01	0.35 ug/L	8.5 ug/L	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A	
alpha-Chlordane	ug/L	0.01	NS	NS	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A	

TABLE A2
GROUNDWATER ANALYTICAL RESULTS
CONTINUED

Parameter	Units	RDL					Sample Location:		2405, 2419 Mer Bleue Road				
			MOECC Table 2*	MOECC Table 3**	City of Ottawa Sanitary Sewer Guidelines***	City of Ottawa Storm Sewer Guidelines****	Sample ID:	BH 18-3	BH 18-4	BH 18-6	BH 18-9	BH 18-10	
							Laboratory Sample ID:	1815096-01	1815096-02	1815096-03	1815096-04	1815096-05	
							Date Sampled:	4/9/2018	4/9/2018	4/9/2018	4/9/2018	4/9/2018	
gamma-Chlordane	ug/L	0.01	NS	NS	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
Chlordane	ug/L	0.01	7 ug/L	28 ug/L	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
<i>o,p-DDD</i>	ug/L	0.01	NS	NS	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
<i>p,p-DDD</i>	ug/L	0.01	NS	NS	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
DDD	ug/L	0.01	10 ug/L	45 ug/L	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
<i>o,p-DDE</i>	ug/L	0.01	NS	NS	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
<i>p,p-DDE</i>	ug/L	0.01	NS	NS	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
DDE	ug/L	0.01	10 ug/L	20 ug/L	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
<i>o,p-DDT</i>	ug/L	0.01	NS	NS	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
<i>p,p-DDT</i>	ug/L	0.01	NS	NS	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
DDT	ug/L	0.01	2.8 ug/L	2.8 ug/L	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
Dieldrin	ug/L	0.01	0.35 ug/L	0.75 ug/L	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
Endosulfan I	ug/L	0.01	NS	NS	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
Endosulfan II	ug/L	0.01	NS	NS	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
Endosulfan I/II	ug/L	0.01	1.5 ug/L	1.5 ug/L	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
Endrin	ug/L	0.01	0.48 ug/L	0.48 ug/L	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
Heptachlor	ug/L	0.01	1.5 ug/L	2.5 ug/L	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
Heptachlor Epoxide	ug/L	0.01	0.048 ug/L	0.048 ug/L	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
Hexachlorobenzene	ug/L	0.01	1 ug/L	3.1 ug/L	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
Hexachlorobutadiene	ug/L	0.01	0.44 ug/L	0.44 ug/L	NS	NS	N/A	N/A	0.07	ND (0.01)	N/A		
G-BHC (LINDANE)	ug/L	0.01	1.2 ug/L	1.2 ug/L	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
Hexachloroethane	ug/L	0.01	2.1 ug/L	94 ug/L	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		
Methoxychlor	ug/L	0.01	6.5 ug/L	6.5 ug/L	NS	NS	N/A	N/A	ND (0.01)	ND (0.01)	N/A		

Notes:

1 RDL - Reported Detection Limit

2 N/A - Not Analyzed

3 NS - No Standard

4 ND- Non-detect

5 * - Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition (MOECC, April 15, 2011)

6 ** - Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition (MOECC, April 15, 2011)

7 *** - City of Ottawa Sanitary Sewer Use Guideline (By-Law No. 2003-514)

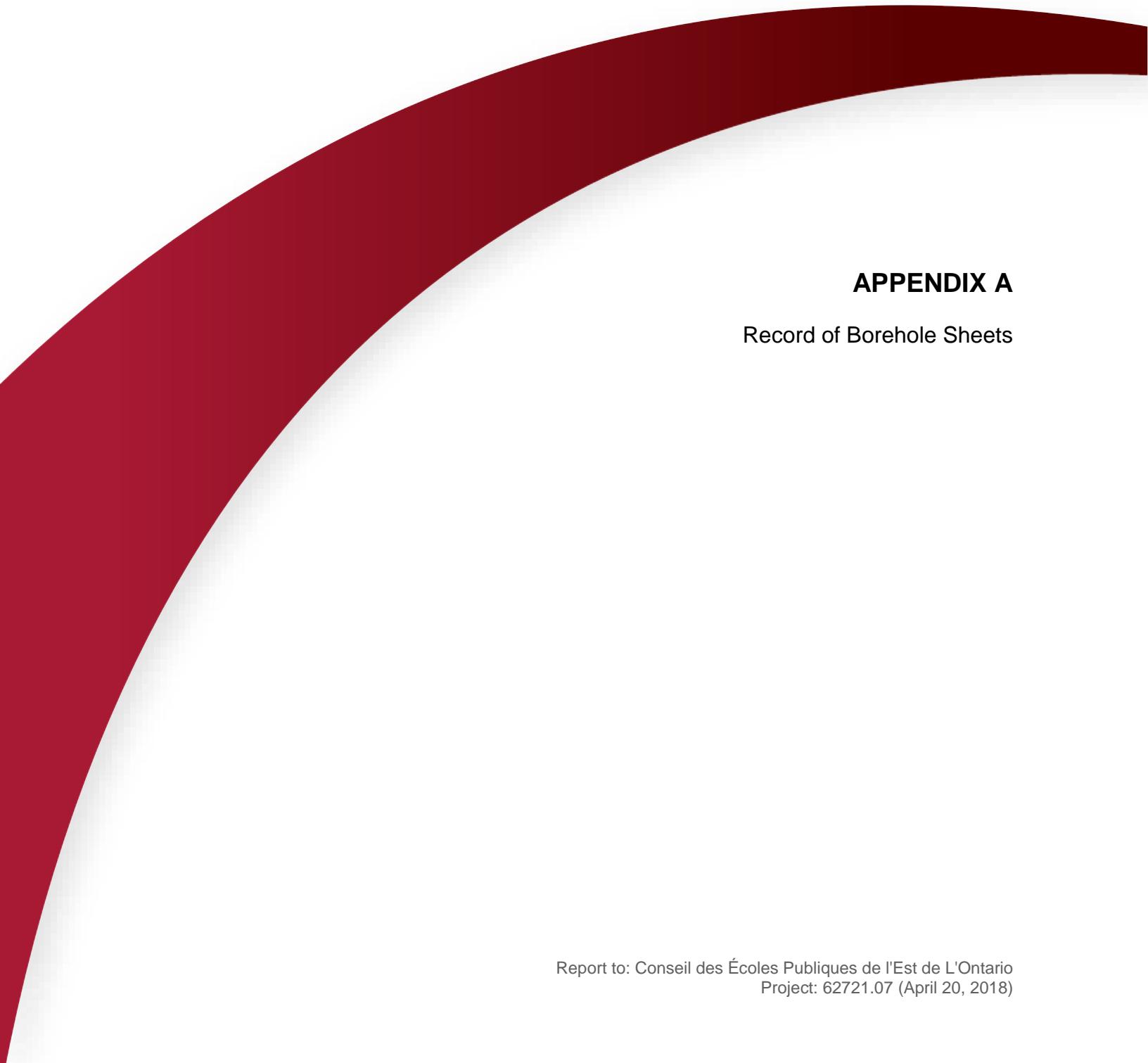
8 **** - City of Ottawa Storm Sewer Use Guideline (By-Law No. 2003-514)

9 *Italicized* - Exceeds MOECC Table 2 SCS

10 **Red** - Exceeds Table 3 SCS

11 Underlined - Exceeds Ottawa Sanitary Sewer Guidelines

12 **Bold** - Exceeds Ottawa Storm Sewer Guidelines



APPENDIX A

Record of Borehole Sheets

RECORD OF BOREHOLE 18-1

CLIENT: _____
PROJECT: _____
JOB#: _____
LOCATION: See Borehole Location Plan, Figure 2

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: April 3, 2018



LOGGED: M.L.

CHECKED:

RECORD OF BOREHOLE 18-2

CLIENT:
PROJECT:
JOB#:
LOCATION: See Borehole Location Plan, Figure 2

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: April 3, 2018

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLE DATA				LABORATORY ANALYSES	COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)	MONITORING WELL INSTALLATION AND NOTES	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOW/S/0.3m	RECOVERY (mm)						
0		Ground Surface		88.03										
1		Dark brown silty sand, trace clay with organics (FILL MATERIAL)			1	50 DO	5							
1				86.66	2	50 DO	8							
1.37		Dark brown sandy silt with organic material (TOPSOIL)		86.41	3	50 DO	9							
1.62		Very stiff, brown SILTY CLAY (Weathered Crust)			4	50 DO	4							
2					5	50 DO	3							
3					6	50 DO	2							
4	Power Auger	Firm to soft, grey SILTY CLAY		84.22	7	50 DO	WH for 0.3 metres							
4	200 mm Diameter Hollow Stem			3.81	8	50 DO	WH for 0.3 metres							
5					9	TW								
6														
7														
8														
9														
10		End of Borehole		77.66										
				10.37										
GROUNDWATER OBSERVATIONS														
DATE	TIME	DEPTH (m)	ELEVATION (m)											
Apr. 09/18	00:00	1.40	86.63											
Apr. 18/18	00:00	0.92	87.11											

RECORD OF BOREHOLE 18-3

CLIENT:
PROJECT:
JOB#:
LOCATION: See Borehole Location Plan, Figure 2

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: April 3, 2018

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLE DATA				LABORATORY ANALYSES	COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)	MONITORING WELL INSTALLATION AND NOTES
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOW/S 0.3m	RECOVERY (mm)					
0		Ground Surface		87.35									
0		Grey brown silty clay, some sand and gravel (FILL MATERIAL)		86.74	1	50 DO	15						
1		Very stiff, brown SILTY CLAY (Weathered Crust)		86.74 0.61	2	50 DO	12			0			
2					3	50 DO	3			30			
3		Firm to soft, grey SILTY CLAY		84.30 3.05	4	50 DO	2			0			
3	Power Auger 200 mm Diameter Hollow Stem				5	50 DO	WH for 0.3 metres			0			
4					6	TW				0			
5					7	50 DO	WH for 0.3 metres			0			
6					8	50 DO	WH for 0.3 metres			0			
7					9	50 DO	WH for 0.3 metres						
8													
9													
10		End of Borehole		76.98 10.37									
GROUNDWATER OBSERVATIONS													
DATE	TIME	DEPTH (m)	ELEVATION (m)										
Apr. 09/18	00:00	2.00	85.35										
Apr. 18/18	00:00	0.15	87.20										

RECORD OF BOREHOLE 18-4

CLIENT:
PROJECT:
JOB#:
LOCATION: See Borehole Location Plan, Figure 2

SHEET: 1 OF 2
DATUM: Geodetic
BORING DATE: April 2, 2018

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLE DATA				LABORATORY ANALYSES	COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)	MONITORING WELL INSTALLATION AND NOTES	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOW/S 0.3m	RECOVERY (mm)						
0		Ground Surface		87.84										
1		Dark brown silty sand, gravel, fragments of asphalt and other debris (FILL MATERIAL)		86.47										
2		Very stiff, brown SILTY CLAY (Weathered Crust)		86.47 1.37	1	50 DO	25			0				Protective flushmount casing
3		Firm to soft, grey SILTY CLAY		84.79 3.05	2	50 DO	12			0				Bentonite seal
4	Power Auger				3	50 DO	4			0				
5	200 mm Diameter Hollow Stem				4	50 DO	1			0				
6					5	50 DO	WH for 0.3 metres							Filter sand
7					6	50 DO	WH for 0.3 metres							TOP OF SCREEN ELEV.: 82.66 m
8					7	50 DO	WH for 0.3 metres							50 mm diameter, 3.05 metres long well screen
9														BOTTOM OF SCREEN ELEV.: 78.70 m
10		End of Borehole		77.47 10.37										Soil cuttings
GROUNDWATER OBSERVATIONS														
DATE	TIME	DEPTH (m)	ELEVATION (m)											
Apr. 09/18	00:00	1.20	86.64											
Apr. 18/18	00:00	0.76	87.08											

RECORD OF BOREHOLE 18-5

CLIENT:
PROJECT:
JOB#:
LOCATION: See Borehole Location Plan, Figure 2

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: April 6, 2018

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLE DATA				LABORATORY ANALYSES	COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)	MONITORING WELL INSTALLATION AND NOTES	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOW/S 0.3m	RECOVERY (mm)						
0		Ground Surface		86.84										
0		Brown SILTY CLAY, trace sand with organics		86.23	1	50 DO	4		PAHs, metals and inorganics, and OC pesticides					
1		Very stiff, brown SILTY CLAY Weathered Crust)		86.61	2	50 DO	6		PHCs, and BTEX	0				
2					3	50 DO	4			10				
3		Firm to soft, grey SILTY CLAY		84.10	4	50 DO	2			0				
3				84.74	5	50 DO	WH for 300 mm			5				
4					6	50 DO	WH for 300 mm			0				
5					7	50 DO	WH for 300 mm			0				
6					8	TW								
7														
8														
9														
10														
		End of Borehole		76.47										
				10.37										
GROUNDWATER OBSERVATIONS														
DATE	TIME	DEPTH (m)	ELEVATION (m)											
Apr. 09/18	00:00	3.30	83.54											
Apr. 18/18	00:00	1.21	85.63											

RECORD OF BOREHOLE 18-6

CLIENT:
PROJECT:
JOB#:
LOCATION: See Borehole Location Plan, Figure 2

SHEET: 1 OF 2
DATUM: Geodetic
BORING DATE: April 6, 2018

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLE DATA				LABORATORY ANALYSES	COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)	MONITORING WELL INSTALLATION AND NOTES	
		DESCRIPTION	STRATA PILOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOW/S 0.3m	RECOVERY (mm)						
0		Ground Surface		86.77										
0		Brown SILTY CLAY, trace sand with organics		86.16	1	50 DO	3		PAHs, metals and inorganics, and OC Pesticides					
1		Very stiff, brown SILTY CLAY (Weathered Crust)		86.01	2	50 DO	7			0				Bentonite seal
2		Firm to soft, grey SILTY CLAY		84.48	3	50 DO	5			5				
3				84.29	4	50 DO	WH for 300 mm			0				Filter sand TOP OF SCREEN ELEV.: 84.64 m
4	Power Auger				5	50 DO	WH for 300 mm			0				50 mm diameter, 3.05 metres long well screen
5	200 mm Diameter Hollow Stem				6	50 DO	WH for 300 mm			0				BOTTOM OF SCREEN ELEV.: 81.59 m
6					7	TW								Soil cuttings
7														
8														
9														
10		End of Borehole		77.02										
				9.75										
GROUNDWATER OBSERVATIONS														
DATE	TIME	DEPTH (m)	ELEVATION (m)											
Apr. 09/18	00:00	6.40	80.37											
Apr. 18/18	00:00	0.14	86.63											

RECORD OF BOREHOLE 18-7

CLIENT: _____
PROJECT: _____
JOB#: _____
LOCATION: See Borehole Location Plan, Figure 2

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: April 4, 2018



LOGGED: M.L.

CHECKED:

RECORD OF BOREHOLE 18-8

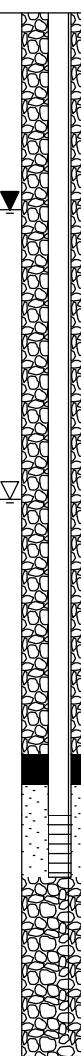
CLIENT:
PROJECT:
JOB#:
LOCATION: See Borehole Location Plan, Figure 2

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: April 4, 2018

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLE DATA				LABORATORY ANALYSES	COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)	MONITORING WELL INSTALLATION AND NOTES
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOW/S 0.3m	RECOVERY (mm)					
0		Ground Surface		86.87									
0		Brown SILTY CLAY, trace sand with organics		86.11	1	50 DO	2						
1		Very stiff, brown SILTY CLAY (Weathered Crust)		86.11 0.76	2	50 DO	6			0			
2		Firm to soft, grey SILTY CLAY		84.58 2.29	3	50 DO	WH for 300 mm			10			
3					4	50 DO	WH for 300 mm			0			
4	Power Auger				5	50 DO	WH for 300 mm			5			
5	200 mm Diameter Hollow Stem				6	50 DO	WH for 300 mm			5			
6													
7													
8													
9													
10		End of Borehole		76.81 10.06									
GROUNDWATER OBSERVATIONS													
DATE	TIME	DEPTH (m)	ELEVATION (m)										
Apr. 09/18	00:00	4.80	82.07										
Apr. 18/18	00:00	1.94	84.93										

Soil cuttings

Bentonite Seal
Filter sand
TOP OF SCREEN
ELEV.: 78.95 m
22 mm diameter, 0.6
metres long well screen
BOTTOM OF SCREEN
ELEV.: 78.34 m



RECORD OF BOREHOLE 18-9

CLIENT:
PROJECT:
JOB#:
LOCATION: See Borehole Location Plan, Figure 2

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: April 2, 2018

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLE DATA				LABORATORY ANALYSES	COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)	MONITORING WELL INSTALLATION AND NOTES	
		DESCRIPTION	STRATA PILOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOW/S 0.3m	RECOVERY (mm)						
0		Ground Surface		87.31 87.21 0.10	1	50 DO	6		PAHs, metals and inorganics, and OC pesticides	0				
1		Brown SILTY CLAY, trace sand with organics			2	50 DO	8		PHCs, and BTEX	0				
2		Very stiff, brown SILTY CLAY (Weathered Crust)			3	50 DO	4							
3	Power Auger 200 mm Diameter Hollow Stem			84.26 3.05	4	50 DO	2							
4		Firm to soft, grey SILTY CLAY		82.74	5	50 DO	WH for 300 mm			5				
		End of Borehole		4.57	6	50 DO	2			0				
GROUNDWATER OBSERVATIONS														
DATE	TIME	DEPTH (m)	ELEVATION (m)											
Apr. 09/18	00:00	0.70	86.61											
Apr. 18/18	00:00	0.08	87.23											

RECORD OF BOREHOLE 18-10

CLIENT:
PROJECT:
JOB#:
LOCATION: See Borehole Location Plan, Figure 2

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: April 2, 2018

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLE DATA				LABORATORY ANALYSES	COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)	MONITORING WELL INSTALLATION AND NOTES	
		DESCRIPTION	STRATA PILOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOW/S 0.3m	RECOVERY (mm)						
0		Ground Surface		87.41 87.31	1	50 DO	4		PHCs, VOCs, PAHs, and metals and inorganics					
1		Brown SILTY CLAY, trace sand with organics		85.12 2.29	2	50 DO	9			0				
2		Very stiff, brown SILTY CLAY (Weathered Crust)			3	50 DO	4			0				
3	Power Auger 200 mm Diameter Hollow Stem	Firm to soft, grey SILTY CLAY			4	50 DO	3			0				
4				82.84	5	50 DO	WH for 300 mm		PHCs, and VOCs	10				
					6	50 DO	WH for 300 mm			0				
		End of Borehole		4.57										
GROUNDWATER OBSERVATIONS														
DATE	TIME	DEPTH (m)	ELEVATION (m)											
Apr. 09/18	00:00	0.50	86.91											
Apr. 18/18	00:00	0.31	87.10											

APPENDIX B

Laboratory Certificates of Analysis Soil Samples

Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited

32 Steacie Drive
Kanata, ON K2K 2A9
Attn: Nicole Soucy

Client PO:

Project: 62721.07
Custody: 42094/42093

Report Date: 13-Apr-2018
Order Date: 9-Apr-2018

Order #: 1815109

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

Paracel ID	Client ID
1815109-01	BH18-3 SA3
1815109-02	BH18-103 SA3
1815109-03	BH18-4 SA1
1815109-04	BH18-5 SA1
1815109-05	BH18-5 SA3
1815109-06	BH18-6 SA1
1815109-07	BH18-7 SA1
1815109-08	BH18-8 SA2
1815109-09	BH18-8 SA3
1815109-10	BH18-9 SA1
1815109-11	BH18-9 SA2
1815109-12	BH18-10 SA1
1815109-13	BH18-10 SA5

Approved By:



Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 13-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	11-Apr-18	11-Apr-18
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	10-Apr-18	11-Apr-18
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	10-Apr-18	11-Apr-18
Conductivity	MOE E3138 - probe @25 °C, water ext	10-Apr-18	10-Apr-18
Cyanide, free	MOE E3015 - Auto Colour, water extraction	10-Apr-18	10-Apr-18
Mercury by CVAA	EPA 7471B - CVAA, digestion	11-Apr-18	11-Apr-18
Metals, ICP-MS	EPA 6020 - Digestion - ICP-MS	10-Apr-18	10-Apr-18
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	10-Apr-18	10-Apr-18
PHC F1	CWS Tier 1 - P&T GC-FID	10-Apr-18	11-Apr-18
PHC F4G (gravimetric)	CWS Tier 1 - Extraction Gravimetric	13-Apr-18	13-Apr-18
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	10-Apr-18	11-Apr-18
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	10-Apr-18	12-Apr-18
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	10-Apr-18	11-Apr-18
SAR	Calculated	11-Apr-18	11-Apr-18
Solids, %	Gravimetric, calculation	11-Apr-18	11-Apr-18

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 13-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

Client ID:	BH18-3 SA3	BH18-103 SA3	BH18-4 SA1	BH18-5 SA1
Sample Date:	04/03/2018 09:00	04/03/2018 09:00	04/02/2018 09:00	04/06/2018 09:00
Sample ID:	1815109-01	1815109-02	1815109-03	1815109-04
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	68.8	69.6	83.9	72.5
----------	--------------	------	------	------	------

General Inorganics

SAR	0.01 N/A	3.49	-	6.23	2.70
Conductivity	5 uS/cm	291	-	888	435
Cyanide, free	0.03 ug/g dry	<0.03	-	<0.03	<0.12 [1]
pH	0.05 pH Units	7.76	-	8.91	7.94

Metals

Antimony	1 ug/g dry	<1	-	<1	<1
Arsenic	1 ug/g dry	2	-	1	1
Barium	1 ug/g dry	157	-	101	112
Beryllium	0.5 ug/g dry	1.1	-	<0.5	0.6
Boron	5.0 ug/g dry	20.8	-	14.7	12.0
Boron, available	0.5 ug/g dry	<0.5	-	1.7	<0.5
Cadmium	0.5 ug/g dry	<0.5	-	<0.5	<0.5
Chromium	5 ug/g dry	80	-	28	54
Chromium (VI)	0.2 ug/g dry	<0.2	-	<0.2	<0.2
Cobalt	1 ug/g dry	16	-	7	9
Copper	5 ug/g dry	35	-	13	18
Lead	1 ug/g dry	10	-	11	10
Mercury	0.1 ug/g dry	<0.1	-	<0.1	<0.1
Molybdenum	1 ug/g dry	<1	-	<1	<1
Nickel	5 ug/g dry	48	-	17	26
Selenium	1 ug/g dry	<1	-	<1	<1
Silver	0.3 ug/g dry	<0.3	-	<0.3	<0.3
Thallium	1 ug/g dry	<1	-	<1	<1
Uranium	1 ug/g dry	<1	-	<1	2
Vanadium	10 ug/g dry	58	-	29	42
Zinc	20 ug/g dry	68	-	38	52

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	-

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 13-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

	Client ID: Sample Date: Sample ID: MDL/Units	BH18-3 SA3 04/03/2018 09:00 1815109-01 Soil	BH18-103 SA3 04/03/2018 09:00 1815109-02 Soil	BH18-4 SA1 04/02/2018 09:00 1815109-03 Soil	BH18-5 SA1 04/06/2018 09:00 1815109-04 Soil
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	-
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 (dibromoethane)	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	-

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 13-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

	Client ID: Sample Date: Sample ID: MDL/Units	BH18-3 SA3 04/03/2018 09:00 1815109-01 Soil	BH18-103 SA3 04/03/2018 09:00 1815109-02 Soil	BH18-4 SA1 04/02/2018 09:00 1815109-03 Soil	BH18-5 SA1 04/06/2018 09:00 1815109-04 Soil
4-Bromofluorobenzene	Surrogate	105%	-	105%	-
Dibromofluoromethane	Surrogate	95.3%	-	94.8%	-
Toluene-d8	Surrogate	98.8%	-	98.6%	-
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	-	99.8%	-	-

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	-
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	66	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	180 [2]	-
F4G PHCs (gravimetric)	50 ug/g dry	-	-	1130	-

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	-	0.06	<0.02
Fluorene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
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	-	0.04	<0.01
Phenanthrene	0.02 ug/g dry	<0.02	-	0.08	<0.02
Pyrene	0.02 ug/g dry	<0.02	-	0.05	<0.02
2-Fluorobiphenyl	Surrogate	82.1%	-	88.4%	111%

Certificate of Analysis

Report Date: 13-Apr-2018

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 9-Apr-2018

Client PO:
Project Description: 62721.07

	Client ID: BH18-3 SA3	Sample Date: 04/03/2018 09:00	BH18-103 SA3	BH18-4 SA1	BH18-5 SA1
	Sample ID: 1815109-01		04/03/2018 09:00	04/02/2018 09:00	04/06/2018 09:00
	MDL/Units Soil		1815109-02	1815109-03	1815109-04
Terphenyl-d14	Surrogate	96.5%	-	186% [4]	109%

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 13-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

Client ID:	BH18-5 SA3	BH18-6 SA1	BH18-7 SA1	BH18-8 SA2
Sample Date:	04/06/2018 09:00	04/06/2018 09:00	04/04/2018 09:00	04/04/2018 09:00
Sample ID:	1815109-05	1815109-06	1815109-07	1815109-08
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	71.7	69.8	70.7	75.4
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General Inorganics

SAR	0.01 N/A	-	1.30	1.31	1.65
Conductivity	5 uS/cm	-	209	204	303
Cyanide, free	0.03 ug/g dry	-	<0.12 [1]	<0.12 [1]	<0.03
pH	0.05 pH Units	-	6.89	7.23	7.55

Metals

Antimony	1 ug/g dry	-	<1	<1	<1
Arsenic	1 ug/g dry	-	<1	<1	1
Barium	1 ug/g dry	-	111	132	177
Beryllium	0.5 ug/g dry	-	0.7	0.7	0.8
Boron	5.0 ug/g dry	-	10.7	10.8	11.1
Boron, available	0.5 ug/g dry	-	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	-	<0.5	<0.5	<0.5
Chromium	5 ug/g dry	-	51	61	84
Chromium (VI)	0.2 ug/g dry	-	<0.2	<0.2	<0.2
Cobalt	1 ug/g dry	-	9	12	16
Copper	5 ug/g dry	-	16	22	33
Lead	1 ug/g dry	-	10	9	9
Mercury	0.1 ug/g dry	-	<0.1	<0.1	<0.1
Molybdenum	1 ug/g dry	-	<1	<1	<1
Nickel	5 ug/g dry	-	25	32	47
Selenium	1 ug/g dry	-	<1	<1	<1
Silver	0.3 ug/g dry	-	<0.3	<0.3	<0.3
Thallium	1 ug/g dry	-	<1	<1	<1
Uranium	1 ug/g dry	-	2	2	<1
Vanadium	10 ug/g dry	-	40	48	63
Zinc	20 ug/g dry	-	52	53	67

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	-	-	-

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 13-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

	Client ID: Sample Date: Sample ID: MDL/Units	BH18-5 SA3 04/06/2018 09:00 1815109-05 Soil	BH18-6 SA1 04/06/2018 09:00 1815109-06 Soil	BH18-7 SA1 04/04/2018 09:00 1815109-07 Soil	BH18-8 SA2 04/04/2018 09:00 1815109-08 Soil
Toluene-d8	Surrogate	99.2%	-	-	-
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	-	-	-
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
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	-	108%	119%	98.4%
Terphenyl-d14	Surrogate	-	112%	114%	103%

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 13-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

Client ID:	BH18-8 SA3	BH18-9 SA1	BH18-9 SA2	BH18-10 SA1
Sample Date:	04/04/2018 09:00	04/02/2018 09:00	04/02/2018 09:00	04/02/2018 09:00
Sample ID:	1815109-09	1815109-10	1815109-11	1815109-12
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	70.9	79.7	71.3	61.5
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General Inorganics

SAR	0.01 N/A	-	0.12	-	0.23
Conductivity	5 uS/cm	-	179	-	215
Cyanide, free	0.03 ug/g dry	-	<0.03	-	<0.06 [1]
pH	0.05 pH Units	-	8.13	-	7.35

Metals

Antimony	1 ug/g dry	-	<1	-	<1
Arsenic	1 ug/g dry	-	1	-	1
Barium	1 ug/g dry	-	133	-	77
Beryllium	0.5 ug/g dry	-	0.6	-	<0.5
Boron	5.0 ug/g dry	-	11.2	-	8.0
Boron, available	0.5 ug/g dry	-	<0.5	-	<0.5
Cadmium	0.5 ug/g dry	-	<0.5	-	<0.5
Chromium	5 ug/g dry	-	57	-	32
Chromium (VI)	0.2 ug/g dry	-	<0.2	-	<0.2
Cobalt	1 ug/g dry	-	11	-	7
Copper	5 ug/g dry	-	24	-	15
Lead	1 ug/g dry	-	15	-	18
Mercury	0.1 ug/g dry	-	<0.1	-	<0.1
Molybdenum	1 ug/g dry	-	<1	-	<1
Nickel	5 ug/g dry	-	33	-	19
Selenium	1 ug/g dry	-	<1	-	<1
Silver	0.3 ug/g dry	-	<0.3	-	<0.3
Thallium	1 ug/g dry	-	<1	-	<1
Uranium	1 ug/g dry	-	1	-	<1
Vanadium	10 ug/g dry	-	44	-	29
Zinc	20 ug/g dry	-	69	-	43

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

Certificate of Analysis
Client: GEMTEC Consulting Engineers and Scientists Limited
Client PO:

Report Date: 13-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

	Client ID: Sample Date: Sample ID: MDL/Units	BH18-8 SA3 04/04/2018 09:00 1815109-09 Soil	BH18-9 SA1 04/02/2018 09:00 1815109-10 Soil	BH18-9 SA2 04/02/2018 09:00 1815109-11 Soil	BH18-10 SA1 04/02/2018 09:00 1815109-12 Soil
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
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

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 13-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

	Client ID: Sample Date: Sample ID: MDL/Units	BH18-8 SA3 04/04/2018 09:00 1815109-09 Soil	BH18-9 SA1 04/02/2018 09:00 1815109-10 Soil	BH18-9 SA2 04/02/2018 09:00 1815109-11 Soil	BH18-10 SA1 04/02/2018 09:00 1815109-12 Soil
Xylenes, total	0.05 ug/g dry	-	-	-	<0.05
4-Bromofluorobenzene	Surrogate	-	-	-	101%
Dibromofluoromethane	Surrogate	-	-	-	110%
Toluene-d8	Surrogate	-	-	-	98.8%
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	-	-	99.5%	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	-	-	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	-	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	-	<8	<8
F4 PHCs (C34-C50)	6 ug/g dry	<6	-	<6	<6
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	-	<0.02	-	<0.02
Acenaphthylene	0.02 ug/g dry	-	<0.02	-	<0.02
Anthracene	0.02 ug/g dry	-	<0.02	-	<0.02
Benzo [a] anthracene	0.02 ug/g dry	-	<0.02	-	<0.02
Benzo [a] pyrene	0.02 ug/g dry	-	<0.02	-	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	-	<0.02	-	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	-	<0.02	-	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	-	<0.02	-	<0.02
Chrysene	0.02 ug/g dry	-	<0.02	-	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	-	<0.02	-	<0.02
Fluoranthene	0.02 ug/g dry	-	<0.02	-	<0.02
Fluorene	0.02 ug/g dry	-	<0.02	-	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	-	<0.02	-	<0.02
1-Methylnaphthalene	0.02 ug/g dry	-	<0.02	-	<0.02
2-Methylnaphthalene	0.02 ug/g dry	-	<0.02	-	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	-	<0.04	-	<0.04
Naphthalene	0.01 ug/g dry	-	<0.01	-	<0.01
Phenanthrene	0.02 ug/g dry	-	<0.02	-	<0.02

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 13-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

	Client ID: BH18-8 SA3 04/04/2018 09:00	Sample Date: 04/02/2018 09:00	Sample ID: 1815109-09 Soil	BH18-9 SA2 04/02/2018 09:00	BH18-10 SA1 04/02/2018 09:00
	MDL/Units				
Pyrene	0.02 ug/g dry	-	<0.02	-	<0.02
2-Fluorobiphenyl	Surrogate	-	96.0%	-	103%
Terphenyl-d14	Surrogate	-	115%	-	101%

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 13-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

Client ID:	BH18-10 SA5	-	-	-
Sample Date:	04/02/2018 09:00	-	-	-
Sample ID:	1815109-13	-	-	-
MDL/Units	Soil	-	-	-

Physical Characteristics

% Solids	0.1 % by Wt.	55.8	-	-	-
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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	-	-	-
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	-	-	-

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 13-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

	Client ID: BH18-10 SA5		-	-	-
	Sample Date: 04/02/2018 09:00		-	-	-
	Sample ID: 1815109-13		-	-	-
	MDL/Units	Soil	-	-	-
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	103%	-	-	-
Toluene-d8	Surrogate	99.5%	-	-	-
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: 13-Apr-2018

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 9-Apr-2018

Client PO:

Project Description: 62721.07

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Conductivity	ND	5	uS/cm						
Cyanide, free	ND	0.03	ug/g						
Hydrocarbons									
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						
F4G PHCs (gravimetric)	ND	50	ug/g						
Metals									
Antimony	ND	1	ug/g						
Arsenic	ND	1	ug/g						
Barium	ND	1	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5	ug/g						
Cobalt	ND	1	ug/g						
Copper	ND	5	ug/g						
Lead	ND	1	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1	ug/g						
Nickel	ND	5	ug/g						
Selenium	ND	1	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1	ug/g						
Uranium	ND	1	ug/g						
Vanadium	ND	10	ug/g						
Zinc	ND	20	ug/g						
Semi-Volatiles									
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	1.42		ug/g		106	50-140			
Surrogate: Terphenyl-d14	1.25		ug/g		93.5	50-140			
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

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Project Description: 62721.07

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD RPD	RPD Limit	Notes
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						
1,1,2,2-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						
Surrogate: 4-Bromofluorobenzene	9.21		ug/g		115	50-140			
Surrogate: Dibromofluoromethane	8.74		ug/g		109	50-140			
Surrogate: Toluene-d8	7.44		ug/g		92.9	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						
Surrogate: Toluene-d8	7.44		ug/g		92.9	50-140			

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Report Date: 13-Apr-2018

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 9-Apr-2018

Client PO:

Project Description: 62721.07

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
SAR	1.13	0.01	N/A	1.15			1.8	200	
Conductivity	890	5	uS/cm	888			0.1	6.2	
Cyanide, free	ND	0.12	ug/g dry	ND				35	
pH	7.77	0.05	pH Units	7.73			0.5	10	GEN09
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	4	4	ug/g dry	4			2.5	30	
F3 PHCs (C16-C34)	29	8	ug/g dry	40			31.9	30	QR-01
F4 PHCs (C34-C50)	61	6	ug/g dry	59			2.9	30	
Metals									
Antimony	ND	1	ug/g dry	ND			0.0	30	
Arsenic	1.1	1	ug/g dry	ND			0.0	30	
Barium	4.7	1	ug/g dry	4.5			5.2	30	
Beryllium	ND	0.5	ug/g dry	ND			0.0	30	
Boron, available	ND	0.5	ug/g dry	ND			0.0	35	
Boron	6.5	5.0	ug/g dry	ND			0.0	30	
Cadmium	0.60	0.5	ug/g dry	0.98			47.6	30	QR-01
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	ND	5	ug/g dry	ND			0.0	30	
Cobalt	1.0	1	ug/g dry	1.0			4.4	30	
Copper	6.3	5	ug/g dry	ND			0.0	30	
Lead	2.0	1	ug/g dry	2.0			2.5	30	
Mercury	0.160	0.1	ug/g dry	0.172			7.1	30	
Molybdenum	3.9	1	ug/g dry	3.8			1.4	30	
Nickel	8.9	5	ug/g dry	8.5			4.9	30	
Selenium	ND	1	ug/g dry	ND			0.0	30	
Silver	ND	0.3	ug/g dry	ND			0.0	30	
Thallium	ND	1	ug/g dry	ND			0.0	30	
Uranium	2.5	1	ug/g dry	2.4			4.8	30	
Vanadium	ND	10	ug/g dry	ND			0.0	30	
Zinc	93.7	20	ug/g dry	124			27.7	30	
Physical Characteristics									
% Solids	87.6	0.1	% by Wt.	85.8			2.0	25	
Semi-Volatiles									
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			0.0	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] perlylene	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			0.0	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			0.0	40	
Phenanthrene	ND	0.02	ug/g dry	ND				40	
Pyrene	ND	0.02	ug/g dry	ND				40	
Surrogate: 2-Fluorobiphenyl	2.12		ug/g dry	109	50-140				
Surrogate: Terphenyl-d14	2.16		ug/g dry	111	50-140				
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 13-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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			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	9.45		ug/g dry		106	50-140			
Surrogate: Dibromofluoromethane	8.20		ug/g dry		91.6	50-140			
Surrogate: Toluene-d8	8.92		ug/g dry		99.6	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	8.92		ug/g dry		99.6	50-140			

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 13-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	195	7	ug/g		97.7	80-120			
F2 PHCs (C10-C16)	110	4	ug/g	4	109	60-140			
F3 PHCs (C16-C34)	296	8	ug/g	40	128	60-140			
F4 PHCs (C34-C50)	241	6	ug/g	59	135	60-140			
F4G PHCs (gravimetric)	1000	50	ug/g		100	80-120			
Metals									
Antimony	39.5		ug/L	ND	79.0	70-130			
Arsenic	41.8		ug/L	ND	82.8	70-130			
Barium	44.1		ug/L	1.8	84.6	70-130			
Beryllium	42.7		ug/L	ND	85.4	70-130			
Boron, available	4.60	0.5	ug/g	ND	91.9	70-122			
Boron	44.0		ug/L	ND	84.9	70-130			
Cadmium	40.8		ug/L	ND	80.8	70-130			
Chromium (VI)	4.3	0.2	ug/g	ND	73.0	70-130			
Chromium	43.6		ug/L	ND	85.7	70-130			
Cobalt	42.1		ug/L	ND	83.3	70-130			
Copper	42.4		ug/L	ND	80.8	70-130			
Lead	42.5		ug/L	ND	83.4	70-130			
Mercury	1.54	0.1	ug/g	0.172	90.9	70-130			
Molybdenum	40.7		ug/L	1.5	78.3	70-130			
Nickel	44.8		ug/L	ND	82.8	70-130			
Selenium	40.3		ug/L	ND	80.2	70-130			
Silver	36.0		ug/L	ND	71.9	70-130			
Thallium	42.1		ug/L	ND	84.1	70-130			
Uranium	44.2		ug/L	1.0	86.5	70-130			
Vanadium	44.7		ug/L	ND	85.6	70-130			
Zinc	86.9		ug/L	49.5	74.7	70-130			
Semi-Volatiles									
Acenaphthene	0.214	0.02	ug/g	ND	88.2	50-140			
Acenaphthylene	0.188	0.02	ug/g	ND	77.5	50-140			
Anthracene	0.214	0.02	ug/g	ND	88.4	50-140			
Benzo [a] anthracene	0.170	0.02	ug/g	ND	70.1	50-140			
Benzo [a] pyrene	0.164	0.02	ug/g	ND	67.7	50-140			
Benzo [b] fluoranthene	0.204	0.02	ug/g	ND	84.3	50-140			
Benzo [g,h,i] perylene	0.154	0.02	ug/g	ND	63.5	50-140			
Benzo [k] fluoranthene	0.336	0.02	ug/g	ND	139	50-140			
Chrysene	0.230	0.02	ug/g	ND	94.8	50-140			
Dibenzo [a,h] anthracene	0.129	0.02	ug/g	ND	53.2	50-140			
Fluoranthene	0.223	0.02	ug/g	ND	92.2	50-140			
Fluorene	0.231	0.02	ug/g	ND	95.2	50-140			
Indeno [1,2,3-cd] pyrene	0.135	0.02	ug/g	ND	55.5	50-140			
1-Methylnaphthalene	0.267	0.02	ug/g	ND	110	50-140			
2-Methylnaphthalene	0.279	0.02	ug/g	ND	115	50-140			
Naphthalene	0.223	0.01	ug/g	ND	92.0	50-140			
Phenanthrene	0.242	0.02	ug/g	ND	100	50-140			
Pyrene	0.236	0.02	ug/g	ND	97.3	50-140			
Surrogate: 2-Fluorobiphenyl	1.72		ug/g		88.5	50-140			
Volatiles									
Acetone	13.2	0.50	ug/g		132	50-140			
Benzene	5.02	0.02	ug/g		126	60-130			

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 13-Apr-2018

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Project Description: 62721.07

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Bromodichloromethane	4.08	0.05	ug/g		102	60-130			
Bromoform	3.80	0.05	ug/g		95.0	60-130			
Bromomethane	4.02	0.05	ug/g		101	50-140			
Carbon Tetrachloride	4.95	0.05	ug/g		124	60-130			
Chlorobenzene	3.62	0.05	ug/g		90.5	60-130			
Chloroform	4.72	0.05	ug/g		118	60-130			
Dibromochloromethane	3.52	0.05	ug/g		88.0	60-130			
Dichlorodifluoromethane	4.66	0.05	ug/g		116	50-140			
1,2-Dichlorobenzene	3.82	0.05	ug/g		95.6	60-130			
1,3-Dichlorobenzene	4.20	0.05	ug/g		105	60-130			
1,4-Dichlorobenzene	3.54	0.05	ug/g		88.5	60-130			
1,1-Dichloroethane	4.47	0.05	ug/g		112	60-130			
1,2-Dichloroethane	5.10	0.05	ug/g		127	60-130			
1,1-Dichloroethylene	4.13	0.05	ug/g		103	60-130			
cis-1,2-Dichloroethylene	4.84	0.05	ug/g		121	60-130			
trans-1,2-Dichloroethylene	4.93	0.05	ug/g		123	60-130			
1,2-Dichloropropane	5.01	0.05	ug/g		125	60-130			
cis-1,3-Dichloropropylene	4.38	0.05	ug/g		110	60-130			
trans-1,3-Dichloropropylene	5.02	0.05	ug/g		126	60-130			
Ethylbenzene	3.88	0.05	ug/g		96.9	60-130			
Ethylene dibromide (dibromoethane)	3.82	0.05	ug/g		95.4	60-130			
Hexane	3.73	0.05	ug/g		93.2	60-130			
Methyl Ethyl Ketone (2-Butanone)	13.8	0.50	ug/g		138	50-140			
Methyl Isobutyl Ketone	13.4	0.50	ug/g		134	50-140			
Methyl tert-butyl ether	8.09	0.05	ug/g		80.9	50-140			
Methylene Chloride	4.37	0.05	ug/g		109	60-130			
Styrene	3.73	0.05	ug/g		93.4	60-130			
1,1,1,2-Tetrachloroethane	3.70	0.05	ug/g		92.4	60-130			
1,1,2,2-Tetrachloroethane	3.64	0.05	ug/g		91.0	60-130			
Tetrachloroethylene	3.77	0.05	ug/g		94.2	60-130			
Toluene	3.65	0.05	ug/g		91.4	60-130			
1,1,1-Trichloroethane	4.91	0.05	ug/g		123	60-130			
1,1,2-Trichloroethane	4.36	0.05	ug/g		109	60-130			
Trichloroethylene	4.00	0.05	ug/g		100	60-130			
Trichlorofluoromethane	3.99	0.05	ug/g		99.8	50-140			
Vinyl chloride	3.71	0.02	ug/g		92.8	50-140			
m,p-Xylenes	7.38	0.05	ug/g		92.3	60-130			
o-Xylene	3.77	0.05	ug/g		94.3	60-130			
Benzene	5.02	0.02	ug/g		126	60-130			
Ethylbenzene	3.88	0.05	ug/g		96.9	60-130			
Toluene	3.65	0.05	ug/g		91.4	60-130			
m,p-Xylenes	7.38	0.05	ug/g		92.3	60-130			
o-Xylene	3.77	0.05	ug/g		94.3	60-130			

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 13-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

Qualifier Notes:***Sample Qualifiers :***

- 1 : Elevated detection limits due to the nature of the sample matrix.
- 2 : GC-FID signal did not return to baseline by C50
- 4 : The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.

QC Qualifiers :

- GEN09 : Elevated detection limits due to the nature of the sample matrix.
QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

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.



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Paracel ID: 1815109



Chain of Custody
(Lab Use Only)

No 42094

Page 1 of 2

Client Name: Gemtec	Project Reference: 62771.07	Turnaround Time:
Contact Name: Nicole	Quote #	<input type="checkbox"/> 1 Day <input checked="" type="checkbox"/> 3 Day
Address: 32 Steacie	PO #	<input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular
Telephone: 613-836-1422	Email Address: nicole.soucy@gemtec.ca	Date Required: Fri April 13/18
Criteria: <input checked="" type="checkbox"/> O. Reg 153/04 (As Amended) Table <input type="checkbox"/> RSC Filing <input type="checkbox"/> O. Reg 558/00 <input type="checkbox"/> PWQO <input type="checkbox"/> CCME <input type="checkbox"/> SUB (Storm) <input type="checkbox"/> SUB (Sanitary) Municipality <input type="checkbox"/> Other:		

				Required Analyses										
				Pesticides										
				Sample Taken		PHC	VOC	BTC	PAH	Metals + Inorg	OC Pest			
Paracel Order Number:	Matrix	Air Volume	# of Containers	Date	Time									
1815109	S	Q		Apr 3/18		X	X		X	X				
BH18-3 SA3				"			X	X						
BH18-4 SA1				Apr 3/18			X	X		X	X			
BH18-5 SA1				Apr 6/18						X	X	X		
BH18-5 SA3				"			X	X						
BH18-6 SA1				"						X	X	X		
BH18-7 SA1				Apr 4/18						X	X	X		
BH18-8 SA2				"						X	X			
BH18-8 SA3				"			X	X					F2-F4 only per	
BH18-9 SA1				Apr 2/18						X	X	X		N/A

Comments: BH-NO 9 - Sample ID on vial read = BH18-3 SA-8 and Sample date read = Apr 3/18 Walkin	Method of Delivery:		
Relinquished By (Sign): M. Valcourt	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): April 9, 2018	Date/Time:	Date/Time: 2018-4-9 14:00	Date/Time: Apr 9/18 4:59
Date/Time: 4:20 pm	Temperature: °C	Temperature: 20.1 °C	pH Verified [] By: N/A

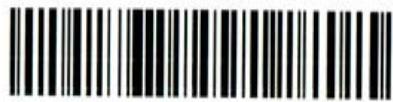
Chain of Custody (Blank) - Rev 0.4 Feb 2016

OC Pesticides for Mon Apr 16th Rec
Nicole, SC.



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Paracel ID: 1815109



Chain of Custody
(Lab Use Only)

No 42093

Page 2 of 2

Turnaround Time:

1 Day 3 Day

2 Day Regular

Date Required: April 13/18

Client Name: Gemtec	Project Reference: 62721.07	PO #	Email Address: nicole.soucy@gemtek.ca
Contact Name: Nicole	Quote #		
Address: 32 Steacie			
Telephone: 613-836-1472			
Criteria: O.O. Reg. 153/04 (As Amended) Table <input type="checkbox"/> RSC Filing <input type="checkbox"/> O. Reg 558/00 <input type="checkbox"/> PWQO <input type="checkbox"/> CCME <input type="checkbox"/> SUB (Storm) <input type="checkbox"/> SUB (Sanitary) Municipality: <input type="checkbox"/> 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	Sample Taken		PHC	VOC	BTX	PAH	Metals	OC Resid
Sample ID/Location Name	# of Containers			Date	Time						
1 BH18-9 SA2	5			Apr 2/18		X	X				- 850 ml + 1 vial -
2 BH18-10 SA1	1			"		X	X	X X			/
3 BH18-10 SAS	1			"		X	X				/
4											
5											
6											
7											
8											
9											
10											

Comments: Method of Delivery: Walking

Relinquished By (Sign): Mich Lalonde	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): April 9, 2018	Date/Time:	Date/Time: 04/09/18 9:21 AM	Date/Time: Apr 9/18 4:59
Date/Time: Apr 9/18 4:26 PM	Temperature: °C	Temperature: 9.1 °C	pH Verified By: N/A

Chain of Custody (Blank) - Rev 0.4 Feb 2016

Subcontracted Analysis

GEMTEC Consulting Engineers and Scientists Limited

32 Steacie Drive
Kanata, ON K2K 2A9
Attn: Nicole Soucy

Tel: (613) 836-1422
Fax: (613) 836-9731

Paracel Report No**1815109**

Order Date: 09-Apr-18
Report Date: 16-Apr-18

Client Project(s): **62721.07**

Client PO:

Reference: **Standing Offer - 2015**

CoC Number: **42094/42093**

Sample(s) from this project were subcontracted for the listed parameters. A copy of the subcontractor's report is attached

Paracel ID	Client ID	Analysis
1815109-04	BH18-5 SA1	Pesticides - Organochlorine in soil
1815109-06	BH18-6 SA1	Pesticides - Organochlorine in soil
1815109-07	BH18-7 SA1	Pesticides - Organochlorine in soil
1815109-10	BH18-9 SA1	Pesticides - Organochlorine in soil

CERTIFICATE OF ANALYSIS

Client:	Dale Robertson	Work Order Number:	341018
Company:	Paracel Laboratories Ltd.- Ottawa	PO #:	
Address:	300-2319 St. Laurent Blvd. Ottawa, ON, K1G 4J8	Regulation:	O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/Commer/Comm 1815109
Phone/Fax:	(613) 731-9577 / (613) 731-9064	Project #:	
Email:	drobertson@paracellabs.com	DWS #:	
Sample Collected By:		Analysis Started:	4/11/2018
Date Order Received:	4/11/2018	Analysis Completed:	4/16/2018
Arrival Temperature:	8 °C		

WORK ORDER SUMMARY

ANALYSES WERE PERFORMED ON THE FOLLOWING SAMPLES. THE RESULTS RELATE ONLY TO THE ITEMS TESTED.

Sample Description	Lab ID	Matrix	Type	Comments	Date Collected	Time Collected
BH18-5 SA1	1085792	Soil	None		4/6/2018	
BH18-6 SA1	1085793	Soil	None		4/6/2018	
BH18-7 SA1	1085794	Soil	None		4/4/2018	
BH18-9 SA1	1085795	Soil	None		4/2/2018	

METHODS AND INSTRUMENTATION

THE FOLLOWING METHODS WERE USED FOR YOUR SAMPLE(S):

Method	Lab	Description	Reference
Moisture (A99)	Garson	Determination of Percent Moisture	In House
OCPs Soil (R19)	Garson	Determination of Organochlorine Pesticides in Soil by GC/ECD	Modified from SW846-8081B

This report has been approved by:



Khaled Omari, Ph.D.
Laboratory Director

CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 341018

WORK ORDER RESULTS

Sample Description	BH18 - 5 SA1		BH18 - 6 SA1		BH18 - 7 SA1		BH18 - 9 SA1			
Lab ID	1085792		1085793		1085794		1085795			
General Chemistry	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/Commer/Comm
% Moisture	27.7	0.1	27.5	0.1	25.5	0.1	19.8	0.1	%	~

Sample Description	BH18 - 5 SA1		BH18 - 6 SA1		BH18 - 7 SA1		BH18 - 9 SA1			
Lab ID	1085792		1085793		1085794		1085795			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/Commer/Comm
2,4'-DDD	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
2,4'-DDE	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
2,4'-DDT	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
4,4'-DDD	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
4,4'-DDE	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
4,4'-DDT	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
Aldrin	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.05
DDD (Total) (Calc.)	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.05
DDE (Total) (Calc.)	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.05
DDT (Total) (Calc.)	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	1.4
Decachlorobiphenyl (Surr.)	99 [110]	N/A	107	N/A	129	N/A	138	N/A	% Rec	~
Dieldrin	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.05
Endosulfan I	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~

CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 341018

Sample Description	BH18 - 5 SA1		BH18 - 6 SA1		BH18 - 7 SA1		BH18 - 9 SA1		Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
Lab ID	1085792		1085793		1085794		1085795			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
Endosulfan I + II (Calc.)	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.04
Endosulfan II	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
Endosulfan sulfate	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
Endrin	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.04
Endrin aldehyde	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
Heptachlor	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.05
Heptachlor epoxide	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.05
Hexachlorobenzene	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.01
Hexachlorobutadiene	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.01
Hexachloroethane	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.01
Methoxychlor	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.05
Mirex	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
Oxychlordane	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
β-BHC	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
α - Chlordane	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
α + γ -Chlordane (Calc.)	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.05
α-BHC	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
γ - Chlordane	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~

CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 341018

Sample Description	BH18 - 5 SA1		BH18 - 6 SA1		BH18 - 7 SA1		BH18 - 9 SA1		Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
Lab ID	1085792		1085793		1085794		1085795			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
γ-BHC (Lindane)	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.01
δ-BHC	<0.01 [<0.01]	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~

LEGEND

Dates: Dates are formatted as mm/dd/year throughout this report.

MDL: Method detection limit or minimum reporting limit.

[]: Results for laboratory replicates are shown in square brackets immediately below the associated sample result for ease of comparison.

% Rec: Surrogate compounds are added to the sample in some cases and the recovery is reported as a % recovered.

~: In a criteria column indicates the criteria is not applicable for the parameter row..

Quality Control: All associated Quality Control data is available on request.



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300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited

32 Steacie Drive
Kanata, ON K2K 2A9
Attn: Nicole Soucy

Client PO:

Project: 62721.07
Custody: 42094

Report Date: 17-Apr-2018
Order Date: 16-Apr-2018

Order #: 1816062

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

Paracel ID Client ID
1816062-01 BH18-4 SA1

Approved By:

A handwritten signature in black ink that reads "Mark Foto".

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liability in connection with this work, however arising shall be limited to the amount paid by you for this work, and that our employees or agents shall not under circumstances be liable to you in connection with this work

Certificate of Analysis

Report Date: 17-Apr-2018

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 16-Apr-2018

Client PO:

Project Description: 62721.07

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	17-Apr-18	17-Apr-18

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'.

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 17-Apr-2018

Order Date: 16-Apr-2018

Project Description: 62721.07

Sample Results

Boron, available					Matrix: Soil
					Sample Date: 02-Apr-18
Paracel ID	Client ID		Units	MDL	Result
1816062-01	BH18-4 SA1		ug/g dry	0.5	1.4

Laboratory Internal QA/QC

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Matrix Blank									
Boron, available	ND	0.5	ug/g						
Matrix Duplicate									
Boron, available	1.80	0.5	ug/g dry	1.43			22.7	35	
Matrix Spike									
Boron, available	4.98	0.5	ug/g	1.43	70.9	70-122			



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Paracel ID: 1816062



Chain of Custody
(Lab Use Only)

No 42094

Page 1 of 2

Turnaround Time:

1 Day 3 Day
 2 Day Regular

Date Required: 11 April 2018

Client Name: <u>Gemtec</u>	Project Reference: <u>62771.07</u>
Contact Name: <u>Nicole</u>	Quote #: _____
Address: <u>32 Steacie</u>	PO #: _____
Telephone: <u>613 836-1422</u>	Email Address: <u>Nicole.Soucy@gemtec.ca</u>
Criteria: <input type="checkbox"/> O. Reg. 153/04 (As Amended) Table _____ <input type="checkbox"/> RSC Filing <input type="checkbox"/> O. Reg. 558/00 <input type="checkbox"/> PWQO <input type="checkbox"/> CCME <input type="checkbox"/> SUB (Storm) <input type="checkbox"/> SUB (Sanitary) Municipality _____ <input type="checkbox"/> Other _____	

				Required Analyses								
				PHC	VOC	BTEX	PAH	Metals + Inorg	OC Pest	PCP	Re-extract Fully	Re-analyze
				Date	Time							
1	BH18-3 SA3	S	Q	Apr 3/18		X X	X X					
2	BH18-103 SA1			"		X	X					
3	BH18-4 SAI			Apr 3/18		X X	X X					
4	BH18-5 SAI			Apr 6/18				X X X				
5	BH18-5 SA3			"		X	X					
6	BH18-6 SAI			"				X X X				
7	BH18-7 SAI			Apr 4/18				X X X				
8	BH18-8 SA2			"				X X				
9	BH18-8 SA3			"		X	X				F2-F4 only per	
10	BH18-9 SAI		V	Apr 2/18				X X X			N/A	

Comments:

109 - Sample ID on vial read = BH18-3 SA-8 and Sample date read = Apr 3/18 Walkin

Method of Delivery:

Relinquished By (Sign): <u>M. Valcourt</u>	Received by Driver/Depot:	Received at Lab:	Verified By: <u>M.C.</u>
Relinquished By (Print): <u>April 9, 2018</u>	Date/Time:	Date/Time: <u>Apr 9/18 4:34</u>	Date/Time: <u>Apr 9/18 4:59</u>
Date/Time: <u>4:20 pm</u>	Temperature: <u>20 °C</u>	Temperature: <u>20.1 °C</u>	pH Verified By: <u>N/A</u>

Chain of Custody (Blank) - Rev 04 Feb 2016

OC Pesticides for Mon Apr 16th Rec nicole.soucy 04/16/18 3:41pm

Test Baron available on BH18-4 SAI on a today as per Client. KW 04/16/18

APPENDIX C

Laboratory Certificates of Analysis Groundwater Samples

Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited

32 Steacie Drive
Kanata, ON K2K 2A9
Attn: Nicole Soucy

Client PO:

Project: 62721.07
Custody: 42092

Report Date: 17-Apr-2018
Order Date: 9-Apr-2018

Order #: 1815096

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

Paracel ID	Client ID
1815096-01	BH 18-3
1815096-02	BH 18-4
1815096-03	BH 18-6
1815096-04	BH 18-9
1815096-05	BH 18-10

Approved By:



Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 17-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC	11-Apr-18	11-Apr-18
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	11-Apr-18	11-Apr-18
Chromium, hexavalent - water	MOE E3056 - colourimetric	11-Apr-18	11-Apr-18
Cyanide, free	MOE E3015 - Auto Colour	10-Apr-18	10-Apr-18
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	12-Apr-18	12-Apr-18
Metals, ICP-MS	EPA 200.8 - ICP-MS	12-Apr-18	12-Apr-18
pH	EPA 150.1 - pH probe @25 °C	11-Apr-18	11-Apr-18
PHC F1	CWS Tier 1 - P&T GC-FID	10-Apr-18	11-Apr-18
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	9-Apr-18	10-Apr-18
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	11-Apr-18	11-Apr-18
REG 153: Pesticides, OC	EPA 8081B - GC-ECD	16-Apr-18	17-Apr-18
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	10-Apr-18	11-Apr-18

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 17-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

Client ID:	BH 18-3	Sample Date:	04/09/2018 09:00	BH 18-4	04/09/2018 09:00	BH 18-6	04/09/2018 09:00	BH 18-9	04/09/2018 09:00	
Sample ID:	1815096-01	MDL/Units	Water	Sample ID:	1815096-02	MDL/Units	Water	Sample ID:	1815096-03	MDL/Units

General Inorganics

Cyanide, free	2 ug/L	<2	<2	<2	<2
pH	0.1 pH Units	7.8	7.9	7.8	7.7

Anions

Chloride	1 mg/L	3540	2490	953	1830
----------	--------	------	------	-----	------

Metals

Mercury	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	2	2	1	1
Barium	1 ug/L	112	151	72	131
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	381	720	237	320
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Chromium	1 ug/L	<1	2	<1	<1
Chromium (VI)	10 ug/L	<10	<10	<10	<10
Cobalt	0.5 ug/L	1.2	1.3	0.6	1.8
Copper	0.5 ug/L	0.6	0.5	<0.5	1.8
Lead	0.1 ug/L	0.1	0.6	0.1	<0.1
Molybdenum	0.5 ug/L	2.4	7.4	1.6	2.4
Nickel	1 ug/L	4	2	1	4
Selenium	1 ug/L	1	1	<1	<1
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Sodium	200 ug/L	1900000	1650000	539000	<20000
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Uranium	0.1 ug/L	4.7	0.4	1.8	4.9
Vanadium	0.5 ug/L	3.4	2.7	1.2	1.2
Zinc	5 ug/L	<5	10	9	<5

Volatiles

Acetone	5.0 ug/L	-	<5.0	-	-
Benzene	0.5 ug/L	-	<0.5	-	-
Bromodichloromethane	0.5 ug/L	-	<0.5	-	-
Bromoform	0.5 ug/L	-	<0.5	-	-
Bromomethane	0.5 ug/L	-	<0.5	-	-
Carbon Tetrachloride	0.2 ug/L	-	<0.2	-	-
Chlorobenzene	0.5 ug/L	-	<0.5	-	-
Chloroform	0.5 ug/L	-	<0.5	-	-

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 17-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

	Client ID: Sample Date: Sample ID: MDL/Units	BH 18-3 04/09/2018 09:00 1815096-01 Water	BH 18-4 04/09/2018 09:00 1815096-02 Water	BH 18-6 04/09/2018 09:00 1815096-03 Water	BH 18-9 04/09/2018 09:00 1815096-04 Water
Dibromochloromethane	0.5 ug/L	-	<0.5	-	-
Dichlorodifluoromethane	1.0 ug/L	-	<1.0	-	-
1,2-Dichlorobenzene	0.5 ug/L	-	<0.5	-	-
1,3-Dichlorobenzene	0.5 ug/L	-	<0.5	-	-
1,4-Dichlorobenzene	0.5 ug/L	-	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	-	<0.5	-	-
1,2-Dichloroethane	0.5 ug/L	-	<0.5	-	-
1,1-Dichloroethylene	0.5 ug/L	-	<0.5	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	-	<0.5	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	-	<0.5	-	-
1,2-Dichloropropane	0.5 ug/L	-	<0.5	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	-	<0.5	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	-	<0.5	-	-
1,3-Dichloropropene, total	0.5 ug/L	-	<0.5	-	-
Ethylbenzene	0.5 ug/L	-	<0.5	-	-
Ethylene dibromide (dibromoethan	0.2 ug/L	-	<0.2	-	-
Hexane	1.0 ug/L	-	<1.0	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	-	<5.0	-	-
Methyl Isobutyl Ketone	5.0 ug/L	-	<5.0	-	-
Methyl tert-butyl ether	2.0 ug/L	-	<2.0	-	-
Methylene Chloride	5.0 ug/L	-	<5.0	-	-
Styrene	0.5 ug/L	-	<0.5	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	-	<0.5	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	-	<0.5	-	-
Tetrachloroethylene	0.5 ug/L	-	<0.5	-	-
Toluene	0.5 ug/L	-	<0.5	-	-
1,1,1-Trichloroethane	0.5 ug/L	-	<0.5	-	-
1,1,2-Trichloroethane	0.5 ug/L	-	<0.5	-	-
Trichloroethylene	0.5 ug/L	-	<0.5	-	-
Trichlorofluoromethane	1.0 ug/L	-	<1.0	-	-
Vinyl chloride	0.5 ug/L	-	<0.5	-	-
m,p-Xylenes	0.5 ug/L	-	<0.5	-	-
o-Xylene	0.5 ug/L	-	<0.5	-	-
Xylenes, total	0.5 ug/L	-	<0.5	-	-
4-Bromofluorobenzene	Surrogate	-	93.9%	-	-
Dibromofluoromethane	Surrogate	-	106%	-	-

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 17-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

	Client ID: Sample Date: Sample ID: MDL/Units	BH 18-3 04/09/2018 09:00 1815096-01 Water	BH 18-4 04/09/2018 09:00 1815096-02 Water	BH 18-6 04/09/2018 09:00 1815096-03 Water	BH 18-9 04/09/2018 09:00 1815096-04 Water
Toluene-d8	Surrogate	-	109%	-	-
Benzene	0.5 ug/L	<0.5	-	-	<0.5
Ethylbenzene	0.5 ug/L	<0.5	-	-	<0.5
Toluene	0.5 ug/L	<0.5	-	-	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	-	-	<0.5
o-Xylene	0.5 ug/L	<0.5	-	-	<0.5
Xylenes, total	0.5 ug/L	<0.5	-	-	<0.5
Toluene-d8	Surrogate	109%	-	-	110%

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

Semi-Volatiles

Acenaphthene	0.05 ug/L	0.08	<0.05	<0.05	<0.05
Acenaphthylene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Anthracene	0.01 ug/L	0.13	<0.01	<0.01	<0.01
Benzo [a] anthracene	0.01 ug/L	0.23	<0.01	<0.01	<0.01
Benzo [a] pyrene	0.01 ug/L	0.17	<0.01	<0.01	<0.01
Benzo [b] fluoranthene	0.05 ug/L	0.09	<0.05	<0.05	<0.05
Benzo [g,h,i] perylene	0.05 ug/L	0.12	<0.05	<0.05	<0.05
Benzo [k] fluoranthene	0.05 ug/L	0.06	<0.05	<0.05	<0.05
Chrysene	0.05 ug/L	0.36	<0.05	<0.05	<0.05
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.01 ug/L	0.99	<0.01	<0.01	0.10
Fluorene	0.05 ug/L	0.09	<0.05	<0.05	<0.05
Indeno [1,2,3-cd] pyrene	0.05 ug/L	0.10	<0.05	<0.05	<0.05
1-Methylnaphthalene	0.05 ug/L	0.09	<0.05	<0.05	<0.05
2-Methylnaphthalene	0.05 ug/L	0.16	0.07	<0.05	<0.05
Methylnaphthalene (1&2)	0.10 ug/L	0.25	0.11	<0.10	<0.10
Naphthalene	0.05 ug/L	0.14	0.07	<0.05	<0.05
Phenanthrene	0.05 ug/L	0.74	0.06	<0.05	0.05
Pyrene	0.01 ug/L	0.71	<0.01	<0.01	0.06
2-Fluorobiphenyl	Surrogate	86.1%	83.4%	121%	76.8%
Terphenyl-d14	Surrogate	89.2%	86.7%	98.9%	137%

Pesticides, OC

Aldrin	0.01 ug/L	-	-	<0.01	<0.01
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Certificate of Analysis

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Client PO:

Report Date: 17-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

	Client ID: Sample Date: Sample ID: MDL/Units	BH 18-3 04/09/2018 09:00 1815096-01 Water	BH 18-4 04/09/2018 09:00 1815096-02 Water	BH 18-6 04/09/2018 09:00 1815096-03 Water	BH 18-9 04/09/2018 09:00 1815096-04 Water
alpha-Chlordane	0.01 ug/L	-	-	<0.01	<0.01
gamma-Chlordane	0.01 ug/L	-	-	<0.01	<0.01
Chlordane	0.01 ug/L	-	-	<0.01	<0.01
o,p'-DDD	0.01 ug/L	-	-	<0.01	<0.01
p,p'-DDD	0.01 ug/L	-	-	<0.01	<0.01
DDD	0.01 ug/L	-	-	<0.01	<0.01
o,p'-DDE	0.01 ug/L	-	-	<0.01	<0.01
p,p'-DDE	0.01 ug/L	-	-	<0.01	<0.01
DDE	0.01 ug/L	-	-	<0.01	<0.01
o,p'-DDT	0.01 ug/L	-	-	<0.01	<0.01
p,p'-DDT	0.01 ug/L	-	-	<0.01	<0.01
DDT	0.01 ug/L	-	-	<0.01	<0.01
Dieldrin	0.01 ug/L	-	-	<0.01	<0.01
Endosulfan I	0.01 ug/L	-	-	<0.01	<0.01
Endosulfan II	0.01 ug/L	-	-	<0.01	<0.01
Endosulfan I/II	0.01 ug/L	-	-	<0.01	<0.01
Endrin	0.01 ug/L	-	-	<0.01	<0.01
Heptachlor	0.01 ug/L	-	-	<0.01	<0.01
Heptachlor epoxide	0.01 ug/L	-	-	<0.01	<0.01
Hexachlorobenzene	0.01 ug/L	-	-	<0.01	<0.01
Hexachlorobutadiene	0.01 ug/L	-	-	0.07	<0.01
Hexachlorocyclohexane, gamma	0.01 ug/L	-	-	<0.01	<0.01
Hexachloroethane	0.01 ug/L	-	-	<0.01	<0.01
Methoxychlor	0.01 ug/L	-	-	<0.01	<0.01
Decachlorobiphenyl	Surrogate	-	-	110%	132%

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 17-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

Client ID:	BH 18-10	-	-	-
Sample Date:	04/09/2018 09:00	-	-	-
Sample ID:	1815096-05	-	-	-
MDL/Units	Water	-	-	-

General Inorganics

Cyanide, free	2 ug/L	<2	-	-	-
pH	0.1 pH Units	7.5	-	-	-

Anions

Chloride	1 mg/L	2070	-	-	-
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Metals

Mercury	0.1 ug/L	<0.1	-	-	-
Antimony	0.5 ug/L	<0.5	-	-	-
Arsenic	1 ug/L	<1	-	-	-
Barium	1 ug/L	211	-	-	-
Beryllium	0.5 ug/L	<0.5	-	-	-
Boron	10 ug/L	216	-	-	-
Cadmium	0.1 ug/L	0.1	-	-	-
Chromium	1 ug/L	<1	-	-	-
Chromium (VI)	10 ug/L	<10	-	-	-
Cobalt	0.5 ug/L	1.8	-	-	-
Copper	0.5 ug/L	0.9	-	-	-
Lead	0.1 ug/L	<0.1	-	-	-
Molybdenum	0.5 ug/L	1.2	-	-	-
Nickel	1 ug/L	5	-	-	-
Selenium	1 ug/L	<1	-	-	-
Silver	0.1 ug/L	<0.1	-	-	-
Sodium	200 ug/L	1100000	-	-	-
Thallium	0.1 ug/L	<0.1	-	-	-
Uranium	0.1 ug/L	4.3	-	-	-
Vanadium	0.5 ug/L	0.8	-	-	-
Zinc	5 ug/L	<5	-	-	-

Volatiles

Acetone	5.0 ug/L	9.4	-	-	-
Benzene	0.5 ug/L	<0.5	-	-	-
Bromodichloromethane	0.5 ug/L	<0.5	-	-	-
Bromoform	0.5 ug/L	<0.5	-	-	-
Bromomethane	0.5 ug/L	<0.5	-	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	-	-	-
Chlorobenzene	0.5 ug/L	<0.5	-	-	-
Chloroform	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

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Report Date: 17-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

	Client ID: Sample Date: Sample ID: MDL/Units	BH 18-10 04/09/2018 09:00 1815096-05 Water	-	-	-	-
Dibromochloromethane	0.5 ug/L	<0.5	-	-	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	-	-	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	-	-	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	-	-	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	-	-	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	-	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-	-
Ethylene dibromide (dibromoethane)	0.2 ug/L	<0.2	-	-	-	-
Hexane	1.0 ug/L	<1.0	-	-	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	-	-	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	-	-	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	-	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-	-
Styrene	0.5 ug/L	<0.5	-	-	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	-	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	-	-	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	-	-	-	-
Trichloroethylene	0.5 ug/L	<0.5	-	-	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	-	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-	-
Xylenes, total	0.5 ug/L	<0.5	-	-	-	-
4-Bromofluorobenzene	Surrogate	93.6%	-	-	-	-

Certificate of Analysis

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Client PO:

Report Date: 17-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

	Client ID: Sample Date: Sample ID: MDL/Units	BH 18-10 04/09/2018 09:00 1815096-05 Water	-	-	-	-
Dibromofluoromethane	Surrogate	106%	-	-	-	-
Toluene-d8	Surrogate	110%	-	-	-	-
Hydrocarbons						
F1 PHCs (C6-C10)	25 ug/L	<25	-	-	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	-	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	-	-	-
Semi-Volatiles						
Acenaphthene	0.05 ug/L	<0.05	-	-	-	-
Acenaphthylene	0.05 ug/L	<0.05	-	-	-	-
Anthracene	0.01 ug/L	<0.01	-	-	-	-
Benzo [a] anthracene	0.01 ug/L	<0.01	-	-	-	-
Benzo [a] pyrene	0.01 ug/L	<0.01	-	-	-	-
Benzo [b] fluoranthene	0.05 ug/L	<0.05	-	-	-	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	-	-	-	-
Benzo [k] fluoranthene	0.05 ug/L	<0.05	-	-	-	-
Chrysene	0.05 ug/L	<0.05	-	-	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	-	-	-	-
Fluoranthene	0.01 ug/L	<0.01	-	-	-	-
Fluorene	0.05 ug/L	<0.05	-	-	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	-	-	-	-
1-Methylnaphthalene	0.05 ug/L	<0.05	-	-	-	-
2-Methylnaphthalene	0.05 ug/L	<0.05	-	-	-	-
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	-	-	-	-
Naphthalene	0.05 ug/L	<0.05	-	-	-	-
Phenanthrene	0.05 ug/L	<0.05	-	-	-	-
Pyrene	0.01 ug/L	<0.01	-	-	-	-
2-Fluorobiphenyl	Surrogate	83.2%	-	-	-	-
Terphenyl-d14	Surrogate	112%	-	-	-	-

Certificate of Analysis

Report Date: 17-Apr-2018

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 9-Apr-2018

Client PO:

Project Description: 62721.07

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
General Inorganics									
Cyanide, free	ND	2	ug/L						
Hydrocarbons									
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						
Metals									
Mercury	ND	0.1	ug/L						
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 (VI)	ND	10	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						
Sodium	ND	200	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						
Pesticides, OC									
Aldrin	ND	0.01	ug/L						
alpha-Chlordane	ND	0.01	ug/L						
gamma-Chlordane	ND	0.01	ug/L						
Chlordane	ND	0.01	ug/L						
o,p'-DDD	ND	0.01	ug/L						
p,p'-DDD	ND	0.01	ug/L						
DDD	ND	0.01	ug/L						
o,p'-DDE	ND	0.01	ug/L						
p,p'-DDE	ND	0.01	ug/L						
DDE	ND	0.01	ug/L						
o,p'-DDT	ND	0.01	ug/L						
p,p'-DDT	ND	0.01	ug/L						
DDT	ND	0.01	ug/L						
Dieldrin	ND	0.01	ug/L						
Endosulfan I	ND	0.01	ug/L						
Endosulfan II	ND	0.01	ug/L						
Endosulfan I/II	ND	0.01	ug/L						
Endrin	ND	0.01	ug/L						
Heptachlor	ND	0.01	ug/L						
Heptachlor epoxide	ND	0.01	ug/L						
Hexachlorobenzene	ND	0.01	ug/L						
Hexachlorobutadiene	ND	0.01	ug/L						
Hexachlorocyclohexane, gamma	ND	0.01	ug/L						
Hexachloroethane	ND	0.01	ug/L						
Methoxychlor	ND	0.01	ug/L						
Surrogate: Decachlorobiphenyl	0.543		ug/L	109		50-140			

Certificate of Analysis

Report Date: 17-Apr-2018

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 9-Apr-2018

Client PO:

Project Description: 62721.07

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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Semi-Volatiles

Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenz [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	17.1		ug/L		85.7	50-140			
Surrogate: Terphenyl-d14	20.9		ug/L		105	50-140			

Volatiles

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						
1,1,2-Trichloroethane	ND	0.5	ug/L						
Trichloroethylene	ND	0.5	ug/L						

Certificate of Analysis

Report Date: 17-Apr-2018

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 9-Apr-2018

Client PO:

Project Description: 62721.07

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD RPD	RPD Limit	Notes
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						
<i>Surrogate: 4-Bromofluorobenzene</i>	75.1		ug/L		93.8	50-140			
<i>Surrogate: Dibromofluoromethane</i>	90.6		ug/L		113	50-140			
<i>Surrogate: Toluene-d8</i>	88.6		ug/L		111	50-140			
Benzene	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Toluene	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						
<i>Surrogate: Toluene-d8</i>	88.6		ug/L		111	50-140			

Certificate of Analysis

Report Date: 17-Apr-2018

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 9-Apr-2018

Client PO:

Project Description: 62721.07

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	271	5	mg/L	269			0.6	10	
General Inorganics									
Cyanide, free	ND	2	ug/L	ND				20	
pH	7.7	0.1	pH Units	7.6			0.9	10	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND				30	
Metals									
Mercury	ND	0.1	ug/L	ND			0.0	20	
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 (VI)	ND	10	ug/L	ND				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			0.0	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				20	
Zinc	ND	5	ug/L	ND				20	
Volatiles									
Acetone	14.5	5.0	ug/L	14.4			0.8	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			0.0	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			0.0	30	
Ethylene dibromide (dibromoethane)	ND	0.2	ug/L	ND				30	
Hexane	ND	1.0	ug/L	ND			0.0	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			0.0	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND				30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND				30	

Certificate of Analysis

Report Date: 17-Apr-2018

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 9-Apr-2018

Client PO:

Project Description: 62721.07

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
Tetrachloroethylene	ND	0.5	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND			0.0	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND				30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			0.0	30	
Trichloroethylene	ND	0.5	ug/L	ND			0.0	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				30	
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	76.0		ug/L	95.0	50-140				
Surrogate: Dibromofluoromethane	83.4		ug/L	104	50-140				
Surrogate: Toluene-d8	87.4		ug/L	109	50-140				
Benzene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND			0.0	30	
Toluene	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: Toluene-d8	87.4		ug/L	109	50-140				

Certificate of Analysis

Report Date: 17-Apr-2018

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 9-Apr-2018

Client PO:

Project Description: 62721.07

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	43.5	1	mg/L	34.1	94.4	78-112			
General Inorganics									
Cyanide, free	31.6	2	ug/L	ND	105	70-130			
Hydrocarbons									
F1 PHCs (C6-C10)	1590	25	ug/L		79.5	68-117			
F2 PHCs (C10-C16)	1880	100	ug/L		105	60-140			
F3 PHCs (C16-C34)	3310	100	ug/L		88.9	60-140			
F4 PHCs (C34-C50)	2670	100	ug/L		108	60-140			
Metals									
Mercury	2.84	0.1	ug/L	ND	94.5	70-130			
Antimony	43.7		ug/L	ND	86.9	80-120			
Arsenic	56.3		ug/L	ND	113	80-120			
Barium	52.9		ug/L	ND	106	80-120			
Beryllium	48.3		ug/L	ND	96.6	80-120			
Boron	50		ug/L	ND	82.4	80-120			
Cadmium	45.0		ug/L	ND	90.0	80-120			
Chromium (VI)	192	10	ug/L	ND	96.0	70-130			
Chromium	44.3		ug/L	ND	88.5	80-120			
Cobalt	47.4		ug/L	ND	94.9	80-120			
Copper	42.6		ug/L	ND	85.2	80-120			
Lead	45.3		ug/L	ND	90.5	80-120			
Molybdenum	43.2		ug/L		86.4	80-120			
Nickel	43.2		ug/L	ND	86.4	80-120			
Selenium	50.3		ug/L	ND	99.7	80-120			
Silver	41.2		ug/L	ND	82.4	80-120			
Sodium	992		ug/L	ND	88.2	80-120			
Thallium	46.2		ug/L	ND	92.2	80-120			
Uranium	34.1		ug/L	ND	68.1	80-120			QM-07
Vanadium	50.7		ug/L	ND	101	80-120			
Zinc	50		ug/L	ND	99.6	80-120			
Pesticides, OC									
Aldrin	0.36	0.01	ug/L		72.7	50-140			
alpha-Chlordane	0.36	0.01	ug/L		71.4	50-140			
gamma-Chlordane	0.36	0.01	ug/L		72.0	50-140			
o,p'-DDD	0.34	0.01	ug/L		67.8	50-140			
p,p'-DDD	0.35	0.01	ug/L		70.1	50-140			
o,p'-DDE	0.40	0.01	ug/L		80.9	50-140			
p,p'-DDE	0.36	0.01	ug/L		71.3	50-140			
o,p'-DDT	0.36	0.01	ug/L		71.1	50-140			
p,p'-DDT	0.32	0.01	ug/L		64.8	50-140			
Dieldrin	0.36	0.01	ug/L		72.2	50-140			
Endosulfan I	0.37	0.01	ug/L		74.2	50-140			
Endosulfan II	0.36	0.01	ug/L		71.6	50-140			
Endrin	0.37	0.01	ug/L		74.7	50-140			
Heptachlor	0.37	0.01	ug/L		74.2	50-140			
Heptachlor epoxide	0.34	0.01	ug/L		68.7	50-140			
Hexachlorobenzene	0.35	0.01	ug/L		70.8	50-140			
Hexachlorobutadiene	0.25	0.01	ug/L		50.0	50-140			
Hexachlorocyclohexane, gamma	0.33	0.01	ug/L		66.0	50-140			
Hexachloroethane	0.15	0.01	ug/L		30.5	50-140			QS-02

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 17-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Methoxychlor	0.32	0.01	ug/L		63.1	50-140			
Surrogate: Decachlorobiphenyl	0.600		ug/L		120	50-140			
Semi-Volatiles									
Acenaphthene	5.31	0.05	ug/L		106	50-140			
Acenaphthylene	4.32	0.05	ug/L		86.5	50-140			
Anthracene	4.64	0.01	ug/L		92.8	50-140			
Benzo [a] anthracene	3.84	0.01	ug/L		76.7	50-140			
Benzo [a] pyrene	4.00	0.01	ug/L		80.0	50-140			
Benzo [b] fluoranthene	5.48	0.05	ug/L		110	50-140			
Benzo [g,h,i] perylene	3.95	0.05	ug/L		79.0	50-140			
Benzo [k] fluoranthene	5.99	0.05	ug/L		120	50-140			
Chrysene	5.92	0.05	ug/L		118	50-140			
Dibenzo [a,h] anthracene	4.09	0.05	ug/L		81.9	50-140			
Fluoranthene	4.92	0.01	ug/L		98.4	50-140			
Fluorene	4.14	0.05	ug/L		82.9	50-140			
Indeno [1,2,3-cd] pyrene	4.63	0.05	ug/L		92.7	50-140			
1-Methylnaphthalene	5.59	0.05	ug/L		112	50-140			
2-Methylnaphthalene	6.11	0.05	ug/L		122	50-140			
Naphthalene	5.40	0.05	ug/L		108	50-140			
Phenanthrene	5.42	0.05	ug/L		108	50-140			
Pyrene	5.59	0.01	ug/L		112	50-140			
Volatiles									
Acetone	104	5.0	ug/L		104	50-140			
Benzene	37.6	0.5	ug/L		93.9	60-130			
Bromodichloromethane	35.9	0.5	ug/L		89.8	60-130			
Bromoform	36.3	0.5	ug/L		90.8	60-130			
Bromomethane	49.6	0.5	ug/L		124	50-140			
Carbon Tetrachloride	32.6	0.2	ug/L		81.5	60-130			
Chlorobenzene	38.0	0.5	ug/L		95.0	60-130			
Chloroform	40.4	0.5	ug/L		101	60-130			
Dibromochloromethane	31.1	0.5	ug/L		77.8	60-130			
Dichlorodifluoromethane	41.6	1.0	ug/L		104	50-140			
1,2-Dichlorobenzene	38.9	0.5	ug/L		97.3	60-130			
1,3-Dichlorobenzene	39.8	0.5	ug/L		99.4	60-130			
1,4-Dichlorobenzene	40.4	0.5	ug/L		101	60-130			
1,1-Dichloroethane	41.9	0.5	ug/L		105	60-130			
1,2-Dichloroethane	41.1	0.5	ug/L		103	60-130			
1,1-Dichloroethylene	42.8	0.5	ug/L		107	60-130			
cis-1,2-Dichloroethylene	36.4	0.5	ug/L		91.1	60-130			
trans-1,2-Dichloroethylene	43.8	0.5	ug/L		109	60-130			
1,2-Dichloropropane	36.5	0.5	ug/L		91.2	60-130			
cis-1,3-Dichloropropylene	29.2	0.5	ug/L		72.9	60-130			
trans-1,3-Dichloropropylene	31.4	0.5	ug/L		78.4	60-130			
Ethylbenzene	37.4	0.5	ug/L		93.5	60-130			
Ethylene dibromide (dibromoethane)	37.4	0.2	ug/L		93.4	60-130			
Hexane	38.2	1.0	ug/L		95.6	60-130			
Methyl Ethyl Ketone (2-Butanone)	98.1	5.0	ug/L		98.1	50-140			
Methyl Isobutyl Ketone	81.2	5.0	ug/L		81.2	50-140			
Methyl tert-butyl ether	97.6	2.0	ug/L		97.6	50-140			
Methylene Chloride	38.4	5.0	ug/L		95.9	60-130			
Styrene	35.8	0.5	ug/L		89.5	60-130			
1,1,1,2-Tetrachloroethane	36.1	0.5	ug/L		90.3	60-130			

Certificate of Analysis

Report Date: 17-Apr-2018

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 9-Apr-2018

Client PO:

Project Description: 62721.07

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1,1,2,2-Tetrachloroethane	42.9	0.5	ug/L	107	60-130				
Tetrachloroethylene	37.4	0.5	ug/L	93.4	60-130				
Toluene	41.0	0.5	ug/L	102	60-130				
1,1,1-Trichloroethane	34.5	0.5	ug/L	86.3	60-130				
1,1,2-Trichloroethane	36.4	0.5	ug/L	90.9	60-130				
Trichloroethylene	36.2	0.5	ug/L	90.6	60-130				
Trichlorofluoromethane	45.8	1.0	ug/L	114	60-130				
Vinyl chloride	39.3	0.5	ug/L	98.4	50-140				
m,p-Xylenes	78.8	0.5	ug/L	98.5	60-130				
o-Xylene	39.9	0.5	ug/L	99.7	60-130				
Benzene	37.6	0.5	ug/L	93.9	60-130				
Ethylbenzene	37.4	0.5	ug/L	93.5	60-130				
Toluene	41.0	0.5	ug/L	102	60-130				
m,p-Xylenes	78.8	0.5	ug/L	98.5	60-130				
o-Xylene	39.9	0.5	ug/L	99.7	60-130				

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 17-Apr-2018

Order Date: 9-Apr-2018

Project Description: 62721.07

Qualifier Notes:
Login Qualifiers :

Container(s) - Bottle and COC sample ID don't match - MW18-10

Applies to samples: BH 18-10

Container(s) - Bottle and COC sample ID don't match - MW18-3

Applies to samples: BH 18-3

Container(s) - Bottle and COC sample ID don't match - MW18-4

Applies to samples: BH 18-4

Container(s) - Bottle and COC sample ID don't match - MW18-6

Applies to samples: BH 18-6

Container(s) - Bottle and COC sample ID don't match - MW18-9

Applies to samples: BH 18-9

Sample - Filtered and preserved by Paracel upon receipt at the laboratory - Metal

Applies to samples: BH 18-6
QC Qualifiers :

QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

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.



Paracel ID: 1815096



St. Laurent Blvd.
Ontario K1G 4J8
49-1947
paracellabs.com

Chain of Custody

(Lab Use Only)

No 42092

Page 1 of 1

Client Name: GEMTEC	Project Reference: BH 62721.07
Contact Name: Nicole Soucy	Quote #
Address: 32 Steacie Dr	PO #
Telephone: 613-836-1422	Email Address: nicole.soucy@gemtec.ca
Criteria: <input checked="" type="checkbox"/> O. Reg. 153/04 (As Amended) Table <input type="checkbox"/> RSC Filing <input type="checkbox"/> O. Reg 558/00 <input type="checkbox"/> PWQO <input type="checkbox"/> CCME <input type="checkbox"/> SUB (Storm) <input type="checkbox"/> SUB (Sanitary) Municipality <input type="checkbox"/> Other	

Turnaround Time:

1 Day 3 Day
 2 Day Regular

Date Required: April 13/18

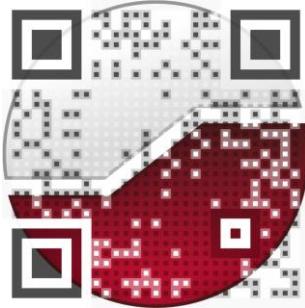
				Sample Taken		Required Analyses					
Paracel Order Number:	Matrix	Air Volume	# of Containers	Date	Time	PAH	Metals + Filter	OC Pest	pH	VOC	BTEX
1 BH18-3	GW	9	1	April 9/18		X	X		X		X
2 BH18-4		9	1						X X		
3 BH18-6		7	1					X			
4 BH18-9		10	1					X X		X	
5 BH18-10		9	1					X X			
6 BH18											
7	The bottles read MW Not BH										
8	L7 Report as BH as per Nicole SC										
9											
10											

Comments: BH60 metals bottle not filtered, Subsample from gen chem for new metals+lab filter. Walkin	Method of Delivery:		
Relinquished By (Sign): NB	Received by Driver/Depot: SC	Received at Lab: SC	Verified By: SB
Relinquished By (Print): Nicole Soucy	Date/Time: Apr 9/18	Date/Time: Apr 9/18	Date/Time: Apr 9/18 4:30
Date/Time: 1:02PM 4/9/18	Temperature: °C	Temperature: 105°C	pH Verified By: JN

Chain of Custody (Blank) - Rev 0.4 Feb 2016

*whole bottle extraction if necessary SC.

experience • knowledge • integrity

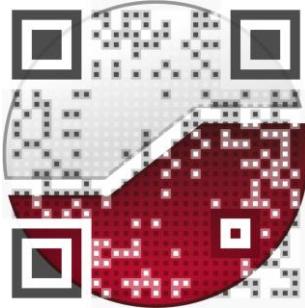


civil	civil
geotechnical	géotechnique
environmental	environnementale
field services	surveillance de chantier
materials testing	service de laboratoire des matériaux

expérience • connaissance • intégrité



experience • knowledge • integrity



civil	civil
geotechnical	géotechnique
environmental	environnementale
field services	surveillance de chantier
materials testing	service de laboratoire des matériaux

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