



# GEMTEC

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**Phase Two Environmental Site  
Assessment  
2885 Carp Road  
Ottawa, Ontario**

GEMTEC Project: 101688.002



# GEMTEC

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Submitted to:

Bell & Associates Architecture  
PO Box 178 (101-3108 Carp Road)  
Carp, Ontario  
K0A 1L0

**Phase Two Environmental Site  
Assessment  
2885 Carp Road  
Ottawa, Ontario**

September 23, 2022  
GEMTEC Project: 101688.002

GEMTEC Consulting Engineers and Scientists Limited  
32 Steacie Drive  
Ottawa, ON, Canada  
K2K 2A9

September 23, 2022

File: 101688.002

Bell & Associates Architecture  
PO Box 178 (101-3108 Carp Road)  
Carp, Ontario  
K0A 1L0

Attention: Tim Gilchrist

**Re: Phase Two Environmental Site Assessment  
2885 Carp Road, Ottawa, Ontario**

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Please find enclosed GEMTEC's Phase Two Environmental Site Assessment per our proposal dated May 20, 2022. The Phase Two ESA was completed in general accordance with Ontario Regulation 153/04 and describes the interpreted environmental conditions at the above noted property at the time the investigation was completed.

We trust this information is sufficient for your current needs. If you have any questions or require further information, please contact the undersigned.

Sincerely,



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Connor Shaw, B.Eng.



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Brenda Thom, M.Sc.(Eng.), P.Eng.

CS/BT

Enclosures  
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## EXECUTIVE SUMMARY

GEMTEC Consulting Engineers and Scientists Limited (GEMTEC) was retained by Bell & Associates Architecture to complete a Phase Two Environmental Site Assessment (ESA) in support of a site plan application for the property located at 2885 Carp Road in Ottawa, Ontario (the 'Site'). The location of the Site is shown on Figure A.1, Appendix A. This Phase Two ESA was completed in general accordance with Ontario Regulation (O.Reg.) 153/04.

Based on GEMTEC's Report entitled "Phase One Environmental Site Assessment, Proposed Residential Development, 2885 Carp Road, Ottawa, Ontario" dated June 1, 2022, one area of potential environmental concern (APEC) was identified at the Site. The APEC resulted from one potential contaminating activity (PCA) with a potential to result in contamination to soil on the Site. The APEC at the Site was identified as:

- **APEC 1 – Importation of Fill Material of Unknown Quality**

Through review of aerial photographs and the site reconnaissance, fill of unknown origin was identified across the Site, particularly on the southwest portion where a previously visible pond was filled in between 2014 and 2019. The associated contaminants of potential concern (COPC) are metals and inorganics (M&I), and polycyclic aromatic hydrocarbons (PAHs) in soil. This APEC is present across the Site.

As part of the Phase Two ESA investigation, a total of two boreholes (BH22-01 and BH22-02), were advanced with a track mounted drill rig to enable soil quality sampling.

A total of 7 soil samples were collected and analyzed for the following contaminants of potential concern (COPCs): polycyclic aromatic hydrocarbons (PAHs), and metals and inorganics.

Based on the soil analytical results of the Phase Two ESA, GEMTEC offers the following conclusions:

- The overburden observed at the Site during the Phase Two investigation generally consisted of a fill layer of brown silty sand with varying amounts of gravel, underlain by glacial till at varying depths.
- Soil sample BH22-02 SA 2 exceeded the MECP Table 8 SCS for:
  - Metals: boron (hot water soluble) and mercury
  - PAHs: acenaphthene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, fluoranthene, fluorene, indeno[1,2,3-cd]pyrene, methyl-naphthalene[1&2], naphthalene, phenanthrene, and pyrene.
- Sample BH22-02 SA8 exceeded MECP Table 8 SCS for barium.

- Soil samples submitted for analysis from BH22-01 and BH22-02 SA7 met the MECP Table 8 SCS for the parameters analyzed.

Based on the findings of the Phase Two ESA, GEMTEC recommends additional soil sampling be completed during construction to remove the soil exceedances found at BH22-02 SA2.

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## 1.0 INTRODUCTION

GEMTEC Consulting Engineers and Scientists Limited (GEMTEC) was retained by Bell & Associates Architecture to complete a Phase Two Environmental Site Assessment (ESA) to support a site plan application for the property located at 2885 Carp Road in Ottawa, Ontario (the 'Site'). The location of the Site is shown on Figure A.1, Appendix A.

The Phase Two ESA was completed based on the recommendations provided in the Phase One ESA completed by GEMTEC in June 2022 and submitted to Bell & Associates Architecture under separate cover. This Phase Two ESA was completed in general accordance with Ontario Regulation (O.Reg.) 153/04.

It is noted that the environmental investigation was limited to soil quality sampling in specific locations and groundwater quality sampling was considered outside of the present scope of work based on the finding of the Phase One ESA for the Site.

### 1.1 Site Description

The Site is currently a commercial property with two structures used as temporary site offices by Bekim Concrete. The majority of the Site consists of gravel fill material, grass, two tire mounted trailers, and two shipping containers. The Site boundary is shown on Figure A.2, Appendix A.

The Site is rectangular in shape and is located on the west side of Carp Road. The Site has an area of approximately 1.21 hectares (2.99 acres). The PIN ID and legal description for the Site are presented below:

- 04538-0128 (LT): Part of Lot 9 Concession 3 Huntley Parts 3 & 4, 5R10814; West Carleton; City of Ottawa.

Based on a cursory review of available information, the Site land use category is presently rural commercial. Property uses in the vicinity of the Site include commercial, community use roadways/pathways, and residential. The location of the Site is shown on Figure A.1, Appendix A.

### 1.2 Property Ownership

The parcel register abstract reviewed during the Phase One ESA for the Site identified a numbered company transferring the Site to Bekim Holdings Inc. in April 2019; and a charge from Bekim Holdings Inc. to Westboro Management Ltd. and Westboro Mortgage Investment LP in April 2019.

### 1.3 Current and Proposed Future Uses

The Site is currently used for commercial purposes. It is GEMTEC's understanding that the Site is to be developed for future commercial use.



## 1.4 Applicable Site Condition Standards

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

The relevant Site characteristics considered in the selection of the applicable regulatory criteria were are as follows:

- Land Use: The most sensitive land use for the Site is commercial.
- Soil Texture: Based on visual observations during the field program, although fine grained materials were encountered on-site, coarse grained soils are also present on-site in some locations. Section 42(2) of O.Reg. 153/04 defines coarse textured soil as “soil that contains more than 50 percent by mass of particles that are 75 micrometres or larger in mean diameter”. Thus, as a conservative measure, coarse grained soils have been assumed for the purposes of site condition standards selection.
- Soil Thickness and Proximity to Water Body: For the purposes of selection of the appropriate provincial standard, Section 43.1 of O.Reg. 153/04 identifies specific SCS be applied if any of the following circumstances exist:
  - (a) the property is a shallow soil property; or
  - (b) the property includes all or part of a water body or is adjacent to a water body or includes land that is within 30 metres of a water body.

Based on the results of the field program completed during the environmental investigation, more than 2 metres of overburden was encountered in the advanced borehole locations without encountering bedrock to the depth of the borehole. Therefore, it is inferred that the Site is not considered a shallow soil property.

The Site was noted to be within 30 metres of water body. The waterbody is located approximately 5 m south of the southwest portion of the Site.

- Groundwater Use: Potable water at the Site and surrounding properties is supplied by private wells. Therefore, the potable groundwater condition applies at the Site.
- Environmentally Sensitive Site: Environmental sensitivity is considered in the selection of appropriate provincial standards for comparison. Section 41 of O.Reg.153/04 states that a property is to be considered environmentally sensitive if any of the following are applicable:
  - (1) the property is,
    - (i) within an area of natural significance;
    - (ii) includes or is adjacent to an area of natural significance or part of such an area;
  - or

(iii) includes land that is within 30 metres of an area of natural significance or part of such an area;

(2) the soil at the property has a pH value as follows:

(i) for surface soil, less than 5 or greater than 9;

(ii) for sub surface soil, less than 5 or greater than 11; or

(3) a qualified person is of the opinion that, given the characteristics of the property and the certifications the qualified person would be required to make in a record of site condition in relation to the property as specified in Schedule A, it is appropriate to apply this section to the property.

Through a review of samples submitted for analysis during the environmental investigation the pH value of the soils is between 7.38 and 9.75. Following a review of areas of natural significance, no areas were identified on, adjacent to or within 30 metres of the Site. Therefore, the Site is not considered to be an environmentally sensitive site.

Based on the review of site characteristics, the following provincial standards were considered to be applicable to the soil quality results obtained during the investigation:

- MECP, 2011. Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act. Table 8: Generic Site Condition Standards for Use within 30 m of a Water Body in a Potable Groundwater Condition.

## **2.0 BACKGROUND INFORMATION**

### **2.1 Physical Setting**

Topographic mapping available through the Ministry of Natural Resources and Forestry was reviewed to determine topographic features in the vicinity of the Site and study area.

The elevation of the Site is between approximately 115 and 120 metres above sea level with a regional sloping topography to the northeast towards the Carp River located, at its closest point, approximately 2.3 kilometers northeast of the northern extent of the Site (MNR, 2019).

Regional groundwater flow often reflects topographic features and typically flows toward nearby lakes, rivers, and wetland areas. Based on the topography and hydrogeological features, it is anticipated that regional shallow groundwater flow would be to the east.

Surficial and bedrock geology maps of the Ottawa area were reviewed. Based on the review, overburden in the vicinity of the Site generally consists of coarse textured glaciomarine deposits with sand, gravel, minor silt, and clay with a thickness of approximately 5 to 10 metres (ESRI, 2016). Bedrock is mapped as primarily limestone, dolostone, shale, arkose, and sandstone from the Ottawa and Simcoe Groups of the Shadow Lake Formation (ESRI, 2016).

### **2.2 Past Investigations**

To GEMTEC's knowledge, the only other investigations for the Site were the Phase One ESA, Geotechnical Investigation, hydrogeological investigation, and tree conservation investigation completed by GEMTEC in 2022. These investigations are reported under separate covers.

## 3.0 SCOPE OF THE INVESTIGATION

### 3.1 Study Objectives and Scope of Work

The Phase Two ESA was completed to provide a preliminary assessment of the soil quality on site within Areas of Potential Environmental Concern (APECs) identified during the Phase One ESA investigation. The soil quality sampling was completed in conjunction with a Geotechnical field investigation program (also completed by GEMTEC as reported under separate cover). The soil quality investigation was completed in general accordance with O.Reg. 153/04, and other applicable industry standards to support a site plan application.

The objective of the Phase Two ESA was to provide subsurface information relative to the potential environmental impacts related to the areas of potential environmental concern (APECs) identified in the Phase One ESA, namely:

- **APEC 1 – Importation of Fill Material of Unknown Quality.**

Through review of aerial photographs and the site reconnaissance, fill of unknown origin was identified across the Site, particularly on the southwest portion where a previously visible pond was filled in between 2014 and 2019. The associated contaminants of potential concern (COPC) are metals and inorganics (M&I), and polycyclic aromatic hydrocarbons (PAHs) in soil. This APEC is present across the Site.

Environmental sampling was carried out to characterize the soil quality within the APEC on the southwest portion of the Site. The scope of work as outlined in GEMTEC's proposal included the following (any deviations from the proposed scope have been noted):

- Advancement of three additional sampling locations on the east portion of the Site via hand shovel and hand auger to enable collection of soil quality samples.
- Two bulk soil samples, one from fill and one from native material, from each of the geotechnical boreholes, as well as one bulk soil sample from each of the three proposed environmental hand auger holes were to be collected and submitted for laboratory analysis of the COPCs identified in the Phase One ESA, metals and inorganics (M&I) and polycyclic aromatic hydrocarbons (PAHs).
- One composite soil sample was collected for toxicity characteristic leaching procedure (TCLP) analysis to confirm soil waste category to inform future disposal options.
- One duplicate soil sample was to be collected and submitted for the same COPCs as part of the field program Quality Assurance / Quality Control (QA/QC) requirements.
- Assessment of soil analytical results against applicable provincial standards; and,
- Preparation of a Phase Two ESA report summarizing the purpose, methodology and results of the investigation (this report).

**Note:** Due to the information provided by the owner during the site visit to complete the hand auger holes, no samples were retrieved via hand auger. The owner noted that no soil fill material

had been placed on the eastern portion of the Site, only wood chips from felled trees. A total of 7 soil samples were collected during the geotechnical investigation and submitted for laboratory analysis (4 soil samples from BH22-01 and 3 soil samples from BH22-02). In addition, no field duplicate sample was submitted for laboratory analysis.

## **4.0 SCOPE OF THE INVESTIGATION**

### **4.1 General**

Prior to initiating the intrusive investigation, underground utilities were cleared by the locates subcontractor (Premier Locates) to identify the location of buried utilities on-site. Public and private utilities including telephone, gas, hydro, and municipal services were cleared.

### **4.2 Borehole Advancement**

The borehole investigation was carried out on May 18, 2022. At that time, a total of two boreholes (BH22-1 and BH22-2) were advanced on-site. The boreholes were advanced on-site by CCC Geotechnical & Environmental Drilling Ltd, of Ottawa, Ontario, operating under GEMTEC oversight. Boreholes BH22-1 and BH22-2 were advanced using a truck mounted drill rig to approximate depths of 6.8 and 6.0 metres below ground surface (mbgs), respectively.

### **4.3 Field Methodology**

#### **4.3.1 Soil Sampling**

Soil samples were recovered at regular intervals during drilling. The soil samples were examined for texture and screened for visual and olfactory evidence of contamination in the field. Environmental soil samples were collected after the drilling investigation from the geotechnical sampling bags in GEMTEC's soils laboratory. Clean gloves were worn and changed between each sample to prevent cross contamination.

Borehole locations were identified as BHX-Y SAZ where X indicates the year the borehole was advanced, Y is the borehole identifier, and Z is the sample identifier. For example, BH22-2 SA1 indicates the borehole was constructed in 2022 and is identified as sample number 1 of borehole 2.

All samples were stored in laboratory supplied coolers with ice. Samples were submitted to Paracel Laboratories Ltd, of Ottawa, Ontario, under standard chain-of-custody protocols and in accordance with GEMTEC QA/QC procedures. A summary of the soil samples which were collected from each location for laboratory analyses is summarized in Table 4.1.

**Table 4.1 – Summary of Soil Samples Submitted for Laboratory Analysis.**

Borehole	Sample	Depth Interval (m bgs)	Soil Description	Laboratory Analyses
BH22-1	SA2	0.76 – 1.37	Brown silty sand and gravel fill	PAHs
	SA3	1.52 – 2.13	Brown silty sand and gravel fill	M&I
	SA7	4.52 – 5.18	Grey sandy gravel with some silt, cobbles, and boulders, glacial till	PAHs
	SA9	6.09 – 6.68	Grey-brown sand with some silt and gravel, glacial till	M&I
BH22-2	SA2	0.76 – 1.37	Brown silty sand and gravel fill	M&I, PAHs
	SA7	4.57 – 5.18	Grey sand and gravel with some silt, glacial till	PAHs
	SA8	5.33 – 5.74	Grey sand and gravel with some silt, glacial till	M&I

**Notes:** m bgs – metres below ground surface  
M&I – Metals and Inorganics  
PAHs – Polycyclic Aromatic Hydrocarbons

#### 4.4 Laboratory Analytical Program

Soil samples were submitted to Paracel Laboratories Ltd. (Paracel) of Ottawa, Ontario, for analysis of the COPCs. Paracel is accredited by the Standards Council of Canada (SCC) in cooperation with the Canadian Association of Laboratory Accreditation (CALA) for specific environmental tests listed in the scope of accreditation. They are accredited to the ISO/IEC 17025 (2017) standard and employ in-house quality assurance and quality control programs to govern sample analysis including the analysis of method blanks, spiked blanks, and the analysis of duplicates (10%) for each sample batch.

#### 4.5 Surveying

The boreholes were located to assess potential impacts within the identified APEC and were constrained by accessibility and underground service locations. The ground surface elevations at the location of the boreholes (ground surface) were determined using a Trimble R10 global positioning system. The coordinates of the boreholes are referenced to NAD83 (CSRS) Epoch 2010, vertical network CGVD28 and are considered to be accurate within the tolerance of the instrument. The locations of the boreholes advanced on-site are shown on Figure A.1 in Appendix A.

#### 4.6 Quality Assurance / Quality Control Program

Quality assurance and quality control of the soil samples was maintained by adhering to the following:

- The field investigation was completed under GEMTEC standard operating procedures (SOPs) for intrusive investigations;
- Samples were assigned unique identification numbers, as they were collected, identifying the project number, date, sample location, and depth. The sample numbers were recorded in field notes for each location;
- Sample containers provided by the analytical laboratory were used and laboratory requirements for sample size, container type, preservatives and filtering were maintained;
- Non-disposable sampling equipment was cleaned using Alconox® and distilled water following each use to avoid potential cross-contamination;
- A chain-of-custody (COC) form was filled out prior to submitting the selected samples to the laboratory. The COC documented sample movement from time of field collection to receipt at the laboratory and provided a record of sample identification, requested analysis and conditions of samples upon arrival at the laboratory (e.g. temperature, container status, etc.); and,
- Samples were randomly selected by the laboratory for Quality Assurance checks. Generally, one sample for every ten samples submitted is assessed by the laboratory internal QA/QC program. For each parameter, there is an acceptable upper and lower limit for measured concentrations.

## **5.0 RESULTS**

### **5.1 Site Stratigraphy**

The surficial geology for the Site was visually observed and logged during the borehole program. The soil conditions identified in the boreholes advanced as part of this investigation are provided on the borehole logs in Appendix B. The borehole logs indicate the subsurface conditions encountered at the specific test locations only, conditions at other than the test locations may vary. Boundaries between zones on the logs are often not distinct, but rather are transitional and have been interpreted based on observations by GEMTEC field personnel. The following sections present a summary of the subsurface conditions observed in the boreholes advanced during this investigation.

#### **5.1.1 Topsoil**

Topsoil was encountered at the ground surface in borehole BH22-02. The topsoil has a thickness of approximately 100 millimetres.

#### **5.1.2 Fill Material**

A layer of fill material was encountered at the ground surface in borehole BH22-01 and below the topsoil in borehole BH22-02. The fill material consists of silty sand with varying amount of gravel and clay and extends to depths of approximately 2.3 metres below the existing ground surface.

### 5.1.3 Glacial Till

Native deposits of glacial till were encountered below the fill material in boreholes BH22-01 and BH22-02. The glacial till was not fully penetrated in the boreholes but was proven depths of approximately 6.0 metres below the existing ground surface. The glacial till can be described as a heterogeneous mix of all grain sizes, which at this Site is described as sand and gravel, some silt, trace clay. The glacial till also contains cobbles and boulders.

## 5.2 Analytical Results

### 5.2.1 Soil Quality

Soil samples were selected for laboratory analysis based on visual, olfactory and tactile evidence of impact, and presence of fill material. A total of 7 soil samples were submitted to Paracel for analysis of the COPCs. Exceedances to the selected MECP Table 8 SCS are summarized in Table 5.2 below and are presented in Figure A.2 of Appendix A.

**Table 5.2 – Summary of Soil Samples Submitted for Laboratory Analysis.**

Location ID	Sample ID	Depth Interval (mbgs)	Laboratory Analysis	MECP Table 8 SCS
BH22-02	SA2	0.79 – 1.40	M&I, PAHs	<b>M&amp;I:</b> Boron (Hot Water Soluble), Mercury <b>PAHs:</b> Acenaphthene, Anthracene, Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Chrysene, Dibenzo[a,h]anthracene, Fluoranthene, Fluorene, Indeno[1,2,3-cd]pyrene, Methylnaphthalene[1&2, Naphthalene, Phenanthrene, Pyrene
	SA8	5.33 – 5.74	M&I	<b>M&amp;I:</b> Barium

**Notes:**

PAHs – Polycyclic Aromatic Hydrocarbons

M&I – Metals and Inorganics

None – No exceedances

MECP Table 8 SCS: Table 8: Generic Site Condition Standards (SCS) for Use within 30 m of a Water Body in Potable Groundwater Condition, Residential/Parkland/Institutional/Industrial/Commercial/Community (RPI/ICC) land use, coarse textured soils. (MECP, 2011).

## 5.3 Quality Assurance / Quality Control

### 5.3.1 Analytical Laboratory QA/QC

The analytical laboratory completed all analyses in accordance with internal laboratory QA/QC which includes standardized analytical methods and procedures, in accordance with



O.Reg. 153/04, as amended. GEMTECs review of Paracel's QA/QC certificates indicates the following:

- The TCLP sample exceeded the holding time upon receipt of the sample at the laboratory or prior to the analysis being requested. The analysis was conducted after the accepted holding time had been exceeded. However, since the parameters selected are of the non-volatile the exceeded holding time was not a concern.
- BH22-01 SA3, BH22-01 SA9, BH22-02 SA2, and BH22-02 SA8 had one or more parameters received past the hold time (conductivity, cyanide, mercury, hexavalent chromium, pH). Since the parameters exceeding the holding time are not of volatile in nature, the exceeded holding time was not a concern.
- The spike recovery was outside acceptance limits for the matrix spike due to matrix interference for hexavalent chromium.

### 5.3.2 QA/QC Summary

Based on the measures discussed above and considering the heterogenous nature of soil, sample collection and handling protocols are considered acceptable and associated analytical results are considered reliable. The sample collection methods do not suggest inconsistencies in the field collection or in the laboratory analysis methods.

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the analytical results of the Phase Two ESA, GEMTEC offers the following conclusions:

- The overburden observed at the site during the subsurface investigation generally consisted of a fill layer of brown silty sand with varying amounts of gravel, underlain by glacial till at varying depths.
- Soil sample BH22-02 SA 2 exceeded the MECP Table 8 SCS for:
  - Metals: boron (hot water soluble), mercury,
  - PAHs: acenaphthene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, fluoranthene, fluorene, indeno[1,2,3-cd]pyrene, methyl-naphthalene[1&2], naphthalene, phenanthrene, and pyrene.
- Sample BH22-02 SA8 exceeded MECP Table 8 SCS for barium.
- Soil samples BH22-01 SA2, SA3, SA7, SA9 and BH22-02 SA7 submitted for analysis met the MECP Table 8 SCS for the parameters analyzed.

Based on the findings of the Phase Two ESA, GEMTEC recommends additional soil sampling be completed during construction to remove the soil exceedances found at BH22-02 SA2.

## 7.0 LIMITATION OF LIABILITY

This report and the work referred to herein was completed by GEMTEC Consulting Engineers and Scientists Ltd. (GEMTEC) for Bell & Associates Architecture. It is intended for the exclusive use of Bell & Associates Architecture. This report may not be relied upon by any other person or entity without the express written consent of GEMTEC or Bell & Associates Architecture. 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 reflect the best judgment of GEMTEC based on the site conditions observed during the investigations undertaken at the date(s) identified in the report and on the information available at the time the report was prepared. Unless otherwise stated, the findings contained in this report cannot be extrapolated or extended to historical 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 elsewhere on the site, the chemical parameters addressed in the report may exist in soil 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.

The aggregate limit of our liability for any claims, damages, injuries, losses and other liabilities on this assignment, including for negligence, errors, and omissions shall not exceed the amount of our Professional Liability Insurance.

## 8.0 REFERENCES

Environmental Systems Research Institute (ESRI). 2011. ArcGIS Desktop: Release 10. Redlands, CA: Environmental Systems Research Institute.

Geography Network Canada (GNC). October 2004. Ontario Basic Mapping Accessed: October 2020. Available: <http://www.geographynetwork.ca/website/obm/viewer.htm>.

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Ontario Ministry of the Environment, Laboratory Services Branch (MOE). Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. March 9, 2004, amended as of July 1, 2011.

Ontario Ministry of the Environment, Conservation and Parks (MECP). Ontario Regulation 153/04, Made under the Environmental Protection Act, Part XV.1 – Records of Site Condition. October 31, 2011 updated January 1, 2014.

## 9.0 CLOSURE

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.



Connor Shaw, B.Eng.  
Environmental Scientist



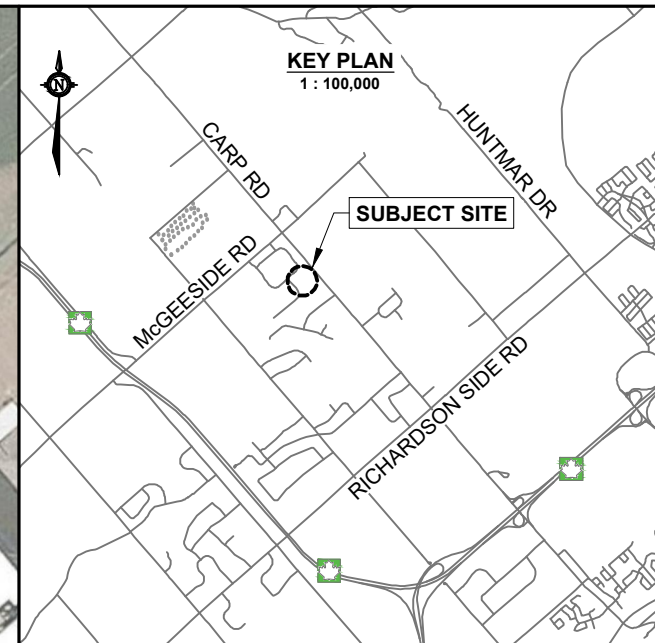
Brenda Thom, M.Sc.(Eng.), P.Eng.  
Senior Environmental Engineer



## **APPENDIX A**

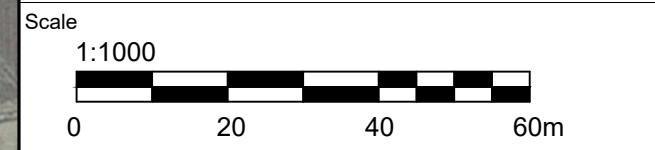
Figures

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**LEGEND**

- BH # — BOREHOLE ID
- XX.XX — GROUND SURFACE ELEVATION, IN METRES  
GEODEIC DATUM
- BOREHOLE LOCATION  
(current investigation by GEMTEC)
- MONITORING WELL LOCATION  
(current investigation by GEMTEC)
- APPROXIMATE PROPERTY BOUNDARY



**GEMTEC**  
CONSULTING ENGINEERS  
AND SCIENTISTS

32 Steacie Drive  
Ottawa, ON K2K 2A9  
Tel: (613) 836-1422  
www.gemtec.ca  
ottawa@gemtec.ca

Drawing  
**BOREHOLE AND  
MONITORING WELL LOCATION PLAN**

Client  
**BELL & ASSOCIATES ARCHITECTURE**

Project 101688.002	Phased by B.T.	PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 2885 CARP ROAD CARP, ONTARIO
Drwn by S.L.		

Date SEPTEMBER, 2022	Rev. 0	<b>FIGURE A.1</b>
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\\LUCID\DRAWINGS AND FILES\PROJECTS\101600\101688.002\DRAWING\1.DRAWINGS\101688.002\_ESA-PH2\_RO\_2022-09.DWG



Sample ID:	BH22-02 SA 2	BH22-02 SA 8
Depth (mbgs):	0.76 - 1.37	5.33 - 5.74
Parameter	Analytical Result (ug/g)	Analytical Result (ug/g)
<b>Polycyclic Aromatic Hydrocarbons</b>		
Acenaphthene	1.13	N/A
Anthracene	2.58	N/A
Benzo[a]anthracene	4.33	N/A
Benzo[a]pyrene	2.16	N/A
Benzo[b]fluoranthene	3.81	N/A
Benzo[g,h,i]perylene	1.68	N/A
Benzo[k]fluoranthene	2.03	N/A
Chrysene	4.22	N/A
Dibenzo[a,h]anthracene	0.30	N/A
Fluoranthene	8.44	N/A
Fluorene	1.48	N/A
Indeno [1,2,3-cd] pyrene	1.78	N/A
Methylnaphthalene (1&2)	0.61	N/A
Naphthalene	0.85	N/A
Phenanthrene	9.05	N/A
Pyrene	5.58	N/A
<b>Metals</b>		
Barium	88.6	346
Boron (Hot Water Soluble)	2.5	ND(0.5)
Mercury	0.7	ND(0.1)

Parameter	MECP Table 8 SCS RPI/ICC <sup>1</sup>
<b>Polycyclic Aromatic Hydrocarbons</b>	
Acenaphthene	0.072
Anthracene	0.22
Benzo[a]anthracene	0.36
Benzo[a]pyrene	0.3
Benzo[b]fluoranthene	0.47
Benzo[g,h,i]perylene	0.68
Benzo[k]fluoranthene	0.48
Chrysene	2.8
Dibenzo[a,h]anthracene	0.1
Fluoranthene	0.69
Fluorene	0.19
Indeno [1,2,3-cd] pyrene	0.23
Methylnaphthalene (1&2)	0.59
Naphthalene	0.09
Phenanthrene	0.69
Pyrene	1
<b>Metals</b>	
Barium	220
Boron (Hot Water Soluble)	1.5
Mercury	0.27

**LEGEND**

- BH # — BOREHOLE ID
- XX.XX — GROUND SURFACE ELEVATION, IN METRES GEODETIC DATUM
- BOREHOLE LOCATION (current investigation by GEMTEC)
- MONITORING WELL LOCATION (current investigation by GEMTEC)
- APPROXIMATE PROPERTY BOUNDARY

**Notes:**

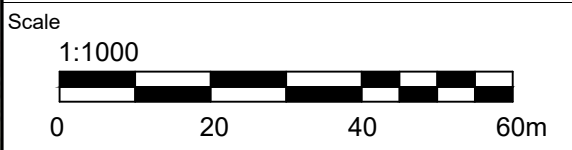
N/A - Not Analyzed

ND - Concentration not detected above method detection limit

'mbgs' - metres below ground surface

1 - MECP Table 8: Ontario Ministry of the Environment, "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act," March 2004, amended July 1, 2011. Generic Site Condition Standards for Soil (other than Sediment) for Use within 30 m of a Water Body in a Potable Groundwater Condition for Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use.

**Bold - Exceeds MECP Table 8 SCS RPI/ICC**



**GEMTEC**  
CONSULTING ENGINEERS AND SCIENTISTS

32 Steacie Drive  
Ottawa, ON K2K 2A9  
Tel: (613) 836-1422  
www.gemtec.ca  
ottawa@gemtec.ca

Drawing

**BULK SOIL EXCEEDANCES**

Client

**BELL & ASSOCIATES ARCHITECTURE**

Project	101688.002	PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 2885 CARP ROAD CARP, ONTARIO
Drwn by	S.L.	
Chkd by	B.T.	

Date	SEPTEMBER, 2022	Rev.	0	<b>FIGURE A.2</b>
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## **APPENDIX B**

### Borehole Logs

# RECORD OF BOREHOLE 22-01

CLIENT: Bell & Associates Architecture  
 PROJECT: Phase Two ESA, Proposed Development, 2885 Carp Road, Ottawa  
 JOB#: 101688.002  
 LOCATION: See Site Plan, Figure 1

SHEET: 1 OF 1  
 DATUM: CGVD28  
 BORING DATE: May 18 2022

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLE DATA				COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)	MONITORING WELL INSTALLATION AND NOTES
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY (mm)	BLOWS/0.3m				
0		Ground Surface		117.36								
1	Power Auger Hollow Stem Auger (108mm OD)	Loose to compact, brown silty sand, some gravel, trace clay (FILL MATERIAL)		115.07	1	SS	205	14	BH22-01 SA2: PAHs			
2				2	SS	355	9	BH22-01 SA3: M&I				
3				3	SS	510	9					
4		Dense to very dense, grey sand and gravel, some silt, trace clay (GLACIAL TILL)		2.29	4	SS	455	31	BH22-01 SA7: PAHs			
5				5	SS	355	34					
6				6	SS	405	84					
7				7	SS	560	58					
8		Dense, grey brown, SAND, some silt and gravel		111.42	8	SS	205	57	BH22-01 SA9: M&I			
9				9	SS	560	29					
6		End of Borehole Auger Refusal		110.56			6.80					




ENV - BOREHOLE LOG 101785.001\_BH.LOGS\_2022-05-20.GPJ GEMTEC 2018.GDT 9/16/22



# RECORD OF BOREHOLE 22-02

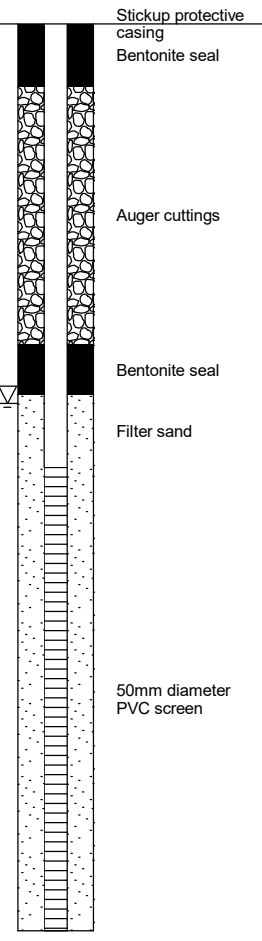
CLIENT: Bell & Associates Architecture  
 PROJECT: Phase Two ESA, Proposed Development, 2885 Carp Road, Ottawa  
 JOB#: 101688.002  
 LOCATION: See Site Plan, Figure 1

SHEET: 1 OF 1  
 DATUM: CGVD28  
 BORING DATE: May 18 2022

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLE DATA				COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)	MONITORING WELL INSTALLATION AND NOTES
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY (mm)	BLOWS/0.3m				
0		Ground Surface		117.27								
0.10		TOPSOIL Loose, brown silty sand (FILL MATERIAL)		0.10	1	SS	305	7				
1.0		Loose to compact, dark brown, silty sand, some gravel (FILL MATERIAL)		116.36 0.91	2	SS	405	11				
2.0					3	SS	255	8				
3.0		Compact to very dense, grey sand and gravel, some silt, trace clay (GLACIAL TILL)		114.98 2.29	4	SS	100	>50 for 75mm				
4.0					5	SS	205	14				
5.0					6	SS	150	>50 for 100mm				
					7	SS	355	29				
					8	SS	205	>50 for 100mm				
		End of Borehole Auger Refusal		111.30 5.97								

GROUNDWATER OBSERVATIONS		
DATE	DEPTH (m)	ELEVATION (m)
May. 25/22	2.50	▽ 114.77



ENV - BOREHOLE LOG 101785.001\_BH.LOGS\_2022-05-20.GPJ GEMTEC 2018.GDT 9/16/22



## **APPENDIX C**

### Summary of Analytical Results

TABLE C.1  
Bulk Soil Analytical Results  
2885 Carp Road  
Ottawa, Ontario

Parameter	Units	MDL	MECP Table 8 RPI/ICC SCS <sup>1</sup>	Sample ID:	BH22-01 SA2	BH22-01 SA3	BH22-01 SA7	BH22-01 SA9	BH22-02 SA2	BH22-02 SA7	BH22-02 SA8
				Laboratory Sample ID:	2226525-01	2226525-04	2226525-06	2226525-03	2226525-05	2226525-02	
				Date Sampled (yyyy-mm-dd):	2022-05-18	2022-05-18	2022-05-18	2022-05-18	2022-05-18	2022-05-18	2022-05-18
				Sample Depth (mbgs):	0.76 - 1.37	1.52 - 2.13	4.52 - 5.18	6.09 - 6.68	0.76 - 1.37	4.57 - 5.18	5.33 - 5.74
<b>General Inorganics</b>											
SAR	NA	NA	5		N/A	1.03	N/A	0.14	0.73	N/A	0.28
Conductivity	µS/cm	0.005	700		N/A	330	N/A	104	572	N/A	169
Cyanide, free	µg/g	0.04	0.051		N/A	ND (0.03)	N/A	ND (0.03)	ND (0.03)	N/A	ND (0.03)
pH	pH units	NA	NV		N/A	7.38	N/A	7.52	7.69	N/A	7.95
<b>Metals</b>											
Antimony	µg/g	0.8	1.3		N/A	ND (1.0)	N/A	ND (1.0)	ND (1.0)	N/A	ND (1.0)
Arsenic	µg/g	1	18		N/A	4.2	N/A	2.7	3.5	N/A	2.9
Barium	µg/g	2	220		N/A	126	N/A	57.4	88.6	N/A	346
Beryllium	µg/g	0.4	2.5		N/A	0.6	N/A	ND (0.5)	ND (0.5)	N/A	ND (0.5)
Boron, Hot Water Soluble	µg/g	5	1.5		N/A	ND (0.5)	N/A	ND (0.5)	2.5	N/A	ND (0.5)
Boron	µg/g	0.1	36		N/A	12.9	N/A	7.8	12.8	N/A	13.0
Cadmium	µg/g	0.5	1.2		N/A	ND (0.5)	N/A	ND (0.5)	ND (0.5)	N/A	ND (0.5)
Chromium (VI)	µg/g	5	0.66		N/A	ND (0.2)	N/A	ND (0.2)	ND (0.2)	N/A	ND (0.2)
Chromium	µg/g	0.5	70		N/A	24.2	N/A	15.2	21.2	N/A	49.7
Cobalt	µg/g	1	22		N/A	8.5	N/A	7.3	6.0	N/A	9.2
Copper	µg/g	1	92		N/A	15.3	N/A	9.5	13.7	N/A	15.9
Lead	µg/g	0.5	120		N/A	14.3	N/A	5.3	18.2	N/A	6.9
Mercury	µg/g	1	0.27		N/A	ND (0.1)	N/A	ND (0.1)	0.7	N/A	ND (0.1)
Molybdenum	µg/g	0.8	2		N/A	ND (1.0)	N/A	ND (1.0)	ND (1.0)	N/A	1.2
Nickel	µg/g	0.5	82		N/A	16.2	N/A	10.5	13.8	N/A	15.6
Selenium	µg/g	0.5	1.5		N/A	ND (1.0)	N/A	ND (1.0)	ND (1.0)	N/A	ND (1.0)
Silver	µg/g	0.5	0.5		N/A	ND (0.3)	N/A	ND (0.3)	ND (0.3)	N/A	ND (0.3)
Thallium	µg/g	0.4	1		N/A	ND (1.0)	N/A	ND (1.0)	ND (1.0)	N/A	ND (1.0)
Uranium	µg/g	5	2.5		N/A	ND (1.0)	N/A	ND (1.0)	ND (1.0)	N/A	ND (1.0)
Vanadium	µg/g	0.2	86		N/A	36.2	N/A	29.4	29.9	N/A	38.0
Zinc	µg/g	0.1	290		N/A	42.4	N/A	21.4	41.9	N/A	30.7
<b>Polycyclic Aromatic Hydrocarbons</b>											
Acenaphthene	ug/g	0.04	0.072		ND (0.02)	N/A	ND (0.02)	N/A	1.13	ND (0.02)	N/A
Acenaphthylene	ug/g	0.03	0.093		ND (0.02)	N/A	ND (0.02)	N/A	0.05	ND (0.02)	N/A
Anthracene	ug/g	0.05	0.22		0.02	N/A	ND (0.02)	N/A	2.58	ND (0.02)	N/A
Benzo[a]anthracene	ug/g	0.05	0.36		0.09	N/A	ND (0.02)	N/A	4.33	ND (0.02)	N/A
Benzo[a]pyrene	ug/g	0.02	0.3		0.09	N/A	ND (0.02)	N/A	2.16	ND (0.02)	N/A
Benzo[b]fluoranthene	ug/g	0.03	0.47		0.10	N/A	ND (0.02)	N/A	3.81	ND (0.02)	N/A
Benzo[g,h,i]perylene	ug/g	0.03	0.68		0.06	N/A	ND (0.02)	N/A	1.68	ND (0.02)	N/A
Benzo[k]fluoranthene	ug/g	0.05	0.48		0.04	N/A	ND (0.02)	N/A	2.03	ND (0.02)	N/A
Chrysene	ug/g	0.5	2.8		0.12	N/A	ND (0.02)	N/A	4.22	ND (0.02)	N/A
Dibenzo[a,h]anthracene	ug/g	0.04	0.1		ND (0.02)	N/A	ND (0.02)	N/A	0.30	ND (0.02)	N/A
Fluoranthene	ug/g	0.05	0.69		0.17	N/A	ND (0.02)	N/A	8.44	ND (0.02)	N/A
Fluorene	ug/g	0.05	0.19		ND (0.02)	N/A	ND (0.02)	N/A	1.48	ND (0.02)	N/A
Indeno [1,2,3-cd] pyrene	ug/g	0.04	0.23		0.05	N/A	ND (0.02)	N/A	1.78	ND (0.02)	N/A
1-Methylnaphthalene	ug/g	0.05	0.59*		ND (0.02)	N/A	ND (0.02)	N/A	0.24	ND (0.02)	N/A
2-Methylnaphthalene	ug/g	0.04	0.59*		ND (0.02)	N/A	ND (0.02)	N/A	0.37	ND (0.02)	N/A
Methylnaphthalene (1&2)	ug/g	0.05	0.59*		ND (0.04)	N/A	ND (0.04)	N/A	0.61	ND (0.04)	N/A
Naphthalene	ug/g	0.05	0.09		ND (0.01)	N/A	ND (0.01)	N/A	0.85	ND (0.01)	N/A
Phenanthrene	ug/g	0.05	0.69		0.09	N/A	ND (0.02)	N/A	9.05	ND (0.02)	N/A
Pyrene	ug/g	0.05	1		0.14	N/A	ND (0.02)	N/A	5.58	ND (0.02)	N/A

**Notes:**

MDL - Method Detection Limit  
 'mbgs' - Metres Below Ground Surface  
 'NV' - No Standard/ Guideline Value  
 'ND' - Non-Detect Sample  
 'NA' - Not Analyzed

\* - The methylnaphthalene standards are applicable to both 1-methylnaphthalene and 2-methylnaphthalene, with the provision that if both are detected, the sum of the two must not exceed the standard

1 - MECP Table 8: Ontario Ministry of the Environment, "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, " March 2004, amended July 1, 2011. Generic Site Condition Standards for Soil (other than Sediment) for Use within 30 m of a Water Body in a Potable Groundwater Condition for Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use.

Grey Fill Exceeds MECP Table 8 RPI/ICC

**TABLE C.2**  
**TCLP Analytical Results**  
**2885 Carp Road**  
**Ottawa, Ontario**

Parameter	Units	MDL	O.Reg. 558 Schedule 4 <sup>1</sup>	Sample ID: Laboratory Sample ID: Date Sampled (yyyy-mm-dd):	TCLP 2226527-01 2022-05-18
<b>Physical Characteristics</b>					
Flashpoint	Deg. C	-	70		>70
<b>EPA 1311 - TCLP Leachate Metals</b>					
Arsenic	mg/L	0.01	2.5		ND (0.05)
Barium	mg/L	0.01	100		<b>0.78</b>
Boron	mg/L	0.05	500		ND (0.05)
Cadmium	mg/L	0.01	0.5		ND (0.01)
Chromium	mg/L	0.05	5		ND (0.05)
Lead	mg/L	0.01	5		ND (0.05)
Mercury	mg/L	0.01	0.1		ND (0.005)
Selenium	mg/L	0.01	1		ND (0.05)
Silver	mg/L	0.01	5		ND (0.05)
Uranium	mg/L	0.05	10		ND (0.05)
<b>EPA 1311 - TCLP Leachate Semi-Volatiles and Volatiles</b>					
Benzene	mg/L	0.005	0.5		ND (0.005)
Carbon Tetrachloride	mg/L	0.005	0.5		ND (0.005)
Chlorobenzene	mg/L	0.004	8		ND (0.004)
Chloroform	mg/L	0.006	10		ND (0.006)
1,2-Dichlorobenzene	mg/L	0.004	20		ND (0.004)
1,4-Dichlorobenzene	mg/L	0.004	0.5		ND (0.004)
1,2-Dichloroethane	mg/L	0.005	0.5		ND (0.005)
1,1-Dichloroethylene	mg/L	0.006	1.4		ND (0.006)
Methyl Ethyl Ketone (2-Butanone)	mg/L	0.30	200		ND (0.30)
Methylene Chloride	mg/L	0.04	5		ND (0.04)
Tetrachloroethylene	mg/L	0.005	3		ND (0.005)
Trichloroethylene	mg/L	0.004	5		ND (0.004)
Vinyl Chloride	mg/L	0.005	0.2		ND (0.005)
<b>EPA 1311 - TCLP Leachate Organics</b>					
Benzo[a]pyrene	mg/L	0.0001	0.001		ND (0.0001)

**Notes:**

MDL - Method Detection Limit

'ND' - Non-Detect Sample

1 - MECP O.Reg. 558 and O.Reg 347 Schedule 4, Quality Criteria, to evaluate waste classification (hazardous or non-hazardous waste) for on-site soils. (MECP, 2000).

**Exceeds Reg. 558 Standards**



## **APPENDIX D**

### Laboratory Certificates of Analysis

## Certificate of Analysis

**GEMTEC Consulting Engineers and Scientists Limited**

32 Steacie Drive  
Kanata, ON K2K 2A9  
Attn: Brenda Thom

Client PO: 101688.002 - Soil Sampling  
Project: 101688.002  
Custody: 125227

Report Date: 4-Jul-2022  
Order Date: 23-Jun-2022

**Order #: 2226525**

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

Parcel ID	Client ID
2226525-01	BH22-01 SA2
2226525-02	BH22-02 SA7
2226525-03	BH22-01 SA9
2226525-04	BH22-01 SA3
2226525-05	BH22-02 SA2
2226525-06	BH22-01 SA7
2226525-07	BH22-02 SA8

Approved By:



Mark Foto, M.Sc.  
Lab Supervisor

Certificate of Analysis

Report Date: 04-Jul-2022

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 23-Jun-2022

Client PO: 101688.002 - Soil Sampling

Project Description: 101688.002

**Analysis Summary Table**

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.8 - ICP-MS	30-Jun-22	30-Jun-22
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	27-Jun-22	28-Jun-22
Conductivity	MOE E3138 - probe @25 °C, water ext	29-Jun-22	30-Jun-22
Cyanide, free	MOE E3015 - Auto Colour, water extraction	28-Jun-22	28-Jun-22
Mercury by CVAA	EPA 7471B - CVAA, digestion	30-Jun-22	30-Jun-22
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	29-Jun-22	29-Jun-22
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	30-Jun-22	30-Jun-22
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	24-Jun-22	1-Jul-22
SAR	Calculated	30-Jun-22	30-Jun-22
Solids, %	Gravimetric, calculation	27-Jun-22	27-Jun-22

Certificate of Analysis

Report Date: 04-Jul-2022

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 23-Jun-2022

Client PO: 101688.002 - Soil Sampling

Project Description: 101688.002

<b>Client ID:</b>	BH22-01 SA2	BH22-02 SA7	BH22-01 SA9	BH22-01 SA3
<b>Sample Date:</b>	18-May-22 09:00	18-May-22 09:00	18-May-22 09:00	18-May-22 09:00
<b>Sample ID:</b>	2226525-01	2226525-02	2226525-03	2226525-04
<b>MDL/Units</b>	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	87.4	91.4	90.8	87.8
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**General Inorganics**

SAR	0.01 N/A	-	-	0.14	1.03
Conductivity	5 uS/cm	-	-	104 [1]	330 [1]
Cyanide, free	0.03 ug/g dry	-	-	<0.03 [1]	<0.03 [1]
pH	0.05 pH Units	-	-	7.52 [1]	7.38 [1]

**Metals**

Antimony	1.0 ug/g dry	-	-	<1.0	<1.0
Arsenic	1.0 ug/g dry	-	-	2.7	4.2
Barium	1.0 ug/g dry	-	-	57.4	126
Beryllium	0.5 ug/g dry	-	-	<0.5	0.6
Boron	5.0 ug/g dry	-	-	7.8	12.9
Boron, available	0.5 ug/g dry	-	-	<0.5	<0.5
Cadmium	0.5 ug/g dry	-	-	<0.5	<0.5
Chromium	5.0 ug/g dry	-	-	15.2	24.2
Chromium (VI)	0.2 ug/g dry	-	-	<0.2 [1]	<0.2 [1]
Cobalt	1.0 ug/g dry	-	-	7.3	8.5
Copper	5.0 ug/g dry	-	-	9.5	15.3
Lead	1.0 ug/g dry	-	-	5.3	14.3
Mercury	0.1 ug/g dry	-	-	<0.1 [1]	<0.1 [1]
Molybdenum	1.0 ug/g dry	-	-	<1.0	<1.0
Nickel	5.0 ug/g dry	-	-	10.5	16.2
Selenium	1.0 ug/g dry	-	-	<1.0	<1.0
Silver	0.3 ug/g dry	-	-	<0.3	<0.3
Thallium	1.0 ug/g dry	-	-	<1.0	<1.0
Uranium	1.0 ug/g dry	-	-	<1.0	<1.0
Vanadium	10.0 ug/g dry	-	-	29.4	36.2
Zinc	20.0 ug/g dry	-	-	21.4	42.4

**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	0.09	<0.02	-	-
Benzo [a] pyrene	0.02 ug/g dry	0.09	<0.02	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	0.10	<0.02	-	-



Certificate of Analysis

Report Date: 04-Jul-2022

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 23-Jun-2022

Client PO: 101688.002 - Soil Sampling

Project Description: 101688.002

	Client ID:	BH22-01 SA2	BH22-02 SA7	BH22-01 SA9	BH22-01 SA3
	Sample Date:	18-May-22 09:00	18-May-22 09:00	18-May-22 09:00	18-May-22 09:00
	Sample ID:	2226525-01	2226525-02	2226525-03	2226525-04
	MDL/Units	Soil	Soil	Soil	Soil
Benzo [g,h,i] perylene	0.02 ug/g dry	0.06	<0.02	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	0.04	<0.02	-	-
Chrysene	0.02 ug/g dry	0.12	<0.02	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	-	-
Fluoranthene	0.02 ug/g dry	0.17	<0.02	-	-
Fluorene	0.02 ug/g dry	<0.02	<0.02	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.05	<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	0.09	<0.02	-	-
Pyrene	0.02 ug/g dry	0.14	<0.02	-	-
2-Fluorobiphenyl	Surrogate	99.0%	88.4%	-	-
Terphenyl-d14	Surrogate	125%	106%	-	-

Certificate of Analysis

Report Date: 04-Jul-2022

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 23-Jun-2022

Client PO: 101688.002 - Soil Sampling

Project Description: 101688.002

<b>Client ID:</b>	BH22-02 SA2	BH22-01 SA7	BH22-02 SA8	-
<b>Sample Date:</b>	18-May-22 09:00	18-May-22 09:00	18-May-22 09:00	-
<b>Sample ID:</b>	2226525-05	2226525-06	2226525-07	-
<b>MDL/Units</b>	Soil	Soil	Soil	-

**Physical Characteristics**

% Solids	0.1 % by Wt.	88.3	87.3	92.7	-
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**General Inorganics**

SAR	0.01 N/A	0.73	-	0.28	-
Conductivity	5 uS/cm	572 [1]	-	169 [1]	-
Cyanide, free	0.03 ug/g dry	<0.03 [1]	-	<0.03 [1]	-
pH	0.05 pH Units	7.69 [1]	-	7.95 [1]	-

**Metals**

Antimony	1.0 ug/g dry	<1.0	-	<1.0	-
Arsenic	1.0 ug/g dry	3.5	-	2.9	-
Barium	1.0 ug/g dry	88.6	-	346	-
Beryllium	0.5 ug/g dry	<0.5	-	<0.5	-
Boron	5.0 ug/g dry	12.8	-	13.0	-
Boron, available	0.5 ug/g dry	2.5	-	<0.5	-
Cadmium	0.5 ug/g dry	<0.5	-	<0.5	-
Chromium	5.0 ug/g dry	21.2	-	49.7	-
Chromium (VI)	0.2 ug/g dry	<0.2 [1]	-	<0.2 [1]	-
Cobalt	1.0 ug/g dry	6.0	-	9.2	-
Copper	5.0 ug/g dry	13.7	-	15.9	-
Lead	1.0 ug/g dry	18.2	-	6.9	-
Mercury	0.1 ug/g dry	0.7 [1]	-	<0.1 [1]	-
Molybdenum	1.0 ug/g dry	<1.0	-	1.2	-
Nickel	5.0 ug/g dry	13.8	-	15.6	-
Selenium	1.0 ug/g dry	<1.0	-	<1.0	-
Silver	0.3 ug/g dry	<0.3	-	<0.3	-
Thallium	1.0 ug/g dry	<1.0	-	<1.0	-
Uranium	1.0 ug/g dry	<1.0	-	<1.0	-
Vanadium	10.0 ug/g dry	29.9	-	38.0	-
Zinc	20.0 ug/g dry	41.9	-	30.7	-

**Semi-Volatiles**

Acenaphthene	0.02 ug/g dry	1.13	<0.02	-	-
Acenaphthylene	0.02 ug/g dry	0.05	<0.02	-	-
Anthracene	0.02 ug/g dry	2.58	<0.02	-	-
Benzo [a] anthracene	0.02 ug/g dry	4.33	<0.02	-	-
Benzo [a] pyrene	0.02 ug/g dry	2.16	<0.02	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	3.81	<0.02	-	-

Certificate of Analysis

Report Date: 04-Jul-2022

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 23-Jun-2022

Client PO: 101688.002 - Soil Sampling

Project Description: 101688.002

	MDL/Units	Client ID: BH22-02 SA2	BH22-01 SA7	BH22-02 SA8	
		Sample Date: 18-May-22 09:00	18-May-22 09:00	18-May-22 09:00	-
		Sample ID: 2226525-05	2226525-06	2226525-07	-
		Soil	Soil	Soil	-
Benzo [g,h,i] perylene	0.02 ug/g dry	1.68	<0.02	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	2.03	<0.02	-	-
Chrysene	0.02 ug/g dry	4.22	<0.02	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.30	<0.02	-	-
Fluoranthene	0.02 ug/g dry	8.44	<0.02	-	-
Fluorene	0.02 ug/g dry	1.48	<0.02	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	1.78	<0.02	-	-
1-Methylnaphthalene	0.02 ug/g dry	0.24	<0.02	-	-
2-Methylnaphthalene	0.02 ug/g dry	0.37	<0.02	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	0.61	<0.04	-	-
Naphthalene	0.01 ug/g dry	0.85	<0.01	-	-
Phenanthrene	0.02 ug/g dry	9.05	<0.02	-	-
Pyrene	0.02 ug/g dry	5.58	<0.02	-	-
2-Fluorobiphenyl	Surrogate	73.5%	56.4%	-	-
Terphenyl-d14	Surrogate	83.9%	82.7%	-	-

Certificate of Analysis

Report Date: 04-Jul-2022

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 23-Jun-2022

Client PO: 101688.002 - Soil Sampling

Project Description: 101688.002

**Method Quality Control: Blank**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>General Inorganics</b>									
Conductivity	ND	5	uS/cm						
Cyanide, free	ND	0.03	ug/g						
<b>Metals</b>									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	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	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
<b>Semi-Volatiles</b>									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	1.00		ug/g		75.3	50-140			
Surrogate: Terphenyl-d14	1.40		ug/g		105	50-140			

Certificate of Analysis

Report Date: 04-Jul-2022

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 23-Jun-2022

Client PO: 101688.002 - Soil Sampling

Project Description: 101688.002

**Method Quality Control: Duplicate**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>General Inorganics</b>									
SAR	1.19	0.01	N/A	1.12			6.1	30	
Conductivity	263	5	uS/cm	262			0.4	5	
Cyanide, free	ND	0.03	ug/g	ND			NC	35	
pH	7.40	0.05	pH Units	7.52			1.6	2.3	
<b>Metals</b>									
Antimony	ND	1.0	ug/g	ND			NC	30	
Arsenic	2.9	1.0	ug/g	4.0			NC	30	
Barium	93.8	1.0	ug/g	124			27.6	30	
Beryllium	0.5	0.5	ug/g	0.6			17.0	30	
Boron, available	ND	0.5	ug/g	ND			NC	35	
Boron	13.3	5.0	ug/g	13.9			3.9	30	
Cadmium	ND	0.5	ug/g	ND			NC	30	
Chromium (VI)	ND	0.2	ug/g	ND			NC	35	
Chromium	23.9	5.0	ug/g	29.2			20.1	30	
Cobalt	7.6	1.0	ug/g	9.3			20.3	30	
Copper	18.7	5.0	ug/g	23.1			20.9	30	
Lead	30.4	1.0	ug/g	36.8			19.1	30	
Mercury	ND	0.1	ug/g	ND			NC	30	
Molybdenum	ND	1.0	ug/g	ND			NC	30	
Nickel	16.4	5.0	ug/g	19.8			18.7	30	
Selenium	ND	1.0	ug/g	ND			NC	30	
Silver	ND	0.3	ug/g	ND			NC	30	
Thallium	ND	1.0	ug/g	ND			NC	30	
Uranium	ND	1.0	ug/g	ND			NC	30	
Vanadium	30.9	10.0	ug/g	37.3			18.9	30	
Zinc	ND	20.0	ug/g	ND			NC	30	
<b>Physical Characteristics</b>									
% Solids	84.6	0.1	% by Wt.	86.7			2.5	25	
<b>Semi-Volatiles</b>									
Acenaphthene	ND	0.02	ug/g	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g	ND			NC	40	
Anthracene	0.025	0.02	ug/g	0.038			NC	40	
Benzo [a] anthracene	ND	0.02	ug/g	ND			NC	40	
Benzo [a] pyrene	ND	0.02	ug/g	0.030			NC	40	
Benzo [b] fluoranthene	ND	0.02	ug/g	0.048			NC	40	
Benzo [g,h,i] perylene	ND	0.02	ug/g	0.025			NC	40	
Benzo [k] fluoranthene	ND	0.02	ug/g	ND			NC	40	
Chrysene	ND	0.02	ug/g	0.023			NC	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g	ND			NC	40	
Fluoranthene	0.029	0.02	ug/g	0.030			2.9	40	
Fluorene	ND	0.02	ug/g	ND			NC	40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g	ND			NC	40	
1-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
Naphthalene	ND	0.01	ug/g	ND			NC	40	
Phenanthrene	0.024	0.02	ug/g	0.032			27.0	40	
Pyrene	0.021	0.02	ug/g	0.024			15.8	40	
Surrogate: 2-Fluorobiphenyl	1.57		ug/g		90.7	50-140			
Surrogate: Terphenyl-d14	1.69		ug/g		97.5	50-140			

Certificate of Analysis

Report Date: 04-Jul-2022

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 23-Jun-2022

Client PO: 101688.002 - Soil Sampling

Project Description: 101688.002

**Method Quality Control: Spike**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>General Inorganics</b>									
Cyanide, free	0.273	0.03	ug/g	ND	83.8	50-150			
<b>Metals</b>									
Arsenic	61.7	1.0	ug/g	1.6	120	70-130			
Barium	110	1.0	ug/g	49.5	122	70-130			
Beryllium	61.7	0.5	ug/g	ND	123	70-130			
Boron, available	4.14	0.5	ug/g	ND	82.7	70-122			
Boron	67.8	5.0	ug/g	5.5	124	70-130			
Cadmium	55.5	0.5	ug/g	ND	111	70-130			
Chromium (VI)	3.7	0.2	ug/g	ND	65.0	70-130			QM-05
Chromium	76.0	5.0	ug/g	11.7	129	70-130			
Cobalt	65.2	1.0	ug/g	3.7	123	70-130			
Copper	65.4	5.0	ug/g	9.2	112	70-130			
Lead	79.5	1.0	ug/g	14.7	130	70-130			
Mercury	1.33	0.1	ug/g	ND	88.9	70-130			
Molybdenum	55.8	1.0	ug/g	ND	111	70-130			
Nickel	68.3	5.0	ug/g	7.9	121	70-130			
Selenium	52.1	1.0	ug/g	ND	104	70-130			
Silver	53.9	0.3	ug/g	ND	108	70-130			
Thallium	57.7	1.0	ug/g	ND	115	70-130			
Uranium	52.8	1.0	ug/g	ND	105	70-130			
Vanadium	65.4	10.0	ug/g	13.5	104	70-130			
Zinc	119	20.0	ug/g	80.2	78.3	70-130			
<b>Semi-Volatiles</b>									
Acenaphthene	0.190	0.02	ug/g	ND	87.8	50-140			
Acenaphthylene	0.136	0.02	ug/g	ND	62.9	50-140			
Anthracene	0.195	0.02	ug/g	0.038	72.4	50-140			
Benzo [a] anthracene	0.181	0.02	ug/g	ND	83.6	50-140			
Benzo [a] pyrene	0.230	0.02	ug/g	0.030	92.5	50-140			
Benzo [b] fluoranthene	0.266	0.02	ug/g	0.048	101	50-140			
Benzo [g,h,i] perylene	0.193	0.02	ug/g	0.025	77.5	50-140			
Benzo [k] fluoranthene	0.210	0.02	ug/g	ND	96.8	50-140			
Chrysene	0.190	0.02	ug/g	0.023	77.3	50-140			
Dibenzo [a,h] anthracene	0.181	0.02	ug/g	ND	83.4	50-140			
Fluoranthene	0.192	0.02	ug/g	0.030	74.9	50-140			
Fluorene	0.194	0.02	ug/g	ND	89.5	50-140			
Indeno [1,2,3-cd] pyrene	0.195	0.02	ug/g	ND	90.0	50-140			
1-Methylnaphthalene	0.175	0.02	ug/g	ND	81.0	50-140			
2-Methylnaphthalene	0.196	0.02	ug/g	ND	90.5	50-140			
Naphthalene	0.187	0.01	ug/g	ND	86.4	50-140			
Phenanthrene	0.170	0.02	ug/g	0.032	63.9	50-140			
Pyrene	0.185	0.02	ug/g	0.024	74.0	50-140			
Surrogate: 2-Fluorobiphenyl	1.40		ug/g		81.0	50-140			
Surrogate: Terphenyl-d14	1.77		ug/g		102	50-140			

Certificate of Analysis

Report Date: 04-Jul-2022

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 23-Jun-2022

Client PO: 101688.002 - Soil Sampling

Project Description: 101688.002

**Qualifier Notes:**

**Login Qualifiers :**

Sample - One or more parameter received past hold time - Conductivity, cyanide, mercury, hexavalent chromium, pH

*Applies to samples: BH22-01 SA9, BH22-01 SA3, BH22-02 SA2, BH22-02 SA8*

**Sample Qualifiers :**

1 : Holding time had been exceeded upon receipt of the sample at the laboratory or prior to the analysis being requested.

**QC Qualifiers :**

QM-05 : The spike recovery was outside acceptance limits for the matrix spike due to matrix interference.

**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.

NC: Not Calculated

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.



Parcel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2226525	Nº 125227

Client Name: <b>GEMTEC</b>	Project Ref: <b>101688.002 - Soil Sampling</b>	Page <b>1</b> of <b>1</b>
Contact Name: <b>Brenda Thom</b>	Quote #:	Turnaround Time <input type="checkbox"/> 1 day <input type="checkbox"/> 3 day <input type="checkbox"/> 2 day <input checked="" type="checkbox"/> Regular
Address: <b>32 steacie dr. Kanata ON</b>	PO #: <b>101688.002</b>	
Telephone:	E-mail: <b>brenda.thom@gemtec.ca</b> <b>luca.fiorindi@gemtec.ca</b>	Date Required: _____

Regulation 153/04		Other Regulation		Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)		Required Analysis													
<input type="checkbox"/> Table 1	<input type="checkbox"/> Res/Park	<input type="checkbox"/> Med/Fine	<input type="checkbox"/> REG 558	<input type="checkbox"/> PWQO	Matrix	Air Volume	# of Containers	Sample Taken Date   Time		PHCS F1-F4+BTEX	VOCs	PAHs	Metals by ICP			Conductivity	Cyanide (Free)	pH	SAR
<input checked="" type="checkbox"/> Table 2	<input checked="" type="checkbox"/> Ind/Comm	<input checked="" type="checkbox"/> Coarse	<input type="checkbox"/> CCME	<input type="checkbox"/> MISA									Hg	CrVI	B (HWS)				
<input type="checkbox"/> Table 3	<input type="checkbox"/> Agri/Other		<input type="checkbox"/> SU - Sani	<input type="checkbox"/> SU - Storm															
<input type="checkbox"/> Table _____		Mun: _____																	
For RSC: <input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Other: _____																	
Sample ID/Location Name																			
1	BH22-01 SA2			S		1	May 18 2022				X								
2	BH22-01 SA7			S		1					X								
3	BH22-01 SA9			S		1						X	X	X	X	X	X	X	
4	BH22-01 SA3			S		1						X	X	X	X	X	X	X	
5	BH22-02 SA2			S		1					X	X	X	Y	Y	Y	Y	X	
6	BH22-02 SA7			S		1					X								
7	BH22-02 SA8			S		1						X	X	Y	Y	X	X	Y	
8																			
9																			
10																			

Comments: <b>low sample volume may contain some rocks</b> <b>• PAHs likely passed hold, please proceed with qualifier</b>		Method of Delivery: <b>DROP BOX</b>	
Relinquished By (Sign): <b>Luca Fiorindi</b>	Received By Driver/Depot:	Received at Lab: <b>Blam</b>	Verified By: <b>DGC</b>
Relinquished By (Print): <b>Luca Fiorindi</b>	Date/Time:	Date/Time: <b>JUNE 23 2022 17:57</b>	Date/Time: <b>JUN 24 2022 11:25</b>
Date/Time: <b>JUNE 23 2022</b>	Temperature: _____ °C	Temperature: <b>11.3</b> °C	pH Verified: <input type="checkbox"/> By: <b>NA</b>



## Certificate of Analysis

**GEMTEC Consulting Engineers and Scientists Limited**

32 Steacie Drive  
Kanata, ON K2K 2A9  
Attn: Brenda Thom

Client PO: 101688.002 - Soil Sampling  
Project: 101688.002  
Custody: 56119

Report Date: 4-Jul-2022  
Order Date: 23-Jun-2022

**Order #: 2226527**

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

Paracel ID	Client ID
2226527-01	TCLP

Approved By:



Mark Foto, M.Sc.  
Lab Supervisor

Certificate of Analysis

Report Date: 04-Jul-2022

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 23-Jun-2022

Client PO: 101688.002 - Soil Sampling

Project Description: 101688.002

**Analysis Summary Table**

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Flashpoint	ASTM D93 - Pensky-Martens Closed Cup	27-Jun-22	27-Jun-22
Metals, ICP-MS	TCLP EPA 6020 - Digestion - ICP-MS	30-Jun-22	30-Jun-22
REG 558 - Mercury by CVAA	TCLP EPA 7470A, CVAA	30-Jun-22	30-Jun-22
REG 558 - PAHs	TCLP EPA 625 - GC-MS	30-Jun-22	1-Jul-22
REG 558 - VOCs	TCLP ZHE EPA 624 - P&T GC-MS	29-Jun-22	30-Jun-22
Solids, %	Gravimetric, calculation	29-Jun-22	30-Jun-22

Certificate of Analysis

Report Date: 04-Jul-2022

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 23-Jun-2022

Client PO: 101688.002 - Soil Sampling

Project Description: 101688.002

Client ID:	TCLP	-	-	-
Sample Date:	18-May-22 09:00	-	-	-
Sample ID:	2226527-01	-	-	-
MDL/Units	Soil	-	-	-

**Physical Characteristics**

% Solids	0.1 % by Wt.	89.1	-	-	-
Flashpoint	°C	>70 [2]	-	-	-

**EPA 1311 - TCLP Leachate Metals**

Arsenic	0.05 mg/L	<0.05	-	-	-
Barium	0.05 mg/L	0.78	-	-	-
Boron	0.05 mg/L	<0.05	-	-	-
Cadmium	0.01 mg/L	<0.01	-	-	-
Chromium	0.05 mg/L	<0.05	-	-	-
Lead	0.05 mg/L	<0.05	-	-	-
Mercury	0.005 mg/L	<0.005 [1]	-	-	-
Selenium	0.05 mg/L	<0.05	-	-	-
Silver	0.05 mg/L	<0.05	-	-	-
Uranium	0.05 mg/L	<0.05	-	-	-

**EPA 1311 - TCLP Leachate Volatiles**

Benzene	0.005 mg/L	<0.005 [1]	-	-	-
Carbon Tetrachloride	0.005 mg/L	<0.005 [1]	-	-	-
Chlorobenzene	0.004 mg/L	<0.004 [1]	-	-	-
Chloroform	0.006 mg/L	<0.006 [1]	-	-	-
1,2-Dichlorobenzene	0.004 mg/L	<0.004 [1]	-	-	-
1,4-Dichlorobenzene	0.004 mg/L	<0.004 [1]	-	-	-
1,2-Dichloroethane	0.005 mg/L	<0.005 [1]	-	-	-
1,1-Dichloroethylene	0.006 mg/L	<0.006 [1]	-	-	-
Methyl Ethyl Ketone (2-Butanone)	0.30 mg/L	<0.30 [1]	-	-	-
Methylene Chloride	0.04 mg/L	<0.04 [1]	-	-	-
Tetrachloroethylene	0.005 mg/L	<0.005 [1]	-	-	-
Trichloroethylene	0.004 mg/L	<0.004 [1]	-	-	-
Vinyl chloride	0.005 mg/L	<0.005 [1]	-	-	-
4-Bromofluorobenzene	Surrogate	113% [1]	-	-	-
Dibromofluoromethane	Surrogate	105% [1]	-	-	-
Toluene-d8	Surrogate	95.8% [1]	-	-	-

**EPA 1311 - TCLP Leachate Organics**

Benzo [a] pyrene	0.0001 mg/L	<0.0001 [1]	-	-	-
Terphenyl-d14	Surrogate	122% [1]	-	-	-

Certificate of Analysis

Report Date: 04-Jul-2022

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 23-Jun-2022

Client PO: 101688.002 - Soil Sampling

Project Description: 101688.002

**Method Quality Control: Blank**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>EPA 1311 - TCLP Leachate Metals</b>									
Arsenic	ND	0.05	mg/L						
Barium	ND	0.05	mg/L						
Boron	ND	0.05	mg/L						
Cadmium	ND	0.01	mg/L						
Chromium	ND	0.05	mg/L						
Lead	ND	0.05	mg/L						
Mercury	ND	0.005	mg/L						
Selenium	ND	0.05	mg/L						
Silver	ND	0.05	mg/L						
Uranium	ND	0.05	mg/L						
<b>EPA 1311 - TCLP Leachate Organics</b>									
Benzo [a] pyrene	ND	0.0001	mg/L						
Surrogate: Terphenyl-d14	0.25		mg/L		126	37-156			
<b>EPA 1311 - TCLP Leachate Volatiles</b>									
Benzene	ND	0.005	mg/L						
Carbon Tetrachloride	ND	0.005	mg/L						
Chlorobenzene	ND	0.004	mg/L						
Chloroform	ND	0.006	mg/L						
1,2-Dichlorobenzene	ND	0.004	mg/L						
1,4-Dichlorobenzene	ND	0.004	mg/L						
1,2-Dichloroethane	ND	0.005	mg/L						
1,1-Dichloroethylene	ND	0.006	mg/L						
Methyl Ethyl Ketone (2-Butanone)	ND	0.30	mg/L						
Methylene Chloride	ND	0.04	mg/L						
Tetrachloroethylene	ND	0.005	mg/L						
Trichloroethylene	ND	0.004	mg/L						
Vinyl chloride	ND	0.005	mg/L						
Surrogate: 4-Bromofluorobenzene	0.0915		mg/L		114	83-134			
Surrogate: Dibromofluoromethane	0.0808		mg/L		101	78-124			
Surrogate: Toluene-d8	0.0772		mg/L		96.5	76-118			

Certificate of Analysis

Report Date: 04-Jul-2022

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 23-Jun-2022

Client PO: 101688.002 - Soil Sampling

Project Description: 101688.002

**Method Quality Control: Duplicate**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>EPA 1311 - TCLP Leachate Metals</b>									
Arsenic	ND	0.05	mg/L	ND			NC	29	
Barium	0.407	0.05	mg/L	0.478			16.1	34	
Boron	1.16	0.05	mg/L	1.33			12.9	33	
Cadmium	ND	0.01	mg/L	ND			NC	33	
Chromium	ND	0.05	mg/L	ND			NC	32	
Lead	ND	0.05	mg/L	ND			NC	32	
Mercury	ND	0.005	mg/L	ND			NC	30	
Selenium	ND	0.05	mg/L	ND			NC	28	
Silver	ND	0.05	mg/L	ND			NC	28	
Uranium	ND	0.05	mg/L	ND			NC	27	
<b>EPA 1311 - TCLP Leachate Volatiles</b>									
Benzene	ND	0.005	mg/L	ND			NC	25	
Carbon Tetrachloride	ND	0.005	mg/L	ND			NC	25	
Chlorobenzene	ND	0.004	mg/L	ND			NC	25	
Chloroform	ND	0.006	mg/L	ND			NC	25	
1,2-Dichlorobenzene	ND	0.004	mg/L	ND			NC	25	
1,4-Dichlorobenzene	ND	0.004	mg/L	ND			NC	25	
1,2-Dichloroethane	ND	0.005	mg/L	ND			NC	25	
1,1-Dichloroethylene	ND	0.006	mg/L	ND			NC	25	
Methyl Ethyl Ketone (2-Butanone)	ND	0.30	mg/L	ND			NC	25	
Methylene Chloride	ND	0.04	mg/L	ND			NC	25	
Tetrachloroethylene	ND	0.005	mg/L	ND			NC	25	
Trichloroethylene	ND	0.004	mg/L	ND			NC	25	
Vinyl chloride	ND	0.005	mg/L	ND			NC	25	
Surrogate: 4-Bromofluorobenzene	0.0912		mg/L		114	83-134			
Surrogate: Dibromofluoromethane	0.0826		mg/L		103	78-124			
Surrogate: Toluene-d8	0.0770		mg/L		96.2	76-118			
<b>Physical Characteristics</b>									
% Solids	80.8	0.1	% by Wt.	80.7			0.0	25	

Certificate of Analysis

Report Date: 04-Jul-2022

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 23-Jun-2022

Client PO: 101688.002 - Soil Sampling

Project Description: 101688.002

**Method Quality Control: Spike**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>EPA 1311 - TCLP Leachate Metals</b>									
Arsenic	59.2	0.05	mg/L	0.845	117	83-119			
Barium	97.4	0.05	mg/L	47.8	99.2	80-120			
Boron	174	0.05	mg/L	133	83.0	71-128			
Cadmium	45.9	0.01	mg/L	0.125	91.5	78-119			
Chromium	58.9	0.05	mg/L	ND	118	80-124			
Lead	47.2	0.05	mg/L	0.688	93.1	77-126			
Mercury	0.0300	0.005	mg/L	ND	99.9	70-130			
Selenium	47.0	0.05	mg/L	0.113	93.7	75-125			
Silver	47.5	0.05	mg/L	ND	95.0	70-128			
Uranium	53.6	0.05	mg/L	0.064	107	70-131			
<b>EPA 1311 - TCLP Leachate Organics</b>									
Benzo [a] pyrene	0.0566	0.0001	mg/L	ND	113	39-123			
<i>Surrogate: Terphenyl-d14</i>	<i>0.24</i>		<i>mg/L</i>		<i>122</i>	<i>37-156</i>			
<b>EPA 1311 - TCLP Leachate Volatiles</b>									
Benzene	0.036	0.005	mg/L	ND	91.2	55-141			
Carbon Tetrachloride	0.033	0.005	mg/L	ND	82.8	49-149			
Chlorobenzene	0.038	0.004	mg/L	ND	95.4	64-137			
Chloroform	0.037	0.006	mg/L	ND	92.2	58-138			
1,2-Dichlorobenzene	0.037	0.004	mg/L	ND	92.6	60-150			
1,4-Dichlorobenzene	0.035	0.004	mg/L	ND	88.4	63-132			
1,2-Dichloroethane	0.039	0.005	mg/L	ND	97.6	50-140			
1,1-Dichloroethylene	0.035	0.006	mg/L	ND	88.4	43-153			
Methyl Ethyl Ketone (2-Butanone)	0.092	0.30	mg/L	ND	91.9	26-153			
Methylene Chloride	0.037	0.04	mg/L	ND	92.6	58-149			
Tetrachloroethylene	0.035	0.005	mg/L	ND	87.7	51-145			
Trichloroethylene	0.045	0.004	mg/L	ND	112	52-135			
Vinyl chloride	0.039	0.005	mg/L	ND	97.0	31-159			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0814</i>		<i>mg/L</i>		<i>102</i>	<i>83-134</i>			
<i>Surrogate: Dibromofluoromethane</i>	<i>0.0820</i>		<i>mg/L</i>		<i>103</i>	<i>78-124</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0799</i>		<i>mg/L</i>		<i>99.8</i>	<i>76-118</i>			

Certificate of Analysis

Report Date: 04-Jul-2022

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 23-Jun-2022

Client PO: **101688.002 - Soil Sampling**

Project Description: **101688.002**

**Qualifier Notes:**

***Login Qualifiers :***

Sample - One or more parameter received past hold time - Mercury, PAH, VOCs, flashpoint

*Applies to samples: TCLP*

- 1 : Holding time had been exceeded upon receipt of the sample at the laboratory or prior to the analysis being requested.
- 2 : This analysis was conducted after the accepted holding time had been exceeded.

**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.

NC: Not Calculated

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.



vd.  
18  
com

Parcel Order Number  
(Lab Use Only)

2226527

Chain Of Custody  
(Lab Use Only)

No 56119

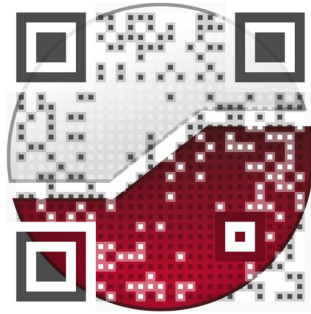
Client Name: <b>GEMTEC</b>	Project Ref: <b>101688.002 - Soil sampling</b>	Page <u>1</u> of <u>1</u>
Contact Name: <b>Brenda Thom</b>	Quote #:	Turnaround Time <input type="checkbox"/> 1 day <input type="checkbox"/> 3 day <input type="checkbox"/> 2 day <input checked="" type="checkbox"/> Regular
Address: <b>32 Steacie Drive Kanata ON</b>	PO #: <b>101688.002</b>	
Telephone:	E-mail: <b>brenda.thom@gemtec.ca</b> <b>luca.fiorindi@gemtec.ca</b>	
Date Required: _____		

Regulation 153/04		Other Regulation		Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)		Required Analysis														
<input type="checkbox"/> Table 1	<input type="checkbox"/> Res/Park	<input type="checkbox"/> Med/Fine	<input type="checkbox"/> REG 558	<input type="checkbox"/> PWQO	Matrix	Air Volume	# of Containers	Sample Taken		Leachate VOCs	Leachate Metals	Leachate BGR/P	Flash point							
<input type="checkbox"/> Table 2	<input type="checkbox"/> Ind/Comm	<input type="checkbox"/> Coarse	<input type="checkbox"/> CCME	<input type="checkbox"/> MISA				Date	Time											
<input type="checkbox"/> Table 3	<input type="checkbox"/> Agri/Other		<input type="checkbox"/> SU - Sani	<input type="checkbox"/> SU - Storm																
<input type="checkbox"/> Table _____			Mun: _____																	
For RSC: <input type="checkbox"/> Yes <input type="checkbox"/> No				<input type="checkbox"/> Other: _____																
Sample ID/Location Name																				
1	<b>TCLP</b>				S		2	May 18 2022		X	X	X	X							
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Comments:				Method of Delivery: <b>Drop Box</b>			
Relinquished By (Sign): <b>Luca Fiorindi</b>	Received By Driver/Depot:	Received at Lab: <b>EFAM</b>	Verified By: <b>DB</b>				
Relinquished By (Print): <b>Luca Fiorindi</b>	Date/Time:	Date/Time: <b>June 23, 21 17:57</b>	Date/Time: <b>June 24 2022</b>				
Date/Time: <b>June 23 2022</b>	Temperature: _____ °C	Temperature: <b>11.3</b> °C	pH Verified: <input type="checkbox"/> By: <b>1130</b>				



experience • knowledge • integrity



civil	civil
geotechnical	géotechnique
environmental	environnement
structural	structures
field services	surveillance de chantier
materials testing	service de laboratoire des matériaux

expérience • connaissance • intégrité

