GEI Consultants

Consulting Engineers and Scientists

Phase Two Environmental Site Assessment

830, 864 and 912 Lockhart Road, Barrie, Ontario

Submitted to:
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Table of Contents

Figures

Appendices

Executive Summary

GEI Consultants (GEI) was retained by Pratt Homes (Client), to conduct a Phase Two Environmental Site Assessment (ESA) at the proposed Crisdawn (Phase 3) Subdivision which consists of the properties located at 830, 864 and 912 Lockhart Road, Barrie, Ontario (Site), as shown on Figure 1.

This Phase Two ESA was conducted in accordance with the Phase Two ESA standard defined by Ontario Regulation 153/04 (O.Reg.153/04), as amended.

The objective of the Phase Two ESA was to assess the Areas of Potential Environmental Concern (APECs) identified in the Phase One ESA completed by Peto MacCallum Ltd. *("Phase One Environmental Site Assessment, Proposed Crisdawn Subdivision – Phase 3, Lockhart Road, Barrie, Ontario",* PML Ref. 17BF007, Report 5 Revised, by Peto MacCallum Ltd., dated February 2022); and, to obtain soil and groundwater chemical data to characterize the Site.

The findings of the Phase Two ESA conducted at the Site are summarized as follows:

1. The general stratigraphy at the Site, as revealed in the borehole logs, consists of fill material at the surface in the vicinity of the identified Above ground Storage Tank (AST) underlain by native sandy silt to silty clay over sand and silt glacial till.
2. Based on the borehole logs and observations in the field the native overburden samples and were identified as coarse textured. However, the Ministry of Environment, Conservation, and Parks (MECP) Table 8: Generic Site Condition Standards for use within 30 m of a water body in a Non-Potable Ground Water Condition apply to both medium-fine and coarse textured soil classifications.
3. The depth to groundwater was observed on May 26, 2022 and ranged between 1.02 m and 1.26 m bgs.
4. The soil analytical results indicated that all soil samples submitted for Petroleum Hydrocarbons (PHCs), Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX), Volatile Organic Compounds (VOCs), and metals and inorganics (including Electrical Conductivity (EC), Sodium Absorption Ratio (SAR), and pH) analyses were either non-detected or detected below the applicable MECP (2011) Table 8 Site Condition Standards (SCS) for Residential/Parkland/Institutional (RPI) / Industrial/Commercial/Community (ICC); and all laboratory RDLs were below the applicable SCS, except for:
    - The concentration of EC (2.21 mS/cm) exceeded the MECP Table 8 RPI/ICC SCS (0.7 mS/cm) in the BH/MW22-3-2 sample.

    However, under the newly amended O.Reg.153/04 (O.Reg.407/19), if a substance has been applied to surfaces for the safety of vehicular or pedestrian traffic under the conditions of snow or ice or both (i.e. application of de-icing salts), its related parameters are not deemed to be in exceedance of the MECP Table 8 SCS RPI/ICC SCSs. As de-icing salts were used at the Site, EC is not considered as a contaminant of concern.
5. The groundwater analytical results indicated that all groundwater samples submitted for PHCs, BTEX, VOCs, and metals and inorganics (including sodium and chloride) analyses were either non-detected or detected below the applicable MECP (2011) Table 8 RPI/ICC SCSs; and all laboratory RDLs were below the applicable SCSs.

Conclusions and Recommendations

As a result of this Phase Two Environmental Site Assessment, no impacts were identified in soil based on the APECs and PCAs identified from the Phase One Environmental Site Assessment.

1. Introduction

GEI Consultants (GEI) was retained by Pratt Homes. (Client), to conduct a Phase Two Environmental Site Assessment (ESA) at the proposed Crisdawn (Phase 3) Subdivision which consists of the properties located at 830, 864 and 912 Lockhart Road, Barrie, Ontario (Site), as shown on Figure 1.

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1.1 Site Description

The site is located north of Lockhart Road and approximately 1.0 km east of Yonge Street in Barrie, Ontario, as shown on Figure 1. The Site measures approximately 625,000 m^2 (62.5 ha) in size. The site is currently occupied by three residential dwellings, with the majority of the site being undeveloped or farmland. A Site Layout Plan is provided as Figure 2.

The Site is bound to the north by agricultural land, to the west by forested areas, to the east by agricultural and forested areas, and to the south by Lockhart Road followed by residential properties. The surrounding properties are shown on Figure 3.

The legal description of the Site as obtained from the chain of title is "PART SW1/4 ;OT 18 CONCESSION 11 INNISFIL PART 1, PLAN 51R34222 EXCEPT PLAN 51M1176; CITY OF BARRIE", "PART LOT 19 CONCESSION 11 INNISFIL AND PART SE1/4 LOT 18 CONCESSION 11 INNISFIL PARTS 1, 2, 3, & 4 PLAN 51R39092 EXCEPT PLAN 51M1176; ST EASEMENT OVER PART SE1/4 LOT 18 CONCESSION 11 INNISFIL PART 2 PLAN 51R39092 AS IN IN31296; TOGETHER WITH AN EASEMENT OVER PART LOT 19 CONCESSION 11 INNISFIL PARTS 5, 6 & 7 PLAN 51R39092 IN FAVOUR OF PART 4 PLAN 51R39092 AS IN SC1075033; CITY OF BARRIE" and "PART S1/2 LOT 17 CONCESSION 11 INNISFIL PART 1 PLAN 51R39932, EXCEPT PLAN 51M1176; CITY OF BARRIE". The Property Identification Numbers (PIN) are 58092-0103 (LT), 58092-0105 (LT) and 58092-0107 (LT), respectively. A legal survey is included in Appendix A.

1.2 Legal Description and Property Ownership

Refer to the table below for the Site identification information.

Site Details	
Municipal Addresses	830, 864 and 912 Lockhart Road, Barrie, Ontario
Owner	Pratt Developments Inc. Crisdawn Construction Inc.
Owner Address	301 King Street Barrie, Ontario M3B 2T5
Owner Contact	Ms. Taylor Pratt

Site Details	
Legal Description	• "PART SW1/4 ;OT 18 CONCESSION 11 INNISFIL PART 1, PLAN 51R34222 EXCEPT PLAN 51M1176; CITY OF BARRIE". • "PART LOT 19 CONCESSION 11 INNISFIL AND PART SE1/4 LOT 18 CONCESSION 11 INNISFIL PARTS 1, 2, 3, & 4 PLAN 51R39092 EXCEPT PLAN 51M1176; ST EASEMENT OVER PART SE1/4 LOT 18 CONCESSION 11 INNISFIL PART 2 PLAN 51R39092 AS IN IN31296; TOGETHER WITH AN EASEMENT OVER PART LOT 19 CONCESSION 11 INNISFIL PARTS 5, 6 & 7 PLAN 51R39092 IN FAVOUR OF PART 4 PLAN 51R39092 AS IN SC1075033; CITY OF BARRIE". • "PART S1/2 LOT 17 CONCESSION 11 INNISFIL PART 1 PLAN 51R39932, EXCEPT PLAN 51M1176; CITY OF BARRIE".
Property Identification Numbers (PINs)	• 58092-0103 (LT) • 58092-0105 (LT) • 58092-0107 (LT)
Property Size	625,000 m^2
Approximate Universal Transverse Mercator (UTM) coordinates	Zone: 17 Easting: 611021 Northing: 4910783 (1m, NAD83, QGIS)

1.3 Current and Proposed Future Uses

At the time of the Phase Two ESA investigation, the Site was mostly agricultural and undeveloped land with three (3) residential properties. The site will be redeveloped into a residential development. Section 168.3.1 of the Environmental Protection Act does not prohibit the proposed future use of the Property. Current surrounding land uses are included in Figure 3.

1.4 Applicable Site Condition Standards

Analytical results obtained for Site soil and groundwater samples were assessed against Site Condition Standards (SCS) as established under subsection 169.4(1) of the Environmental Protection Act, and presented in the document Ministry of the Environment, Conservation and Parks (MECP) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act',* ("SGWS" Standards). Tabulated background SCS (Table 1) applicable to environmentally sensitive sites and effects based generic SCS (Tables 2 to 9) applicable to non-environmentally sensitive sites are provided in MECP. The effects based SCS (Tables 2 to 9) are protective of human health and the environment for different groundwater conditions (potable and non-potable), land use scenarios (residential, parkland, institutional, commercial, industrial, community and agricultural/other), soil texture (coarse or medium/fine) and restoration depth (full or stratified).

Tables 1 to 9 of MECP are summarized as follows:

a) Table 1 - applicable to sites where background concentrations must be met (full depth), such as sensitive sites where site-specific criteria have not been derived;
b) Table 2 - applicable to sites with potable groundwater and full depth restoration;
c) Table 3 - applicable to sites with non-potable groundwater and full depth restoration;
d) Table 4 - applicable to sites with potable groundwater and stratified restoration;

e) Table 5 - applicable to sites with non-potable groundwater and stratified restoration;
f) Table 6 - applicable to sites with potable groundwater and shallow soils;
g) Table 7 - applicable to sites with non-potable groundwater and shallow soils;
h) Table 8 - applicable to sites with potable groundwater and that are within 30 m of a water body; and,
i) Table 9 - applicable to sites with non-potable groundwater and that are within 30 m of a water body.

Application of the generic or background SCS to a specific site is based on a consideration of site conditions related to soil pH (i.e., surface and subsurface soil), thickness and extent of overburden material, (i.e., shallow soil conditions), and proximity to an area of environmental sensitivity or of natural significance. For some chemical constituents, consideration is also given to soil textural classification with SCS having been derived for both coarse and medium/fine textured soil conditions.

For assessment purposes, GEI selected the MECP Table 8: Generic Site Condition Standards for use within 30 m of a water body in a Potable Ground Water Condition within for Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use and All Textures. The selection of this category was based on the following factors:

a) The Site is not considered a shallow property, based on the recovered soil cores, which indicate that more than two-thirds of the Site has an overburden thickness of 2 m;
b) The Site is located within 30 m of a surface water body; a tributary of Hewitt's Creek was observed in the middle of the Site and flowing westward;
c) The soil at the Site has a pH value between 5 and 9 for surficial soils; and, between 5 and 11 for subsurface soils.
d) The property is not within, or adjacent to, an area of natural significance, or part of such an area; and, the Site does not include land that is within 30 m or an area of natural significance, or part of such an area;
e) The future land use of the Site is residential.
f) Textural classification for the selected table includes all textured materials.
g) There was no intention to carry out a stratified restoration at the Site.

2. Background Information

2.1 Physical Setting

The following physiographic, geological, soil and survey maps were reviewed on July 7, 2021:

- Atlas of Canada – Toporama Topographic Map (Toporama);
- Ontario Base Map (OBM);
- Ontario Ministry of Energy, Northern Development and Mines (MENDM) website, Bedrock Geology of Ontario, 2011 – MRD 126; and Paleozoic Geology of Southern Ontario, 2007 - MRD 219 (KML format);
- Ontario MENDM website, Surficial Geology of Southern Ontario, 2010. (KML format);
- Ontario MENDM website, Physiography of Southern Ontario 2007; and,
- Plan of Survey of Park of Southeast ¼ of Lot 18 and Part of Lot 19 Concession 11, Geographic Township of Innisfil, City of Barrie, County of Simcoe, Rudy Mak Surveying Ltd., June 21, 2013.

Based on the review of the above maps, the following information was obtained:

a) The Site is at an elevation of ranging approximately from 262 to 252 metres above sea level (m asl). The surrounding properties to the south and east are generally at a higher elevation than the Site, while the surrounding properties to the west are generally at a lower elevation than the Site. The Site slopes down from the east (262 m asl) to the west towards the Hewitt's Creek (252 m asl). A grade change of approximately 10 m from east to the west.

b) The Site is located within 30 m of a surface water body; a tributary of Hewitts Creek was observed in the middle of the Site and flowing westward. The Site is within the Lake Simcoe and Counchiching/Black River Source Water Protection Area. The middle portion of the Site lies within an Lake Simcoe Regional Conservation Area (LSRCA) Regulated Area. Based on the information, the inferred regional groundwater flow direction is towards the north/northeast towards Lake Simcoe.

c) The bedrock in the general area consists of Middle Ordovician Lindsay limestone of the Simcoe Group.

d) The physiography of the Site is within Peterborough Drumlin Field and is characterized as drumlinized till plains.

e) The surficial geology of the Site is described as stone-poor, sandy silt to silty sand-textured till, and ice-contact stratified deposits comprising sand and gravel.

2.2 Past Environmental Investigations

The following documents were available for review, GEI reviewed and used as a source of background information during the preparation of this report:

1. *"Phase One Environmental Site Assessment, Proposed Crisdawn Subdivision – Phase 3, Lockhart Road, Barrie, Ontario"* by Peto MacCallum Ltd, PML Ref.: 17BF007, Report 5 Revised, dated February 25, 2022.

Peto MacCallum (2022) Phase One Environmental Site Assessment	
Objective	Identify former and existing potential environmental concerns at the Site.
Potential Environmental Concerns Identified (PCAs)	• Based on the evaluation of the historical data and the Site reconnaissance, two (2) PCAs on the Site and two (2) PCAs within the Study Area were identified. • On-Site PCAs consisted of the potential use of pesticides for agricultural use on Site (PCA #40 – Pesticides including Herbicides, Fungicides, and Ani-Fouling Agents Manufacturing, Processing, Bulk Storage and Large-Scale Applications) and the presence of an AST on the south portion of the Site (PCA #28 – Gasoline and Associated Products, Storage in Fixed Tanks). • The PCAs within the study area consisted of the potential use of pesticides for agricultural use (PCA #40 – Pesticides including Herbicides, Fungicides, and Ani-Fouling Agents Manufacturing, Processing, Bulk Storage and Large-Scale Applications), and a natural gas leak caused by a falling tree onto a gas line causing a fuel oil spill as reported within the ERIS report (PCA# N/A – Other PCA QP is aware of: fuel oil spills and leaks).
Area of Potential Environmental Concerns (APECs)	• The above noted PCA concerning the AST on Site (PCA#28) was considered an APEC.

3. Scope of the Investigation

3.1 Overview of the Site Investigation

The objective of the Phase Two ESA was to assess the APECs identified in Phase One ESA completed by Peto MacCallum Ltd.; and, to obtain soil and groundwater data to characterize the Site to assess the soil and groundwater chemical quality on-site.

3.1.1 *Scope of Work*

The scope of work for the Phase Two ESA was as follows:

a) Request public utility locating companies *(e.g.,* cable, telephone, gas, hydro, water, sewer and storm water) to mark any underground utilities present at the Site;
b) Advance a total of three (3) boreholes (BH22-1 – BH22-3) up to a maximum depth of 6.70 m bgs;
c) Instrument all three (3) boreholes with monitoring wells;
d) Collect representative soil samples from the boreholes for laboratory chemical analysis of Petroleum Hydrocarbons (PHCs), Benzene, Toluene, Ethylbenzene and Xylenes (BTEX), Volatile Organic Compounds (VOCs), metals and inorganics;
e) Develop the groundwater monitoring wells;
f) Collect groundwater levels from installed monitoring wells;
g) Submit groundwater samples for laboratory chemical analysis of PHCs, BTEX, VOCs, metals and inorganics;
h) Complete an elevation survey of all boreholes and installed monitoring wells to determine the groundwater flow direction in the overburden aquifer beneath the Site;
i) Analyze the data and prepare a report of the findings.

3.2 Media Investigated

The focus of the Phase Two ESA was on the environmental conditions of the surficial material, overburden materials and groundwater beneath the Site. As there was no surface water body on the Site, no sediment sampling was required.

A copy of the Site Sampling and Analysis Plan (SSAP) prepared for the Site is provided in Appendix B.

3.3 Phase One Conceptual Site Model

This section presents the Phase One Conceptual Site Model (P1CSM) providing a narrative, graphical and tabulated description integrating information related to the Site geologic and hydrogeologic conditions, areas of potential environmental concern/potential contaminating activities, and the presence and distribution of potential contaminants of concern. These components are discussed in the following sections.

The site is located north of Lockhart Road and approximately 1.0 km east of Yonge Street in Barrie, Ontario, as shown on Figure 1. The Site measures approximately 625,000 m^2 (62.5 ha) in size. The site is currently

occupied by three residential dwellings, with the majority of the site being undeveloped or farmland. A Site Layout Plan is provided as Figure 2.

The legal description of the Site as obtained from the chain of title is "PART SW1/4 ;OT 18 CONCESSION 11 INNISFIL PART 1, PLAN 51R34222 EXCEPT PLAN 51M1176; CITY OF BARRIE", "PART LOT 19 CONCESSION 11 INNISFIL AND PART SE1/4 LOT 18 CONCESSION 11 INNISFIL PARTS 1, 2, 3, & 4 PLAN 51R39092 EXCEPT PLAN 51M1176; ST EASEMENT OVER PART SE1/4 LOT 18 CONCESSION 11 INNISFIL PART 2 PLAN 51R39092 AS IN IN31296; TOGETHER WITH AN EASEMENT OVER PART LOT 19 CONCESSION 11 INNISFIL PARTS 5, 6 & 7 PLAN 51R39092 IN FAVOUR OF PART 4 PLAN 51R39092 AS IN SC1075033; CITY OF BARRIE" and "PART S1/2 LOT 17 CONCESSION 11 INNISFIL PART 1 PLAN 51R39932, EXCEPT PLAN 51M1176; CITY OF BARRIE". The Property Identification Numbers (PIN) are 58092-0103 (LT), 58092-0105 (LT) and 58092-0107 (LT), respectively. A legal survey is included in Appendix A.

The approximate Universal Transverse Mercator (UTM) coordinates for the Site centroid was NAD83 17-611021 m E, 4910783 m N. The UTM coordinates are based on measurements obtained from QGIS. The accuracy of the centroid is estimated to be 1 m.

Potentially Contaminating Activities

The Phase One ESA conducted by Peto MacCallum Ltd. in 2022 identified the following PCAs:

PCA Identifier	Address	PCA[1]	PCA Location	Contributing to APEC at the Site?	Rationale
Phase One Property					
1.	864 Lockhart Road, Barrie, Ontario	PCA Item # 40 – Pesticides (including Herbicides, Fungicides and Anit-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Entire Site	No	Historical use of pesticides for agricultural property.
2.		PCA Item # 28 – Gasoline and Associated Products Storage in Fixed Tanks.	Southern portion of Site	Yes	Existing AST on-Site. Product stored inside is unknown.
Phase One Study Area					
3.	All north and south adjacent properties	PCA Item #40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications.	All north and south adjacent properties	No	Historical use of pesticides for agricultural use.

4.	894 Lockhart Road, Barrie	PCA Item N/A	South adjacent	No	ERIS report identified a natural gas leak caused by a falling tree onto a gas line.

(1) PCA means a use or activity set out in Column A of Table 2 of Schedule D that is occurring or has occurred in a Phase One study area.

The identification of the PCAs both on-Site and off-Site within the Phase One study area are shown on Figure 3. Based on the rationale provided, it is the opinion of the Qualified Person (QP) that one (1) PCA is considered an APEC at the Site. Further discussion is provided below.

Areas of Potential Environmental Concern

Based on the evaluation of the PCAs located on- and off-Site, one (1) PCA is considered an APEC at the Site, as presented below:

APEC	**Location of APEC on Project Area**	**PCA[1]**	**Location of PCA (On-Site or Off-Site)**	**Contaminants of Concern**	**Media Potentially Impacted (Groundwater, soil and/or sediment)**
APEC 1: AST	Southern portion of Site	PCA Item # 28 – Gasoline and Associated Products Storage in Fixed Tanks.	On-Site	Metals and Inorganics, PHCs and VOCs	Soil and Groundwater

(2) Potentially contaminating activity means a use or activity set out in Column A of Table 2 of Schedule D that is occurring or has occurred in a phase one study area

Refer to Figure 4 for the Site plan illustrating the borehole/monitoring well locations and APECs.

The Site is at an elevation ranging between approximately from 262 to 252 m asl. The surrounding properties to the south and east are generally at a higher elevation than the Site while the surrounding properties to the west are generally at a lower elevation than the Site. The Site slopes down from the east (262 m asl) to the west towards the Hewitt's Creek (252 m asl). A grade change of approximately 10 m, from east to the west.

The bedrock in the general area consists of Middle Ordovician Lindsay limestone of the Simcoe Group .

The Site is located within 30 m of a surface water body; a tributary of Hewitts Creek was observed in the middle of the Site and flowing westward. The Site is within the Lake Simcoe and Couchiching/Black River Source Water Protection Area. The middle portion of the Site lies within an LSRCA Regulated Area. Based on the information, the inferred regional groundwater flow direction is towards the north/northeast towards Lake Simcoe.

One (1) potable well was observed at the Site and (3) potable water wells were found within the Phase One Study Area. The domestic water supply for the Site and the Phase One Study Area are supplied water by wells.

Based on the review of available resources from the County of Simcoe and the Ministry of Norther Development, Mines, Natural Resources and Forestry (MNRF) on June 13, 2022, no areas of natural significance were identified at the Site or within the Phase One Study Area. It is noted that an evaluated wetland is on the west portion of the Site, and an unevaluated wetland lies adjacent to the Site to the East.

No utilities were observed or located on-Site.

3.4 Deviations from Sampling and Analysis Plan

The field investigative and sampling program was carried out following the requirements of the SSAP, shown in Appendix B. No deviations from the SSAP were reported, which affected the sampling and data quality objectives for the Site.

3.5 Impediments

The entire Site was accessible at the time of the investigation, and no physical impediments were encountered during the field investigation.

4. Investigation Method

4.1 General

The Site investigative activities consisted of the drilling of three (3) boreholes to facilitate the collection of soil samples for geologic characterization and chemical analysis and the installation of monitoring wells for hydrogeologic property characterization and the collection of groundwater samples for chemical analysis.

Boreholes were advanced in the surficial overburden soils by a licensed drilling company under the full-time supervision of GEI staff. The drilling equipment used to advance the boreholes is described below. No petroleum-based greases or solvents were used during drilling activities. Monitoring wells were installed in the boreholes by a MECP licensed well contractor in accordance with Ontario Regulation 903/90, as amended (O.Reg.903) using manufactured well components (i.e., riser pipes and screens) and materials (i.e., sand pack and grout) from documented sources.

4.2 Borehole Drilling

Prior to the commencement of drilling activities, the locations of underground utilities including cable, telephone, natural gas, electrical lines, as well as water, sewer, storm water and sanitary lateral conduits were marked out by public locating companies. In addition, a private utility locating service was also retained to clear the individual borehole locations.

The fieldwork for the soil investigative portion of the Phase Two ESA was carried out May 10, 2022.

The boreholes were advanced by Ontario Soil Drilling, under full-time supervision of GEI staff using a truck- mount continuous flight, solid stem augers to a maximum depth of 6.7 m bgs to sufficiently assess the APECs identified in the Phase One ESA. The approximate locations of the boreholes and monitoring wells are shown on Figure 4.

GEI continuously monitored the drilling activities to record the physical characteristics of the soil, depth of soil sample collection and total depth of boreholes. Field observations are summarized on the borehole logs provided in Appendix C. Representative soil samples were recovered at regular intervals using a stainless-steel split spoon sampler in all boreholes.

4.3 Soil Sampling

Soil samples for geologic characterization and chemical analysis were collected on a discrete basis in the overburden materials using 5 cm diameter, 60 cm long, split spoon samples advanced in to the subsurface using a truck mounted continuous flight solid stem augers. The soil cores were extruded from the samplers upon retrieval by drilling personnel. Geologic details of the recovered cores were logged by GEI field staff and samples were collected from selected cores for chemical analysis. Field observations are summarized on the borehole logs prepared from the field logs and provided in Appendix C.

Measures were taken in the field and during transport to preserve sample integrity prior to chemical analysis. Recommended volumes of soil samples selected for chemical analysis were collected from the recovered cores into pre-cleaned, laboratory-supplied glass sample jars/vials identified for the specified analytical test group. All soil samples were placed in clean coolers containing ice prior to and during transportation to the subcontract laboratory, Caduceon Laboratories of Barrie, Ontario. The samples were transported/submitted within the acceptable holding time to Caduceon following Chain of Custody

protocols for chemical analysis.

Decontamination and other protocols were followed during sample collection and handling to minimize the potential for sample cross-contamination. New disposable nitrile gloves were used for the handling and sampling of each retrieved soil core. Drill cuttings were placed in labeled, sealed drums upon completion of sampling. All three (3) of the boreholes were fitted with monitoring wells (MW22-1 to MW22-3).

Soil samples submitted for specific chemical analysis were selected on the basis of visual inspection of the recovered cores, sample location and depth interval.

Geologic details of the soil cores recovered from the boreholes advanced at the Site are provided in boreholes logs presented in Appendix C.

One (1) duplicate soil sample was collected for QA/QC purposes as summarized below.

Borehole	Duplicate Sample Identification	Analytical Test Group
BH22-1	DUP1	Metals and Inorganics, PHCs and VOCs

4.4 Field Screening Measurements

A portion of each soil core was placed in a sealed "Ziploc®" plastic bag and allowed to reach ambient temperature prior to field screening using a RKI Eagle 2 Photo Ionization Detection (PID) instrument, calibrated with isobutulene gas. The measurements were made by inserting the instrument's probe into the plastic bag while manipulating the sample to ensure volatilization of the soil gases. These readings provide a real-time indication of the relative concentration of combustible vapors encountered in the subsurface during drilling and are used to aid in the assessment of the vertical and horizontal extent of contamination and the selection of soil samples for analysis.

The field screening measurements, in parts per million (ppm) isobutylene equivalents, are presented on the borehole logs in Appendix C.

Each sample was additionally examined for visual, textural and olfactory classification at the time of sampling.

4.5 Monitoring Well Installation

All three (3) boreholes were instrumented with groundwater monitoring wells at the Site (MW22-1 to MW22-3). The monitoring wells were installed in general accordance with the Ontario Water Resources Act - R.R.O. 1990, Regulation 903/90 - amended to O.Reg.128/03 and were installed by a licensed well contractor.

All monitoring wells consisted of a either a 3.0 m or 1.5 m length, 50 mm diameter PVC screen, and an appropriate length of PVC riser pipe. All pipe connections were factory machined threaded flush couplings. The annular space around the wells was backfilled with sand to an average height of 0.3 m above the top of the screen. A bentonite seal was added from the top of the sand pack to approximately 0.3 m below ground surface.

When the monitoring wells are no longer required, they must be decommissioned in accordance with the procedure outlined in the Ontario Water Resources Act - R.R.O. 1990, Regulation 903 - amended to O.Reg.128/03. Monitoring well completion details are summarized in Table 4.

Measures taken to minimize the potential for cross contamination or the introduction of contaminants during well construction included:

a) The use of well pipe components (e.g., riser pipe and well screens) with factory machine threaded flush coupling joints;
b) Construction of wells without the use of glues or adhesives;
c) Removing the protective plastic wraps from well components at the time of borehole insertion to prevent contact with the ground and other surfaces;
d) Cleaning of augers between sampling locations; and,
e) The use of hollow stem augers to prevent loose and potentially contaminated material in overlying layers from sloughing into the boreholes and coming into contact with groundwater.

4.6 Monitoring Well Development

Upon completion of monitoring well installation, the new monitoring wells were developed to remove fine sediment particles from the sand pack and enhance hydraulic communication with the surrounding formation waters. The monitoring wells were developed on May 26, 2022, using dedicated low- flow tubing and low-flow peristaltic pump to disturb the water column and recover groundwater containing dislodged sediment particles.

4.7 Groundwater Level Monitoring

Groundwater level monitoring activities, which consisted of measuring the depths to groundwater in each monitoring well, were conducted on newly installed monitoring wells so that groundwater flow and direction below the Site could be assessed. These groundwater monitoring activities were conducted on May 26 and 27, 2022. Water levels were measured with respect to the top of cut by means of an electronic water level meter. The water level measurements were recorded on water level log sheets or in a bound field notebook. The water level meter probe was decontaminated between monitoring well locations.

4.8 Monitoring Well Purging

Monitoring wells were purged prior to groundwater sample collection. A minimum of three (3) well volumes of water were purged from each well or until the well was dry to remove standing water and draw in fresh formation water. Water levels and wetted well volumes were determined by means of an electronic water level meter.

Equipment used during groundwater monitoring were thoroughly cleaned and decontaminated between wells. Well purging details were documented on a log sheet or in a bound hard cover notebook.

4.9 Field Measurements of Water Quality Parameters

Field parameters including pH, conductivity and temperature were not monitored during well development.

4.10 Groundwater Sampling

Upon completion of purging, the three (3) newly installed monitoring wells were sampled on May 27, 2022. Recommended groundwater sample volumes were collected into laboratory-supplied vials or bottles provided with analytical test group specific preservatives, as required. The samples were placed in an insulated cooler pre-chilled with ice immediately upon collection. The groundwater samples were transported to Caduceon.

4.11 Sediment Sampling

Due to the distance of the APEC from the tributary, sediment sampling was not conducted as part of the Phase Two ESA.

4.12 Analytical Testing

All analytical testing was performed by Caduceon Environmental Laboratories, which is an accredited laboratory. Caduceon is accredited under the Standards Council of Canada/Canadian Association of Environmental Analytical Laboratories (Accredited Laboratory No. 4090, 2728, 2644, 2628, and 2921) in accordance with ISO/IEC 17025:2005 - "General Requirements for the Competence of Testing and Calibration Laboratories".

4.12.1 *Soil Sampling*

Representative soil samples from each borehole were selected for laboratory analysis based on field screening results, sample location and depth interval. The requested laboratory analysis was based on the identified contaminants of concern. The representative soil samples selected for laboratory analysis, the rationale for each sample and the requested analyses are summarized below.

Soil Sample ID	Rationale	Requested Analyses	Depth (m bgs)
BH/MW22-1-2	APEC 1/Soil Characterization	Metals and Inorganics, PHCs and VOCs	0.6 – 1.4
BH/MW22-2-2	APEC 1/Soil Characterization	Metals and Inorganics, PHCs and VOCs	0.6 – 1.4
BH/MW22-3-2	APEC 1/Soil Characterization	Metals and Inorganics, PHCs and VOCs	0.6 – 1.4
DUP1 (BH/MW22-1)	QA/QC	Metals and Inorganics, PHCs and VOCs	0.6 – 1.4

4.12.2 *Groundwater Sampling*

Representative groundwater samples were submitted for specific chemical analysis based on the identified contaminants of concern. The representative groundwater samples selected for lab analysis, the rationale for each sample, and the required analyses are summarized below.

Monitoring Well ID	Rationale	Requested Analyses
BH/MW22-1	APEC 1	Metals and Inorganics, PHCs and VOCs
BH/MW22-2	APEC 1	Metals and Inorganics, PHCs and VOCs
BH/MW22-3	APEC 1	Metals and Inorganics, PHCs and VOCs
DUP (BH/MW22-3)	QA/QC	Metals and Inorganics, PHCs and VOCs
Trip Blank	QA/QC	VOCs

4.13 Elevation Survey

An elevation survey was conducted to obtain vertical control of the ground surface at the borehole locations and monitoring well specifics. The ground surface elevations of each location was surveyed relative to the local benchmark. A summary of monitoring well installation details is provided below.

Well ID	Ground Elevation (m bgs)	Well Screen Details Depth (m) / Elevation	Geologic Units Intercepted by Well Screen	Well Condition
BH/MW22-1	98.51	1.5 to 4.5 / 97.01 to 94.01	Silty Clay / Sandy Silt	Intact
BH/MW22-2	98.53	1.5 to 3.0 / 97.03 to 95.53	Silty Clay / Sandy Silt	Intact
BH/MW22-3	98.57	1.5 to 3.0 / 97.07 to 95.57	Silty Clay / Sandy Silt	Intact

The elevation survey was completed using GEI's own Topcon RL-HSA. The survey equipment was calibrated by GEI personnel prior to use.

4.14 Quality Assurance and Quality Control Measures

Quality Assurance/Quality Control (QA/QC) measures, as set out in the Sampling and Analysis Plan, were implemented during sample collection, storage and transport to provide accurate data representative of conditions in the surficial fill and upper overburden soils and the water table aquifer. The QA/QC measures included decontamination procedures to minimize the potential for sample cross contamination, the execution of standard operating procedures to collect representative and unbiased samples, the collection of quality control samples to evaluate sample precision and accuracy, and the implementation of measures to preserve sample integrity.

Decontamination protocols were followed during sample collection and handling to minimize the potential for cross-contamination. During the collection of soil samples, split-spoon samplers were scraped and decontaminated between sampling intervals by washing with a potable water/phosphate-free detergent solution followed by a rinse with potable water. New disposable nitrile gloves were used for the handling and collection of samples from each soil core and for sample collection from each borehole.

Soil samples selected for chemical analyses were collected from the retrieved soil cores and placed directly into pre-cleaned, laboratory-supplied glass jars or vials. Sample volumes were consistent with analytical test group requirements as specified by the receiving laboratory.

Groundwater samples were collected into pre-clean laboratory-supplied vials or bottles provided with analytical test group specific preservatives, as required. Recommended analytical test group specific sample volumes were collected as specified by the contractual laboratory. Sample vials for analysis of BTEX were inspected for the presence of gas bubbles and the presence of head space, where volatiles may partition into.

Measures were followed to preserve sample integrity between collection and receipt by the contractual laboratory. All samples, both soil and groundwater, immediately upon collection were placed in insulated coolers pre-chilled with ice for storage and transport to the contractual laboratory. Samples were received by the contractual laboratory within specific analytical test group holding time requirements.

Documentation procedures were followed to confirm sample identification and tracked sample movement. Each sample was assigned a unique identification ID number, which was recorded along with the date, time

of sampling and requested analyses on labels affixed to the sampling containers, and in a bound field notebook. Chain of Custody protocols were followed to track sample handling and movement until receipt by the contractual laboratory.

Field QA/QC samples were collected during the soil and groundwater sampling. Duplicate samples were collected to evaluate sampling precision and trip blanks were included to evaluate the potential for sample cross-contamination during handling and transport.

Geologic details of the soil cores recovered from the boreholes advanced at the Site are provided in boreholes logs presented in Appendix C.

One (1) duplicate soil sample was collected for QA/QC purposes as summarized below.

Borehole	Duplicate Sample Identification	Analytical Test Group
BH22-1	DUP1	Metals and Inorganics, PHCs and VOCs

One (1) duplicate groundwater sample and one (1) trip blank was collected for QA/QC purposes as summarized below.

Borehole	Duplicate Sample Identification	Analytical Test Group
BH/MW22-3	DUP	Metals and Inorganics, PHCs and VOCs
Trip blank	Trip blank	VOCs

There were no significant deviations from the SSAP.

5. Review and Evaluation

5.1 Geology

The soil investigation conducted at the Site consisted of the advancement of three (3) boreholes into the surficial soil and the underlying native materials to a maximum depth of 6.70 m bgs. Borehole logs describing geologic details of the soil cores recovered during the Site drilling activities are presented in Appendix C. Boundaries of soil indicated on the log sheets are intended to reflect transition zones for the purpose of environmental assessment and should not be interpreted as exact planes of geological change.

The general stratigraphy at the Site, as revealed in the borehole logs, consists of fill material at the surface surrounding the AST underlain by native sandy silt to silty clay over sand and silt glacial till. As previously indicated, more than two-thirds (2/3) of the Site consisted of soil equal to or greater than 2 m in depth.

A brief description of the soil stratigraphy at the Site, in order of depth, is summarized in the following sections. The interpreted Site geology is shown on the enclosed cross section (Figure 6).

5.1.1 *Surficial Material*

Topsoil was encountered in BH22-1 and BH22-2 to depths ranging between 25 to 50 mm.

5.1.2 *Fill Material*

Fill material was noted at surface in BH22-3, and was encountered below the surficial topsoil in BH22-1 and BH22-2 to depths of 0.8 to 1.5 m below existing grade (local elevation 97.1 to 97.8). The fill material comprised brown to black silty sand with some gravel and trace organics. The fill material was moist.

5.1.3 *Native Material*

Sandy Silt

A sandy silt layer was encountered below the fill material in all three (3) boreholes to a depth of 2.0 to 2.3 m below existing grade (local elevation 96.2 to 96.5). The layer was grey with trace to some clay and was wet.

Silty Clay

A silty clay layer was encountered below the sandy silt layer in all boreholes to a depth of 3.1 m below existing grade (local elevation 95.5). The layer was grey and wet.

Sand and Silt Glacial Till

A sand and silt glacial till was noted below the silty clay layer in all boreholes to the 6.7 m depth of exploration. The glacial till varied between sand and silt to sandy silt composition with trace clay and gravel. Cobbles and boulders were noted during drilling. The layer was wet.

5.1.4 *Inferred Bedrock*

Bedrock was not encountered at the Site. The depth to bedrock in the vicinity is approximately 100 to 149 m below existing grade based on the MECP water well records.

5.2 Groundwater Elevations and Flow Direction

The on-Site monitoring well network consists of a total of three (3) monitoring wells advanced by GEI. The 1.5 to 3.0 m long screens were installed within the sandy silt and silty clay layers to intercept the overburden groundwater aquifer.

Groundwater depths observed within the Site ranged between 1.02 m to 1.26 m below the existing grade (local elevation 97.25 to 97.55) on May 26, 2022. The inferred groundwater flow direction is towards the north/northeast as shown on Figure 5.

5.2.1 *Groundwater: Hydraulic Gradients*

The horizontal hydraulic gradient, between each monitoring well pair, is calculated using the following equation:

$$i = A_h/A_s$$

Where,

i = horizontal hydraulic gradient;

A_h (m) = groundwater elevation difference; and,

A_s (m) = separation distance.

The horizontal hydraulic gradient in groundwater, based on groundwater measurements collected on May 26, 2022 were 0.08 to 0.09 m/m.

It is noted that vertical hydraulic gradients were not evaluated for this Site as a second water bearing unit was not identified at the depths investigated at the Site.

5.2.2 *Groundwater: Hydraulic Conductivity*

The hydraulic conductivity testing was not completed at the site. Estimates of the hydraulic conductivity were taken from borehole logs at the monitoring well screen depths and compared to Freeze and Cherry (1979), to estimate the typical hydraulic conductivity of the soil investigated.

The summary of the hydraulic conductivity (K) values estimated from the Freeze and Cherry (1979) are provided below in Table 6:

Table 6: Summary of Hydraulic Conductivity (K) Estimates

Monitoring Well	Well Depth (m bgs)	Hydraulic Conductivity (m/s)
BH/MW22-1	1.5 to 4.5	$1.0 \times 10^{-5} – 1.0 \times 10^{-9}$
BH/MW22-2	1.5 to 3.0	$1.0 \times 10^{-5} – 1.0 \times 10^{-9}$
BH/MW22-3	1.5 to 3.0	$1.0 \times 10^{-5} – 1.0 \times 10^{-9}$

The Freeze and Cherry (1979) provides an estimate of K for the geological formation in the immediate media zone surrounding the well screen and may not be representative of bulk formation hydraulic conductivities.

5.3 Soil Texture

Based on the borehole logs and observations in the field the native overburden samples and were identified as coarse textured. However, the Ministry of Environment, Conservation, and Parks (MECP) Table 8: Generic Site Condition Standards for use within 30 m of a water body in a Non-Potable Ground Water Condition apply to both medium-fine and coarse textured soil classifications.

5.4 Soil Field Screening

All soil samples were submitted for chemical analyses based on field screening, observations, location and depth.

5.5 Soil Quality

In accordance with the scope of work conducted by GEI, chemical analyses were performed on selected soil samples recovered from the boreholes. The selection of representative "worst case" soil samples was based on field screening, visual and/or olfactory evidence of impacts, and the presence of potential water bearing zones. Copies of the laboratory Certificates of Analysis for the analyzed soil samples are provided in Appendix D.

5.5.1 *PHCs*

The material from the Site submitted for PHCs analysis indicated that all parameters were detected below the applicable MECP Table 8 SCS; and, all laboratory RDLs were below the applicable SCS.

Refer to Appendix E and Figure 7 for a summary of the soil results analyzed for PHCs and BTEX.

5.5.2 *Benzene, Toluene, Ethylbenzene, and Xylene (BTEX)*

The material from the Site submitted for BTEX analysis indicated that all parameters were detected below the applicable MECP Table 8 SCS; and, all laboratory RDLs were below the applicable SCS.

Refer to Appendix E and Figure 8 for a summary of the soil results analyzed for BTEX.

5.5.3 *VOCs*

The material from the Site submitted for VOCs analysis indicated that all parameters were detected below the applicable MECP Table 8 SCS; and, all laboratory RDLs were below the applicable SCS.

Refer to Appendix E and Figure 9 for a summary of the soil results analyzed for VOCs.

5.5.4 *Metals*

The material from the Site submitted for metals analysis indicated that all parameters were detected below the applicable MECP Table 8 SCS; and, all laboratory RDLs were below the applicable SCS.

Refer to Appendix E and Figure 10 for a summary of the soil results analyzed for metals.

5.5.5 *Inorganics Incl. Electrical Conductivity (EC) and Sodium Adsorption Ratio (SAR)*

The material from the Site submitted for inorganics (including EC and SAR) analysis indicated that all parameters were detected below the applicable MECP Table 8 SCS; and, all laboratory RDLs were below the applicable SCS except for:

- The concentration of EC (2.21 mS/cm) exceeded the MECP Table 8 SCS (0.7 mS/cm) in sample BH/MW 22-3-2.

However, under the newly amended O.Reg.153/04 (O.Reg.407/19), if a substance has been applied to surfaces for the safety of vehicular or pedestrian traffic under the conditions of snow or ice or both (i.e. application of de-icing salts), its related parameters are not deemed to be in exceedance of the MECP Table 8 SCS RPI/ICC SCS. As de-icing salts were used at the Site, EC is not considered as a contaminant of concern.

Refer to Appendix E and Figure 11 for a summary of the soil results analyzed for inorganics (including EC and SAR).

5.5.6 *Chemical Transformation and Soil Contaminant Sources*

A variety of physical, chemical and biochemical mechanisms affect the fate and transport of the potential COCs in soil, the contribution of which is dependent on the soil conditions and the chemical/physical properties of the COCs. Relevant fate and transport mechanisms are natural attenuation mechanisms, including advection mixing, mechanical dispersion/molecular diffusion, phase partitions (i.e. sorption and volatilization), and possibly abiotic or biotic chemical reactions, which effectively reduce COC concentrations.

Concentrations of the COCs in soil will be reduced by the effects of molecular diffusion and the creation of concentration gradients. As volatile chemical constituents (i.e., moderately high Henry's Law Constant and saturated vapour pressure), PHC Fraction F1 and PHC Fraction F2 can volatilize into soil gas and be transported through soil gas under the influence of pressure (e.g., water table fluctuations) and partial pressure gradients in the unsaturated zone. The transport of volatile Contaminates of Concern (COCs) can also be retarded by sorption on to organic material that may be associated with the soil mineral particles through the overburden material. As non-volatile chemical constituents, Polycyclic Aromatic Hydrocarbons (PAHs), lead, EC and SAR may undergo abiotic or biotic chemical reactions associated with the soil mineral particles and the micro-organisms present in the overburden material.

As there are no existing COCs in soil at the Site, natural attenuation mechanisms and preferential pathways are not a concern.

5.5.7 *Evidence of Non-Aqueous Phase Liquid*

Inspection of the soil cores retrieved from the boreholes did not indicate the presence of non-aqueous phase liquid (NAPL), staining or sheen.

5.6 Groundwater Quality

In accordance with the scope of work conducted by GEI, representative groundwater samples were collected from the newly installed monitoring wells to assess groundwater quality at the Site. Evidence of free product (i.e., visible film or sheen), and odour was not observed during well purging.

Analytical results summary tables are provided in Appendix E and copies of the laboratory Certificates of Analysis for the analyzed groundwater samples are provided in Appendix D.

5.6.1 *PHCs*

Groundwater samples submitted for PHCs analysis indicated that all parameters were detected below the applicable MECP Table 8 SCS; and all laboratory RDLs were below the applicable SCS.

Refer to Appendix E and Figure 12 for a summary of the groundwater results analyzed for PHCs.

5.6.2 *Benzene, Toluene, Ethylbenzene, and Xylene (BTEX)*

Groundwater samples submitted for BTEX analysis indicated that all parameters were detected below the applicable MECP Table 8 SCS; and all laboratory RDLs were below the applicable SCS.

Refer to Appendix E and Figure 13 for a summary of the groundwater results analyzed for BTEX.

5.6.3 *VOCs*

Groundwater samples submitted for VOCs analysis indicated that all parameters were detected below the applicable MECP Table 8 SCS; and all laboratory RDLs were below the applicable SCS.

Refer to Appendix E and Figure 14 for a summary of the groundwater results analyzed for VOCs.

5.6.4 *Metals & Inorganics*

Groundwater samples submitted for metals and inorganics analysis indicated that all parameters were detected below the applicable MECP Table 8 SCS; and all laboratory RDLs were below the applicable SCS.

Refer to Appendix E and Figure 15 for a summary of the groundwater results analyzed for metals & inorganics.

5.6.5 *Sodium and Chloride*

Groundwater samples submitted for sodium and chloride analysis indicated that all parameters were detected below the applicable MECP Table 8 SCS; and all laboratory RDLs were below the applicable SCS.

Refer to Appendix E and Figure 16 for a summary of the groundwater results analyzed for sodium and chloride.

5.6.6 *Chemical Transformation and Contaminant Sources*

As there are no existing COCs in groundwater at the Site, natural attenuation mechanisms and preferential pathways are not a concern.

5.6.7 *Evidence of Non-Aqueous Liquid*

Inspection of the purged groundwater retrieved from the monitoring wells did not indicate the presence of NAPL in groundwater.

5.7 Sediment Quality

As the AST was located at a significant distance from the tributary on-Site, the Phase Two ESA did not include sediment sampling.

5.8 Quality Assurance and Quality Control Measures

QA/QC measures were taken during the field activities to meet the objectives of the sampling and QA plan to collect unbiased and representative samples to characterize existing conditions in the fill/upper overburden materials and water table aquifer unit at the Site. QA/QC measures included:

a) The collection of soil and groundwater samples following standard operating procedures;
b) The implementation of decontamination procedures to minimize the potential for sample cross contamination;
c) The collection of recommended analytical test group specific volumes into pre-cleaned laboratory supplied containers provided with necessary preservatives as required;
d) Sample preservation in insulated coolers pre-chilled with ice and meeting holding time requirements;
e) Sample documentation including Chain of Custody protocols; and
f) The collection of QC samples.

Review of field activity documentation indicated that recommended sample volumes were collected from soil and groundwater for each analytical test group into appropriate containers and preserved with proper chemical reagents in accordance with the protocols set out in the "Protocol for Analytical Methods used in the Assessment of Properties under Part XV.1 of the *Environmental Protection Act',* dated March 9, 2004, amended as of July 1, 2011. Samples were preserved at the required temperatures in pre-chilled insulated coolers and met applicable holding time requirements, when relinquished to the receiving laboratory.

Field QA/QC samples were collected during the soil and groundwater sampling. Duplicate samples were collected to evaluate sampling precision.

One (1) duplicate soil sample was collected for QA/QC purposes as summarized below:

Borehole	Duplicate Sample Identification	Analytical Test Group
BH22-1	DUP1	Metals and Inorganics, PHCs and VOCs

One (1) duplicate groundwater sample was collected for QA/QC purposes as summarized below:

Borehole	Duplicate Sample Identification	Analytical Test Group
BH/MW22-3	DUP	Metals and Inorganics, PHCs and VOCs

The field duplicate sample results were quantitatively evaluated by calculating the relative percent difference (RPD). Assessment of the duplicate soil samples, where quantifiable, showed that the results met analytical test group specific acceptance criteria. The overall assessment indicates that the soil samples were collected within an acceptable level of precision, and the data is acceptable quality for meeting the objectives of the Phase Two ESA.

All analytical testing was performed by Caduceon, which is an accredited laboratory. Caduceon is accredited under the Standards Council of Canada/Canadian Association of Environmental Analytical Laboratories (Accredited Laboratory No. 4090, 2728, 2644, 2628, and 2921) in accordance with ISO/IEC 17025:2005 - "General Requirements for the Competence of Testing and Calibration Laboratories".

Certificates of Analysis were received from Caduceon reporting the results of all the chemical analyses performed on the submitted soil and groundwater samples. Copies of the Caduceon Certificates of Analysis are provided in Appendix D. Review of the Certificates of Analysis prepared by Caduceon indicates that they were in compliance with the requirements set out under subsection 47(3) of O.Reg.153/04.

The analytical program conducted by Caduceon included analytical test group specific QA/QC measures to evaluate the accuracy and precision of the analytical results and the efficiency of analyte recovery during solute extraction procedures. The laboratory QA/QC program consisted of the preparation and analysis of laboratory duplicate samples to assess precision and sample homogeneity, method blanks to assess analytical bias, spiked blanks and QC standards to evaluate analyte recovery, matrix spikes to evaluate matrix interferences and surrogate compound recoveries (VOCs only) to evaluate extraction efficiency. The laboratory QA/QC results are presented in the Quality Assurance Report provided in the Certificate of Analysis prepared by Caduceon. The QA/QC results are reported as percent recoveries for matrix spikes, spike blanks and QC standards, RPDs for laboratory duplicates and analyte concentrations for method blanks.

The Caduceon QA/QC results were assessed against test group control limits in the case of spiked blanks, matrix spikes and surrogate recoveries and alert criteria in the case of method blanks and laboratory duplicates. Review of the laboratory QA/QC results reported by Caduceon indicated that they were within acceptable control limits or below applicable alert criteria for the sampled media and analytical test groups. Based on the assessment of the QA/QC, the analytical results reported by Caduceon are of acceptable quality and data qualifications are not required.

5.9 Phase Two Conceptual Model

This section presents a Phase Two Conceptual Site Model (CSM), providing a narrative, graphical and tabulated description integrating information related to the Site geologic and hydrogeologic conditions, APECs / PCAs, presence and distribution of potential contaminants of concern, contaminant fate and transport and potential exposure pathways. The Phase Two CSM was completed in accordance with O.Reg. 153/04, as amended, and defined by the MECP.

5.9.1 *Introduction*

The site is located north of Lockhart Road and approximately 1.0 km east of Yonge Street in Barrie, Ontario, as shown on Figure 1. The Site measures approximately 625,000 m^2 (62.5 ha) in size. The site is currently occupied by three residential dwellings, with the majority of the site being undeveloped or farmland. A Site Layout Plan is provided as Figure 2.

The Site is bound to the north by agricultural land, to the west by forested areas, to the east by agricultural and forested areas, and to the south by Lockhart Road followed by residential properties. The surrounding properties are shown on Figure 3.

Refer to the following table for the Site identification information.

Site Details	
Municipal Addresses	830, 864 and 912 Lockhart Road, Barrie, Ontario
Owner	Pratt Developments Inc. Crisdawn Construction Inc.
Owner Address	301 King Street Barrie, Ontario M3B 2T5
Owner Contact	Ms. Taylor Pratt
Legal Description	• "PART SW1/4 ;OT 18 CONCESSION 11 INNISFIL PART 1, PLAN 51R34222 EXCEPT PLAN 51M1176; CITY OF BARRIE". • "PART LOT 19 CONCESSION 11 INNISFIL AND PART SE1/4 LOT 18 CONCESSION 11 INNISFIL PARTS 1, 2, 3, & 4 PLAN 51R39092 EXCEPT PLAN 51M1176; ST EASEMENT OVER PART SE1/4 LOT 18 CONCESSION 11 INNISFIL PART 2 PLAN 51R39092 AS IN IN31296; TOGETHER WITH AN EASEMENT OVER PART LOT 19 CONCESSION 11 INNISFIL PARTS 5, 6 & 7 PLAN 51R39092 IN FAVOUR OF PART 4 PLAN 51R39092 AS IN SC1075033; CITY OF BARRIE". • "PART S1/2 LOT 17 CONCESSION 11 INNISFIL PART 1 PLAN 51R39932, EXCEPT PLAN 51M1176; CITY OF BARRIE".
Property Identification Numbers (PINs)	• 58092-0103 (LT) • 58092-0105 (LT) • 58092-0107 (LT)
Property Size	625,000 m²
Approximate Universal Transverse Mercator (UTM) coordinates	Zone: 17 Easting: 611021 Northing: 4910783 (1m, NAD83, QGIS)

5.9.2 *Potentially Contaminating Activities and Areas of Potential Environmental Concern*

A Phase One ESA, in accordance with O. Reg. 153/04, as amended, has been conducted by others for the Site (*"Phase One Environmental Site Assessment, Proposed Crisdawn Subdivision – Phase 3, Lockhart Road, Barrie, Ontario"* by Peto MacCallum Ltd, PML Ref.: 17BF007, Report 5 Revised, dated February 25, 2022). The surrounding land use plan and PCAs identified On-Site and in the Phase One ESA Study Area are shown on Figure 3. A list of all PCA's identified at the Site and within the Phase One ESA Study Area are presented below.

PCA Identifier	Address	PCA[1]	PCA Location	Contributing to APEC at the Site?	Rationale
Phase One Property					
1.	864 Lockhart Road, Barrie, Ontario	PCA Item # 40 – Pesticides (including Herbicides, Fungicides and Anit-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Entire Site	No	Historical use of pesticides for agricultural property.
2.		PCA Item # 28 – Gasoline and Associated Products Storage in Fixed Tanks.	Southern portion of Site	Yes	Existing AST on-Site. Product stored inside is unknown.
Phase One Study Area					
3.	North and South Adjacent Properties	PCA Item #40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications.	All north and south adjacent properties	No	Historical use of pesticides for agricultural use. ERIS report identified Pesticide Registries for adjacent properties.
4.	894 Lockhart Road, Barrie	PCA Item N/A	South adjacent	No	ERIS report identified a natural gas leak caused by a falling tree onto a gas line.

(i) Potentially contaminating activity means a use or activity set out in Column A of Table 2 of Schedule D that is occurring or has occurred in a phase one study area

Based on the rationale provided, it is the opinion of the Qualified Person (QP) that one (1) PCA is considered an APEC at the Site.

5.9.3 *Areas of Potential Environmental Concern*

Based on the evaluation of the PCAs located on- and off-Site, one (1) PCA is considered an APEC at the Site, as presented below:

APEC	Location of APEC on Project Area	PCA[1]	Location of PCA (On-Site or Off-Site)	Contaminants of Concern	Media Potentially Impacted (Groundwater, soil and/or sediment)
APEC 1: AST	Southern portion of Site	PCA Item # 28 – Gasoline and Associated Products Storage in Fixed Tanks.	On-Site	Metals and Inorganics, PHCs and VOCs	Soil and Groundwater

(i) Potentially contaminating activity means a use or activity set out in Column A of Table 2 of Schedule D that is occurring or has occurred in a phase one study area

Refer to Figure 4 for the Site plan illustrating the borehole/monitoring well locations and APECs.

5.9.4 *Underground Utilities*

No utilities were observed on Site during the Site Reconnaissance.

5.9.5 *Physical Site Description*

Information on the overburden and bedrock geology of the general Site area was obtained during the Phase One ESA. Based on the review, the following was summarized:

a) The Site is currently farm fields and has three (3) residential homes which have been present since at least 1954. A Site Layout Plan is provided as Figure 2.

b) The bedrock in the general area consists of Middle Ordovician Lindsay limestone of the Simcoe Group. The physiography of the Site is within Peterborough Drumlin Field and is characterized as drumlinized till plains. The surficial geology of the Site is described as stone-poor, sandy silt to silty sand-textured till, and ice-contact stratified deposits comprising sand and gravel.

c) The Site is at an elevation ranging from 262 to 252 m asl. The surrounding properties to the south and east are generally at a higher elevation than the Site while the surrounding properties to the west are generally at a lower elevation than the Site. The Site slopes down from the east (262 m asl) to the west towards the Hewitt's Creek (252 m asl). A grade change of approximately 10 m from east to the west.

d) The Site is located within 30 m of a surface water body; a tributary of Hewitts Creek was observed in the middle of the Site and flowing westward. The Site is within the Lake Simcoe and Counchiching/Black River Source Water Protection Area. The middle portion of the Site lies within an LSRCA Regulated Area. Based on the information, the inferred regional groundwater flow direction is towards the north/northeast towards Lake Simcoe. The groundwater data collected from across the Site on May 26, 2022, inferred that the groundwater flow direction is to the north, northeast.

e) Based on the review of available resources from the County of Simcoe and the MNRF on June 13, 2022, no areas of natural significance were identified at the Site or within the Phase One Study Area.

It is noted that an evaluated wetland is on the west portion of the Site, and an unevaluated wetland lies adjacent to the Site to the East.

f) The general stratigraphy at the Site, as revealed in the borehole logs, consists of fill material at the surface surrounding the AST underlain by native sandy silt to silty clay over sand and silt glacial till.

A brief description of the soil stratigraphy at the Site, in order of depth, is summarized in the following sections. The interpreted Site geology is shown on the enclosed cross section (Figure 6).

Surface Material

Topsoil was encountered in BH22-1 and BH22-2 to depths ranging between 25 to 50 mm.

Fill

Fill material was noted at surface in BH22-3, and was encountered below the surficial topsoil in BH22-1 and BH22-2 to depths of 0.8 to 1.5 m below existing grade (local elevation 97.1 to 97.8). The fill material comprised brown to black silty sand with some gravel and trace organics. The fill material was moist.

Sandy Silt

A sandy silt layer was encountered below the fill material in all three (3) boreholes to a depth of 2.0 to 2.3 m below existing grade (local elevation 96.2 to 96.5). The layer was grey with trace to some clay and was wet.

Silty Clay

A silty clay layer was encountered below the sandy silt layer in all boreholes to a depth of 3.1 m below existing grade (local elevation 95.5). The layer was grey and wet.

Sand and Silt Glacial Till

A sand and silt glacial till was noted below the silty clay layer in all boreholes to the 6.7 m depth of exploration. The glacial till varied between sand and silt to sandy silt composition with trace clay and gravel. Cobbles and boulders were noted during drilling. The layer was wet.

Bedrock

Bedrock was not encountered at the Site. The depth to bedrock in the vicinity is approximately 100 to 149 m bgs based on MECP water well records.

Groundwater

The on-Site monitoring well network consists of a total of three (3) monitoring wells advanced by GEI. The 1.5 to 3.0 m long screens were installed within the sandy silt to silty clay to intercept the overburden groundwater aquifer. Groundwater depths observed within the Site ranged between 1.02 m to 1.26 m below the existing grade (local elevation 97.25 to 97.55) on May 26, 2022. The inferred groundwater flow direction is towards the north/northeast as shown on Figure 5.

Estimates of the saturated hydraulic conductivity in the overburden water table unit were obtained using the conservative values derived from the default Freeze and Cherry (1979) values. The overburden material that the monitoring wells are screened in sandy silt and silty clay layers. Therefore, the hydraulic conductivity at the Site ranges from 1.0×10^{-5} to 1.0×10^{-9} m/s.

The horizontal hydraulic gradient in groundwater, based on groundwater measurements collected on

May 26, 2022 were approximately 0.08 to 0.09 m/m. It is noted that vertical hydraulic gradients were not evaluated for this Site as a second water bearing unit was not identified at the depths investigated at the Site.

5.9.6 *Site Sensitivity*

The Site Sensitivity classification with respect to the conditions set out under Section 41 and 43.1 of O.Reg.153/04 were evaluated to determine if the Site is sensitive, as presented in the table below:

Sensitivity	Classification	Does Sensitivity Apply to Site?
Section 41 applies if	(i) property is within an area of natural significance	No
	(ii) property includes or is adjacent to an area of natural significance or part of such an area	No
	(iii) property includes land that is within 30 m of an area of natural significance or part of such an area	No
	(iv) soil at property has a pH value for surface soil less than 5 or greater than 9	No
	(v) soil at property has a pH value for sub-surface soil less than 5 or greater than 11	No
	(vi) 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	No
Section 43.1 applies if	(i) property is a shallow soil property	No
	(ii) property includes all or part of a water body or is adjacent to a water body or includes land that is within 30 m of a water body	Yes

5.9.7 *Previous Reports*

The following documents were available for review, GEI reviewed and used as a source of background information during the preparation of this report:

1. *"Phase One Environmental Site Assessment, Proposed Crisdawn Subdivision – Phase 3, Lockhart Road, Barrie, Ontario"* by Peto MacCallum Ltd, PML Ref.: 17BF007, Report 5 Revised, dated February 25, 2022.

Peto MacCallum (2022) Phase One Environmental Site Assessment	
Objective	Identify former and existing potential environmental concerns at the Site.
PCAs	• Based on the evaluation of the historical data and the Site reconnaissance, two (2) PCAs on the Site and two (2) PCAs within the Study Area were identified. • On-Site PCAs consisted of the potential use of pesticides for agricultural use on Site (PCA #40 – Pesticides including Herbicides, Fungicides, and Ani-Fouling Agents Manufacturing, Processing, Bulk Storage and Large-Scale Applications). The presence of an above-ground storage tank on the south portion of the Site (PCA #28 – Gasoline and Associated Products, Storage in Fixed Tanks).

Peto MacCallum (2022) Phase One Environmental Site Assessment	
	• The PCAs within the study area consisted of the potential use of pesticides for agricultural use (PCA #40 – Pesticides including Herbicides, Fungicides, and Ani-Fouling Agents Manufacturing, Processing, Bulk Storage and Large-Scale Applications). The ERIS report identified a natural gas leak caused by a falling tree onto a gas line causing a fuel oil spill and is associated with (PCA# N/A – Other PCA QP is aware of: fuel oil spills and leaks).
APECs	• The above noted PCA concerning the above-ground fuel storage tank on Site (PCA#28) was considered an environmental concern.

5.9.8 *Remediation*

No remediation has occurred on Site, past or present.

5.9.9 *Soil Importation*

Fill can be used to re-grade a property and to backfill excavations. Based on the historical information reported in the Phase One ESA, no imported soil has been brought to the Site.

5.9.10 *Land Use*

The Site is vacant and undeveloped. The site will be redeveloped with residential subdivision. Section 168.3.1 of the *Environmental Protection Act* does not prohibit the proposed future use of the Property.

5.9.11 *Contaminants of Concern*

The MECP (2011a) Table 8: Generic Site Condition Standards for use within 30 m of a water body in a Non-Potable Ground Water Condition within for Residential/Parkland/Institutional/ Industrial/Commercial/Community Property Use and All Textures were considered applicable for determining COCs, based on the reasons presented below:

Descriptor	Site-Specific Condition
Section 41 Site Sensitivity	Not applicable o The soil at the Site has pH values between 5 and 9 for surficial soil; and, between 5 and 11 for subsurface soil. o The Site is not located within, or adjacent to, an area of natural significance, or part of such an area; and, the Site does not include land that is within 30 m of an area of natural significance, or part of such an area.
Section 43.1 Site Sensitivity	Applicable o The Site is not considered a shallow soil property, based on the recovered soil cores, which indicated that more than two-thirds of the Site has an overburden thickness in excess of 2 m; and, o The Site is located within 30 m of a surface water body; a tributary of Hewitts Creek was observed in the middle of the Site and flowed westward.

Descriptor	Site-Specific Condition
Ground Water	Potable ○ The RSC property is not located within an area designated in a municipal official plan as a well-head protection area or other designation identified by the municipality for the protection of groundwater. ○ The property, and all other properties located, in whole or in part, within 250 metres of the boundaries of the property, are supplied by a municipal drinking water system, as defined in the *Safe Drinking Water Act, 2002*.
Land Use	Residential/Parkland/Institutional ○ The future use of the Site will be residential land use.
Soil Texture	All textures ○ Due to the application of MECP Table 8 SCS for the RSC Site, all soil textures standards were applied.

No COCs were identified in soil or groundwater at the Site.

5.9.12 *Contaminant Fate and Transport*

Soil Media

No soil COCs were identified at the Site.

Groundwater Media

No groundwater COCs were identified at the Site.

5.9.13 *Preferential Pathways*

The preferential pathways for contaminants present in soil and groundwater media typically include various underground utilities, building footings and surface features.

However, underground utilities were not identified at the Site, as described in Section 2.2. As such, there is no potential for underground utilities to affect soil vapour and groundwater migration. However, the future residential development will have underground utilities and building footings that may affect soil vapour and groundwater migration.

The Phase Two ESA Investigation concluded that the soil and groundwater samples analyzed at the Site meet the applicable MECP Table 8 SCS. As such, no soil or groundwater COCs were present at the Site and there are no preferential pathways.

5.9.14 *Climatic Conditions*

Given that no COCs are present at the Site, the climatic or meteorological conditions are not a potential contaminant transport mechanism.

5.9.15 *Soil Vapour Migration*

Given that no COCs were identified in soil or groundwater at the Site, soil vapour intrusion is not a potential contaminant transport mechanism.

5.9.16 *Receptors and Exposure Pathways*

Human Health Receptors and Exposure Pathways

As no COCs were identified in soil or groundwater at the Site there are no complete exposure pathways for human receptors at the future residential development.

Scenario	Receptor	Exposure Pathways
Property Residents	Adult (including pregnant female), Teen, Child, Toddler, Infant	None
Workers – Long Term (indoor)	Adult (including pregnant female)	None
Workers – Short Term (outdoor)	Adult (including pregnant female)	None
Property Visitor – Recreational/Trespassers	Adult (including pregnant female), Teen, Child, Toddler, Infant	None
Workers – Construction	Adult (including pregnant female)	None

Ecological Receptors and Exposure Pathways

As no COCs were identified in soil or groundwater at the Site there are no complete exposure pathways for ecological receptors at the future residential development.

Primary Source	Secondary Source	Receptor	Exposure Pathway
Impacted soil	Impacted soil	Vegetation	None
		Soil invertebrates	None
		Terrestrial birds and mammals	None
	Impacted groundwater	Terrestrial vegetation	None
		Soil invertebrates	None
		Terrestrial birds and mammals	None
	Impacted animal tissue	Terrestrial birds and mammals	None

6. Summary of Findings

The findings of the Soil Phase Two ESA conducted at the Site are summarized as follows:

1. The general stratigraphy at the Site, as revealed in the borehole logs, consists of fill material at the surface surrounding the AST underlain by native sandy silt to silty clay over sand and silt glacial till.
2. Based on the borehole logs and observations in the field the native overburden samples and were identified as coarse textured. However, the Ministry of Environment, Conservation, and Parks (MECP) Table 8: Generic Site Condition Standards for use within 30 m of a water body in a Non-Potable Ground Water Condition apply to both medium-fine and coarse textured soil classifications.
3. The depth to groundwater was observed on May 26, 2022, and measured between 1.02 m and 1.26 m bgs.
4. The soil analytical results indicated that all soil samples submitted for PHCs, BTEX, VOCs, and metals and inorganics (including EC, SAR, and pH) analyses were either non-detected or detected below the applicable MECP (2011) Table 8 SCS; and all laboratory RDLs were below the applicable SCS, except for:
    - The concentration of EC (2.21 mS/cm) exceeded the MECP Table 8 SCS (0.7 mS/cm) in sample BH22-3-2.

    However, under the newly amended O.Reg.153/04 (O.Reg.407/19), if a substance has been applied to surfaces for the safety of vehicular or pedestrian traffic under the conditions of snow or ice or both (i.e. application of de-icing salts), its related parameters are not deemed to be in exceedance of the MECP Table 8 SCS RPIICC SCS. As de-icing salts were used at the Site, EC is not considered as a contaminant of concern.
5. The groundwater analytical results indicated that all groundwater samples submitted for PHCs, BTEX, VOCs, and metals and inorganics analyses were either non-detected or detected below the applicable MECP (2011) Table 8 SCS; and all laboratory RDLs were below the applicable SCS.

7. Conclusions and Recommendations

As a result of this Phase Two Environmental Site Assessment, no impacts were identified in soil based on the APECs and PCAs identified from the Phase One Environmental Site Assessment.

8. General Limitations

The information presented in this report is based on a limited investigation designed to provide information to support an assessment of the current environmental conditions within the subject property. The conclusions and recommendations presented in this report reflect Site conditions existing at the time of the investigation.

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Yours truly,

GEI Consultants Inc.

Aiden Belfrage, B.E.S.,
Project Coordinator

June 30, 2022

Alicia Kimberley, M.Sc., P.Geo.,
Geoenvironmental and Hydrogeological Practice Lead

9. References

1. MECP (2011a) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act";*

2. *MECP (2011b) Protocol for Analytical Methods Used in the Assessment of Properties under Prt XV.1 of the Environmental Protection Act. PIBS 4696e01*

3. *MECP (2020) "Rules of Soil Management and Excess Quality Standards" under MECP Ontario Regulation 406/19.*

4. *Environmental Protection Act, Ontario Regulation 406/19, as amended, On-Site and Excess Soil Management, December 4, 2019*

5. *MECP (2018); Well Records Map. Retrieved from https://www.ontario.ca/environment-and-energy/map-well-records*

6. *NHIC (2017); Make a Natural Heritage Map. Retrieved from* http://www.gisapplication.lrc.gov.on.ca/*mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US*

7. *Toporama. Retrieved from* http://www.atlas.gc.ca/toporama/en/index.html

8. Ontario Ministry of Environment, Conservation and Parks, Source Protection Information Atlas, 2020. Accessed online at https://www.gisapplication.lrc.gov.on.ca/SourceWaterProtection/Index.html?viewer=SourceWaterProtection.SWPViewer&locale=en-US&fbclid=IwAR3tsEf9KR8jmRyFJVArgZIzMqhS2hk1mMye_QK8n7yF3xO6noYhVH6SrV4

9. Ontario Ministry of Energy, Northern Development and Mines website, Bedrock Geology of Ontario, 2011 – MRD 126; and Paleozoic Geology of Southern Ontario, 2007 – MRD 219 (KML format)

10. Ontario Ministry of Energy, Northern Development and Mines website, Physiography of Southern Ontario 2007

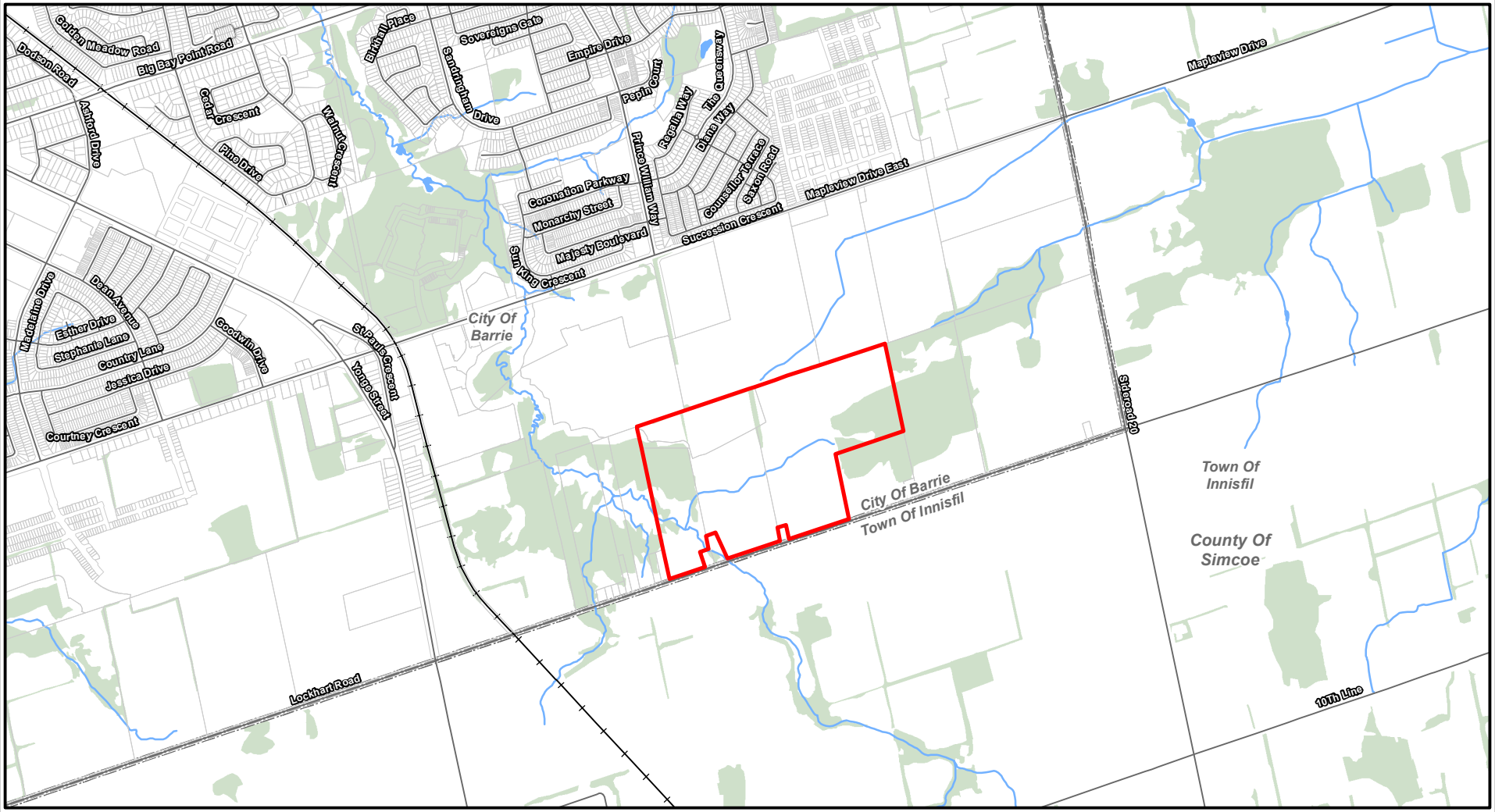
11. Ontario Ministry of Energy, Northern Development and Mines website, Surficial Geology of Southern Ontario, 2010. (KML format)

12. Ontario Ministry of the Environment (2011) Brownfields Environmental Site Registry. Accessed online at: https://www.lrcsde.lrc.gov.on.ca/besrWebPublic/generalSearch

13. Ontario Ministry of the Environment (2018) Records of Site Condition. Accessed online at: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/searchFiledRsc_search.

14. "Plan of Survey of Part of Southeast ¼ of Lot 18 and Part of Lot 19 Concession 11, Geographic Township of Innisfil, City of Barrie, County of Simcoe", File No. 10921R, dated June 21, 2013 by Rudy Mak.

Figures



Legend

Site Boundary | Road | Wooded Area
Parcels | Watercourse
Railway | Waterbody

NOTES:
1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.
3. Barrie Parcel data: 'Tax Parcels', City of Barrie via Arcgis Online (Accessed June 2022).

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Barrie, Ontario

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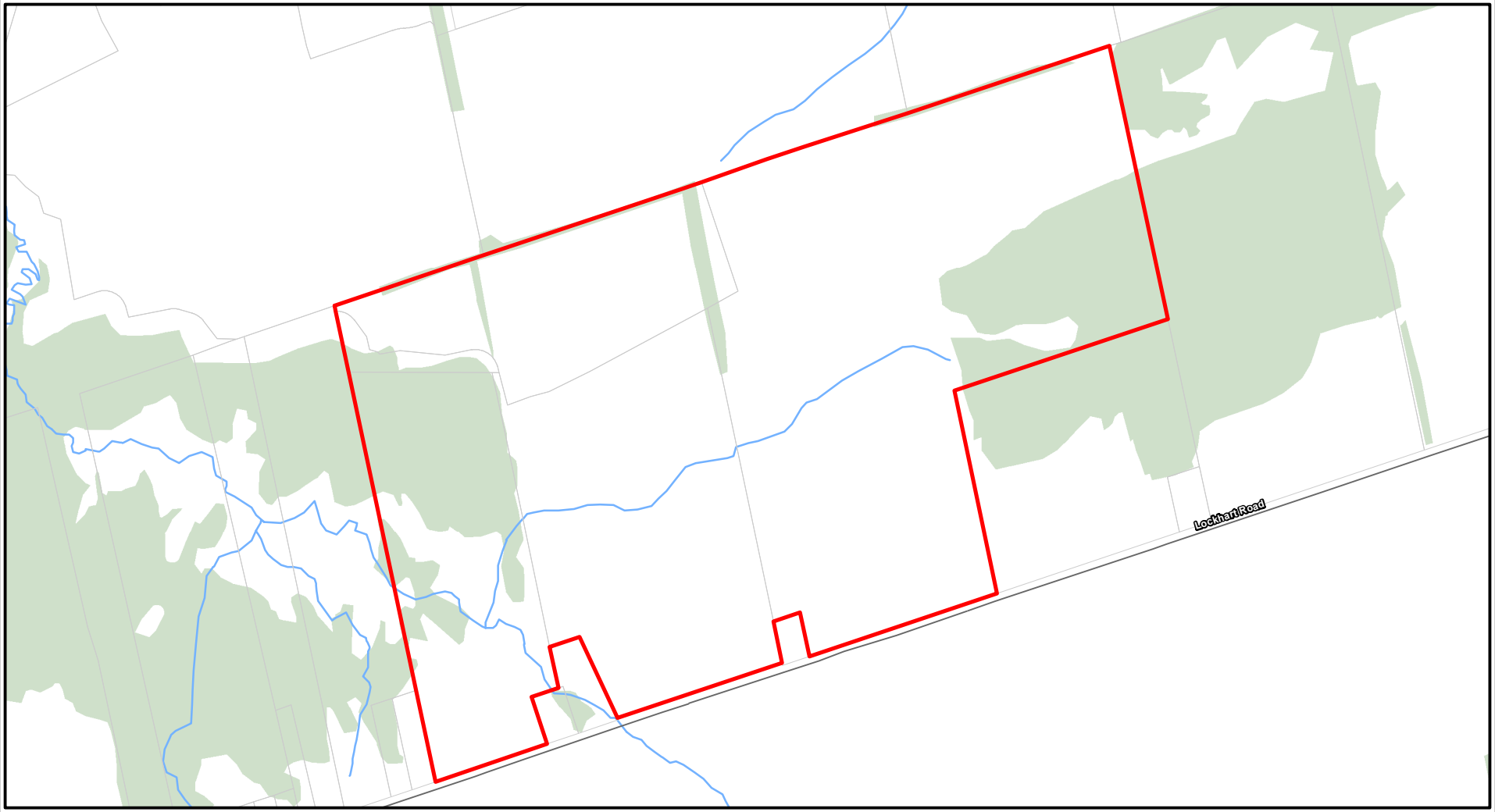
SITE LOCATION PLAN

Project 2201329 | June 2022 | Fig. 1



Legend

Site Boundary
Parcels
Road
Watercourse
Wooded Area

*** No Utilities Present on Site**

NOTES:
1. Coordinate System: NAD 1983 UTM Zone 17N.
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SITE LAYOUT AND UTILITIES PLAN

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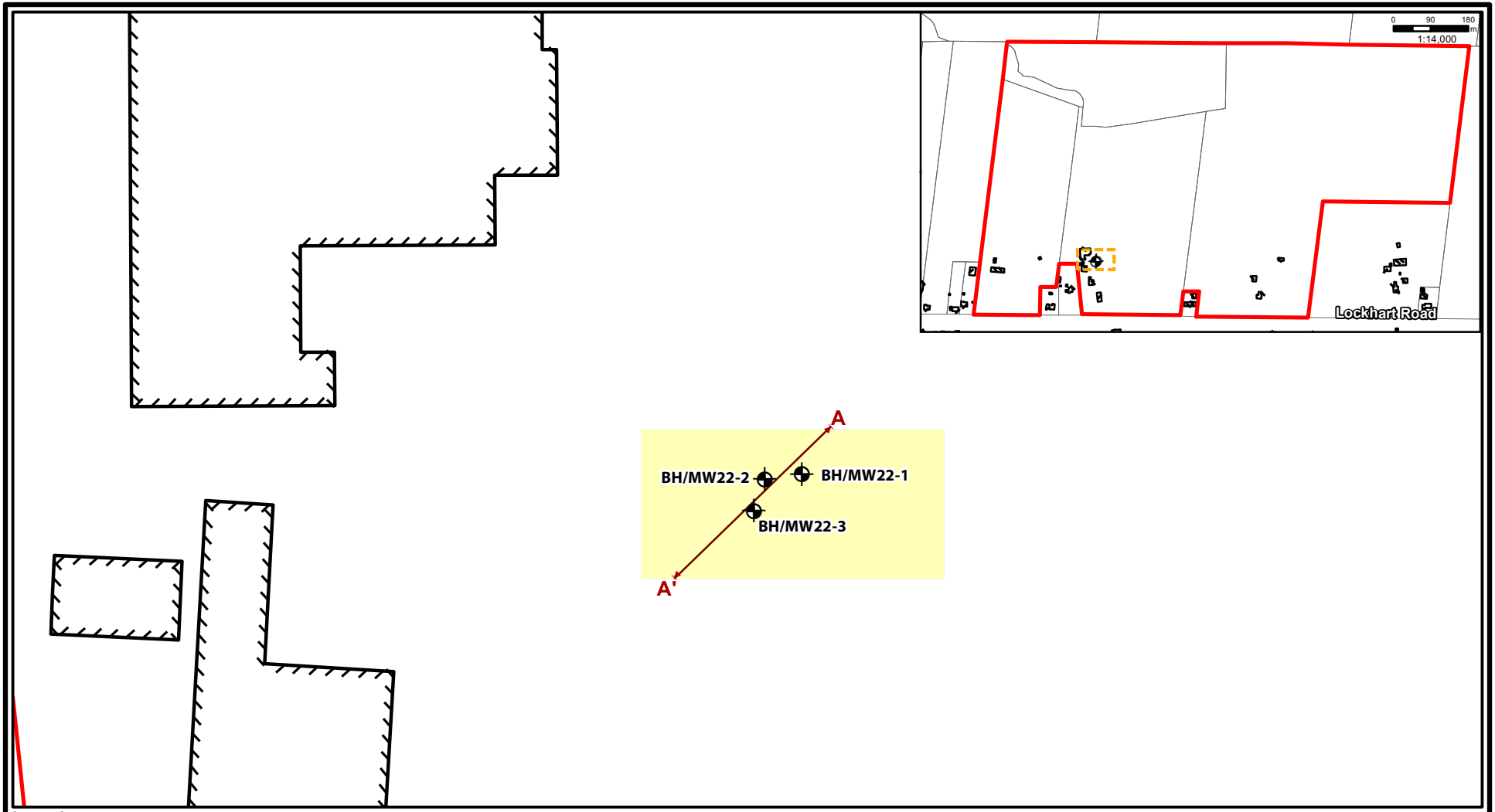

Legend

- Site Boundary
- Parcels
- Borehole/Monitoring Well Location
- Building
- Cross Section Location
- APEC 1

NOTES:

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BOREHOLE/MONITORING WELL LOCATION PLAN WITH AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

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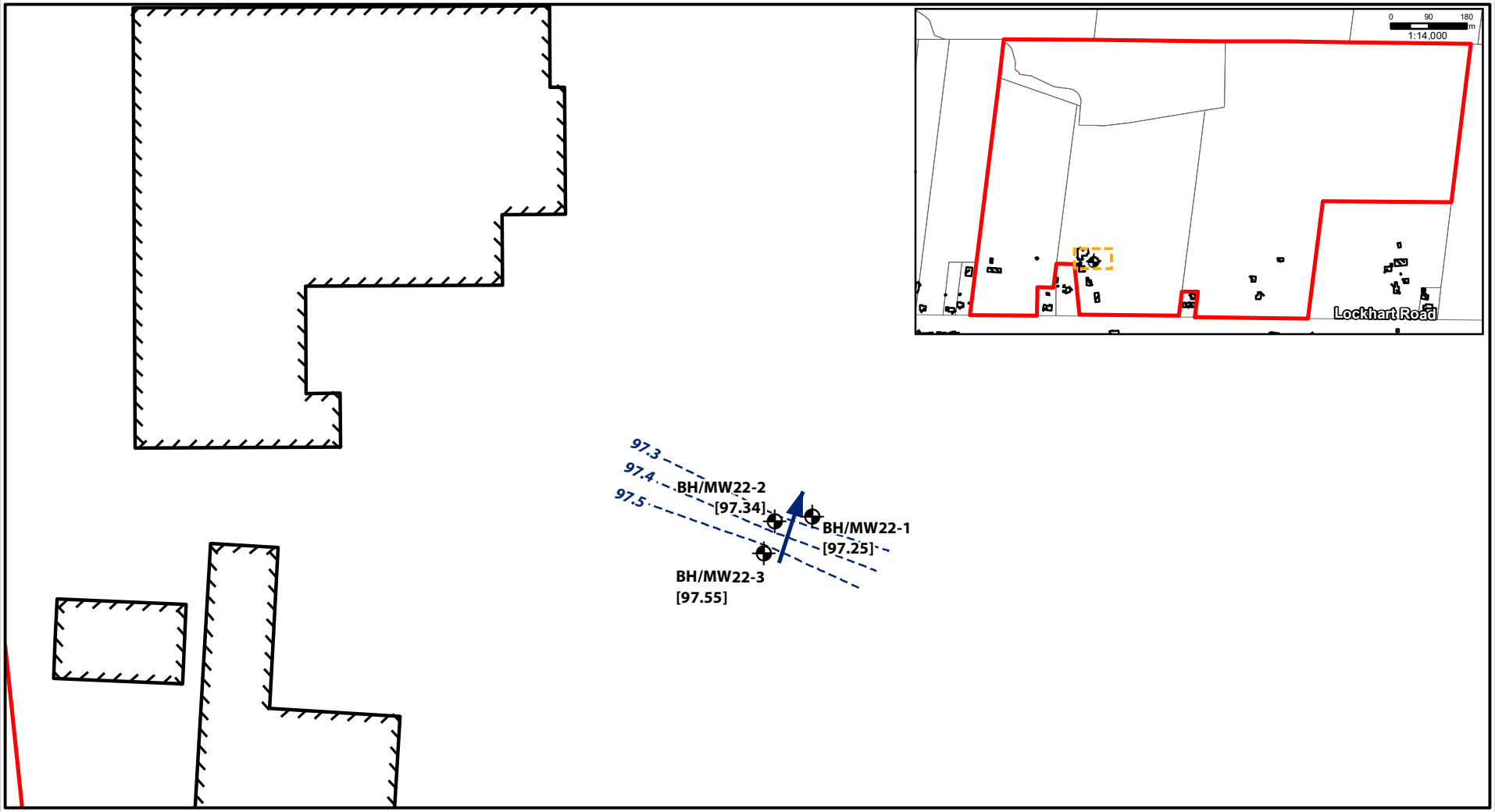

Legend

- Site Boundary
- Parcels
- Building
- Borehole/Monitoring Well Location
- [xx.xx] Water Level (m bgs)
- Groundwater Contour
- Interpreted Direction of Groundwater Flow

NOTES:

1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.
3. Barrie Parcel & Building Footprints, City of Barrie via Arcgis Online (Accessed June 2022).

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GROUNDWATER CONTOURS

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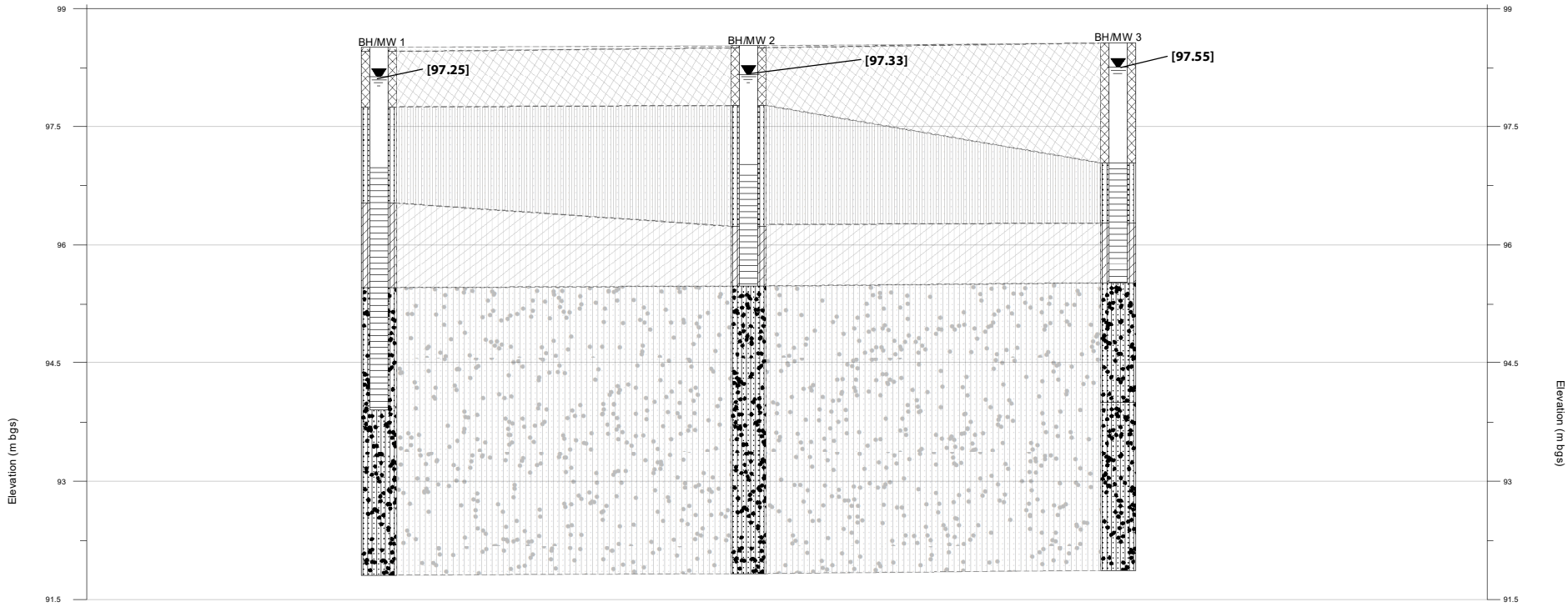

Legend

Water Level In Monitoring Well

[xx.xx] Groundwater level (m bgs), measured March 10, 2022

Strata

- Topsoil
- Fill
- Clayey Silt to Silty Clay Glacial Till
- Sandy Silt/Silty Sand/Sand and Silt
- Sandy Silt Glacial Till/Sand and Silt Glacial Till

NOTES:

1. Subsurface conditions known only at borehole locations.
2. Horizontal distances are not to scale.

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GEOLOGICAL CROSS SECTION A-A'

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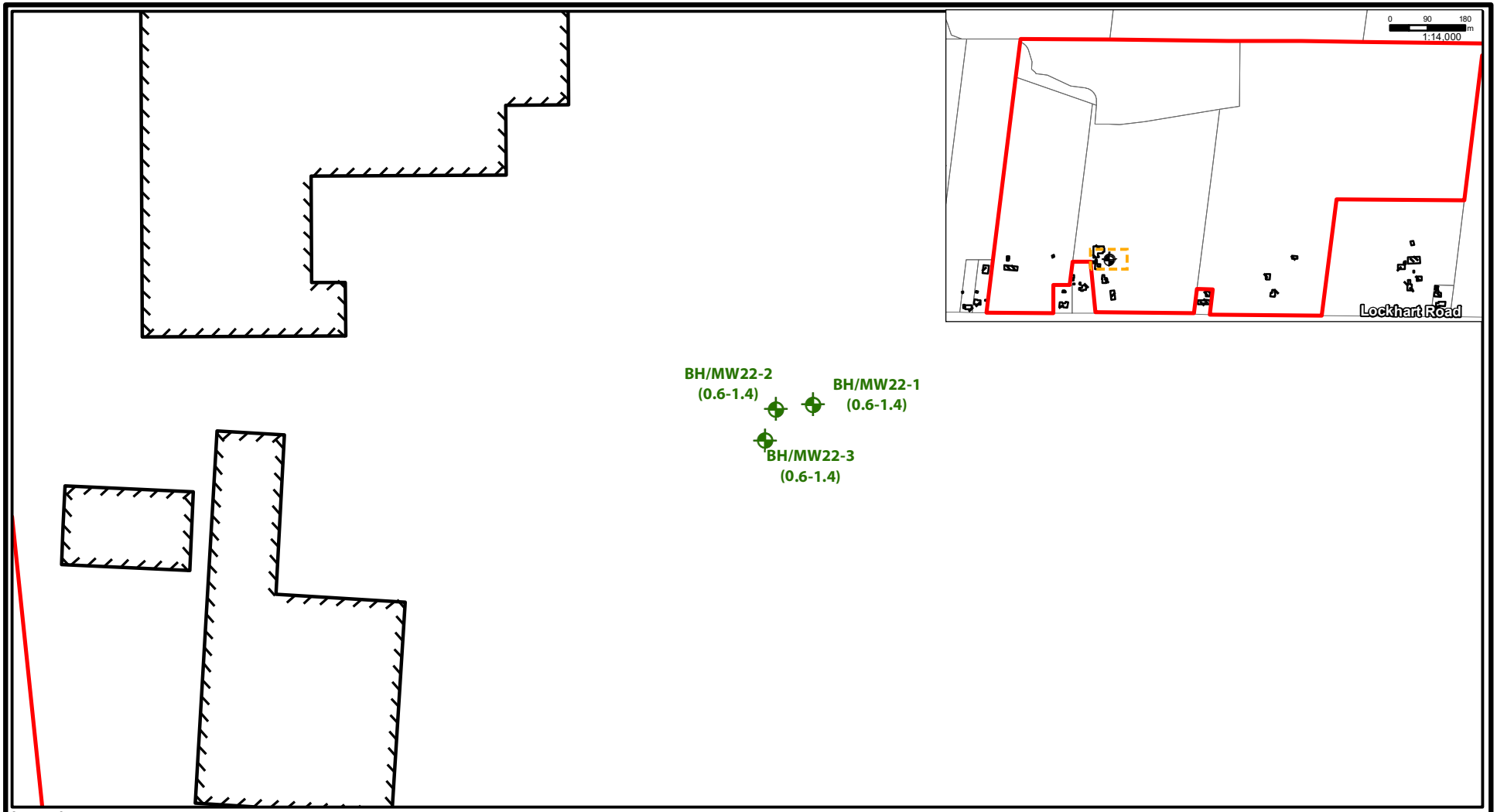

Legend

- Site Boundary
- Parcels
- Building
- Borehole/Monitoring Well Location
- (xx.xx) Sample Depth (m bgs)
- Exceeds MECP Table 8 SCS
- Meets MECP Table 8 SCS

NOTES:

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PHC (F1-F4)
CONCENTRATIONS IN SOIL

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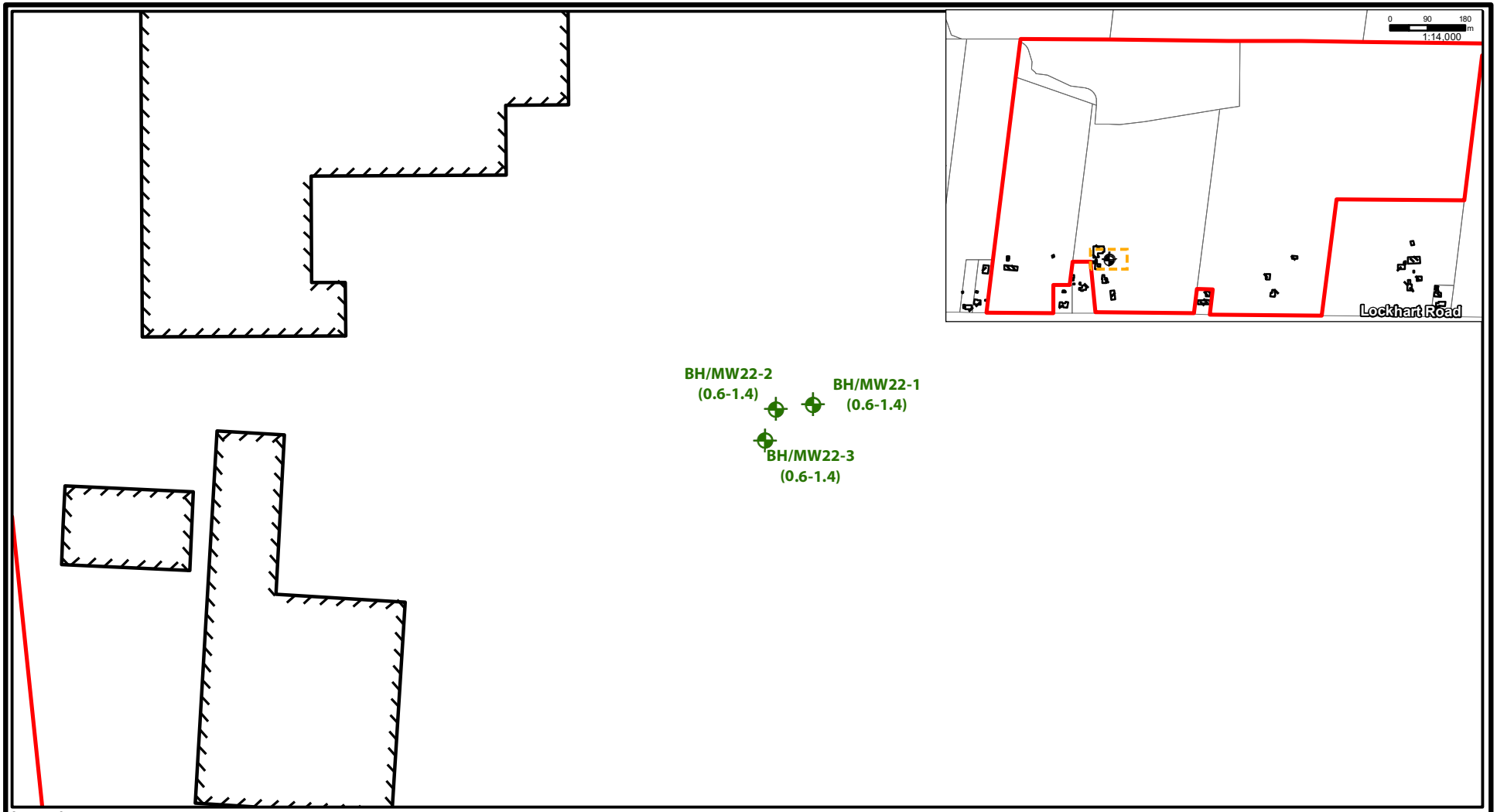

Legend

- Site Boundary
- Parcels
- Building
- Borehole/Monitoring Well Location
- (xx.xx) Sample Depth (m bgs)
- Exceeds MECP Table 8 SCS
- Meets MECP Table 8 SCS

NOTES:

1. Coordinate System: NAD 1983 UTM Zone 17N.
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BTEX CONCENTRATIONS IN SOIL

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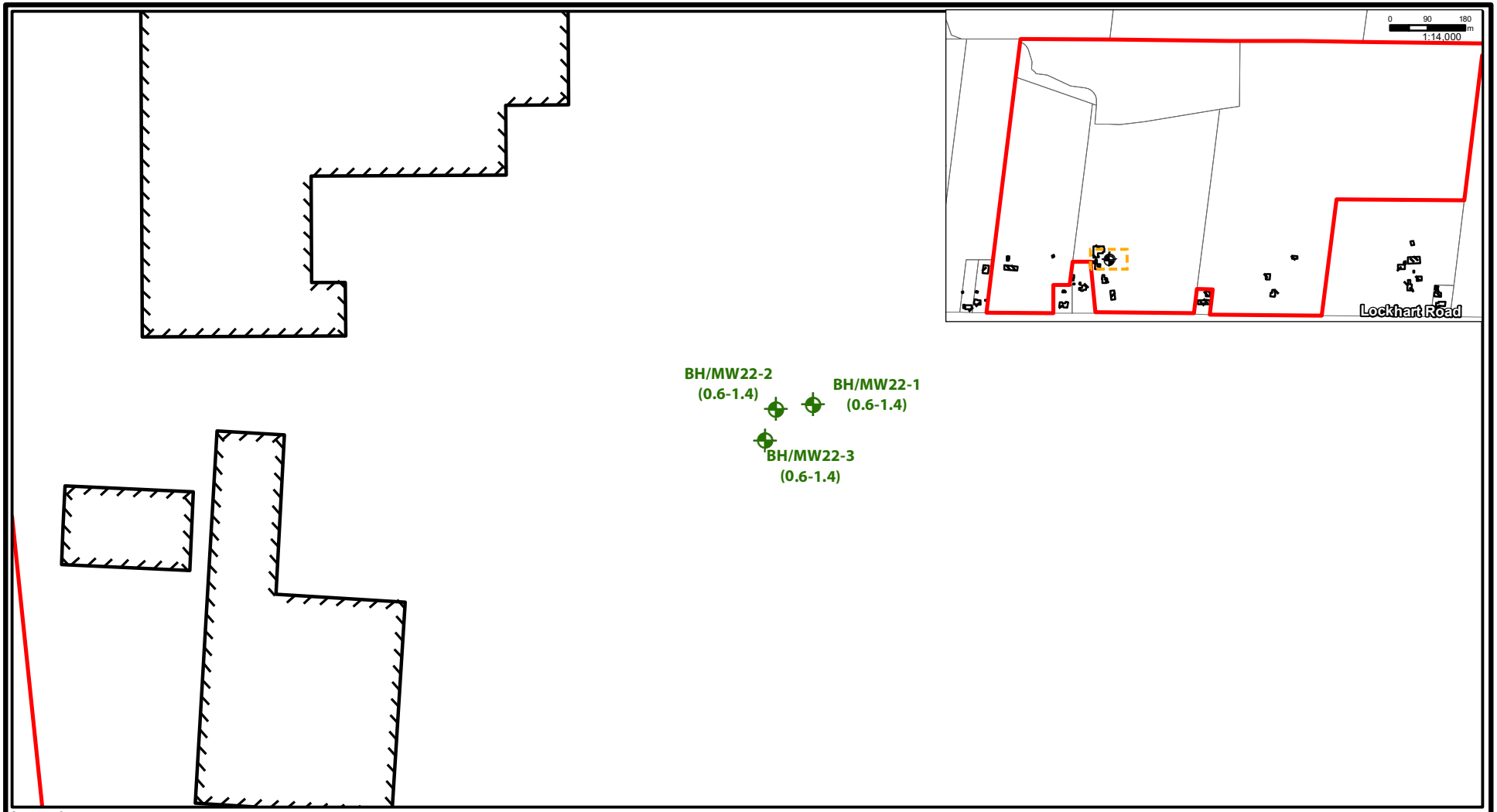

Legend

- Site Boundary
- Parcels
- Building
- Borehole/Monitoring Well Location
- (xx.xx) Sample Depth (m bgs)
- Exceeds MECP Table 8 SCS
- Meets MECP Table 8 SCS

NOTES:

1. Coordinate System: NAD 1983 UTM Zone 17N.
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VOCs CONCENTRATIONS IN SOIL

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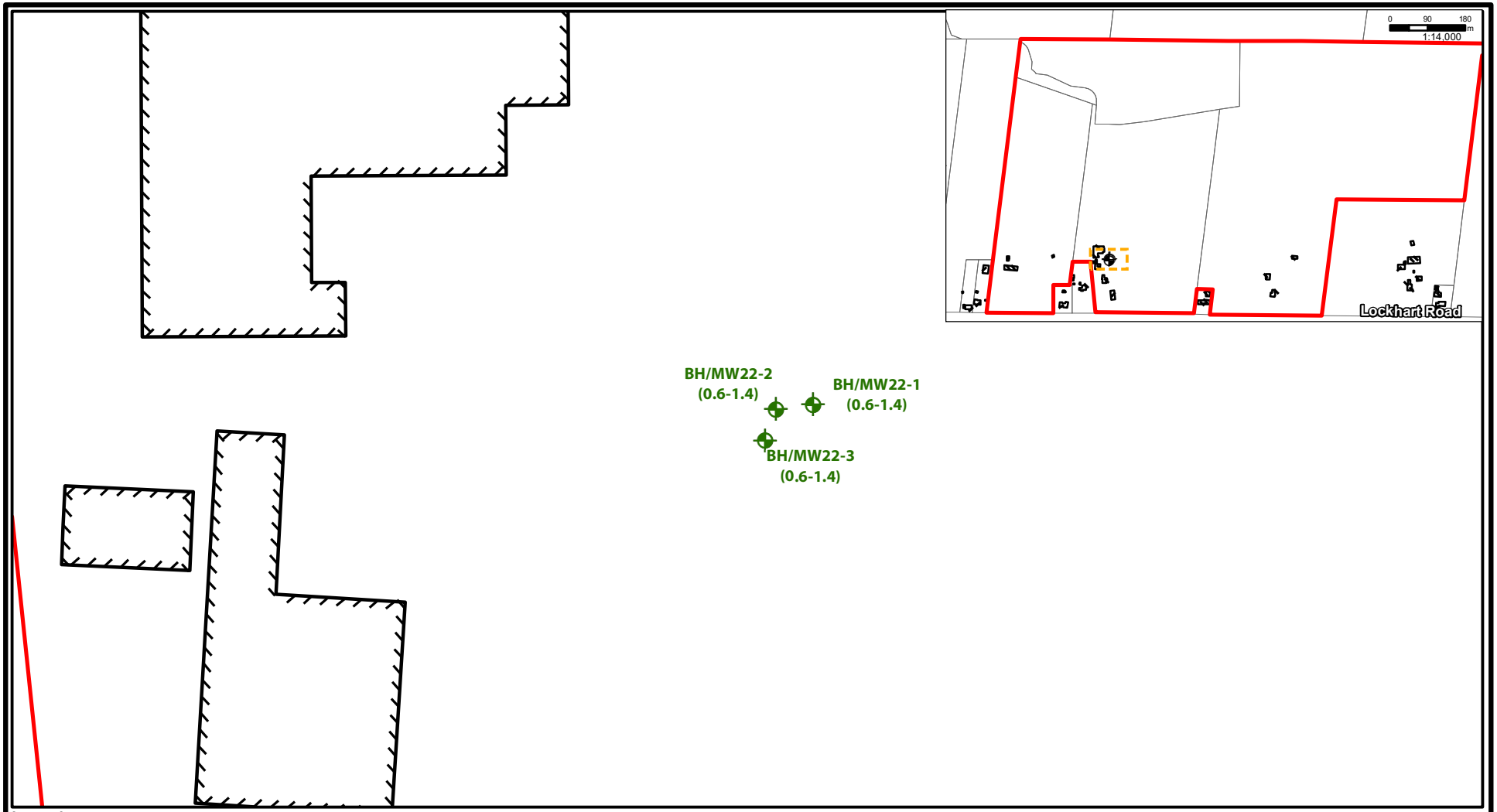

Legend

- Site Boundary
- Parcels
- Building
- Borehole/Monitoring Well Location
- (xx.xx) Sample Depth (m bgs)
- Exceeds MECP Table 8 SCS
- Meets MECP Table 8 SCS

NOTES:

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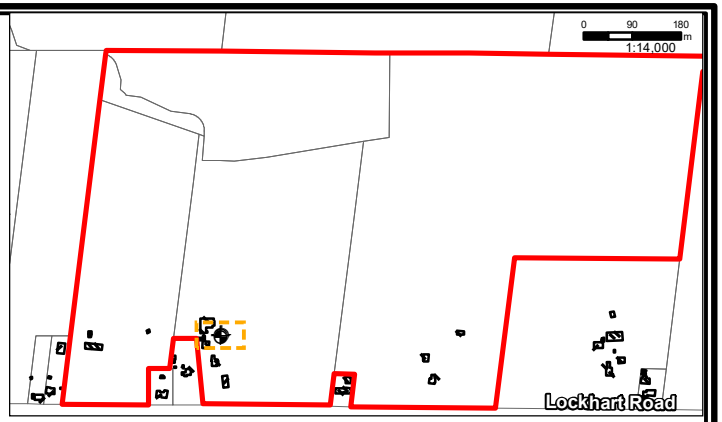
METALS As, Sb, Se, Cr(VI), Hg, B-HWS, CN- CONCENTRATIONS IN SOIL

June 2022 Fig. 10



Legend	
	Date (d-m-y)
Location	Depth (m bgs)
Parameter	Concentration
Note	
Parameter	Table 3 SCS
EC	0.7 mS/cm

Table 8 SCS = MECP (2011a) Table 8: Generic Site Condition Standards for use within 30 m of a water body in a Potable Ground Water Condition within for Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use and All Textures.

Bold	Parameter exceeds Table 8 SCS but is not considered a COC
	Parameter detected below Table 8 SCS

Legend

- Site Boundary
- Parcels
- Building
- Borehole/Monitoring Well Location
- (xx.xx) Sample Depth (m bgs)
- Exceeds MECP Table 8 SCS but is not considered a COC
- Meets MECP Table 8 SCS

NOTES:

1. Coordinate System: NAD 1983 UTM Zone 17N.
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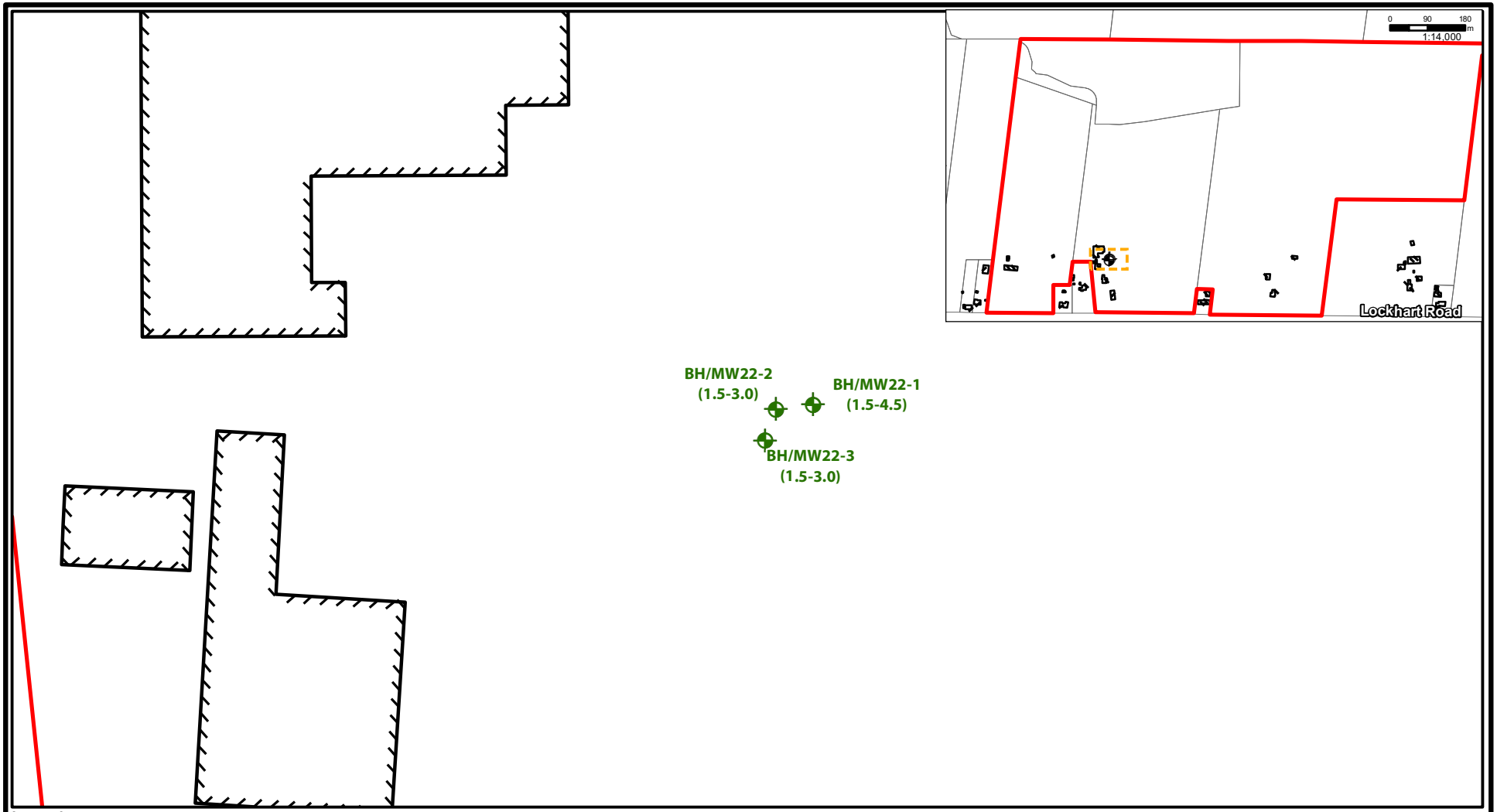
INORGANICS (INCL. EC & SAR) CONCENTRATIONS IN SOIL

June 2022

Fig. 11



Legend

- Site Boundary
- Parcels
- Building
- Borehole/Monitoring Well Location
- (xx.xx) Well Screen Depth (m bgs)
- Exceeds MECP Table 8 SCS
- Meets MECP Table 8 SCS

NOTES:

1. Coordinate System: NAD 1983 UTM Zone 17N.
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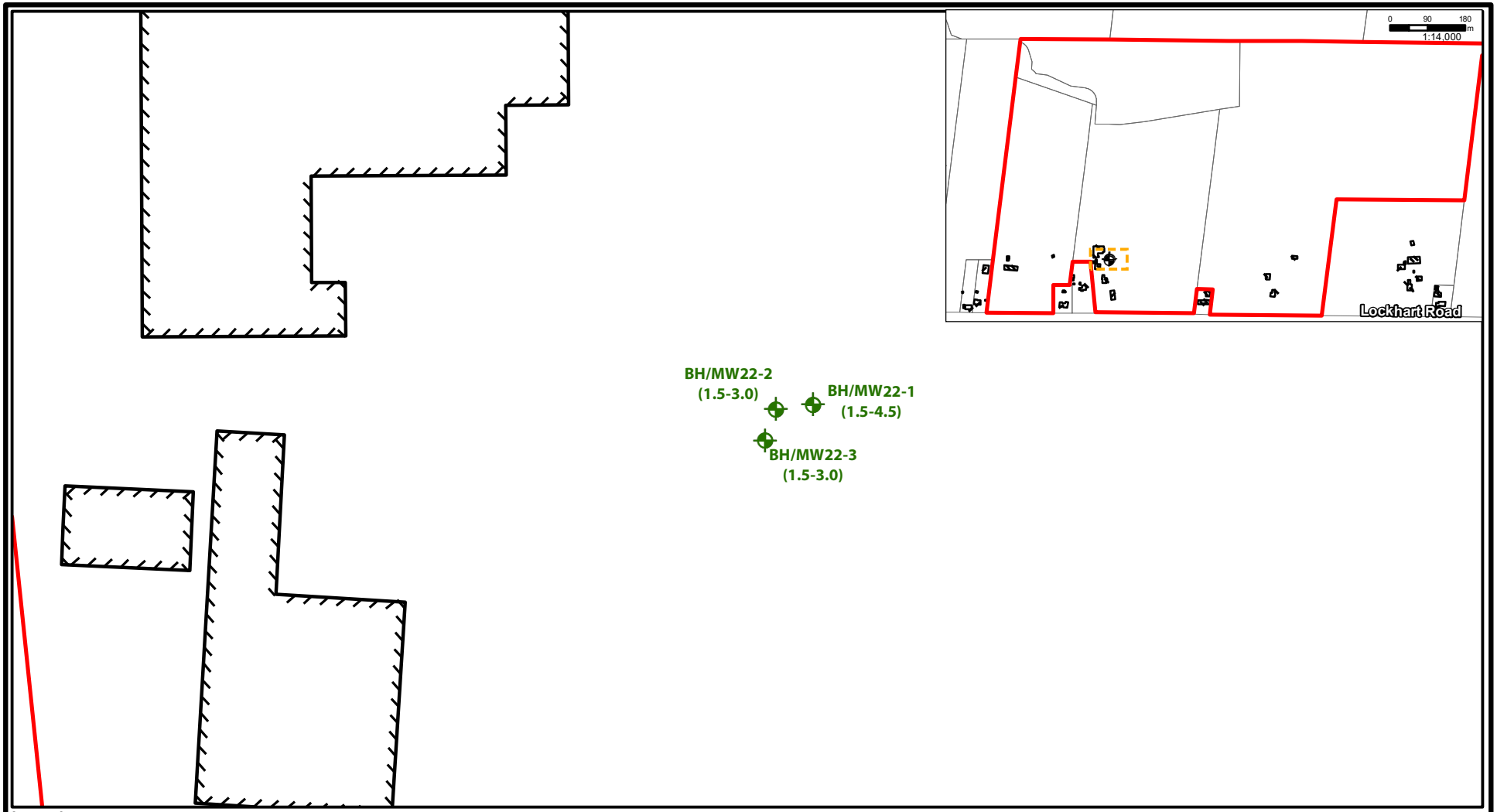
PHC (F1-F4)
CONCENTRATIONS IN
GROUNDWATER

Project 2201329 | June 2022 | Fig. 12



Legend

- Site Boundary
- Parcels
- Building
- Borehole/Monitoring Well Location
- (xx.xx) Well Screen Depth (m bgs)
- Exceeds MECP Table 8 SCS
- Meets MECP Table 8 SCS

NOTES:

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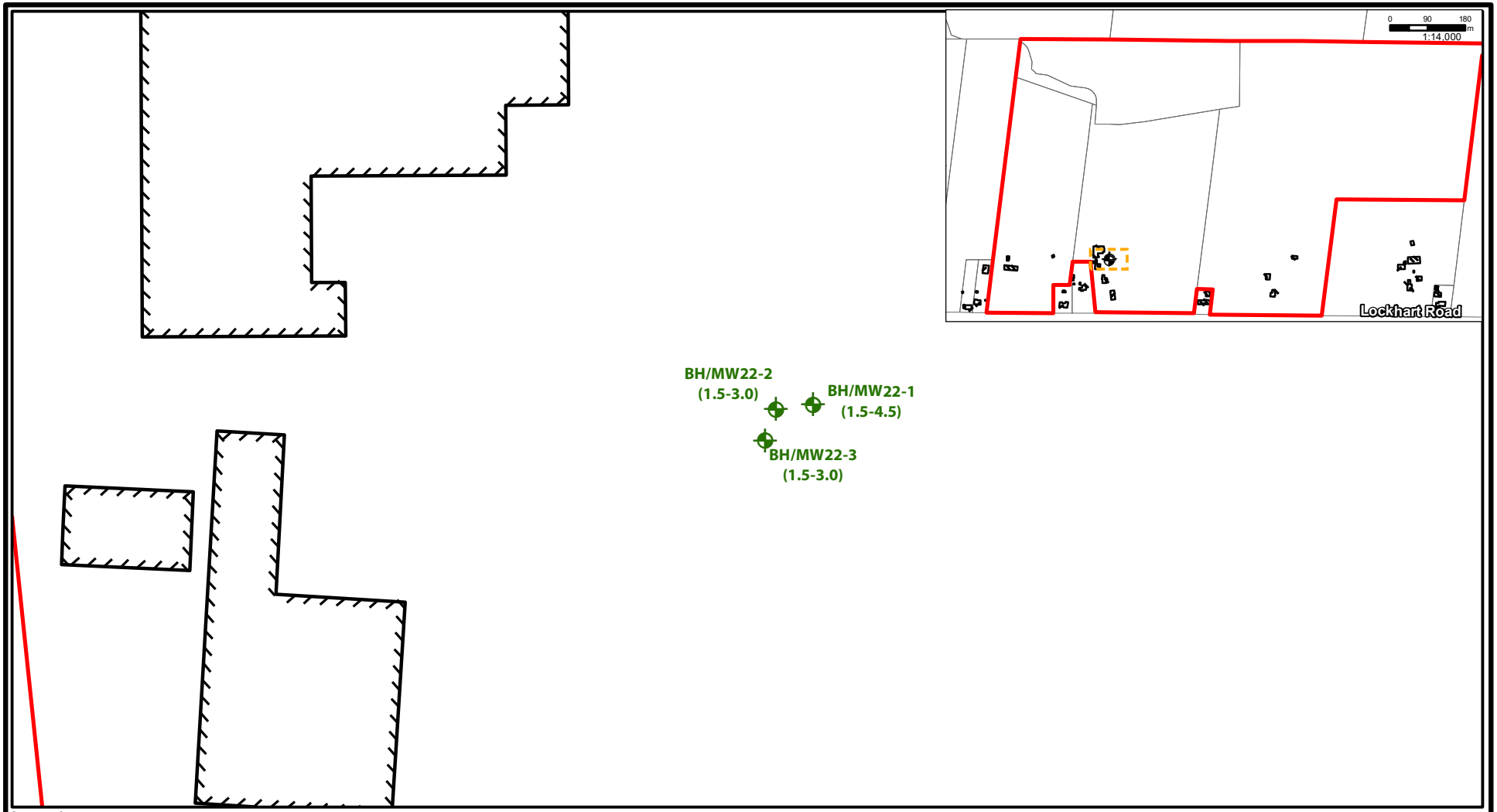
BTEX CONCENTRATIONS IN GROUNDWATER

Project 2201329 | June 2022 | Fig. 13



Legend

- Site Boundary
- Parcels
- Building
- Borehole/Monitoring Well Location
- (xx.xx) Well Screen Depth (m bgs)
- Exceeds MECP Table 8 SCS
- Meets MECP Table 8 SCS

NOTES:

1. Coordinate System: NAD 1983 UTM Zone 17N.
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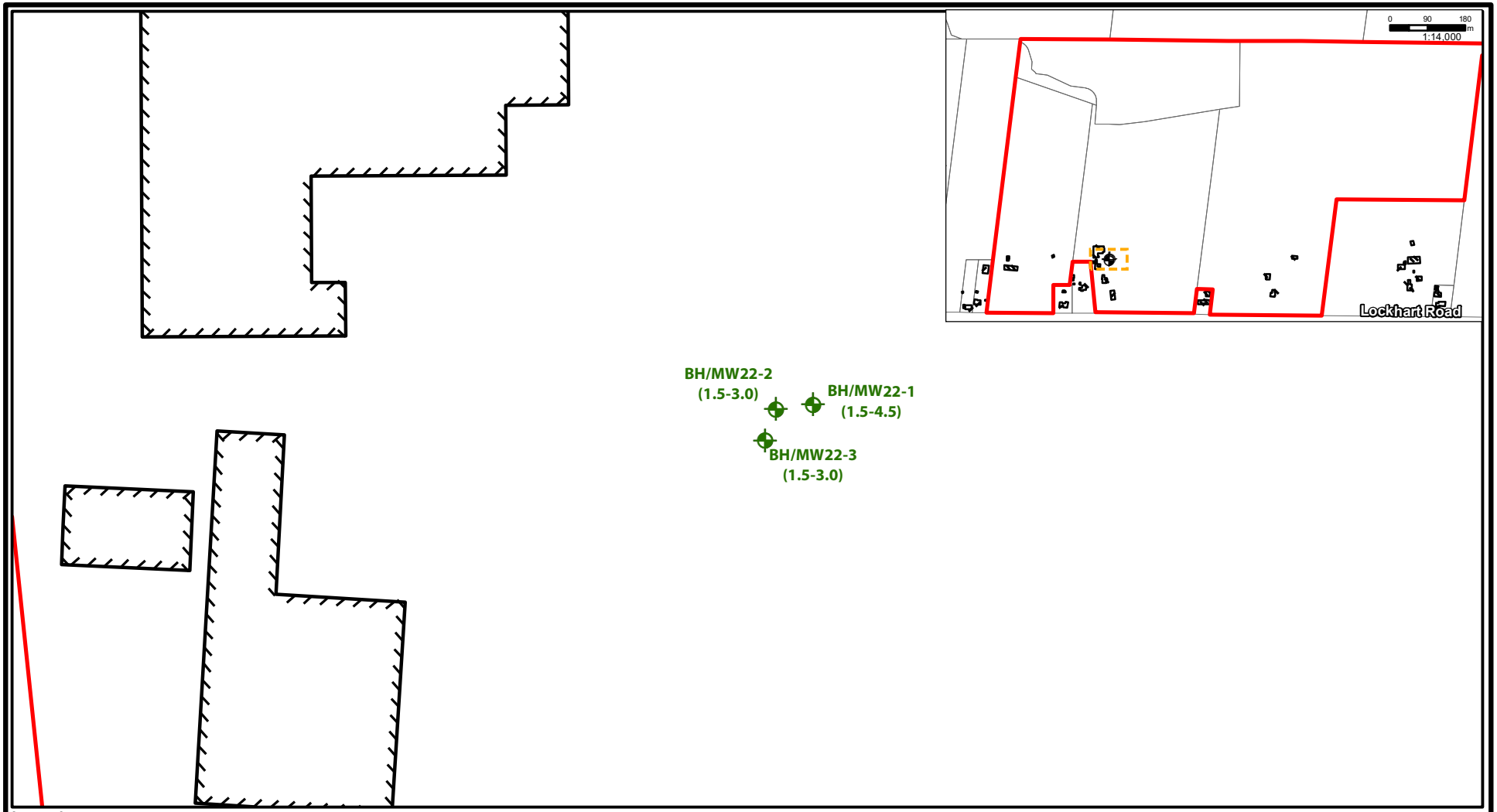
VOC CONCENTRATIONS IN GROUNDWATER

Project 2201329 | June 2022 | Fig. 14



Legend

- Site Boundary
- Parcels
- Building
- Borehole/Monitoring Well Location
- (xx.xx) Well Screen Depth (m bgs)
- Exceeds MECP Table 8 SCS
- Meets MECP Table 8 SCS

NOTES:

1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.
3. Barrie Parcel & Building Footprints, City of Barrie via Arcgis Online (Accessed June 2022).

0 4 8 m

1:350

N

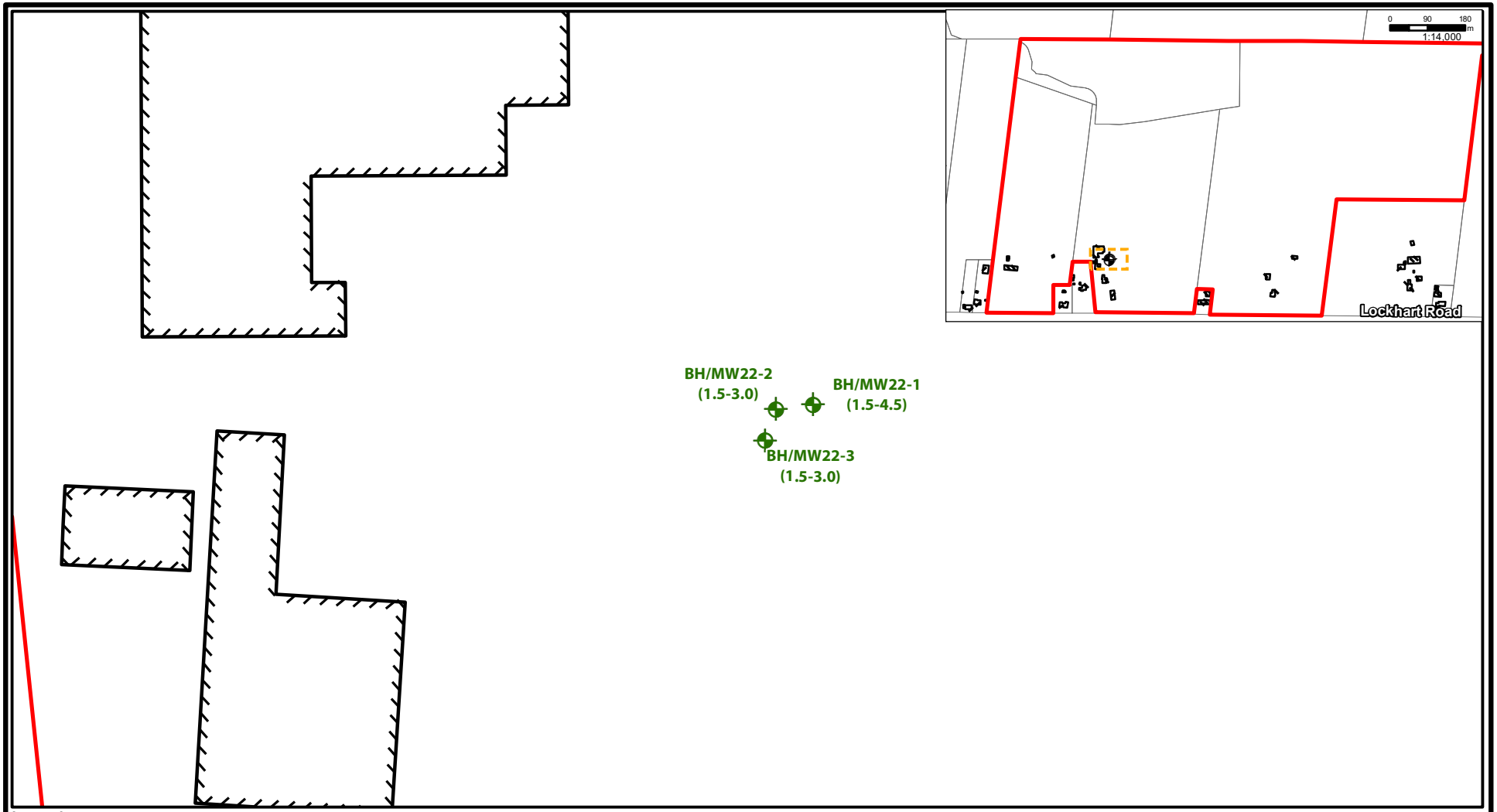
Phase Two ESA
830, 864, and 912 Lockhart Road
Barrie, Ontario

Pratt Homes

GEI Consultants

METALS (As, Sb,Se, Cr(VI), Hg, B-HWS, CN-) CONCENTRATIONS IN GROUNDWATER

Project 2201329 | June 2022 | Fig. 15



Legend

- Site Boundary
- Parcels
- Building
- Borehole/Monitoring Well Location
- (xx.xx) Well Screen Depth (m bgs)
- Exceeds MECP Table 8 SCS
- Meets MECP Table 8 SCS

NOTES:

1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.
3. Barrie Parcel & Building Footprints, City of Barrie via Arcgis Online (Accessed June 2022).

0 4 8 m

1:350

N

Phase Two ESA
830, 864, and 912 Lockhart Road
Barrie, Ontario

Pratt Homes

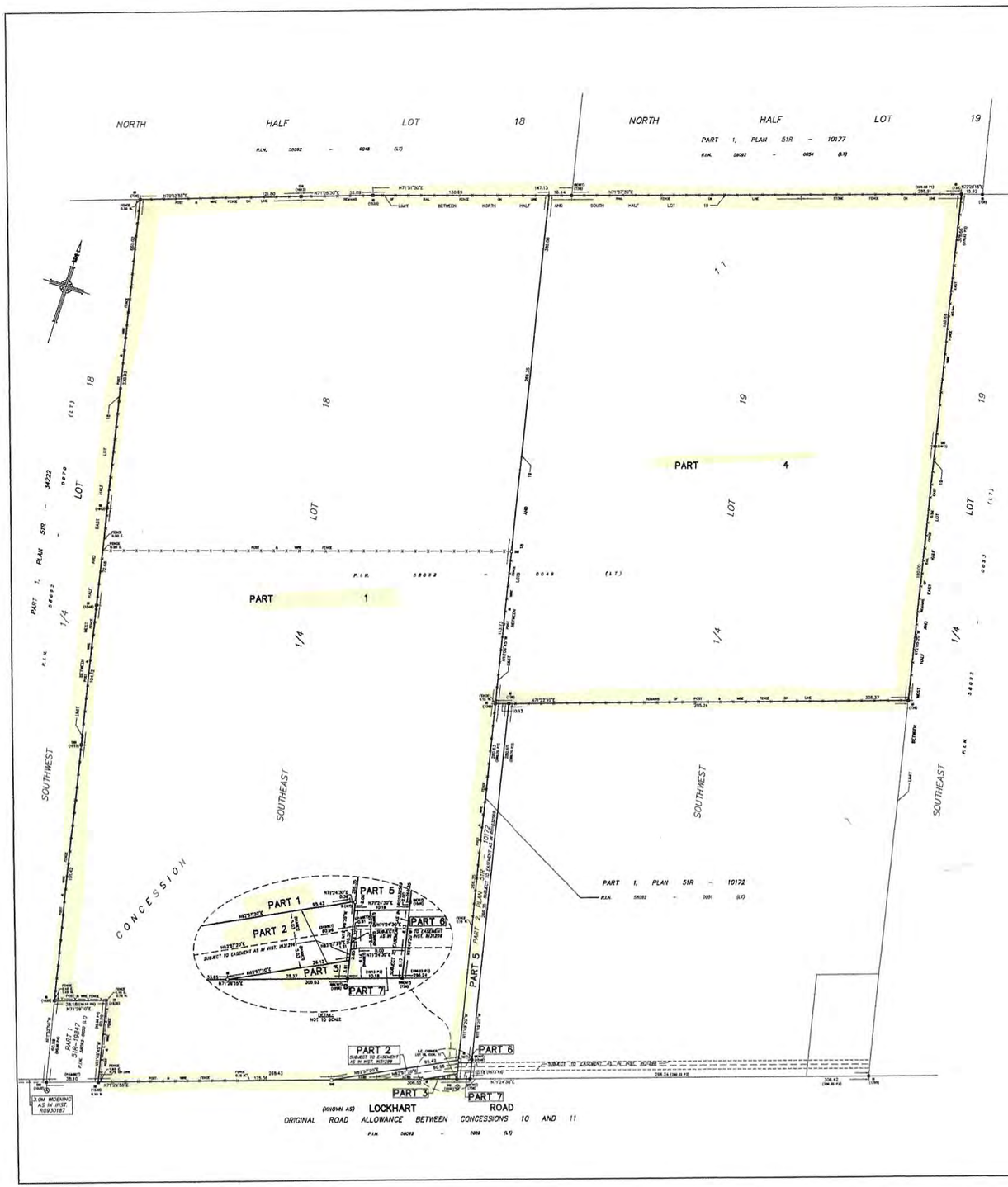
GEI Consultants

INORGANICS, SODIUM AND CHLORIDE CONCENTRATIONS IN GROUNDWATER

Project 2201329 | June 2022 | Fig. 16

Appendix A

Survey Plan



I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT

DATE : JULY 31, 2013

RUDY MAK
ONTARIO LAND SURVEYOR

PLAN 51R- 39092
RECEIVED AND DEPOSITED

DATE : AUGUST 2, 2013

REPRESENTATIVE FOR LAND REGISTRAR FOR THE LAND TITLES DIVISION OF SIMCOE (No. 51)

SCHEDULE

PART	LOT	CONCESSION	P.I.N.
1	PART OF SOUTHEAST 1/4 OF LOT 18	CONCESSION 11	ALL OF P.I.N. 58092-0048 (LT)
2			
3			
4			
5	PART OF LOT 19		PART OF P.I.N. 58092-0051 (LT)
6			
7			

PART 2 IS SUBJECT TO AN EASEMENT AS IN INST. R31299
PART 6 IS SUBJECT TO AN EASEMENT AS IN INST. R31299
PARTS 5, 6 AND 7 ARE SUBJECT TO EASEMENT AS IN RO932568

PLAN OF SURVEY OF PART OF
SOUTHEAST 1/4 OF LOT 18
AND PART OF
LOT 19
CONCESSION 11
GEOGRAPHIC TOWNSHIP OF INNISFIL
CITY OF BARRIE
COUNTY OF SIMCOE

SCALE 1 : 1000
0 10 20 40 60 80 100 metres

RUDY MAK SURVEYING LTD.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1) THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.

2) THE SURVEY WAS COMPLETED ON THE 9TH DAY OF JANUARY, 2013

JUNE 21, 2013
DATE

RUDY MAK
ONTARIO LAND SURVEYOR

METRIC

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

DISTANCES

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999718.

OBSERVED REFERENCE POINTS (ORPs) DERIVED FROM GPS OBSERVATIONS USING THE CSRS (SCRIPPS) NETWORK (UTM ZONE 17, NAD 83 (ORIGINAL) (2002 EPOCH)).
COORDINATES TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10

POINT ID	NORTHING	EASTING
ORP A	4910731.431	611254.837
ORP B	4910821.686	611345.442

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THE PLAN.

BEARING NOTE

BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A TO B, BY RCAL THE NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (ORIGINAL) (2002 EPOCH).

FOR BEARING COMPARISONS, A ROTATION OF 0°29'30" COUNTER-CLOCKWISE WAS APPLIED TO BEARINGS ON PLAN PLAN OF SURVEY BY R.C. KIRKPATRICK, O.L.S. DATED OCTOBER 17, 1972.

LEGEND

■	DENOTES FOUND SURVEY MONUMENT
□	DENOTES PLANTED SURVEY MONUMENT
SIB	DENOTES STANDARD IRON BAR
IB	DENOTES IRON BAR
——x——	DENOTES CHAIN LINK FENCE
(136)	DENOTES R.C. KIRKPATRICK, O.L.S.
(1655)	DENOTES R. WELSMAN, O.L.S.
(1229)	DENOTES RAMES SURVEYING LTD.
(1535)	DENOTES P.J. MANSFIELD, O.L.S.
(1612)	DENOTES CPLETT & WORONIC SURVEYING LTD.
(P1)	DENOTES PLAN 51R-10177
(P2)	DENOTES PLAN OF SURVEY BY R.C. KIRKPATRICK, O.L.S. DATED OCTOBER 17, 1972
(P3)	DENOTES PLAN 51R-10173
(P4)	DENOTES PLAN 51R-10847

RUDY MAK SURVEYING LTD.
ONTARIO LAND SURVEYORS
89 BIG BAY POINT ROAD
BARRIE, ONTARIO L4N 8M5 (705) 722-3845
E-MAIL MAIL@MAKSURVEYING.COM

DRAWN BY: MTD | CHECK BY: RM | FILE No. 109248

Appendix B

Sampling and Analysis Plan

GEI Consultants

Consulting Engineers and Scientists

SITE SAMPLING AND ANALYSIS PLAN

864 Lockhart Road, Barrie, Ontario

Submitted to:
Pratt Homes
301 King Street, Barrie,
ON L4N 6B5

Submitted by:
GEI Consultants, Inc.
647 Welham Road, Unit 14
Barrie, Ontario L4N 0B7
www.geiconsultants.com

June 30, 2022
Project 2201329

Table of Contents

1. Introduction

This Sampling and Analysis Plan (SAAP) that was developed in support of the Soil Characterization Report which will be conducted to provide further characterization of the Site subsurface conditions. The SAAP presents the procedures and measures that will be undertaken during field investigative activities to characterize the Site conditions and meet the data quality objectives of the Soil Characterization Report.

The SAAP presents the sampling program proposed for the Site, the recommended procedures and protocols for sampling and related field activities, the data quality objectives, and the quality assurance/ quality control (QA/QC) measures that will be undertaken to provide for the collection of accurate, reproducible and representative data. These components are described in further detail below.

2. Field Sampling Program

2.1 Field Sampling Program

The field sampling program was developed to provide for the collection of samples of the surficial and subsurface soil materials for chemical analysis of parameters identified as potential contaminants of concern identified in the Phase One ESA.

The soil samples will be collected from of the surficial fill and overburden material. The groundwater samples will be collected from each monitoring well.

The monitoring wells will be installed at selected boreholes to intercept the groundwater table aquifer. The monitoring wells will be installed with 1.52 to 3.05 m long screens extending to a maximum depth of approximately 6.70 m below grade.

Elevation of the boreholes and monitoring wells will be obtained through the completion of an elevation survey with reference to a Site temporary benchmark or a local geodetic benchmark. Groundwater flow will be determined through groundwater level measurements and the relative groundwater elevations established in the Site elevation survey.

3. Field Methods

To meet the requirements of the field sampling program, the following field investigative methods will be undertaken:

- Borehole Drilling;
- Soil Sampling;
- Monitoring Well Installation;
- Monitoring Well Development;
- Groundwater Level Measurements;
- Elevation Survey;
- Groundwater Sampling; and
- Residue Management Procedures.

The field investigative methods will be performed as described below:

3.1 Borehole Drilling

Boreholes will be advanced at the Site to facilitate the collection of soil samples for chemical analysis and geologic characterization and for the installation of groundwater monitoring wells. Boreholes will be advanced at the Site to a maximum depth of approximately 6.70 m below grade, within the overburden materials to provide for the collection of soil samples beneath the Site. The borehole locations will be selected to assess soil and groundwater (if required) quality at the Site.

Prior to borehole drilling, utility clearances will be obtained from public locators, as required. Boreholes will be advanced into the surficial fill and overburden soils by a drilling company under the full-time supervision of GEI staff. A track mounted drilling machine equipped with hollow stem augers and split spoons will be utilized to advance the boreholes through the overburden materials.

3.2 Soil Sampling

Soil samples for geologic characterization and chemical analysis will be collected from the overburden boreholes using 5 cm diameter, 60 cm long, stainless steel split-spoon sampling devices advanced ahead of the augers. The split-spoon samplers will be attached to drill rods and advanced into the soil by means of a machine-driven hammer. Spilt-spoon soil samples will be collected where possible, beginning at the ground surface and subsequently at continuous intervals. Geologic and sampling details of the recovered cores will be logged and the samples will be assessed for the potential presence of non-aqueous phase liquids. A portion of each soil sample will be placed in a sealed “zip-lock” plastic bag and allowed to reach ambient temperature prior to field screening with a photoionization detector (PID) that will be calibrated by the supplier with an appropriate reference gas and zeroed in ambient conditions prior to use. The vapour measurements will be made by inserting the instrument’s probe into the plastic bag while manipulating the sample to ensure volatilization of the soil gases. These readings will provide a real-time indication of the relative concentration of volatile organic vapours encountered in the subsurface during drilling. Samples for chemical analysis will be selected on the basis of visual, combustible gas and olfactory evidence of impacts and at specific intervals to define the lateral and vertical extent of suspected impacts.

Recommended volumes of soil samples selected for chemical analysis will be collected into pre-cleaned, laboratory supplied, analytical test group specific containers. The samples will be placed into clean insulated coolers chilled with ice for storage and transport. Samples intended for PHC and/or VOC and/or BTEX analysis will be collected using a laboratory-supplied soil core sampler, placed into the vials containing methanol for preservation purposes and sealed using Teflon lined septa lids. The samples will be assigned unique identification numbers, and the date, time, location, and requested analyses for each sample will be documented in a bound field notebook. The samples will be submitted to a CAEL certified laboratory within analytical test group holding times under Chain of Custody (COC) protocols. New disposable chemical resistant gloves will be used during the handling and sample collection for each soil core to prevent sample cross-contamination.

3.3 Monitoring Well Installation

Monitoring wells will be installed in general accordance with Ontario Regulation 903/90, as amended and will be installed by a licensed well contractor.

The monitoring wells will be constructed using 50 mm diameter, Schedule 40, PVC riser pipe and number 10 slot size (0.25 mm) well screens. The base of the well screens will be sealed with PVC end caps. All

well pipe connections will be factory machined threaded flush couplings. The pipe components will be pre-wrapped in plastic, which will be removed prior to insertion in the borehole to minimize the potential for contamination. No lubricants or adhesives will be used in the construction of the monitoring wells. The annular space around the well screens will be backfilled with silica sand to at least 0.3 m above the top of the screen. Granular bentonite will be placed in the borehole annulus from the top of the sand pack to approximately grade. The monitoring wells will be completed with protective casings.

3.4 Monitoring Well Development

Monitoring wells will be developed to remove fine sediment particles potentially lodged in the sand pack and well screen to enhance contact with the surrounding formation groundwater and will be developed using dedicated low flow tubing and low-flow peristaltic pump. Monitoring well development will be monitored by multiparameter water quality meter visual observations of turbidity, and by taking field measurements of pH and conductivity for every well volume removed. Standing water volumes will be determined by means of a water level meter. Water quality parameter measurements will be recorded using a multiparameter water quality meter. A minimum of approximately three (3) well volumes will be removed; and, well development will continue until the purged water has chemically stabilized as indicated by field parameters measurements.

Well development details will be documented on a well development log sheet or in a bound hard cover notebook. All water accumulated during well development will be collected and stored in sealed containers.

3.5 Groundwater Level Measurements

Groundwater level measurements will be recorded from monitoring wells to determine groundwater flow and direction at the Site. Water levels will be measured with respect to the top of the casing by means of a groundwater level meter. The water levels will be recorded on water level log sheets or in a bound field notebook. The water level meter probe will be decontaminated between monitoring well locations.

3.6 Elevation Survey

An elevation survey will be conducted to obtain vertical control of the newly installed monitoring well locations. The top of casing and ground surface elevation of each monitoring well location will be surveyed against a known geodetic benchmark, or if unavailable, against a suitable arbitrary temporary benchmark. Elevations measured against a geodetic benchmark will be recorded as meters above mean sea level (m AMSL). The arbitrary temporary benchmark will be assigned an elevation of 100.00 m. The elevation survey will be accurate to within ± 1 cm.

3.7 Groundwater Sampling

If required, groundwater samples will be collected from monitoring wells for chemical analysis. The monitoring wells will be purged first of three to five wetted well volumes of water to remove standing water and draw in fresh formation water as previously described. Dedicated well materials will be used for well purging and sample collection.

Recommended groundwater sample volumes will be collected into pre-cleaned, laboratory-supplied vials or bottles provided with analytical test group specific preservatives, as required. The samples will be placed in an insulated cooler chilled with ice for storage and transport. Where needed, bottles will be checked for headspace.

All groundwater samples will be assigned unique identification numbers, and the date, time, project number and company name will be specified on each bottle. The samples will be submitted to the contractual laboratory within analytical test group holding times under COC protocols. New disposable chemical resistant gloves will be used for each sampling location to prevent sample cross-contamination.

3.8 Residue Management Procedures

The residue materials produced during the borehole drilling, soil sampling programs and monitoring well sampling programs comprised of decontamination fluids from equipment cleaning, and waters from well development and purging will be placed in sealed drums for future off-Site disposal.

4. Field Quality Assurance/Quality Control Program

The objective of the field quality assurance/quality control (QA/QC) program is to obtain soil and groundwater samples and other field measurements that provide data of acceptable quality that meets the objectives of the Soil Characterization Report. The objectives of the QA/QC program will be achieved through the implementation of procedures for the collection of unbiased (i.e., non-contaminated) samples, sample documentation and the collection of appropriate QC samples to provide a measure of sample reproducibility and accuracy. The field QA/QC measures will comprise:

- Decontamination Protocols;
- Equipment Calibration;
- Sample Preservation;
- Sample Documentation; and,
- Field Quality Control Samples.

Details on the field QA/QC measures are provided in the following sections.

4.1 Decontamination Protocols

Decontamination protocols will be followed during field sampling where non-dedicated sampling equipment is used to prevent sample cross contamination. For the borehole drilling and soil sampling, split soil sampling devices will be cleaned/decontaminated between sampling intervals and auger flights between borehole locations. For the monitoring well installation, well components are not to come into contact with the ground surface prior to insertion into boreholes. Electronic water level meters will be decontaminated between monitoring well locations during well development, purging activities and rising head tests. All decontamination fluids will be collected and stored in sealed containers.

4.2 Equipment Calibration

All equipment requiring calibration will be calibrated according to manufacturer's requirements using analytical grade reagents, or by the supplier prior to conducting field activities.

4.3 Sample Preservation

All samples will be preserved using appropriate analytical test group specific reagents, as required, and upon collection placed in ice-filled insulated coolers for storage and transport.

4.4 Sample Documentation

All samples will be assigned a unique identification number, which is to be recorded along with the date, time, project number and company name. All samples will be handled and transported following COC protocols.

4.5 Field Quality Control Samples

Field quality controls samples will be collected to evaluate the accuracy and reproducibility of the field sampling procedures. Where required, for groundwater samples, a trip blank prepared by a laboratory will

be submitted for chemical analysis to evaluate the potential for sample cross-contamination or bias. The recommended alert criteria for the trip blank sample are the detections of any test group analyte at a concentration in excess of laboratory detection limits.

4.6 Accredited Laboratory Quality Assurance/Quality Control

All analytical testing will be performed by Caduceon, which is an accredited laboratory. Caduceon is accredited under the Standards Council of Canada/Canadian Association of Environmental Analytical Laboratories (Accredited Laboratory No. 4090, 2728, 2644, 2628, and 2921) in accordance with ISO/IEC 17025:2005 - "General Requirements for the Competence of Testing and Calibration Laboratories".

Certificates of Analysis are expected from Caduceon reporting the results of all the chemical analyses performed on the submitted soil samples. Review of the Certificates of Analysis prepared by Caduceon is required to determine that they were in compliance with the requirements set out under subsection 47(3) of O.Reg.153/04.

The analytical program conducted by Caduceon includes analytical test group specific QA/QC measures to evaluate the accuracy and precision of the analytical results and the efficiency of analyte recovery during solute extraction procedures. The laboratory QA/QC program consists of the preparation and analysis of laboratory duplicate samples to assess precision and sample homogeneity, method blanks to assess analytical bias, spiked blanks and QC standards to evaluate analyte recovery, matrix spikes to evaluate matrix interferences and surrogate compound recoveries (VOCs only) to evaluate extraction efficiency. The laboratory QA/QC results are presented in the Quality Assurance Report provided in the Certificate of Analysis prepared by Caduceon. The QA/QC results are reported as percent recoveries for matrix spikes, spike blanks and QC standards, RPDs for laboratory duplicates and analyte concentrations for method blanks.

Appendix C

Borehole Logs

RECORD OF BOREHOLE No. 22-1

Project Number: **2201329**
Project Client: **Pratt Homes**
Project Name: **Phase Two ESA**
Project Location: **864 Lockhart, Barrie, Ontario**
Drilling Location: **Refer to Borehole Location Plan**

Drilling Method: **Solid Stems** Drilling Machine: **CME 55, Trackmount**
Logged By: **SP** Northing: **4910784.0** Date Started: **May10.22**
Reviewed By: **AK** Easting: **611023** Date Completed: **May10.22**

Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)	FIELD TESTING / LAB TESTING	Instrumentation Installation	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
	Local 98.51									GR SA SI CL
	0.1 98.5 TOPSOIL: 50 mm					0				
	FILL: silty sand, trace organics, brown, moist, compact 0.8 97.8	SS	1	60	12		97.5			
	SANDY SILT: grey, moist, loose 2.0 96.5	SS	2	25	9	1.5				
		SS	3	100	8		96			
	SILTY CLAY: no odour, no staining, brown, moist, firm to very stiff 3.1 95.5	SS	4	100	15	3				
	SANDY SILT TO SAND AND SILT GLACIAL TILL: trace clay, trace gravel, cobbles and boulders, grey, wet, compact to dense	SS	5	100	14		94.5			Metals & Inorganics PHCs/BTEX VOCs
		SS	6	100	39	4.5				
	6.7 91.8	SS	7	75	23		93			
	Borehole Terminated at 6.70 m					6				

FIELD TESTING: Shear Strength Testing (kPa) — Other Test; Pocket Penetrometer; Field Vane (Intact); Field Vane (Remolded); 40 80 120 160. Penetration Testing — SPT; DCPT; 10 20 30 40.

LAB TESTING: Combustible Organic Vapour (ppm); Combustible Organic Vapour (%LEL); Total Organic Vapour (ppm); 100 200 300 400. Atterberg Limits — PL; LL; Water Content (%); 10 20 30 40.

GEI CONSULTANTS
647 Welham Road, Unit 14
Barrie, Ontario L4N 0B8
T : (705) 719-7994
www.geiconsultants.com

Groundwater depth encountered on completion of drilling: **4.3 m**
Cave depth after auger removal: **5.5 m**
Groundwater depth observed on **May 26.22** at a depth of: **1.26**
Observed on at a depth of:

Scale: **1 :75**
Page: **1 of 1**

RECORD OF BOREHOLE No. 22-2

Project Number: **2201329**
Project Client: **Pratt Homes**
Project Name: **Phase Two ESA**
Project Location: **864 Lockhart, Barrie, Ontario**
Drilling Location: **Refer to Borehole Location Plan**

Drilling Method: **Solid Stems** Drilling Machine: **CEM 55, Trackmount**
Logged By: **SP** Northing: **4910783** Date Started: **May 10.22**
Reviewed By: **AK** Easting: **611021** Date Completed: **May 10.22**

Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)	FIELD TESTING	LAB TESTING	Instrumentation Installation	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
	Local 98.53 / 0.0 98.5							Shear Strength Testing (kPa): Other Test; Pocket Penetrometer; Field Vane (Intact); Field Vane (Remolded) 40 80 120 160	Combustible Organic Vapour (ppm); Combustible Organic Vapour (%LEL); Total Organic Vapour (ppm) 100 200 300 400		GR SA SI CL
	TOPSOIL: 25 mm					0					
	FILL: silty sand, some gravel, brown, moist, compact 0.8 97.8	SS	1	15	16		97.5	16	Atterberg Limits PL LL; Water Content (%) 10 20 30 40		
	SANDY SILT: grey, moist to wet, compact to loose	SS	2	100	19	1.5		19			
	- - - trace clay - - -	SS	3	100	8		96	8			
	SILTY CLAY: grey, moist, very stiff 2.3 96.2	SS	4	60	15	3		15			
	SANDY SILT TO SAND AND SILT GLACIAL TILL: trace gravel, trace clay, cobbles and boulders, grey, wet, compact to dense	SS	5	75	15		94.5	15			Metals & Inorganics PHCs/BTEX VOCs
		SS	6	75	15	4.5		15			
	3.1 95.5	SS	7	40	39	6	93	39			
	6.7 91.8 Borehole Terminated at 6.70 m										

GEI CONSULTANTS
647 Welham Road, Unit 14
Barrie, Ontario L4N 0B8
T : (705) 719-7994
www.geiconsultants.com

Groundwater depth encountered on completion of drilling: **4.57 m**
Cave depth after auger removal: **6.10 m**
Groundwater depth observed on **May 26.22** at a depth of: **1.19 m**
Observed on at a depth of:

Scale: **1 :75**

RECORD OF BOREHOLE No. 22-3

Project Number: **2201329**
Project Client: **Pratt Homes**
Project Name: **Phase Two ESA**
Project Location: **864 Lockhart, Barrie, Ontario**
Drilling Location: **Refer to borehole location plan**

Drilling Method: **solids stems** Drilling Machine: **CME 55 Trackmount**
Logged By: **SP** Northing: **4910781** Date Started: **May 10.22**
Reviewed By: **AK** Easting: **611021** Date Completed: **May 10.22**

Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)	FIELD TESTING	LAB TESTING	Instrumentation Installation	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
	Local 98.57							Shear Strength Testing (kPa): Other Test; Pocket Penetrometer; Field Vane (Intact); Field Vane (Remolded) 40 80 120 160. Penetration Testing: SPT, DCPT 10 20 30 40	Combustible Organic Vapour (ppm); Combustible Organic Vapour (%LEL); Total Organic Vapour (ppm) 100 200 300 400. Atterberg Limits: PL, LL. Water Content (%) 10 20 30 40		GR SA SI CL
	FILL: silty sand, trace gravel, trace organics, brown to black, moist, loose	SS	1	100	7	0		7			Metals & Inorganics PHCs/BTEX VOCs
		SS	2	100	4		97.5	4			
	1.5 97.1					1.5					
	SANDY SILT: grey, wet, loose	SS	3	100	10			10			
	2.3 96.3						96				
	SILTY CLAY: grey, wet, stiff	SS	4	100	10			10			
	3.1 95.5					3					
	SANDY SILT TO SAND AND SILT GLACIAL TILL: some gravel, cobbles and boulders, grey, wet, compact	SS	5	100	14			14			
							94.5				
	- - - very dense - - -	SS	6	55	80	4.5			80		
							93				
	- - - Dense - - -	SS	7	100	44	6			44		
	6.7 91.9										
	Borhole Terminated at 6.70 m										

GEI CONSULTANTS
647 Welham Road, Unit 14
Barrie, Ontario L4N 0B8
T : (705) 719-7994
www.geiconsultants.com

Groundwater depth encountered on completion of drilling: **1.8 m**
Cave depth after auger removal: **4.9 m**
Groundwater depth observed on **May 26.22** at a depth of: **1.02 m**
Observed on at a depth of:

Scale: **1 :75**

Appendix D

Laboratory Certificates of Analysis

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B22-13827 (i)

Rev. 1

Report To:

GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Alicia Kimberley

Caduceon Environmental Laboratories
112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 11-May-22
DATE REPORTED: 23-Jun-22
SAMPLE MATRIX: Soil

JOB/PROJECT NO.:

P.O. NUMBER: 2201329
WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
Cyanide	4	Kingston	TK	17-May-22	A-CN s K	in house
Conductivity	4	Holly Lane	ST	13-May-22	A-COND-01 (o)	SM 2510B
pH	4	Richmond Hill	nka	12-May-22	A-pH-02 (rh)	MOEE3530
Chromium (VI)	4	Holly Lane	ST	13-May-22	D-CRVI-02 (o)	EPA7196A
Mercury	4	Holly Lane	PBK	16-May-22	D-HG-01 (o)	EPA 7471A
Sodium Adsorption Ratio	4	Holly Lane	NHG	13-May-22	D-ICP-01 SAR (o)	SM 3120
Metals - ICP-OES	4	Holly Lane	NHG	13-May-22	D-ICP-02 (o)	EPA 6010
Metals - ICP-MS	4	Holly Lane	TPR	13-May-22	D-ICPMS-01 (o)	EPA 6020

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg
F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)
F2 C10-C16 hydrocarbons in µg/g, (F2-napth if requested)
F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)
F4 C34-C50 hydrocarbons in µg/g
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
Any deviations from the method are noted and reported for any particular sample.
nC6 and nC10 response factor is within 30% of response factor for toluene:
nC10,nC16 and nC34 response factors within 10% of each other:
C50 response factors within 70% of nC10+nC16+nC34 average:
Linearity is within 15%:
All results expressed on a dry weight basis.
Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met.
If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC
QC will be made available upon request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 8 - RPIICC - Table 8 - Res./Ind./Inst./Commercial/Community

Christine Burke
Lab Manager

R.L. = Reporting Limit
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Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B22-13827 (i)

Rev. 1

Report To:

GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Alicia Kimberley

Caduceon Environmental Laboratories
112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 11-May-22
DATE REPORTED: 23-Jun-22
SAMPLE MATRIX: Soil

JOB/PROJECT NO.:
P.O. NUMBER: 2201329
WATERWORKS NO.

	Client I.D.		BH/MW 22-1-2	BH/MW 22-2-2	BH/MW 22-3-2	DUP 1	O. Reg. 153 Tbl. 8 - RPIICC	
	Sample I.D.		B22-13827-1	B22-13827-2	B22-13827-3	B22-13827-4		
	Date Collected		10-May-22	10-May-22	10-May-22	10-May-22		
Parameter	**Units**	**R.L.**						
pH @25°C	pH Units		7.70	7.39	7.62	7.19		
Conductivity @25°C	mS/cm	0.001	0.189	0.175	**2.21**	0.185	0.7	
Cyanide (Free)	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.051	
Sodium Adsorption Ratio	units		0.555	0.454	0.117	0.519	5	
Antimony	µg/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.3	
Arsenic	µg/g	0.5	0.9	0.9	1.2	0.9	18	
Barium	µg/g	1	28	21	46	31	220	
Beryllium	µg/g	0.2	< 0.2	< 0.2	< 0.2	< 0.2	2.5	
Boron	µg/g	0.5	2.2	1.3	6.4	4.0	36	
Cadmium	µg/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.2	
Chromium	µg/g	1	9	9	11	8	70	
Chromium (VI)	µg/g	0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.66	
Cobalt	µg/g	1	4	3	3	3	22	
Copper	µg/g	1	5	3	6	5	92	
Lead	µg/g	5	< 5	< 5	29	< 5	120	
Mercury	µg/g	0.005	0.006	0.009	0.057	0.007	0.27	
Molybdenum	µg/g	1	< 1	< 1	< 1	< 1	2	
Nickel	µg/g	1	5	4	6	5	82	
Selenium	µg/g	0.5	0.6	0.5	0.6	0.6	1.5	
Silver	µg/g	0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.5	
Thallium	µg/g	0.1	< 0.1	< 0.1	< 0.1	< 0.1	1	
Uranium	µg/g	0.1	0.4	0.4	0.4	0.4	2.5	
Vanadium	µg/g	1	21	20	17	18	86	
Zinc	µg/g	3	13	39	96	14	290	

1 . Revised report to change guidelines as per client request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards
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Lab Manager

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Fax: 705-252-5746

DATE RECEIVED: 11-May-22
DATE REPORTED: 23-Jun-22
SAMPLE MATRIX: Soil

JOB/PROJECT NO.:
P.O. NUMBER: 2201329
WATERWORKS NO.

Summary of Exceedances

Table 8 - Res./Ind./Inst./Commercial/Community

BH/MW 22-3-2	Found Value	Limit
Conductivity @25°C (mS/cm)	2.21	0.7

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 8 - RPIICC - Table 8 - Res./Ind./Inst./Commercial/Community

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DATE REPORTED: 23-Jun-22
SAMPLE MATRIX: Soil

JOB/PROJECT NO.:

P.O. NUMBER: 2201329
WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
% Moisture	4	Richmond Hill	FAL	13-May-22	A-% moisture RH	
PHC(F2-F4)	4	Kingston	KPR	16-May-22	C-PHC-S-001 (k)	CWS Tier 1
VOC's	4	Richmond Hill	FAL	12-May-22	C-VOC-02 (rh)	EPA 8260
PHC(F1)	4	Richmond Hill	FAL	12-May-22	C-VPHS-01 (rh)	CWS Tier 1

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg
F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)
F2 C10-C16 hydrocarbons in µg/g, (F2-napth if requested)
F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)
F4 C34-C50 hydrocarbons in µg/g
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
Any deviations from the method are noted and reported for any particular sample.
nC6 and nC10 response factor is within 30% of response factor for toluene:
nC10,nC16 and nC34 response factors within 10% of each other:
C50 response factors within 70% of nC10+nC16+nC34 average:
Linearity is within 15%:
All results expressed on a dry weight basis.
Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met.
If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC
QC will be made available upon request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 8 - RPIICC - Table 8 - Res./Ind./Inst./Commercial/Community

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DATE RECEIVED: 11-May-22
DATE REPORTED: 23-Jun-22
SAMPLE MATRIX: Soil

JOB/PROJECT NO.:
P.O. NUMBER: 2201329
WATERWORKS NO.

	Client I.D.		BH/MW 22-1-2	BH/MW 22-2-2	BH/MW 22-3-2	DUP 1	O. Reg. 153 Tbl. 8 - RPIICC	
	Sample I.D.		B22-13827-1	B22-13827-2	B22-13827-3	B22-13827-4		
	Date Collected		10-May-22	10-May-22	10-May-22	10-May-22		
Parameter	**Units**	**R.L.**						
Acetone	µg/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Benzene	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.02	
Bromodichloromethane	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Bromoform	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Bromomethane	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Carbon Tetrachloride	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Monochlorobenzene (Chlorobenzene)	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Chloroform	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Dibromochloromethane	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Dichlorobenzene,1,2-	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Dichlorobenzene,1,3-	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Dichlorobenzene,1,4-	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Dichlorodifluoromethane	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Dichloroethane,1,1-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Dichloroethane,1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Dichloroethylene,1,1-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Dichloroethene, cis-1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Dichloroethene, trans-1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Dichloropropane,1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Dichloropropene, cis-1,3-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02		
Dichloropropene, trans-1,3-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02		
Dichloropropene 1,3-cis+trans	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 8 - RPIICC - Table 8 - Res./Ind./Inst./Commercial/Community

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Lab Manager

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Final Report

C.O.C.: ---

REPORT No. B22-13827 (ii)

Rev. 1

Report To:

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647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Alicia Kimberley

Caduceon Environmental Laboratories
112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 11-May-22
DATE REPORTED: 23-Jun-22
SAMPLE MATRIX: Soil

JOB/PROJECT NO.:
P.O. NUMBER: 2201329
WATERWORKS NO.

	Client I.D.		BH/MW 22-1-2	BH/MW 22-2-2	BH/MW 22-3-2	DUP 1	O. Reg. 153 Tbl. 8 - RPIICC	
	Sample I.D.		B22-13827-1	B22-13827-2	B22-13827-3	B22-13827-4		
	Date Collected		10-May-22	10-May-22	10-May-22	10-May-22		
Parameter	**Units**	**R.L.**						
Ethylbenzene	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Dibromoethane,1,2-(Ethylene Dibromide)	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Hexane	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Methyl Ethyl Ketone	µg/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Methyl Isobutyl Ketone	µg/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Methyl-t-butyl Ether	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Dichloromethane (Methylene Chloride)	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Styrene	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Tetrachloroethane,1,1,1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Tetrachloroethane,1,1,2,2-	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Tetrachloroethylene	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Toluene	µg/g	0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.2	
Trichloroethane,1,1,1-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Trichloroethane,1,1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Trichloroethylene	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Trichlorofluoromethane	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.25	
Vinyl Chloride	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.02	
Xylene, m,p-	µg/g	0.03	< 0.03	< 0.03	< 0.03	< 0.03		
Xylene, o-	µg/g	0.03	< 0.03	< 0.03	< 0.03	< 0.03		
Xylene, m,p,o-	µg/g	0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.05	
PHC F1 (C6-C10)	µg/g	10	< 10	< 10	< 10	< 10	25	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 8 - RPIICC - Table 8 - Res./Ind./Inst./Commercial/Community

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DATE RECEIVED: 11-May-22
DATE REPORTED: 23-Jun-22
SAMPLE MATRIX: Soil

JOB/PROJECT NO.:
P.O. NUMBER: 2201329
WATERWORKS NO.

	Client I.D.		BH/MW 22-1-2	BH/MW 22-2-2	BH/MW 22-3-2	DUP 1	O. Reg. 153 Tbl. 8 - RPIICC	
	Sample I.D.		B22-13827-1	B22-13827-2	B22-13827-3	B22-13827-4		
	Date Collected		10-May-22	10-May-22	10-May-22	10-May-22		
Parameter	**Units**	**R.L.**						
PHC F2 (>C10-C16)	µg/g	5	< 5	< 5	6	< 5	10	
PHC F3 (>C16-C34)	µg/g	10	17	< 10	46	24	240	
PHC F4 (>C34-C50)	µg/g	10	< 10	< 10	11	< 10	120	
% moisture	%		18.1	16.6	21.9	16.5		

1 . Revised report to change guidelines as per client request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 8 - RPIICC - Table 8 - Res./Ind./Inst./Commercial/Community

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DATE RECEIVED: 11-May-22
DATE REPORTED: 23-Jun-22
SAMPLE MATRIX: Soil

JOB/PROJECT NO.:
P.O. NUMBER: 2201329
WATERWORKS NO.

Summary of Exceedances

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 8 - RPIICC - Table 8 - Res./Ind./Inst./Commercial/Community

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GENERAL SAMPLE SUBMISSION FORM

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured. Proudly Canadian.

SAMPLES SUBMITTED TO:

Kingston	
Ottawa	
Richmond Hill	
Barrie	X
London	
Windsor	

TESTING REQUIREMENTS

X	O'Reg 153/04	1	Table (1 - 9)		Record of Site
	O'Reg 406/19		Table (1 - 9.1)		SPLP Table (1 - 9.1)
	RPI		ICC		Agricultural
	Coarse		Medium/Fine		O'Reg 558 TCLP
	MISA		PWQO		Landfill Monitoring
	Other:				

REPORT NUMBER (Lab Use)

B22-13827

Are any samples to be submitted intended for Human Consumption under any Drinking Water Regulations? ☐ Yes ☒ No (If yes, submit all Drinking Water Samples on a Drinking Water Chain of Custody)

Organization: GEI Consultants	Address: 647 Welham Road, Barrie	Invoicing Address (if different):
Contact: A.Kimberley		
Tel: 705-795-9351 / Fax:		
Email: akimberley@geiconsultants.com	Quote #:	Project Name/#: 2201329
Additional Info (email, cell, etc): sgriffith@geiconsultants.com	P.O. #:	Additional Info: spatrick@geiconsultants.com

ANALYSES REQUESTED

O.Reg 153 Metals; O.Reg. 153 Inorganics; O.Reg. 153 PHCs; O.Reg. 153 VOCs; Suspected Highly Contaminated

TURNAROUND SERVICE REQUESTED (see back page)

*Must be arranged in advance

☐	Platinum*	200% Surcharge
☐	Gold*	100% Surcharge
☐	Silver	50% Surcharge
☐	Bronze	25% Surcharge
X	Standard	5-7 days
☐	Specific Date	_____

Lab No.	Sample Source and/or Sample Identification	S.P.L.	Sample Matrix *	Date Collected (yy-mm-dd)	Time Collected	Indicate Test For Each Sample By Using A Check Mark In The Box Provided	X	Field pH	Field Temp.	# Bottles/ Sample	Field Filtered Y/N
1	BH/MW22-1-2		S	22-05-10		X X X X				3	
2	BH/MW22-2-2		S	22-05-10		X X X X				4	
3	BH/MW22-3-2		S	22-05-10		X X X X				4	
4	DUP1		S	22-05-10		X X X X				3	
	Jar → K										
	Jar → O										
	p-cup + Vials → RH										

SAMPLE SUBMISSION INFORMATION

	Sampled by:	Submitted by:
Print:	E.Forster	S. Love
Sign:		
	22-05-10	22-05-10
	Date (yy-mm-dd)/Time:	Date (yy-mm-dd)/Time:

SHIPPING INFORMATION

Courier (Client account)	☐	Invoice	
Courier (Caduceon account)	☐		
Drop Off	X	# of Pieces	
Caduceon (Pick-up)	☐		

REPORTING / INVOICING

Report by Fax	☐
Report by Email	X
Invoice by Email	X
Invoice by Mail	☐

SAMPLE RECEIVING INFORMATION (LABORATORY USE ONLY)

Received By (print):	Nathalie	Signature:	NK
Date Received (yy-mm-dd):	22-05-11	Time Received:	10:15
Laboratory Prepared Bottles:	☒ Yes	☐ No	
Sample Temperature °C:	5.8	Labeled by:	

Comments:

Please CC eforster@geiconsultants.com and slove@geiconsultants.com with results.

G

CofC, May 2020 Revision No: 23

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Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 30-May-22
DATE REPORTED: 23-Jun-22
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.:

P.O. NUMBER: 2201329
WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
Cyanide	4	Kingston	kwe	31-May-22	A-CN-001 (k)	SM 4500CN
Conductivity	4	Holly Lane	SYL	02-Jun-22	A-COND-02 (o)	SM 2510B
pH	4	Holly Lane	SYL	02-Jun-22	A-PH-01 (o)	SM 4500H
Chromium (VI)	4	Holly Lane	ST	03-Jun-22	D-CRVI-01 (o)	MOE E3056
Mercury	4	Holly Lane	PBK	02-Jun-22	D-HG-02 (o)	SM 3112 B
Metals - ICP-OES	4	Holly Lane	AHM	02-Jun-22	D-ICP-01 (o)	SM 3120
Metals - ICP-MS	4	Holly Lane	TPR	03-Jun-22	D-ICPMS-01 (o)	EPA 200.8

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 8 - GW (µg/L) - Table 8 - Ground Water Standards

Christine Burke
Lab Manager

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DATE RECEIVED: 30-May-22
DATE REPORTED: 23-Jun-22
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.:
P.O. NUMBER: 2201329
WATERWORKS NO.

	Client I.D.		BH/MW22-1	BH/MW22-2	BH/MW22-3	DUP	O. Reg. 153	
	Sample I.D.		B22-15914-1	B22-15914-2	B22-15914-3	B22-15914-4	Tbl. 8 - GW	
	Date Collected		27-May-22	27-May-22	27-May-22	27-May-22	(µg/L)	
Parameter	**Units**	**R.L.**						
pH @25°C	pH Units		7.80	7.62	7.49	7.49		
Conductivity @25°C	mS/cm	0.001	1.25	1.4	1.32	1.32		
Cyanide (Free)	µg/L	5	< 5	< 5	< 5	< 5	52	
Sodium	µg/L	200	143000	103000	68400	68500	490000	
Antimony	µg/L	0.1	0.3	< 0.2	< 0.2	< 0.2	6	
Arsenic	µg/L	0.1	1.5	1.0	0.6	0.5	25	
Barium	µg/L	1	235	276	196	193	1000	
Beryllium	µg/L	0.1	< 0.2	< 0.2	< 0.2	< 0.2	4	
Boron	µg/L	5	110	121	172	169	5000	
Cadmium	µg/L	0.015	< 0.028	< 0.028	< 0.028	< 0.028	2.1	
Chromium	µg/L	2	< 2	< 2	< 2	< 2	50	
Chromium (VI)	µg/L	10	< 10 [1]	< 10 [1]	< 10 [1]	< 10 [1]	25	
Cobalt	µg/L	0.1	1.5	2.1	0.3	0.3	3.8	
Copper	µg/L	2	< 2	< 2	< 2	< 2	69	
Lead	µg/L	0.02	0.27	0.06	< 0.04	< 0.04	10	
Mercury	µg/L	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.29	
Molybdenum	µg/L	0.1	12.3	1.6	< 0.2	< 0.2	70	
Nickel	µg/L	0.2	6.7	5.9	3.1	3.1	100	
Selenium	µg/L	1	< 2	< 2	< 2	< 2	10	
Silver	µg/L	0.1	< 0.1	< 0.1	< 0.1	< 0.1	1.2	
Thallium	µg/L	0.05	< 0.1	< 0.1	< 0.1	< 0.1	2	
Uranium	µg/L	0.05	8.70	1.96	< 0.1	< 0.1	20	
Vanadium	µg/L	0.1	1.3	0.6	1.0	1.0	6.2	
Zinc	µg/L	5	< 5	< 5	< 5	< 5	890	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 8 - GW (µg/L) - Table 8 - Ground Water Standards

Christine Burke
Lab Manager

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B22-15914 (i)

Rev. 1

Report To:

GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Alicia Kimberley

Caduceon Environmental Laboratories
112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 30-May-22
DATE REPORTED: 23-Jun-22
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.:
P.O. NUMBER: 2201329
WATERWORKS NO.

	Client I.D.		BH/MW22-1	BH/MW22-2	BH/MW22-3	DUP	O. Reg. 153
	Sample I.D.		B22-15914-1	B22-15914-2	B22-15914-3	B22-15914-4	Tbl. 8 - GW (µg/L)
	Date Collected		27-May-22	27-May-22	27-May-22	27-May-22	
Parameter	**Units**	**R.L.**					

1 . Chromium (VI) result is based on total Chromium

2 . Revised report to correct sample ID's and change guidelines as per client request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 8 - GW (µg/L) - Table 8 - Ground Water Standards

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Summary of Exceedances

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 8 - GW (µg/L) - Table 8 - Ground Water Standards

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Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
PHC(F2-F4)	4	Kingston	KPR	31-May-22	C-PHC-W-001 (k)	MOE E3421
VOC's	5	Richmond Hill	JE	31-May-22	C-VOC-02 (rh)	EPA 8260
PHC(F1)	5	Richmond Hill	JE	31-May-22	C-VPHW-01 (rh)	MOE E3421

O. Reg. 153 - Soil, Ground Water and Sediment Standards
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WATERWORKS NO.

	Client I.D.		BH/MW22-1	BH/MW22-2	BH/MW22-3	DUP	O. Reg. 153	
	Sample I.D.		B22-15914-1	B22-15914-2	B22-15914-3	B22-15914-4	Tbl. 8 - GW (µg/L)	
	Date Collected		27-May-22	27-May-22	27-May-22	27-May-22		
Parameter	**Units**	**R.L.**						
Acetone	µg/L	30	< 30	< 30	< 30	< 30	2700	
Benzene	µg/L	0.5	0.5	< 0.5	< 0.5	< 0.5	5	
Bromodichloromethane	µg/L	2	< 2	< 2	< 2	< 2	16	
Bromoform	µg/L	5	< 5	< 5	< 5	< 5	25	
Bromomethane	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.89	
Carbon Tetrachloride	µg/L	0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.79	
Monochlorobenzene (Chlorobenzene)	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	30	
Chloroform	µg/L	1	< 1	< 1	< 1	< 1	2.4	
Dibromochloromethane	µg/L	2	< 2	< 2	< 2	< 2	25	
Dichlorobenzene,1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	3	
Dichlorobenzene,1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	59	
Dichlorobenzene,1,4-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1	
Dichlorodifluoromethane	µg/L	2	< 2	< 2	< 2	< 2	590	
Dichloroethane,1,1-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	5	
Dichloroethane,1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.6	
Dichloroethylene,1,1-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.6	
Dichloroethene, cis-1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.6	
Dichloroethene, trans-1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.6	
Dichloropropane,1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	5	
Dichloropropene, cis-1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Dichloropropene, trans-1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Dichloropropene 1,3-cis+trans	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 8 - GW (µg/L) - Table 8 - Ground Water Standards

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Fax: 705-252-5746

DATE RECEIVED: 30-May-22
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SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.:
P.O. NUMBER: 2201329
WATERWORKS NO.

	Client I.D.		BH/MW22-1	BH/MW22-2	BH/MW22-3	DUP	O. Reg. 153	
	Sample I.D.		B22-15914-1	B22-15914-2	B22-15914-3	B22-15914-4	Tbl. 8 - GW (µg/L)	
	Date Collected		27-May-22	27-May-22	27-May-22	27-May-22		
Parameter	**Units**	**R.L.**						
Ethylbenzene	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	2.4	
Dibromoethane,1,2-(Ethylene Dibromide)	µg/L	0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.2	
Hexane	µg/L	5	< 5	< 5	< 5	< 5	51	
Methyl Ethyl Ketone	µg/L	20	< 20	< 20	< 20	< 20	1800	
Methyl Isobutyl Ketone	µg/L	20	< 20	< 20	< 20	< 20	640	
Methyl-t-butyl Ether	µg/L	2	< 2	< 2	< 2	< 2	15	
Dichloromethane (Methylene Chloride)	µg/L	5	< 5	< 5	< 5	< 5	50	
Styrene	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	5.4	
Tetrachloroethane,1,1,1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.1	
Tetrachloroethane,1,1,2,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1	
Tetrachloroethylene	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.6	
Toluene	µg/L	0.5	1.7	0.5	< 0.5	< 0.5	22	
Trichloroethane,1,1,1-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	200	
Trichloroethane,1,1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	4.7	
Trichloroethylene	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.6	
Trichlorofluoromethane	µg/L	5	< 5	< 5	< 5	< 5	150	
Vinyl Chloride	µg/L	0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.5	
Xylene, m,p-	µg/L	1.0	< 1.0	< 1.0	< 1.0	< 1.0		
Xylene, o-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Xylene, m,p,o-	µg/L	1.1	< 1.1	< 1.1	< 1.1	< 1.1	300	
PHC F1 (C6-C10)	µg/L	25	< 25	< 25	< 25	< 25	420	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 8 - GW (µg/L) - Table 8 - Ground Water Standards

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JOB/PROJECT NO.:
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	Client I.D.		BH/MW22-1	BH/MW22-2	BH/MW22-3	DUP	O. Reg. 153	
	Sample I.D.		B22-15914-1	B22-15914-2	B22-15914-3	B22-15914-4	Tbl. 8 - GW (µg/L)	
	Date Collected		27-May-22	27-May-22	27-May-22	27-May-22		
Parameter	**Units**	**R.L.**						
PHC F2 (>C10-C16)	µg/L	50	< 50	< 50	< 50	< 50	150	
PHC F3 (>C16-C34)	µg/L	400	< 400	< 400	< 400	< 400	500	
PHC F4 (>C34-C50)	µg/L	400	< 400	< 400	< 400	< 400	500	

1 . Revised report to correct sample ID's and change guidelines as per client request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 8 - GW (µg/L) - Table 8 - Ground Water Standards

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JOB/PROJECT NO.:
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WATERWORKS NO.

	Client I.D. / Sample I.D. / Date Collected		Trip Blank B22-15914-5				O. Reg. 153 Tbl. 8 - GW (µg/L)	
Parameter	**Units**	**R.L.**						
Acetone	µg/L	30	< 30				2700	
Benzene	µg/L	0.5	< 0.5				5	
Bromodichloromethane	µg/L	2	< 2				16	
Bromoform	µg/L	5	< 5				25	
Bromomethane	µg/L	0.5	< 0.5				0.89	
Carbon Tetrachloride	µg/L	0.2	< 0.2				0.79	
Monochlorobenzene (Chlorobenzene)	µg/L	0.5	< 0.5				30	
Chloroform	µg/L	1	< 1				2.4	
Dibromochloromethane	µg/L	2	< 2				25	
Dichlorobenzene,1,2-	µg/L	0.5	< 0.5				3	
Dichlorobenzene,1,3-	µg/L	0.5	< 0.5				59	
Dichlorobenzene,1,4-	µg/L	0.5	< 0.5				1	
Dichlorodifluoromethane	µg/L	2	< 2				590	
Dichloroethane,1,1-	µg/L	0.5	< 0.5				5	
Dichloroethane,1,2-	µg/L	0.5	< 0.5				1.6	
Dichloroethylene,1,1-	µg/L	0.5	< 0.5				1.6	
Dichloroethene, cis-1,2-	µg/L	0.5	< 0.5				1.6	
Dichloroethene, trans-1,2-	µg/L	0.5	< 0.5				1.6	
Dichloropropane,1,2-	µg/L	0.5	< 0.5				5	
Dichloropropene, cis-1,3-	µg/L	0.5	< 0.5					
Dichloropropene, trans-1,3-	µg/L	0.5	< 0.5					
Dichloropropene 1,3-cis+trans	µg/L	0.5	< 0.5				0.5	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 8 - GW (µg/L) - Table 8 - Ground Water Standards

Christine Burke
Lab Manager

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SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.:
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WATERWORKS NO.

	Client I.D. / Sample I.D. / Date Collected		Trip Blank B22-15914-5				O. Reg. 153 Tbl. 8 - GW (µg/L)	
Parameter	**Units**	**R.L.**						
Ethylbenzene	µg/L	0.5	< 0.5				2.4	
Dibromoethane,1,2-(Ethylene Dibromide)	µg/L	0.2	< 0.2				0.2	
Hexane	µg/L	5	< 5				51	
Methyl Ethyl Ketone	µg/L	20	< 20				1800	
Methyl Isobutyl Ketone	µg/L	20	< 20				640	
Methyl-t-butyl Ether	µg/L	2	< 2				15	
Dichloromethane (Methylene Chloride)	µg/L	5	< 5				50	
Styrene	µg/L	0.5	< 0.5				5.4	
Tetrachloroethane,1,1,1,2-	µg/L	0.5	< 0.5				1.1	
Tetrachloroethane,1,1,2,2-	µg/L	0.5	< 0.5				1	
Tetrachloroethylene	µg/L	0.5	< 0.5				1.6	
Toluene	µg/L	0.5	< 0.5				22	
Trichloroethane,1,1,1-	µg/L	0.5	< 0.5				200	
Trichloroethane,1,1,2-	µg/L	0.5	< 0.5				4.7	
Trichloroethylene	µg/L	0.5	< 0.5				1.6	
Trichlorofluoromethane	µg/L	5	< 5				150	
Vinyl Chloride	µg/L	0.2	< 0.2				0.5	
Xylene, m,p-	µg/L	1.0	< 1.0					
Xylene, o-	µg/L	0.5	< 0.5					
Xylene, m,p,o-	µg/L	1.1	< 1.1				300	
PHC F1 (C6-C10)	µg/L	25	< 25				420	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 8 - GW (µg/L) - Table 8 - Ground Water Standards

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SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.:
P.O. NUMBER: 2201329
WATERWORKS NO.

	Client I.D. / Sample I.D. / Date Collected		Trip Blank B22-15914-5				O. Reg. 153 Tbl. 8 - GW (µg/L)	
Parameter	**Units**	**R.L.**						
PHC F2 (>C10-C16)	µg/L	50					150	
PHC F3 (>C16-C34)	µg/L	400					500	
PHC F4 (>C34-C50)	µg/L	400					500	

1 . Revised report to correct sample ID's and change guidelines as per client request.

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Tbl. 8 - GW (µg/L) - Table 8 - Ground Water Standards

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Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

GENERAL SAMPLE SUBMISSION FORM

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured. Proudly Canadian.

SAMPLES SUBMITTED TO:

Kingston	
Ottawa	
Richmond Hill	
Barrie	x
London	
Windsor	

TESTING REQUIREMENTS

x	O'Reg 153/04	x	Table (1 - 9)		Record of Site
	O'Reg 406/19		Table (1 - 9.1)		SPLP Table (1 - 9.1)
X	RPI		ICC		Agricultural
	Coarse	x	Medium/Fine		O'Reg 558 TCLP
	MISA		PWQO		Landfill Monitoring
	Other:				

table 2

REPORT NUMBER (Lab Use)

B22-15914

Are any samples to be submitted intended for Human Consumption under any Drinking Water Regulations? [ ] Yes [x] No (If yes, submit all Drinking Water Samples on a Drinking Water Chain of Custody)

Organization: GEI Consultants	Address: 647 Wellham Road, Barrie	Invoicing Address (if different):
Contact: Alicia Kimberley		
Tel: 705-795-9351 / Fax:		
Email: akimberley@geiconsultants.com	Quote #:	Project Name/#: 2201329
Additional Info (email, cell, etc): sgriffith@geiconsultants.com	P.O. #:	Additional Info:

ANALYSES REQUESTED

Metals #2 | PHCs | VOCs | ORPs Inorg #2 | CrVI | Suspected Highly Contaminated

TURNAROUND SERVICE REQUESTED (see back page)

*Must be arranged in advance

[ ]	Platinum*	200% Surcharge
[ ]	Gold*	100% Surcharge
[ ]	Silver	50% Surcharge
[ ]	Bronze	25% Surcharge
[x]	Standard	5-7 days
[ ]	Specific Date:	

* Sample Matrix Legend: WW=Waste Water, SW=Surface Water, GW=Groundwater, LS=Liquid Sludge, SS=Solid Sludge, S=Soil, Sed=Sediment, PC=Paint Chips, F=Filter, Oil = Oil

Lab No.	Sample Source and/or Sample Identification	S.P.L.	Sample Matrix *	Date Collected (yy-mm-dd)	Time Collected	Indicate Test For Each Sample By Using A Check Mark In The Box Provided											X	Field pH	Field Temp.	# Bottles/ Sample	Field Filtered Y/N
1	MW1		GW	22-05-27		x	x	x	x											8	Y
2	MW2		GW	22-05-27		x	x	x	x											8	Y
3	MW3		GW	22-05-27		x	x	x	x											8	Y
4	DUP		GW	22-05-27		x	x	x	x											8	Y
5	Trip Blank							X												2	N
	500mL amber + CN → K																				
	Vials → RH																				
	Genchem + metals + CrVI + Hg → O																				

SAMPLE SUBMISSION INFORMATION

	Sampled by:	Submitted by:
Print:	S.Patrick	S.Patrick
Sign:		
	22-5-27	22-5-27
	Date (yy-mm-dd)/Time:	Date (yy-mm-dd)/Time:

SHIPPING INFORMATION

Courier (Client account)		Invoice	
Courier (Caduceon account)			
Drop Off AH	x	# of Pieces	
Caduceon (Pick-up)			

REPORTING / INVOICING

Report by Fax	
Report by Email	x
Invoice by Email	x
Invoice by Mail	

SAMPLE RECEIVING INFORMATION (LABORATORY USE ONLY)

Received By (print):	madison	Signature:	MBZ
Date Received (yy-mm-dd):	22-05-30	Time Received:	8:00
Laboratory Prepared Bottles:	[✓] Yes	[ ] No	
Sample Temperature °C:	6.0	Labeled by:	MBZ

Comments: * samples #3 and #4 filtered CrVI contains high sediment MBZ

Appendix E

Analytical Results

CADUCEON ENVIRONMENTAL LABORATORIES
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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.:

Report Number: B22-13827 (i)

Report To:
GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Alicia Kimberley

Caduceon Environmental Laboratories
112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE SUBMITTED: 11-May-22
DATE REPORTED: 17-May-22
SAMPLE MATRIX: Soil

JOB/PROJECT NO.:
P.O. NUMBER::
WATERWORKS NO.:

2201329

Tbl. 8 - RPIICC

	Client ID:		BH/MW 22-1-2	BH/MW 22-2-2	BH/MW 22-3-2	DUP 1	Table 8 - Res./Ind./Inst./Commercial/Commu
	Sample ID:		B22-13827-1	B22-13827-2	B22-13827-3	B22-13827-4	
	Date Collected:		10-May-22	10-May-22	10-May-22	10-May-22	Maximum Concentration
Parameter	**Units**	**R.L.**					
pH @25°C	pH Units		7.70	7.39	7.62	7.19	
Conductivity @25°C	mS/cm	0.001	0.189	0.175	2.21	0.185	0.7
Cyanide (Free)	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.051
Sodium Adsorption Ratio	units		0.555	0.454	0.117	0.519	5
Antimony	µg/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.3
Arsenic	µg/g	0.5	0.9	0.9	1.2	0.9	18
Barium	µg/g	1	28	21	46	31	220
Beryllium	µg/g	0.2	< 0.2	< 0.2	< 0.2	< 0.2	2.5
Boron	µg/g	0.5	2.2	1.3	6.4	4.0	36
Cadmium	µg/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.2
Chromium	µg/g	1	9	9	11	8	70
Chromium (VI)	µg/g	0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.66
Cobalt	µg/g	1	4	3	3	3	22
Copper	µg/g	1	5	3	6	5	92
Lead	µg/g	5	< 5	< 5	29	< 5	120
Mercury	µg/g	0.005	0.006	0.009	0.057	0.007	0.27
Molybdenum	µg/g	1	< 1	< 1	< 1	< 1	2
Nickel	µg/g	1	5	4	6	5	82
Selenium	µg/g	0.5	0.6	0.5	0.6	0.6	1.5
Silver	µg/g	0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.5
Thallium	µg/g	0.1	< 0.1	< 0.1	< 0.1	< 0.1	1
Uranium	µg/g	0.1	0.4	0.4	0.4	0.4	2.5
Vanadium	µg/g	1	21	20	17	18	86
Zinc	µg/g	3	13	39	96	14	290

R.L. = Reporting Limit

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.:

Report Number: B22-13827 (ii)

Report To:
GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Alicia Kimberley

Caduceon Environmental Laboratories
112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE SUBMITTED: 11-May-22
DATE REPORTED: 17-May-22
SAMPLE MATRIX: Soil

JOB/PROJECT NO.:
P.O. NUMBER:: 2201329
WATERWORKS NO.:

Tbl. 8 - RPIICC

	Client ID:		BH/MW 22-1-2	BH/MW 22-2-2	BH/MW 22-3-2	DUP 1	Table 8 - Res./Ind./Inst./Commercial/Commu
	Sample ID:		B22-13827-1	B22-13827-2	B22-13827-3	B22-13827-4	
	Date Collected:		10-May-22	10-May-22	10-May-22	10-May-22	Maximum Concentration
Parameter	**Units**	**R.L.**					
Acetone	µg/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5
Benzene	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.02
Bromodichloromethane	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05
Bromoform	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05
Bromomethane	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Carbon Tetrachloride	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Monochlorobenzene (Chlorobenzene)	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05
Chloroform	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05
Dibromochloromethane	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05
Dichlorobenzene,1,2-	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Dichlorobenzene,1,3-	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Dichlorobenzene,1,4-	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Dichlorodifluoromethane	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Dichloroethane,1,1-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05
Dichloroethane,1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05
Dichloroethylene,1,1-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05
Dichloroethene, cis-1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05
Dichloroethene, trans-1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05
Dichloropropane,1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05
Dichloropropene, cis-1,3-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	
Dichloropropene, trans-1,3-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	
Dichloropropene 1,3- cis+trans	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05
Ethylbenzene	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Dibromoethane,1,2- (Ethylene Dibromide)	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05
Hexane	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05
Methyl Ethyl Ketone	µg/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5
Methyl Isobutyl Ketone	µg/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5
Methyl-t-butyl Ether	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Dichloromethane (Methylene Chloride)	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Styrene	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Tetrachloroethane,1,1,1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05
Tetrachloroethane,1,1,2,2-	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Tetrachloroethylene	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Toluene	µg/g	0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.2
Trichloroethane,1,1,1-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05
Trichloroethane,1,1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05
Trichloroethylene	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Trichlorofluoromethane	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.25
Vinyl Chloride	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.02
Xylene, m,p-	µg/g	0.03	< 0.03	< 0.03	< 0.03	< 0.03	
Xylene, o-	µg/g	0.03	< 0.03	< 0.03	< 0.03	< 0.03	
Xylene, m,p,o-	µg/g	0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.05
PHC F1 (C6-C10)	µg/g	10	< 10	< 10	< 10	< 10	25
PHC F2 (>C10-C16)	µg/g	5	< 5	< 5	6	< 5	10
PHC F3 (>C16-C34)	µg/g	10	17	< 10	46	24	240
PHC F4 (>C34-C50)	µg/g	10	< 10	< 10	11	< 10	120
% moisture	%		18.1	16.6	21.9	16.5	

R.L. = Reporting Limit

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.:

Report Number: B22-15914 (i)

Report To:
GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Alicia Kimberley

Caduceon Environmental Laboratories
112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE SUBMITTED: 30-May-22
DATE REPORTED: 3-Jun-22
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.:
P.O. NUMBER:: 2201329
WATERWORKS NO.:

Tbl. 8 - GW (µg/L)

	Client ID:		MW1	MW2	MW3	DUP	Table 8 - Ground Water Standards
	Sample ID:		B22-15914-1	B22-15914-2	B22-15914-3	B22-15914-4	
	Date Collected:		27-May-22	27-May-22	27-May-22	27-May-22	Maximum Concentration
Parameter	**Units**	**R.L.**					
pH @25°C	pH Units		7.80	7.62	7.49	7.49	
Conductivity @25°C	mS/cm	0.001	1.25	1.4	1.32	1.32	
Cyanide (Free)	µg/L	5	< 5	< 5	< 5	< 5	52
Sodium	µg/L	200	143,000	103,000	68,400	68,500	490000
Antimony	µg/L	0.1	0.3	< 0.2	< 0.2	< 0.2	6
Arsenic	µg/L	0.1	1.5	1.0	0.6	0.5	25
Barium	µg/L	1	235	276	196	193	1000
Beryllium	µg/L	0.1	< 0.2	< 0.2	< 0.2	< 0.2	4
Boron	µg/L	5	110	121	172	169	5000
Cadmium	µg/L	0.015	< 0.028	< 0.028	< 0.028	< 0.028	2.1
Chromium	µg/L	2	< 2	< 2	< 2	< 2	50
Chromium (VI)	µg/L	10	< 10	< 10	< 10	< 10	25
Cobalt	µg/L	0.1	1.5	2.1	0.3	0.3	3.8
Copper	µg/L	2	< 2	< 2	< 2	< 2	69
Lead	µg/L	0.02	0.27	0.06	< 0.04	< 0.04	10
Mercury	µg/L	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.29
Molybdenum	µg/L	0.1	12.3	1.6	< 0.2	< 0.2	70
Nickel	µg/L	0.2	6.7	5.9	3.1	3.1	100
Selenium	µg/L	1	< 2	< 2	< 2	< 2	10
Silver	µg/L	0.1	< 0.1	< 0.1	< 0.1	< 0.1	1.2
Thallium	µg/L	0.05	< 0.1	< 0.1	< 0.1	< 0.1	2
Uranium	µg/L	0.05	8.70	1.96	< 0.1	< 0.1	20
Vanadium	µg/L	0.1	1.3	0.6	1.0	1.0	6.2
Zinc	µg/L	5	< 5	< 5	< 5	< 5	890

R.L. = Reporting Limit

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.:

Report Number: B22-15914 (ii)

Report To:
GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Alicia Kimberley

Caduceon Environmental Laboratories
112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE SUBMITTED: 30-May-22
DATE REPORTED: 3-Jun-22
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.:
P.O. NUMBER:: 2201329
WATERWORKS NO.:

Tbl. 8 - GW (µg/L)

	Client ID:		MW1	MW2	MW3	DUP	Trip Blank	Table 8 - Ground Water Standards
	Sample ID:		B22-15914-1	B22-15914-2	B22-15914-3	B22-15914-4	B22-15914-5	
	Date Collected:		27-May-22	27-May-22	27-May-22	27-May-22		Maximum Concentration
Parameter	**Units**	**R.L.**						
Acetone	µg/L	30	< 30	< 30	< 30	< 30	< 30	2700
Benzene	µg/L	0.5	0.5	< 0.5	< 0.5	< 0.5	< 0.5	5
Bromodichloromethane	µg/L	2	< 2	< 2	< 2	< 2	< 2	16
Bromoform	µg/L	5	< 5	< 5	< 5	< 5	< 5	25
Bromomethane	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.89
Carbon Tetrachloride	µg/L	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.79
Monochlorobenzene (Chlorobenzene)	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	30
Chloroform	µg/L	1	< 1	< 1	< 1	< 1	< 1	2.4
Dibromochloromethane	µg/L	2	< 2	< 2	< 2	< 2	< 2	25
Dichlorobenzene,1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	3
Dichlorobenzene,1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	59
Dichlorobenzene,1,4-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1
Dichlorodifluoromethane	µg/L	2	< 2	< 2	< 2	< 2	< 2	590
Dichloroethane,1,1-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	5
Dichloroethane,1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.6
Dichloroethylene,1,1-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.6
Dichloroethene, cis-1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.6
Dichloroethene, trans-1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.6
Dichloropropane,1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	5
Dichloropropene, cis-1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Dichloropropene, trans-1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Dichloropropene 1,3-cis+trans	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5
Ethylbenzene	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	2.4
Dibromoethane,1,2- (Ethylene Dibromide)	µg/L	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.2
Hexane	µg/L	5	< 5	< 5	< 5	< 5	< 5	51
Methyl Ethyl Ketone	µg/L	20	< 20	< 20	< 20	< 20	< 20	1800
Methyl Isobutyl Ketone	µg/L	20	< 20	< 20	< 20	< 20	< 20	640
Methyl-t-butyl Ether	µg/L	2	< 2	< 2	< 2	< 2	< 2	15
Dichloromethane (Methylene Chloride)	µg/L	5	< 5	< 5	< 5	< 5	< 5	50
Styrene	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	5.4
Tetrachloroethane,1,1,1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.1
Tetrachloroethane,1,1,2,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1
Tetrachloroethylene	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.6
Toluene	µg/L	0.5	1.7	0.5	< 0.5	< 0.5	< 0.5	22
Trichloroethane,1,1,1-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	200
Trichloroethane,1,1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	4.7
Trichloroethylene	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.6
Trichlorofluoromethane	µg/L	5	< 5	< 5	< 5	< 5	< 5	150
Vinyl Chloride	µg/L	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.5
Xylene, m,p-	µg/L	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Xylene, o-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Xylene, m,p,o-	µg/L	1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	300
PHC F1 (C6-C10)	µg/L	25	< 25	< 25	< 25	< 25	< 25	420
PHC F2 (>C10-C16)	µg/L	50	< 50	< 50	< 50	< 50		150
PHC F3 (>C16-C34)	µg/L	400	< 400	< 400	< 400	< 400		500
PHC F4 (>C34-C50)	µg/L	400	< 400	< 400	< 400	< 400		500

R.L. = Reporting Limit