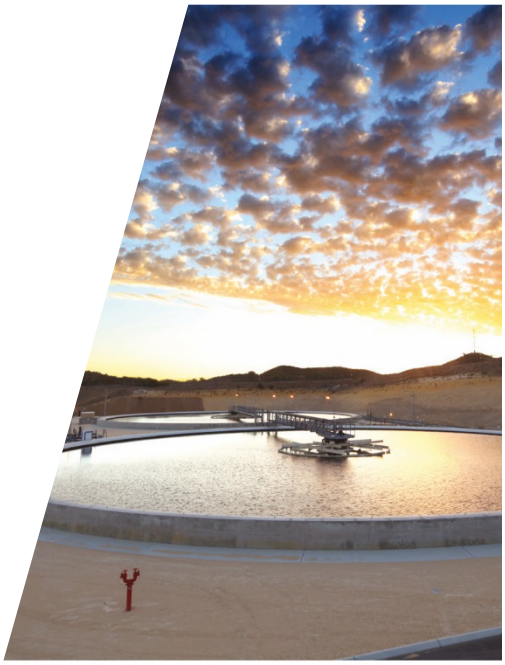
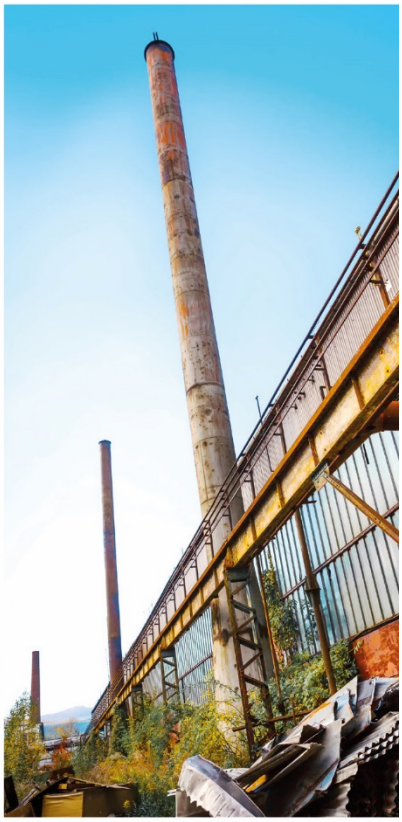


Phase Two Environmental Site Assessment

Vacant Property
1098 Ogilvie Road and
1178 Cummings Avenue
Ottawa, Ontario

6770967 Canada Inc.



Executive Summary

GHD was retained by 6770967 Canada Inc., represented by Mr. Francois Moffet, to conduct a Phase Two Environmental Site Assessment (ESA) of the vacant property municipally known as 1098 Ogilvie Road and 1178 Cummings Avenue in Ottawa, Ontario (Site or Property).

The Site is currently owned by 6770967 Canada Inc. The Site is 1.54 hectares in size and is comprised of two separate parcels of land. The West Parcel (1098 Ogilvie Road) is approximately 0.49 hectares (ha), and was identified with property identification number (PIN) 042640152. The East Parcel (1178 Cummings Avenue) is approximately 1.05 ha, and was identified with PIN 042640160. The approximate centre of the Site has Latitude and Longitude coordinates of 45° 25' 30" N, 75° 37' 55" W (540568 mE/5030362 mN, zone 18T, NAD 87). The municipal zoning for the Site is currently R3V V (Residential Third Density Zone).

The Site is legally described as Part of Lots 26 and 27, Concession 2; Part 1 on Registered Plan 5R-11857; Parts 1 to 3 on Registered Plan 5R-8415; Part 12 on Registered Plan 5R-2005; Part 1 on Registered Plan 4R-10638, in City of Ottawa.

The West Parcel was first developed prior to 1958 and was used for agricultural and rural residential land use. The residential dwelling on the West Parcel was demolished in 2017. The East Parcel was first developed prior to 1958 and was also used for agricultural and rural residential land use up until approximately the 1970s. The east parcel was potentially utilized as a gasoline bar in the 1960s. Between the 1970s and 1980s, the East Parcel was reportedly used as a contractor's yard. The buildings on the East Parcel were demolished prior to 1991. The Site is currently vacant and overgrown with brush, grass and trees.

The Site is planned to be redeveloped for residential land use. The Phase Two ESA was undertaken in support of a local municipal planning department requirement associated with the proposed redevelopment of the Site. The objective of the Phase Two ESA was to undertake a preliminary investigation of the general soil and groundwater quality on Site and in the Areas of Potential Environmental Concern (APECs) that were identified to be associated with the Site based on the findings of the Phase One ESA[1] completed by GHD. Based on the results of the Phase One ESA, the following APECs were identified:

- APEC #1 - Surrounding Land Use (Service Stations/USTs/Releases)
- APEC #2 - Surrounding Land Use (Drycleaner)
- APEC #3 - Potential on-Site Gas Bar
- APEC # 4 - Surrounding Land Use (Autobody Shops)
- APEC #5 - Former Fuel Oil AST
- APEC #6 - Former UST
- APEC #7 – Fill Quality

[1] GHD –Phase One Environmental Site Assessment, Vacant Property, 1098 Ogilvie Road and 1178 Cummings Avenue in Ottawa, Ontario, dated December 5, 2019

The Phase Two ESA included the advancement of boreholes, installation of monitoring wells, field screening, and the collection and laboratory analysis of limited soil and groundwater samples. The Phase Two ESA was completed in conjunction with a geotechnical investigation, the findings of which are presented under separate cover. The soil and groundwater analytical results were assessed to the 2011 Ministry of the Environment Table 7 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition for Residential/Parkland/Institutional Property use for a shallow soil condition and coarse textured soils (Table 7 Standards)[2].

Based on the findings of the Phase Two ESA, all analyzed parameters in soil had concentrations below the MOE Table 7 standards with the exception of select metals (antimony and molybdenum). The impacts were identified in the surficial fill and are considered to be associated with APEC #7 (Fill Quality). Based on the groundwater analytical results, all analyzed parameters had concentrations below the MOE Table 7 standards at the sampled locations.

To meet the regulatory requirements outlined in O. Reg. 153/04 in support of an RSC, further Phase Two ESA investigative activities are required to more fully investigate the on-Site APECs and to define the soil impacts identified on the Site.

[2] Ontario Ministry of the Environment, *"Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act",* dated April 15, 2011.

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1. Introduction

This report presents the results of the Phase Two Environmental Site Assessment (ESA) completed by GHD of the vacant property municipally known as 1098 Ogilvie Road and 1178 Cummings Avenue in Ottawa, Ontario (Site or Property). A Site Location Map is presented on Figure 1 and a Site Plan is presented on Figure 2.

It is GHD's understanding that the Phase Two ESA was undertaken to support a local municipal planning department requirement associated with the development of the Site. The Site is planned to be redeveloped for residential land use. A Record of Site Condition (RSC) is intended to be filed for the Site in accordance with the requirements of O. Reg. 153/04 at a later date due to the change in land use to a more sensitive use.

The objective of the Phase Two ESA was to undertake a preliminary investigation of the general soil and groundwater quality on Site and in the Areas of Potential Environmental Concern (APECs) that were identified to be associated with the Site based on the findings of the Phase One ESA[3] completed by GHD. Based on the results of the Phase One ESA, the following APECs were identified:

- APEC #1 - Surrounding Land Use (Service Stations/USTs/Releases)
- APEC #2 - Surrounding Land Use (Drycleaners)
- APEC #3 - Potential on-Site Gas Bar
- APEC # 4 - Surrounding Land Use (Autobody Shops)
- APEC #5 - Former Fuel Oil AST
- APEC #6 - Former UST
- APEC #7 – Fill Quality

This report has been prepared for the use of the 6770967 Canada Inc. and may not be relied upon by others without the written consent of GHD.

1.1 Site Description

The Site is 1.54 hectares in size and is comprised of two separate parcels of land. The West Parcel (1098 Ogilvie Road) is approximately 0.49 hectares (ha), and was identified with property identification number (PIN) 042640152. The East Parcel (1178 Cummings Avenue) is approximately 1.05 ha, and was identified with PIN 042640160. The approximate centre of the Site has Latitude and Longitude coordinates of 45° 25' 30" N, 75° 37' 55" W (540568 mE/5030362 mN, zone 18T, NAD 87). The municipal zoning for the Site is currently R3V V (Residential Third Density Zone).

[3] GHD –Phase One Environmental Site Assessment, Vacant Property, 1098 Ogilvie Road and 1178 Cummings Avenue in Ottawa, Ontario, dated December 5, 2019

The Site is legally described as Part of Lots 26 and 27, Concession 2; Part 1 on Registered Plan 5R-11857; Parts 1 to 3 on Registered Plan 5R-8415; Part 12 on Registered Plan 5R-2005; Part 1 on Registered Plan 4R-10638, in City of Ottawa.

The West Parcel was first developed prior to 1958 and was used for agricultural and rural residential land use. The residential dwelling on the West Parcel was demolished in 2017. The East Parcel was first developed prior to 1958 and was also used for agricultural and rural residential land use up until approximately the 1970s. The East Parcel was potentially utilized as a gasoline bar in the 1960s. Between the 1970s and 1980s, the East Parcel was reportedly used as a contractor's yard. The buildings on the East Parcel were demolished prior to 1991. The Site is currently vacant and overgrown with brush, grass and trees.

1.2 Property Ownership

The Site is currently owned by 6770967 Canada Inc.

1.3 Current and Proposed Future Uses

The Site is currently vacant. The Site is planned to be redeveloped for residential land use. The proposed development concept currently includes residential towers, a hotel, and underground and above grade parking.

1.4 Applicable Site Condition Standards

Generic site condition standards are provided in the Ontario Ministry of the Environment[4] (MOE) document entitled, "*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act,*" dated April 15, 2011. The 2011 standards are referenced in Ontario Regulation (O. Reg.) 153/04 – Records of Site Condition, as amended by O. Reg. 511/09 (hereafter referred to as the 2011 MOE Standards).

The Standard provides site condition standards for certain chemicals, based on combinations of six different site-specific conditions, as follows:

- *Property use type - agricultural, residential/parkland/institutional, or industrial/commercial/ community*. The Property had been used in the past for residential and commercial land uses. The Property is planned to be redeveloped for residential land use. As such, the standards for residential/parkland/institutional property use were applied to the Site.
- *Restoration of groundwater quality - potable/non-potable.* The Property, and all other properties located, in whole or in part, within 250 m of the boundaries of the property, are supplied by a municipal drinking water system. The Site is not in an area designated on the City of Ottawa official plan as an intake protection zone. The Site is not in an area designated on the City of Ottawa official plan as a well-head protection area (WHPA). As such, the standards for a non-potable groundwater condition are considered applicable to the Site.

[4] Ministry of the Environment (MOE) was renamed the Ministry of Environment and Climate Change (MOECC) in July 3, 2014 and as a result all references to the "Ministry of the Environment" and "MOE" refer to the MOECC.

- *Restoration depth - full depth and stratified depth*. For comparative purposes, the full depth standards were applied to the Site.
- *Soil texture - coarse or medium to fine*. Based on the results of the Phase Two ESA (presented herein), the predominant soil type on Site is considered to be coarse textured. As such, the standards for coarse textured soils were applied to the Site.
- *Shallow soil property.* The Site is considered to be a shallow soil property, due to depth to bedrock.
- *Within 30 metres of a water body.* There are no water bodies or water courses located on the Site.

The generic 2011 MOE Standards are not applicable if the Site is considered to be an environmentally sensitive area based on the conditions presented in Section 41 of O. Reg. 153/04, as amended. Based on GHD's review, there are no Areas of Natural Scientific Interest (ANSI) or Provincially Significant Wetlands (PSW) identified by the Ministry of Natural Resources and Forestry (MNRF) within the 250 m Study Area. There are no areas designated by the municipality in its current official plan (Bylaw 2008-250-Zoning) as 'EP' (Environmentally Protected zoning) within the Study Area. As the Site does not contain an area of natural significance as defined by O.Reg.153/04, and properties within 250 m of the Site limits do not contain areas of natural significance, the Site is not classified as an environmentally sensitive property (O. Reg. 153/04, s41). The pH of the soils was also tested as part of the Phase Two ESA and observed to be within the range of 5-9.

2. Background Information

2.1 Physical Setting

The Site is located in an area developed for commercial and residential land uses. The Site is currently vacant but was historically used for rural residential and commercial purposes (contractor's yard). The Site is 1.54 hectares in size and is comprised of two separate parcels of land. The West Parcel (1098 Ogilvie Road) is approximately 0.49 hectares (ha) and the East Parcel (1178 Cummings Avenue) is approximately 1.05 ha. The Site can be accessed via a driveway located on the south side of Ogilvie Road.

The following buildings or features were located on the properties surrounding the Site:

North: The Site is bound to the north by Ogilvie Road and a hydro transmission corridor and commercial property utilized as a food stand fronting onto Ogilvie Road and Cummings Avenue. A service station is located further north of the Site, on the northwest corner of the intersection of Ogilvie Road and Cummings Avenue (1111 Ogilvie Road). Residential properties are located beyond.

West: The Site is bound to the west by a commercial development occupied by various businesses including a laundromat and dry cleaners.

South: The Site is bound to the south by overgrown lands to the southwest and a commercial business (bank) to the southeast. Cyrville Road is located further south of the Site.

East: The Site is bound to the east by Cummings Avenue. A commercial office building is located on the east side of Cummings Avenue. A gasoline service station is located

further northeast of the Site, on the southeast corner of the intersection of Ogilvie Road and Cummings Avenue (1134 Ogilvie Road).

Based on a review of topographic and elevation mapping and the location of the Rideau River, regional groundwater flow in the Phase One Study Area is anticipated to be in a west to southwest direction. The Rideau River located approximately 2.4 km from the Site limits.

According to the Geological Survey of Canada Map 1506a titled 'Surficial Geology of Ottawa, Ontario-Quebec (1982)', the Site is described as Till Plains, with local relief of less than 5.0 m. Approximately 100 m southeast of the Site (near the intersection of Cummings Avenue and Cyrville Road) is described as Bedrock (limestone, dolomite, sandstone, and locally shale, relatively flat, often with areas of unconsolidated Quaternary sediments up to 1.0 m thick). Approximately 100 m northwest of the Site (on the north side of Ogilvie Road) is described as Post Champlain Sea Alluvial Deposits (medium grained stratified sands with some silt in the form of alluvial terraces and channels cut in marine clays, and in bars and spits within abandoned channels).

The online Ontario Geological Survey Map describes the Site as being Fine Textured Glaciomarine Deposits (silt and clay, minor sand and gravel, massive to well laminated), with a meltwater channel that bisects the site from the northwest to the southeast. South of the Site is described as Paleozoic Bedrock, while north of Ogilvie road to the northwest is described as older alluvial deposits (clay, silt, sand, gravel, may contain organic remnants).

The Ontario Geologic Survey Map P2716 titled 'Paleozoic Geology Ottawa Area Southern Ontario (1984)' was reviewed. The Site is described as the Upper Ordovician Billings Formation (dark brown to black shales, with laminations of calcareous siltstone). A fault approximately parallels Cyrville Road south of the Site. The south side of Cyrville Road is the down thrust (slightly younger) Upper Ordovician Carlsbad Formation (interbedded dark grey shale, fossiliferous calcareous siltstone, and silty bioclastic limestone).

The Site is currently not serviced. Historically, the Site was serviced with hydro, natural gas, water, and storm and sanitary sewer services.

Potable water in the area is supplied by the City. No water supply wells or septic tanks were reported or observed to be located on the Site.

2.2 Past Investigations

In 2011, a Phase I-II ESA was undertaken on the Site. More recently, GHD undertook a Phase One ESA for the Site. The findings are documented in the following reports:

- *"Phase I-II – Environmental Site Assessment 1098 Ogilvie Road and 1178 Cummings Avenue, Ottawa, Ontario"* prepared by Patterson Group Inc. (Paterson), dated September 20, 2011 (Ref. PE2419-1)
- *Phase One Environmental Site Assessment, Vacant Property, 1098 Ogilvie Road and 1178 Cummings Avenue in Ottawa, Ontario,* prepared by GHD, dated December 5, 2019

The salient findings of GHD's review as they relate to the Site are presented below.

Phase I-II ESA (Patterson Group, 2011)

- The 2011 Phase I-II ESA property was occupied by an abandoned residential building on the western portion of the Site. The building reportedly had a concrete foundation, was wood framed with an exterior stucco finish, and was heated with fuel oil. A 905-Litre aboveground storage tank (AST), used for heating oil, was present in the southwest corner of the basement of the dwelling. Fill and vent pipes were visible on the building exterior. The AST was described by Paterson as *"in good condition with no visible rust or perforations"*.
- The eastern portion of the Site was vacant and overgrown with vegetation.
- A former underground storage tank (UST) was reportedly located on the eastern portion of the Site. The 2011 Phase I-II ESA reported that the UST (along with 240 metric tonnes of soil) was removed in 2003 under the supervision of Paterson Group Inc. Confirmatory samples were collected from the excavation in 2003. The 2011 Phase I-II ESA indicates that although low levels of petroleum concentrations were reported in the soils remaining in place; the concentrations were below the then current Ministry of the Environment (MOE) Table B site standards presented in the Guideline for Use at Contaminated Sites in Ontario (revised 1997). No additional information pertaining the UST (including a closure report) was available to GHD at the time of the Phase One ESA.
- The surrounding land uses were noted by Paterson to be as follows:
  - North | Hydro corridor and Ogilvie Road followed by a gasoline service station (northeast)
  - West | Commercial properties
  - South | Automotive service garage (southwest)
  - East | Cummings Avenue followed by a gasoline service station (northeast)
- A Phase II ESA was undertaken by Paterson to investigate soil and/or groundwater conditions in the vicinity of the former on-Site UST and off-Site service stations.
- The Phase II ESA included the advancement of five boreholes (BH1 to BH5) and was conducted in conjunction with a geotechnical investigation on Site. BH1 was advanced in the vicinity of the former UST, and was completed as a monitoring well. BH5 was advanced along the northern portion of the Property and was also completed as a monitoring well. The remaining boreholes were advanced throughout the Site for geotechnical purposes. The locations of the previously boreholes are presented on Figure 2.
  - The soil profile was found to consist of topsoil or gravel over fill followed by shale bedrock. The fill generally consists of brown sandy silt, with gravel, cobbles, brick, and wood chips in all five of the boreholes advanced in 2011.
  - Groundwater was encountered at depths ranging from 2.4 mBGS at BH1 to 5.1 mBGS at BH5 on September 13, 2011.
  - One soil samples was submitted for laboratory analysis of PHCs and BTEX form BH5. Groundwater samples were collected from BH1 and BH5 and were submitted for laboratory analysis of PHCs and BTEX. The analytical results were assessed to the 2009 interim Table 7 standards for a non-potable groundwater condition for shallow soils.

- Elevated concentrations of benzene were detected in the groundwater at BH1 and BH5 at concentrations ranging from 8.3 µg/L to 18.5 µg/L and reported to be above the 2009 Table 7 standard of 0.5 µg/L.

Phase One ESA (GHD, 2019)

Based on the results of the Phase One ESA, including the Site inspection, information provided by Site representatives and regulatory agencies, documents reviewed, and the review of Site history, the following APECs were identified to be associated with the Site:

i. **Surrounding Land Use (Service Stations/USTs/Releases):** Based on the findings of the information review and GHD's site observations, service stations (with USTs) are operated on properties located north and northeast of the Site at 111 Ogilvie Road and 1134 Ogilvie Road. Based on the findings of the ERIS database search, releases have occurred in the past at 1134 Ogilvie Road and at the intersection of Ogilvie Road and Cummings Avenue. In 2011, elevated concentrations of benzene were also detected in the groundwater in the northeastern portion of the Site. The operation of service stations (including USTs) and releases were identified as off-Site PCAs (28. Gasoline and Associated Products Storage in Fixed Tanks and 10. Commercial Autobody Shops). Based on the proximity of these PCAs to the Site, they were identified as having the potential to contribute to an APEC on the Site in the event that releases have occurred and migrated onto the Site. The northern boundary of the Site was identified as **APEC #1**.

ii. **Surrounding Land Use (Drycleaner):** Based on the findings of the information review, a drycleaner is located approximately 65 metres southwest of the Site at 1097 (1099) Cryville Road. One Stop Laundromat & Dry Cleaning/Sketchley Cleaning Services, located at 1097/1099 Cyrville Road (approximately 65 m southwest of the Site) were identified as generators of halogenated solvents from 1986 to 2004. The operation of a drycleaner on a surrounding property in close proximity to the Site was identified as a PCA (37. Operation of Dry Cleaning Equipment) in accordance with O. Reg. 153/04, and was identified as having the potential to contribute to an APEC on the Site in the event that releases have occurred and migrated onto the Site. On this basis the southwestern Property boundary was identified as **APEC #2**.

iii. **Potential on-Site Gas Bar**: Based on a review of the 2011 Phase I-II ESA, the Shamrock Gas Bar was listed as being located on the East Parcel of the Site (1178 Cummings Avenue) in 1965. At the time of the Phase One ESA, no additional information was obtained pertaining to the potential operation of a gas bar on Site. The potential operation of a gas bar on Site was identified as a PCA (28. Gasoline and Associated Products Storage in Fixed Tanks) in accordance with O. Reg. 153/04 and the central portion of the East Parcel was identified as **APEC #3**.

iv. **Surrounding Land Use (Autobody Shops):** Based on the historical information reviewed, various autobody shops were located at 1125-1133 Cyrville Road, located adjacent to the south of the western portion of the Site. At the time of the GHD's site inspection, this property was vacant overgrown land. The operation of autobody shops on the adjacent property to the south of the Site was identified as an off-Site PCA (10. Commercial Autobody Shops) and

identified as having the potential to contribute to an APEC on Site. The southwestern boundary of the Site was identified as **APEC #4**.

v. **Former Fuel Oil AST:** The residential dwelling formerly located on the southwestern portion of the West Parcel was historically heated with fuel oil. A fuel oil AST was located in the basement of the residential dwelling. The residential dwelling was demolished on Site in 2017. The past operation of a fuel oil AST on Site was identified as an on-Site PCA (28. Gasoline and Associated Products Storage in Fixed Tanks) in accordance with O. Reg. 153/04 and the southwestern portion of the West Parcel was identified as **APEC #5**.

vi. **Former UST:** Based on a review of the 2011 Phase I-II ESA, a UST was historically located in the central portion of the West Parcel. The UST and 240 tonnes of soil were reportedly removed in 2003. Based on the findings of the 2011 Phase I-II ESA, elevated concentrations of benzene were detected in the groundwater in the vicinity of the former UST. The historical operation of a UST on Site was identified as an on-Site PCA (28. Gasoline and Associated Products Storage in Fixed Tanks) in accordance with O. Reg. 153/04 and the central portion of the East Parcel was identified as **APEC #6**.

vii. **Fill Quality:** Based on a review of historical aerial photographs and the findings of the 2011 Phase I-II ESA, fill material of unknown quality is present throughout the Site. The presence of fill of unknown quality was identified as an on-Site PCA (30. Fill of Unknown Quality) in accordance with O. Reg. 153/04 and the entire Site was identified as **APEC #7**.

The APECs are presented on Figure 2.

3. Scope of the Investigation

The Phase Two ESA included a preliminary assessment of the soil and groundwater quality on Site and was undertaken in conjunction with a geotechnical investigation, presented under separate cover. The Phase Two ESA field activities included the advancement of boreholes, installation of monitoring wells, field screening, and the collection and laboratory analysis of soil and groundwater samples as described in detail below.. The data generated GHD's investigative activities has been presented herein.

3.1 Media Investigated

The investigation of the soil and groundwater quality on Site included the following:

- Advancement of seven geo-environmental boreholes between September 23 and 25, 2019 to depths ranging from 3.0 to 15.80 mBGS
- Instrumentation of monitoring wells in the shallow overburden/bedrock at BH2A, BH2, BH3, BH4, and BH5 and in the deeper bedrock at BH1 and BH6.
- Field screening of soil and groundwater samples.
- Collection of groundwater levels from on-Site monitoring wells to determine depth to the groundwater table and groundwater flow direction.

- Laboratory analysis of soil samples collected from BH2, BH3, BH4 and BH5 (including field duplicates and one trip blank) and groundwater samples from BH2A, BH3, BH4, and BH5 (including field duplicates and a trip blank). Soil samples were submitted for laboratory analysis of one or more of the following: O. Reg. 153/04 metals and inorganics, petroleum hydrocarbons (PHC) fractions F_1 to F_4, volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), pH, and/or grain size. Groundwater samples were submitted for laboratory analysis of one or more of the following: O. Reg. 153/04 metals, PHC fractions F_1 to F_4, VOCs, and PAHs.
- Laboratory analysis of one composite sample for ignitability and toxicity characteristic leaching procedure (TCLP) VOCs, PAHs, PCBs, and metals and inorganics parameters.

The sample locations are shown on Figure 4.

There are no water bodies located on the Site; therefore, sediment was not sampled during the Phase Two ESA. Soil vapour sampling was not completed as part of the Phase Two ESA. There are no existing buildings on the Site.

3.2 Phase One Conceptual Site Model

The Site is located at 1098 Ogilvie Road and 1178 Cummings Avenue in Ottawa, Ontario (Site or Phase One Property). A Site Location Map and a Site Plan are provided on Figure 1 and Figure 2, respectively.

The Site is currently owned by 6770967 Canada Inc. The Site is 1.54 hectares in size and is comprised of two separate parcels of land. The West Parcel (1098 Ogilvie Road) is approximately 0.49 hectares (ha), and was identified with property identification number (PIN) 042640152. The East Parcel (1178 Cummings Avenue) is approximately 1.05 ha, and was identified with PIN 042640160. The approximate centre of the Site has Latitude and Longitude coordinates of 45° 25' 30" N, 75° 37' 55" W (540568 mE/5030362 mN, zone 18T, NAD 87). The municipal zoning for the Site is currently R3V V (Residential Third Density Zone).

The Site is legally described as Part of Lots 26 and 27, Concession 2; Part 1 on Registered Plan 5R-11857; Parts 1 to 3 on Registered Plan 5R-8415; Part 12 on Registered Plan 5R-2005; Part 1 on Registered Plan 4R-10638, in City of Ottawa.

The Site is located in an area of Ottawa primarily developed for mixed residential and commercial land use. Based on GHD's review of the historical documents, the Site was developed prior to 1958 for rural residential land use and was used in the past for agricultural purposes. The Site is currently vacant and comprised of overgrown grassed and tree covered lands. All former buildings have been demolished.

The Site topography is generally on grade with the adjacent properties with a gentle slope towards the north and east. The elevation on the Site ranges between 68.31 and 70.58 metres above sea level (mASL). Regionally, the topography in the Phase One Study Area slopes down towards the Rideau River to the west; however the Site gently slopes to the north and east.

There are no water bodies located on or adjacent to the Site. The closest significant surface water body is the Rideau River, located approximately 2.4 km west-southwest of the Site. Based on topography and the location of the Rideau River, groundwater flow direction is inferred to be to the west or southwest.

Based on the information reviewed and the definition of area of natural significance provided in O. Reg. 153/04, the Site is not considered an area of natural significance.

To the best of GHD's knowledge, no underground utilities are present beneath the Property with the exception of potential abandoned utilities. The Site is not currently serviced.

Based on the historical information reviewed, the following subsurface structures and utilities that may affect contaminant distribution and transport on Site included the following dating back to the early development of the Site: utility corridors, abandoned utility conduits, and the presence of several former building foundations.

Based on GHD's review of the previous environmental report, the soil conditions on Site consist of fill over a thin layer of glaciolacustrine sands, overlying bedrock found between 1.5 to 3.0 m below grade mBGS.

Based on the results of the Phase One ESA, PCAs were identified to be associated with historical operations on the Site and off Site on the surrounding properties to the north, southwest and south. A summary of the PCAs, APECs, and the associated potentially contaminated media and contaminants of concern (COCs) are presented in the Table of Areas of Potential Environmental Concern. In summary the potential contaminants of concern were identified as metals, PHCs, BTEX, VOCs, and PAHs.

The Phase One ESA CSM was based on the findings of the Phase One ESA. Limited information was available at the time of the Phase One ESA regarding specific details relating to the historical operations conducted on Site since its development. The findings presented herein are based on the Site inspection, information provided by Site representatives and regulatory agencies, documents reviewed, and the review of Site history.

The Phase One ESA Conceptual Site Model is depicted on Figures 1 through 3.

3.3 Deviations from the Sampling and Analysis Plan

There were no significant deviations from the sampling and analysis plan.

3.4 Impediments

There were no impediments encountered during the investigation.

4. Investigation Methods

4.1 General

The following investigative activities were undertaken between September 23 and October 16, 2019 and are described in detail in the following subsections:

- Advancement of boreholes.
- Installation of groundwater monitoring wells.
- Collection of field screening measurements and observations.

- Collection and laboratory analysis of soil and groundwater samples.
- Groundwater field measurements of water quality parameters.
- Collection of groundwater level measurements.
- Residue management.
- Quality assurance and quality control measures.
- Elevation surveying.

The field investigation activities were completed in accordance with MOE (now known as the MECP) protocols, GHD's standard operating procedures (SOPs), and standard industry practice.

Prior to completing the investigation activities undertaken by GHD, a Site-specific Health and Safety Plan (HASP) was prepared to provide specific guidelines and established procedures for the protection of personnel performing the Site investigation activities. In addition, the appropriate public utility notifications were completed and a private utility locator was retained to assist with on-Site utility clearances. Private utility locate services were completed prior to undertaking subsurface investigative activities. Copies of the utility locates are included in Appendix A.

4.2 Drilling

On September 23, 24 and 25, 2019, seven boreholes (BH1, BH2, BH2A, BH3, BH4, BH5, and BH6) were advanced on Site using a truck mounted CME 55 power drill rig. Each of the boreholes was instrumented as a monitoring well. GHD retained George Downing Estate Drilling Ltd., a MECP licensed driller of Grenville Sur La Rouge, Quebec to complete the drilling activities. The location of the boreholes and monitoring wells are shown on Figure 4.

Soil cuttings for GHD's investigative activities were containerized in 205-litre drums pending off Site removal. The purge and wash waters were containerized in 205-litre (45 gallon) drums and temporarily stored for off-Site disposal (refer to Section 4.10).

4.3 Soil Sampling

Soil samples were collected from four of the seven investigative locations (BH2, BH3, BH4, and BH5) completed on Site during the field activities. Soil sample collection from each borehole was facilitated through the use of stainless steel split-spoon samplers. Samples were collected based on field screening results. Field screening methods are described in Section 4.5 below.

Prior to use and between each borehole, the drilling and sampling equipment was thoroughly cleaned using Alconox® soap and potable water rinse.

Soil samples obtained from each borehole were qualitatively and quantitatively screened for the presence of impact. Qualitative screening was based on visual and olfactory observations, while quantitative screening was based on the presence of undifferentiated VOCs in the headspace of soil samples collected as measured in the field.

Soil samples were collected in laboratory supplied glass containers which were placed in a cooler containing ice for sample preservation. Undisturbed samples for VOC analysis were placed directly in sample containers provided by the laboratory. All soil samples were collected using the required

sampling techniques in accordance with O Reg. 153/04, including the methanol field preservation method for those soil samples being submitted for analysis of PHC F1 and VOCs. Samples were submitted to the laboratory for analysis under chain-of-custody protocol.

Select soil samples were submitted for laboratory analysis of one or more of the following parameters: VOCs, PHCs, PAHs, metals, and grain size analysis.

4.4 Field Screening Measurements

As discussed in Section 4.3, soil samples were collected from each borehole using stainless steel split spoons. Soil samples of the overburden were taken from the core and placed into a sealable plastic bag for headspace screening. The headspace soil samples were screened for undifferentiated VOC vapour readings using a photo-ionization detector (PID). Prior to screening, the field screening equipment was inspected and calibrated according to the manufacturer's recommendations by GHD personnel.

The results of the field screening are presented in the stratigraphic and instrumentation logs provided in Appendix B.

4.5 Groundwater: Monitoring Well Installation

Groundwater monitoring wells were installed in all seven (7) of the on Site boreholes as part of the geo-environmental investigation. The locations of the monitoring wells are shown on Figure 4.

The monitoring wells at BH2A, BH3, BH4, and BH5 were installed to straddle the water table to investigate the presence of LNAPL and facilitate the collection of groundwater samples for laboratory analysis. The monitoring wells installed at BH1, BH2, BH6 were installed in the deeper bedrock as part of the geotechnical investigation.

The monitoring wells were constructed with a 1.25” (32 mm) diameter, Schedule 40 polyvinyl chloride (PVC) riser and No. 10 slot size well screens varying in length from 1.5 to 3 metres. The well screens were installed to straddle the groundwater table observed during drilling activities in the field and to assess groundwater conditions in the deeper bedrock. The bottom screened depths of the shallow bedrock wells ranged from 3.0 to 6.15 mBGS. The bottom screened depths of the deeper bedrock monitoring wells ranged from 15.65 to 15.80 mBGS.

A silica sand pack was placed in the annular space between the PVC screen/riser pipe and the borehole to a height of at least 0.3 metres above the top of the screen. A bentonite seal was placed directly above the sand pack and extended to within 0.5 metres of the ground surface. To complete the installation, an expandable J-plug was placed on the riser pipe to protect against debris falling and/or surface runoff infiltrating into the well and a protective aboveground casing with a concrete collar was placed around each well to cover the top of the riser pipe.

The groundwater monitoring well construction and installation details are shown on the stratigraphic

and instrumentation logs provided in Appendix B and in the table below.

Table 4.1 Monitoring Well Installation

Well ID	Grade Elevation (mASD)	TOR Elevation (mASD)	Borehole Bottom Elevation (mASD)	Screen Elevation (mASD)	Sand Pack Elevation (mASD)	Bentonite Seal Elevation (mASD)	Well Bottom Depth (mASD)
BH1	100.37	101.13	84.67	87.72 to 84.67	88.10 to 84.67 Deep bedrock	99.46 to 88.10	84.67
BH2	100.81	101.62	85.16	97.15 to 94.71	97.46 to 94.66 Upper bedrock	99.90 to 97.46 And 94.66 to 85.16	94.71
BH2A	100.93	101.79	97.93	99.46 to 97.93	99.76 to 97.93 Weathered bedrock	100.63 to 99.76	97.93
BH3	100.18	100.92	96.37	97.59 to 96.37	97.89 to 96.37 Upper bedrock	98.66 to 97.89	96.37
BH4	100.76	101.50	96.95	98.47 to 96.95	98.85 to 96.95 Upper bedrock	99.52 to 98.85	96.95
BH5	99.47	100.23	83.67	96.42 to 93.37	96.73 to 93.32 Upper bedrock	98.86 to 96.73 And 93.32 to 83.67	93.37
BH6	99.92	100.61	84.38	87.42 to 84.38	87.73 to 84.38 Deep bedrock	99.31 to 87.73	84.38

Elevations are relative to the top of the spindle of a fire hydrant located on the east side of Cummings Avenue, east of the Site (assigned elevation of 100 mASD).

4.6 Groundwater Field Measurements of Water Quality Parameters

Upon installation the monitoring wells were developed to remove the standing groundwater volume in the well. In order to ensure that samples representative of on-Site groundwater conditions were obtained, each monitoring well was purged prior to groundwater sample collection using dedicated Waterra™ tubing.

The following protocol was generally followed at each monitoring well location during well purging activities:

- Groundwater level measurements were collected prior and subsequent to well development activities using a calibrated oil/water interface probe. The depth to water was measured relative to a specific reference point in the monitoring well. Groundwater elevations are presented in Table 1.
- Where Waterra™ sampling techniques were used, a minimum of three well volumes of water was purged from the monitoring well. In the event that slow groundwater recharge conditions were encountered, the well was purged until dry and then allowed to recover prior to sample collection. Field measurements of temperature, pH, turbidity, and electrical conductivity were taken using a water quality meter after each purged well volume was removed until consistent field measurements were recorded indicating that water in the well was representative of the actual groundwater conditions**.**
- Groundwater in the monitoring well was allowed to recover and settle prior to sample collection to reduce sediment agitation and mobilization in volatile and semi-volatile samples.

The development/purge water was contained in 205-litre drums and temporarily stored on Site.

4.7 Groundwater Sampling

Groundwater samples were collected from four monitoring wells (BH2A, BH3, BH4, and BH5) on October 16, 2019.

Groundwater samples were collected and placed directly into laboratory-supplied sample containers specific to the analytical parameters. Groundwater samples collected for metals analysis were field filtered using a 0.45 micron filter prior to sample collection. Samples were stored in coolers chilled with ice for sample preservation and submitted to the laboratory for analysis under chain-of-custody protocol.

A quality assurance/quality control (QA/QC) program was implemented to ensure quality data was generated. The QA/QC program included the collection/submission of one field duplicate groundwater sample and one trip blank sample. The field duplicate sample was one of two samples taken from the same media (i.e., groundwater) at the same location and time following the same sampling procedures. The field duplicate samples were used to validate field sampling protocol and laboratory analysis procedures. The trip blank sample consisted of analyte-free media prepared by the laboratory, taken to the Site and returned to the laboratory unopened. The trip blank sample was used to document contamination attributable to shipping and field handling procedures.

Groundwater samples were submitted for laboratory analysis of one or more of the following parameters: O. Reg. 153/04 metals, PHC fractions F_1 to F_4, VOCs, and PAHs.

All samples were submitted to the analytical laboratory following chain-of-custody procedures. The chain-of-custody forms document the condition and handling of the samples throughout the collection, transportation, and final analysis of the samples.

Water generated from the well development activities was containerized and temporarily stored on Site.

4.8 Sediment Sampling

Sediment sampling was not completed during the Phase Two ESA as sediment was not identified as a potentially contaminated media.

4.9 Analytical Testing

Soil and groundwater samples collected during GHD's investigation were submitted to Paracel Laboratories Ltd. (Paracel) in Ottawa, Ontario. Paracel is a member of the Standards Council of Canada (SCC) and Canadian Association of Environmental Analytical Laboratories (CAEAL). Copies of the analytical laboratory reports are provided in Appendix C.

Grain size (hydrometer) analysis was undertaken on representative samples. Copies of the grain size results are provided in Appendix D.

4.10 Residue Management Procedures

Soil cuttings, equipment decontamination wash water and purge/well development water for GHD's investigative activities were containerized in 205-litre drums for off-Site disposal. A representative soil sample was collected for TCLP analysis to characterize the soils for off-site disposal at a MECP approved waste disposal facility. The results of the analysis indicated that the soils would be classified as non-hazardous solid waste in accordance with Schedule 4 of Ontario Regulation 347, as amended.

Soil cuttings and wash water/purge/development waters are temporarily stored on Site.

4.11 Elevation Surveying

Each borehole/monitoring well/test pit was surveyed for vertical control with respect to a local benchmark, which was taken to be the top of the spindle of a fire hydrant located on the east side of Cummings Avenue, east of the Site (assumed elevation of 100 mASL). This hydrant is located approximately in line with the north wall of the residential apartment building located at 1177 Cummings Avenue. The ground surface and top of riser pipe reference elevations for each well are summarized in Table 1. The reported elevations are not geodetic.

4.12 Quality Assurance and Quality Control Measures

A Quality Assurance/Quality Control (QA/QC) program was implemented during the program to ensure quality data was generated. This program involved both field and laboratory QA/QC measures.

Samples were collected in laboratory supplied sampling containers with the appropriate preservative in accordance with O. Reg. 153/04, including the methanol field preservation method for those soil samples being submitted for analysis of PHC F_1 and VOCs.

Samples were submitted under chain-of-custody protocol to an analytical laboratory for chemical analysis. For quality assurance, the following was undertaken:

- Between collection of each soil and groundwater sample, GHD field personnel donned a new pair of disposable nitrile gloves.

- Prior to use and between each borehole location, the drilling and non-dedicated sampling equipment was thoroughly cleaned using Alconox® soap and potable water rinse.
- Stainless steel sampling equipment was used and cleaned using Alconox® soap and potable water rinse between each sample collection event.
- Wherever possible, dedicated sampling equipment (e.g., LDPE tubing, fittings, Ziploc® bags, etc.) was used to reduce the potential for cross contamination.
- The groundwater monitoring wells were equipped with a dedicated Waterra™ foot valve and polyethylene tubing for well development activities.

To validate the field analysis, one QA/QC field duplicate sample was generally submitted for approximately every ten samples per media type (soil and groundwater) submitted for laboratory analysis. Trip blanks were also submitted (generally one per laboratory submission) for soil and groundwater where analysis of volatile parameters was required QC samples were also analyzed by the laboratory as required by their analytical methods.

5. Review and Evaluation

The results of the Site investigation activities are described in the following sections. The soil and groundwater sampling locations are shown on Figure 4.

5.1 Geology

The Site has various shrub and tree cover with local areas of pavement and brush/tall grasses. The boreholes identified a thin topsoil with an approximate thickness of 50 to 75 millimeter (mm) covering fill soils. At the BH1 location, there was an asphalt surface as part of an abandoned driveway from previous developments on the site.

- *Fill* – A layer of fill was encountered at all borehole locations. The fill material consisted of a silty sand with trace to some gravel. The fill material was found to be compact, and in a damp to moist condition. The thickness of the fill layer varied from approximately 1.0 m to 2.6 m.
- *Sandy Clay* - Underlying the fill layer at the borehole BH1 and BH2 locations, a native sandy clay deposit was encountered. In general this deposit was found to be very stiff and was recovered in a damp to moist condition.
- *Silty Sand* - Underlying the fill layer at the borehole BH4 and BH6 locations, a native silty sand deposit was encountered. The deposit had varying amounts of clay and gravel. In general this deposit was found to be compact to very dense and was recovered in a damp to moist condition.
- *Bedrock* - Practical refusal to auger advancement was encountered in all boreholes at shallow depths. Bedrock was confirmed by diamond coring methods in all boreholes except BH2A. The depth of bedrock ranged between 1.0 m to 2.7 m. The bedrock was found to be a black and grey sedimentary rock consisting shale of billings formation with limestone interbeds at the borehole locations. The limestone interbeds increased in frequency with depth. The quality of this rock was generally highly weathered and fractured, very poor within the upper approximately 0.2 to 1.5 m of the bedrock. The quality improves becoming what is considered as fair to excellent rock based upon Rock Quality Designation (RQD) values of 52 to 100.

Detailed descriptions of the geologic deposits encountered at each borehole location are presented on the stratigraphic logs provided in Appendix B.

5.2 Groundwater Elevations and Flow Direction

Groundwater level measurements were collected from the on-Site monitoring wells using a calibrated electronic oil/water interface probe (i.e., Solinst) or a Solinst water level tape. The depth to water was measured relative to a specific reference point in the monitoring well (i.e., the top of the monitoring well riser pipe). Based on the survey information of the top of riser pipe elevation, the groundwater elevation was calculated by subtracting the water level measurement from the reference point elevation. Groundwater level measurements for October 16, 2019, and groundwater elevation results are provided in Table 1.

Based on the water level measurements recorded on October 16, 2019, the direction of groundwater flow across the Site in the shallow bedrock was determined to be towards the south-southeast.

It should be noted that the groundwater table is subject to seasonal fluctuations and in response to precipitation and snowmelt events. Also, it would be expected that water may be perched within the fill materials or the very poor bedrock, especially during and following periods of precipitation and in the spring and fall or other wet seasonal periods.

There was no evidence of measurable NAPL during the drilling or groundwater sampling activities.

5.3 Groundwater Hydraulic Gradients

The hydraulic gradient was calculated by dividing the difference in hydraulic head by the lateral distance between monitoring locations. Based on the recorded groundwater elevations in Table 1, the horizontal hydraulic gradient is approximately 0.013 m/m.

5.4 Fine-Medium Soil Texture

Two samples were collected at the Site and submitted for hydrometer and grain size analysis. The results are presented in Appendix D.

Under Section 42 of O. Reg. 153/04, soil is considered medium and fine textured if it contains 50 percent or more by mass particles that are smaller than 75 microns in mean diameter. Based on review of the hydrometer and grain size analysis, the soils are considered to be coarse textured.

5.5 Soil: Field Screening

During the investigation, field screening of collected soil samples was undertaken for organic vapours using a MiniRAE photo-ionization detector (PID). Any visual or olfactory evidence of potential impacts was also documented. The results of the soil field screening and corresponding sample depth intervals are provided on the stratigraphic and instrumentation logs provided in Appendix B.

During the drilling and groundwater sampling activities, there was no field evidence of impact identified nor evidence of light or dense non-aqueous phase liquids on the Site.

5.6 Soil Quality

Soil samples were selected for laboratory analysis from BH2, BH3, BH4, and BH5 as summarized below. For QA/QC purposes, one field duplicate soil sample was also submitted for laboratory analysis.

Table 5.1 Soil Sample Details

Sample Identification	Borehole ID	Sample depth	Parameters	APEC
BH2-SS1	BH2	0.1-0.6 mBGS	PAH, metals, pH	APEC #7 (Fill Quality)
BH7-SS1	BH2	0.1-0.6 mBGS	PAH, metals, pH (duplicate of BH2-SS1)	-
BH2-SS3	BH2	1.5-2.1 mBGS	PHC, VOC	APEC #2 (Service Stations/USTs/Releases)
BH7-SS3	BH2	1.5-2.1 mBGS	PHC, VOC (duplicate of BH2-SS3)	-
BH3-SS1	BH3	0.1-0.6 mBGS	VOC, PAH, metals, pH	APEC #7 (Fill Quality)
BH3-SS2	BH3	0.76-1.4 mBGS	PHC, BTEX	APEC #5 (Former AST)
BH4-SS1	BH4	0.1-0.6 mBGS	PHC, BTEX, metals, pH	APEC #7 (Fill Quality)
BH5-SS1	BH5	0.1-0.6 mBGS	PHC, BTEX, metals, pH	APEC #7 (Fill Quality)

The analytical results are presented in Table 2. Based on a review of the analytical results, all analyzed parameters had concentrations below the 2011 MOE Table 7 standards with the exception of antimony and molybdenum. Antimony was detected at concentrations marginally above the Table 7 standard at BH2 in soil sample BH2-SS1 (0.1-0.6 mBGS), but below the standard in the field duplicate sample (BH7-SS1). At BH5, molybdenum was detected at a concentration marginally above the 2011 MOE Table 7 standard in soil sample BH5-SS1 (0.1-0.6 mBGS). The impacts to soil were identified in the fill and are considered to be associated with APEC #7 (Fill Quality).

A summary of the soil COCs and the maximum detected concentrations is provided in Table 3.

5.7 Groundwater Quality

Groundwater samples were collected for laboratory analysis from BH2A (APEC #1), BH3 (APEC #2), BH4, and BH5 (APEC # 4). Samples were submitted for laboratory analysis of one or more of the following: O. Reg. 153/04 metals, PHC fractions F_1 to F_4, VOCs, and PAHs. The groundwater analytical results were assessed to the applicable 2011 MOE Table 7 Standards for coarse textured soils and are presented in Table 4.

Based on a review of the October 2019 analytical results, all analyzed parameters had concentrations below the MOE Table 7 standards at the locations sampled. A summary of the groundwater COCs and the maximum detected concentrations is provided in Table 5.

5.8 Sediment Quality

Sediment associated with water bodies was not identified as Potentially Contaminated Media on Site; therefore, sediment was not sampled during the Phase Two ESA.

5.9 Phase Two Conceptual Site Model

Introduction

The Site is a vacant property municipally known as 1098 Ogilvie Road and 1178 Cummings Avenue in Ottawa, Ontario (Site or Property). A Site Location Map is presented on Figure 1 and a Site Plan is presented on Figure 2.

The Site is currently owned by 6770967 Canada Inc. The Site is 1.54 hectares in size and is comprised of two separate parcels of land. The West Parcel (1098 Ogilvie Road) is approximately 0.49 hectares (ha), and was identified with property identification number (PIN) 042640152. The East Parcel (1178 Cummings Avenue) is approximately 1.05 ha, and was identified with PIN 042640160. The approximate centre of the Site has Latitude and Longitude coordinates of 45° 25' 30" N, 75° 37' 55" W (540568 mE/5030362 mN, zone 18T, NAD 87). The municipal zoning for the Site is currently R3V V (Residential Third Density Zone).

The Site is legally described as Part of Lots 26 and 27, Concession 2; Part 1 on Registered Plan 5R-11857; Parts 1 to 3 on Registered Plan 5R-8415; Part 12 on Registered Plan 5R-2005; Part 1 on Registered Plan 4R-10638, in City of Ottawa.

The West Parcel was first developed prior to 1958 and was used for agricultural and rural residential land use. The residential dwelling on the West Parcel was demolished in 2017. The East Parcel was first developed prior to 1958 and was also used for agricultural and rural residential land use up until approximately the 1970s. The east parcel was potentially utilized as a gasoline bar in the 1960s. Between the 1970s and 1980s, the East Parcel was reportedly used as a contractor's yard. The buildings on the East Parcel were demolished prior to 1991. The Site is currently vacant and overgrown with brush, grass and trees.

The Site is planned to be redeveloped for residential land use. The Phase Two ESA was undertaken in support of a local municipal planning department requirement associated with the proposed redevelopment of the Site. The objective of the Phase Two ESA was to undertake a preliminary investigation of the general soil and groundwater quality on Site and in the Areas of Potential Environmental Concern (APECs) that were identified to be associated with the Site based on the findings of the Phase One ESA[5] completed by GHD. Based on the results of the Phase One ESA, the following APECs were identified:

- APEC #1 - Surrounding Land Use (Service Stations/USTs/Releases)
- APEC #2 - Surrounding Land Use (Drycleaner)
- APEC #3 - Potential on-Site Gas Bar
- APEC # 4 - Surrounding Land Use (Autobody Shops)

[5] GHD –Phase One Environmental Site Assessment, Vacant Property, 1098 Ogilvie Road and 1178 Cummings Avenue in Ottawa, Ontario, dated December 5, 2019

- APEC #5 - Former Fuel Oil AST
- APEC #6 - Former UST
- APEC #7 – Fill Quality

The Phase Two ESA included the advancement of boreholes, installation of monitoring wells, field screening, and the collection and laboratory analysis of soil and groundwater samples. The Phase Two ESA was completed in conjunction with a geotechnical investigation, the findings of which are presented under separate cover. The soil and groundwater analytical results were assessed to the 2011 Ministry of the Environment Table 7 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition for Residential/Parkland/Institutional Property use for a shallow soil condition and coarse textured soils (Table 7 Standards)[6].

Potential Contaminant Distribution and Transport Pathways

The Site is currently not serviced. Based on the historical information reviewed, subsurface structures and utilities that may affect contaminant distribution and transport on Site included the following (which date back to the early development of the Site): utility corridors, abandoned utility conduits, and the presence of several former building foundations.

Physical Setting

Geology – During the field activities completed at the Site, a layer of fill varying in thickness from 1.0 to 2.6 metres was found at all of the investigative locations. At select locations, the fill was underlain by thin layers of sandy clay and silty sand. Bedrock was encountered at depths between 1.0 and 2.7 mBGS. The bedrock was found to be a black and grey sedimentary rock consisting shale of billings formation with limestone interbeds at the borehole locations.

Hydrogeology – The water table is present in the bedrock and was found to range between 1.15 to 2.59 mBGS. Based on the water level measurements recorded on October 16, 2019, the direction of groundwater flow across the Site in the shallow bedrock was determined to be towards the south-southeast. Based on the recorded groundwater elevations in October, 2019, the horizontal hydraulic gradient in the shallow bedrock is approximately 0.013 m/m.

It should be noted that the groundwater table is subject to seasonal fluctuations and in response to precipitation and snowmelt events. Also, it would be expected that water may be perched within the fill materials or the very poor bedrock, especially during and following periods of precipitation and in the spring and fall or other wet seasonal periods.

The Site topography is generally on grade with the adjacent properties with a gentle slope towards the south. Regional mapping demonstrates the elevation on the Site ranges between 68 and 71 metres above sea level (mASL). Regionally, the topography in the Phase One Study Area slopes down towards the Rideau River to the west; however the Site gently slopes to the north and east.

There are no water bodies located on or adjacent to the Site. The closest significant surface water body is the Rideau River, located approximately 2.4 km west-southwest of the Site. Based on

[6] Ontario Ministry of the Environment, *"Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act",* dated April 15, 2011.

topography and the location of the Rideau River, regional groundwater flow direction is inferred to be to the west or southwest.

Applicable Site Condition Standards

The soil and groundwater analytical results were assessed to the 2011 MOE Table 7 standards for residential/parkland/institutional property use for a non-potable groundwater and shallow soil condition for coarse textured soils.

Nature and Extent of Impact

The preliminary investigation of the soil and groundwater quality included the advancement of boreholes and the instrumentation of the boreholes as groundwater monitoring wells. The investigative locations are shown on Figure 4. A summary of the analytical results is presented below.

Soil Quality – Based on a review of the soil analytical results, all analyzed parameters had concentrations below the 2011 MOE Table 7 standards with the exception of select metals (antimony and molybdenum) which were identified in the surficial (fill) soils on Site at two locations.

Groundwater Quality – Based on a review of the October 2019 groundwater analytical results, all analyzed parameters had concentrations below the 2011 MOE Table 7 standards.

Potential Migration Pathways

As described in the Phase One ESA, seven primary APECs were identified at the Site. The Phase Two ESA results indicate that the impacts to soil quality are likely related to APEC #7 (Fill Quality). Based on the findings of the Phase Two ESA, no preferential migration pathways were identified to be associated with the contaminants identified (metals in soil).

Climatic and Meteorological Conditions

The effect of climatic or meteorological conditions (such as the fluctuation of the groundwater table) on the distribution and migration of the contaminants on Site is not considered to be significant.

Vapour Intrusion

Based on the Phase Two ESA, the soil impacts at the Site include metals. These COCs are not considered to be volatile and, therefore, the soil impacts are not considered to pose a potential risk to receptors. As previously mentioned, further investigative activities are required to investigate soil/groundwater quality in the vicinity of APEC #3/APEC #6 (Potential Gas Bar/UST).

Based on the information obtained in completing this Phase Two ESA, further investigative activities are required to more fully investigate the APECs identified for the Site and to support the filing of a RSC.

6. Conclusions

The objective of the Phase Two ESA was to undertake a preliminary investigation of the general soil and groundwater quality on Site and in the Areas of Potential Environmental Concern (APECs) that

were identified to be associated with the Site. The Phase Two ESA included the advancement of boreholes, installation of monitoring wells, field screening, and the collection and laboratory analysis of limited soil and groundwater samples. Based on the findings of the Phase Two ESA, the following conclusions are provided:

1. All analyzed parameters in soil had concentrations below the MOE Table 7 standards with the exception of select metals (antimony and molybdenum). The impacts were identified in the surficial fill and are considered to be associated with APEC #7 (Fill Quality).

2. Based on the groundwater analytical results, all analyzed parameters had concentrations below the MOE Table 7 standards at the sampled locations, including BH2A (APEC #1 – Service Stations/USTs/Releases), BH3 (APEC # 2 – Off-Site Drycleaner). BH4, and BH5 (APEC # 4 – Off-Site Autobody Shops).

To meet the regulatory requirements outlined in O. Reg. 153/04 in support of an RSC, further Phase Two ESA investigative activities are required to more fully investigate the on-Site APECs # 1 through #7 and to define the soil impacts identified on the Site.

All of Which is Respectfully Submitted,

GHD

Scott Wallis, B.Sc.

Luke Lopers, P. Eng., Q.P. ESA

Luke Lopers, P. Eng., Qualified Person for Environmental Site Assessment under O. Reg. 153/04, confirms the carrying out of the Phase Two Environmental Site Assessment and the findings and conclusions of this report.

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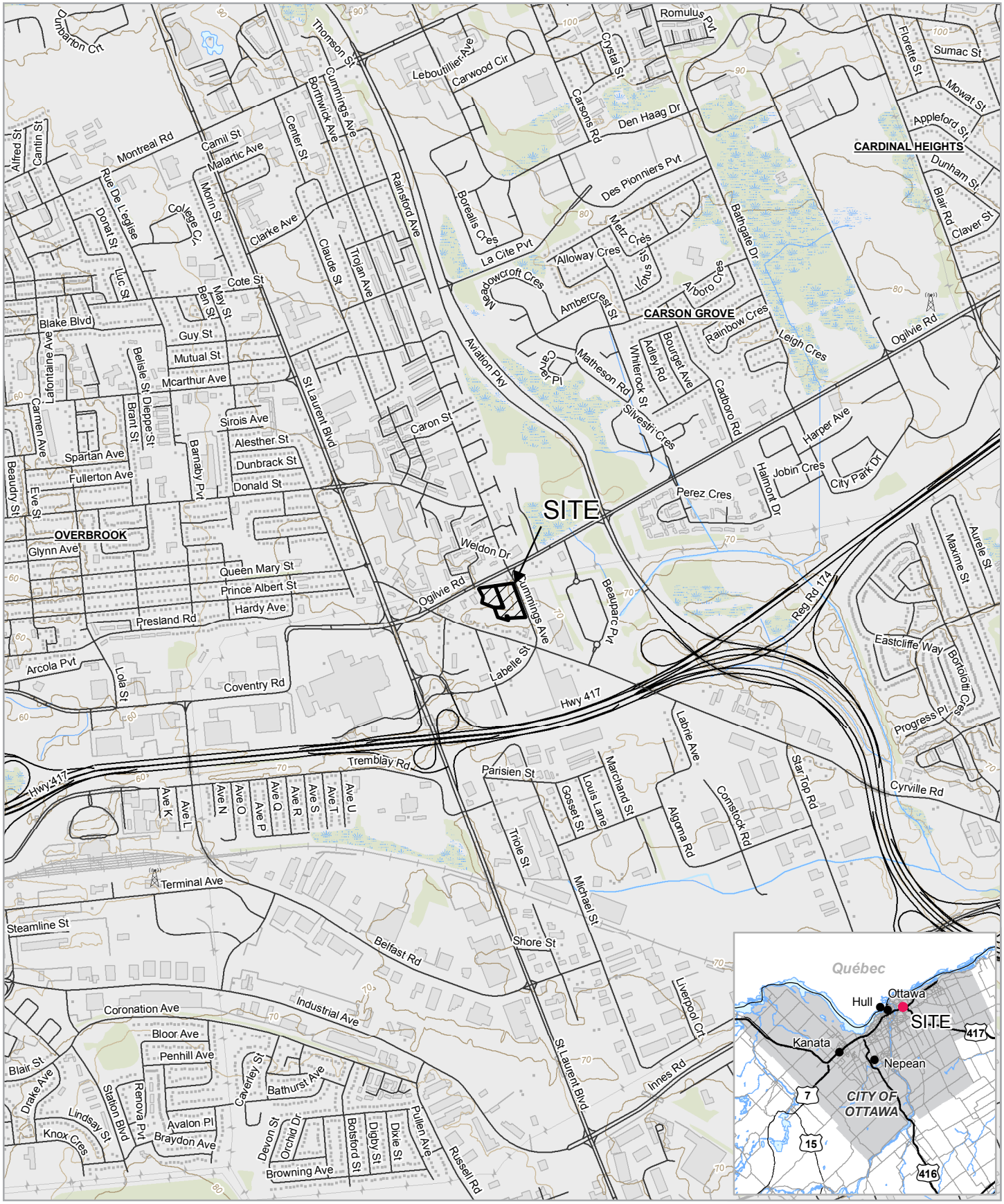

Paper Size ANSI A

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Meters

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 18N

N

6770967 CANADA INC.
1098 OGILVIE ROAD AND 1178 CUMMINGS AVENUE
OTTAWA, ON
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
RESIDENTIAL DEVELOPMENT

SITE LOCATION MAP

Project No. **11201061-E2**
Revision No. **-**
Date **Aug 12, 2019**

FIGURE 1

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Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 18N

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6770967 CANADA INC.
1098 OGILVIE ROAD AND 1178 CUMMINGS AVENUE
OTTAWA, ON
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
RESIDENTIAL DEVELOPMENT

SITE LOCATION PLAN

Project No. **11201061-E2**
Revision No. **-**
Date **Oct 9, 2019**

FIGURE 2

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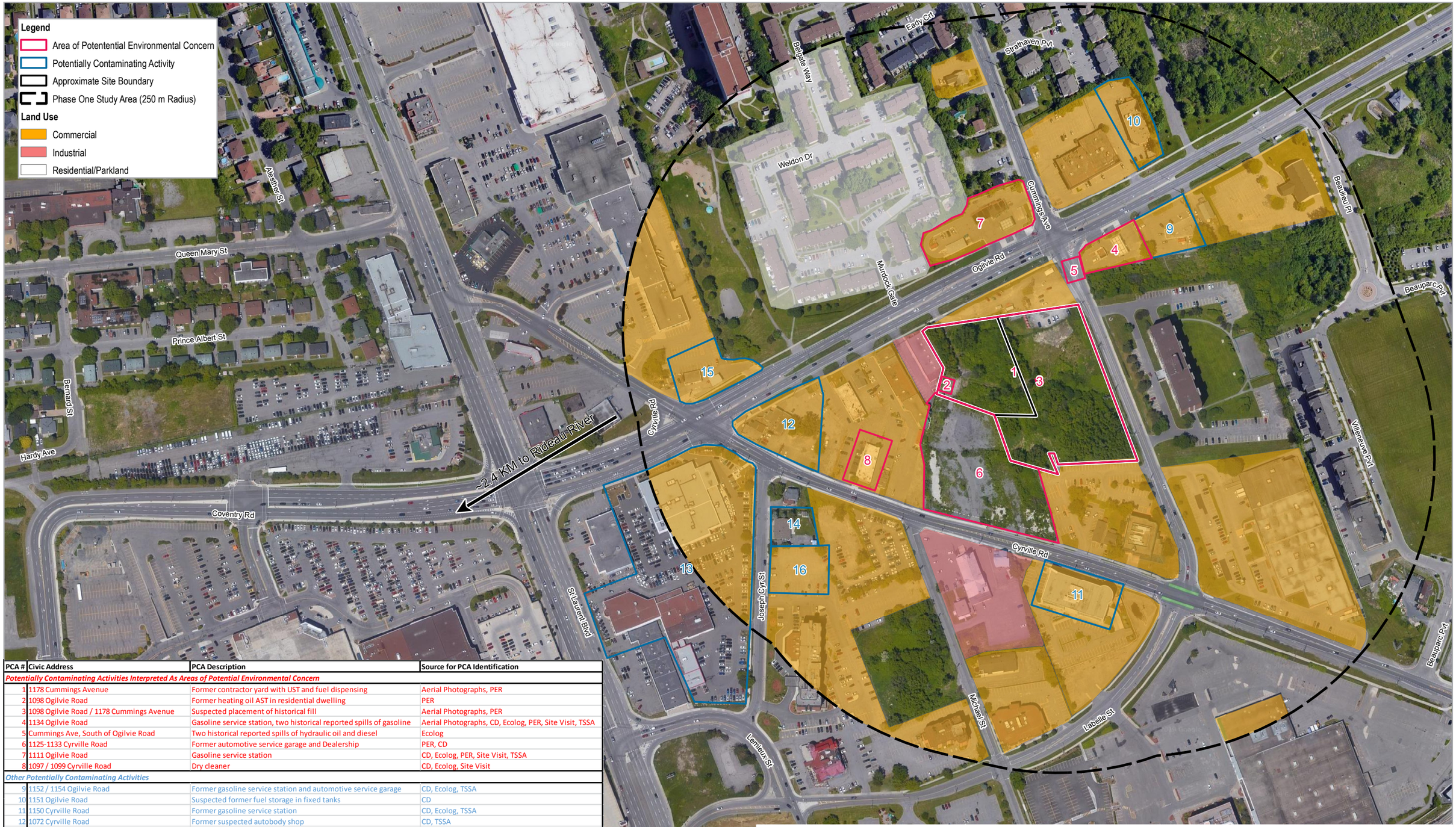

PCA #	Civic Address	PCA Description	Source for PCA Identification
Potentially Contaminating Activities Interpreted As Areas of Potential Environmental Concern			
1	1178 Cummings Avenue	Former contractor yard with UST and fuel dispensing	Aerial Photographs, PER
2	1098 Ogilvie Road	Former heating oil AST in residential dwelling	PER
3	1098 Ogilvie Road / 1178 Cummings Avenue	Suspected placement of historical fill	Aerial Photographs, PER
4	1134 Ogilvie Road	Gasoline service station, two historical reported spills of gasoline	Aerial Photographs, CD, Ecolog, PER, Site Visit, TSSA
5	Cummings Ave, South of Ogilvie Road	Two historical reported spills of hydraulic oil and diesel	Ecolog
6	1125-1133 Cyrville Road	Former automotive service garage and Dealership	PER, CD
7	1111 Ogilvie Road	Gasoline service station	CD, Ecolog, PER, Site Visit, TSSA
8	1097 / 1099 Cyrville Road	Dry cleaner	CD, Ecolog, Site Visit
Other Potentially Contaminating Activities			
9	1152 / 1154 Ogilvie Road	Former gasoline service station and automotive service garage	CD, Ecolog, TSSA
10	1151 Ogilvie Road	Suspected former fuel storage in fixed tanks	CD
11	1150 Cyrville Road	Former gasoline service station	CD, Ecolog, TSSA
12	1072 Cyrville Road	Former suspected autobody shop	CD, TSSA
13	1040 Ogilvie Road / 1171 St. Laurent Boulevard	Car dealership with automotive service garage	CD, Ecolog, Site Visit, Aerial Photographs
14	1094 Cyrville Road / 1157 Joseph Cyr Street	Former Dry cleaner	CD
15	1057 Cyrville Road	Gasoline service station with garage	CD, Ecolog, Site Visit, TSSA, Aerial Photographs
16	1192 Joseph Cyr Street	Former heavy equipment yard	CD

Notes
CD: City Directories
FIP: Fire Insurance Plans
TSSA: Technical Standards and Safety Autority Database
PER: Previous Environmental Reports

Paper Size ANSI B
0 20 40 60 80
Meters
Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 18N

N

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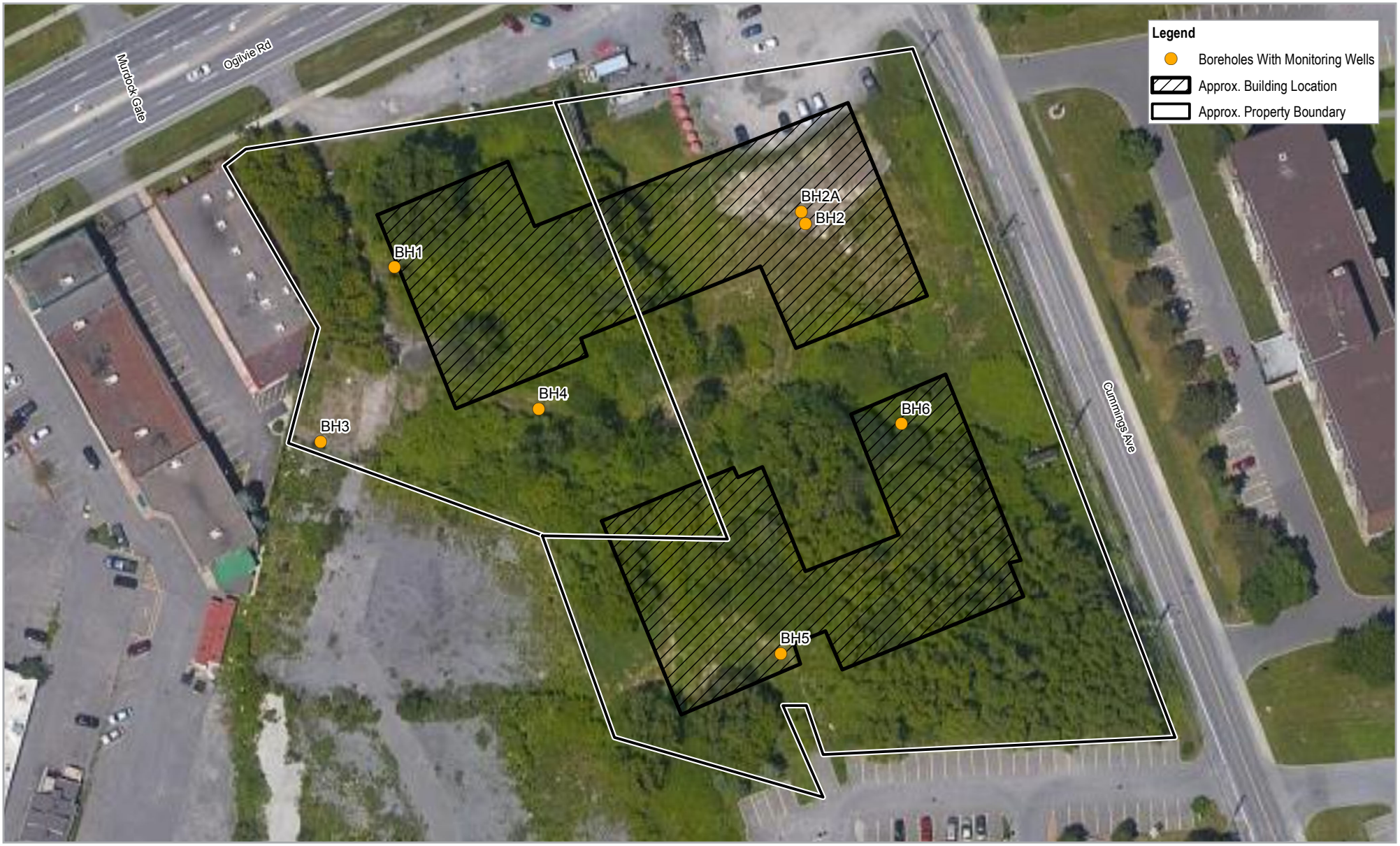
6770967 CANADA INC.
1098 OGILVIE ROAD AND 1178 CUMMINGS AVENUE
OTTAWA, ON
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

Project No. **11201061**
Revision No. **-**
Date **Nov 18, 2019**

SURROUNDING LAND USE PLAN

FIGURE 3

Data source: 2019 Google, Imagery Date: 2018/06/08 .



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Meters

Map Projection: Transverse Mercator
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6770967 CANADA INC.
1098 OGILVIE ROAD AND 1178 CUMMINGS AVENUE
OTTAWA, ON
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
RESIDENTIAL DEVELOPMENT

INVESTIGATIVE LOCATIONS PLAN

Project No. **11201061-A1**
Revision No. **-**
Date **Oct 9, 2019**

FIGURE 4

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Table 1

Groundwater Elevations
Phase Two Environmental Site Assessment
1098 Ogilvie Road and 1178 Cummings Avenue
Ottawa, Ontario

WELL ID	Grade Elevation (m)	TOP Elevation (m)	Bottom Depth (mBG)	Bottom Elevation (m)	October 16, 2019 Depth to Watertable (m below grade)	October 16, 2019 Elevation Watertable (m)	Thickness of LNAPL (m)	Thickness of DNAPL (m)
BH1	100.37	101.13	15.70	84.67	2.42	97.95	0.00	na
BH2	100.81	101.62	6.15	94.66	2.44	98.37	0.00	na
BH2A	100.93	101.79	3.00	97.93	2.44	98.49	0.00	na
BH3	100.18	100.92	3.81	96.37	1.72	98.46	0.00	na
BH4	100.76	101.50	3.81	96.95	2.59	98.17	0.00	na
BH5	99.47	100.23	6.15	93.32	2.26	97.21	0.00	na
BH6	99.92	100.61	15.54	84.38	1.15	98.77	0.00	na

Notes:
Elevation relative to Site BM=100.00 m, assigned to Top of Spindle of Hydrant located west of BH6 on Cummings Avenue.
na - not applicable

Summary of Soil Analysis
Phase Two Environmental Site Assessment
1098 Ogilvie Road and 1178 Cummings Avenue
Ottawa, Ontario

			Sample Location	**BH2**	**BH2**	**BH2**	**BH2**	**BH3**	**BH3**	**BH4**	**BH5**
			Sample Identification	**BH2-SS1**	**BH7-SS1**	**BH2-SS3**	**BH7-SS3**	**BH3-SS1**	**BH3-SS2**	**BH4-SS1**	**BH5-SS1**
			Laboratory Identification	1939472-01	1939472-07	1939472-02	1939472-08	1939472-03	1939472-04	1939472-05	1939472-06
			Sample Date	24-Sep-19	24-Sep-19	24-Sep-19	24-Sep-19	24-Sep-19	24-Sep-19	24-Sep-19	24-Sep-19
			Sample Depth	0.1-0.6mBGS	0.1-0.6mBGS	1.5-2.1mBGS	1.5-2.1mBGS	0.1-0.6mBGS	0.76-1.4 mBGS	0.1-0.6mBGS	0.1-0.61mBGS
			Stratigraphy	fill	fill	fill	fill	fill	fill	fill	fill
Parameter	**Units**	**MDL**	**2011 MOE Table 7 Standards**[1]		(duplicate of BH2-SS1)		(duplicate of BH2-SS3)				
Metals											
Antimony	ug/g dry	1.0	7.5 ug/g dry	**7.8**	ND (1.0)	N/A	N/A	ND (1.0)	N/A	ND (1.0)	ND (1.0)
Arsenic	ug/g dry	1.0	18 ug/g dry	4.2	3.0	N/A	N/A	3.0	N/A	9.0	8.3
Barium	ug/g dry	1.0	390 ug/g dry	139	155	N/A	N/A	121	N/A	108	210
Beryllium	ug/g dry	1.0	4 ug/g dry	0.8	0.5	N/A	N/A	ND (0.5)	N/A	0.7	0.7
Boron	ug/g dry	1.0	120 ug/g dry	8.2	5.9	N/A	N/A	6.6	N/A	7.9	9.5
Cadmium	ug/g dry	0.5	1.2 ug/g dry	ND (0.5)	ND (0.5)	N/A	N/A	ND (0.5)	N/A	ND (0.5)	0.5
Chromium	ug/g dry	1.0	160 ug/g dry	42.6	50.0	N/A	N/A	32.4	N/A	26.9	21.2
Cobalt	ug/g dry	1.0	22 ug/g dry	10.9	11.2	N/A	N/A	7.7	N/A	12.1	12.1
Copper	ug/g dry	1.0	140 ug/g dry	29.6	24.9	N/A	N/A	23.4	N/A	33.7	44.8
Lead	ug/g dry	1.0	120 ug/g dry	28.8	28.0	N/A	N/A	42.4	N/A	38.3	35.0
Molybdenum	ug/g dry	1.0	6.9 ug/g dry	3.4	1.2	N/A	N/A	1.4	N/A	2.8	**10.9**
Nickel	ug/g dry	1.0	100 ug/g dry	35.8	31.6	N/A	N/A	21.7	N/A	38.7	53.8
Selenium	ug/g dry	1.0	2.4 ug/g dry	ND (1.0)	ND (1.0)	N/A	N/A	ND (1.0)	N/A	ND (1.0)	ND (1.0)
Silver	ug/g dry	0.5	20 ug/g dry	ND (0.3)	ND (0.3)	N/A	N/A	ND (0.3)	N/A	ND (0.3)	ND (0.3)
Thallium	ug/g dry	1.0	1 ug/g dry	ND (1.0)	ND (1.0)	N/A	N/A	ND (1.0)	N/A	ND (1.0)	ND (1.0)
Uranium	ug/g dry	1.0	23 ug/g dry	2.1	1.2	N/A	N/A	ND (1.0)	N/A	1.2	3.1
Vanadium	ug/g dry	1.0	86 ug/g dry	46.8	51.2	N/A	N/A	35.2	N/A	36.6	31.9
Zinc	ug/g dry	1.0	340 ug/g dry	86.7	74.9	N/A	N/A	78.6	N/A	66.1	92.2
Volatiles											
Acetone	ug/g dry	0.50	16 ug/g dry	N/A	N/A	ND (0.50)	ND (0.50)	ND (0.50)	N/A	N/A	N/A
Benzene	ug/g dry	0.02	0.21 ug/g dry	N/A	N/A	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Bromodichloromethane	ug/g dry	0.05	13 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Bromoform	ug/g dry	0.05	0.27 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Bromomethane	ug/g dry	0.05	0.05 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Carbon Tetrachloride	ug/g dry	0.05	0.05 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Chlorobenzene	ug/g dry	0.05	2.4 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Chloroform	ug/g dry	0.05	0.05 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Dibromochloromethane	ug/g dry	0.05	9.4 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Dichlorodifluoromethane	ug/g dry	0.05	16 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
1,2-Dichlorobenzene	ug/g dry	0.05	3.4 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
1,3-Dichlorobenzene	ug/g dry	0.05	4.8 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
1,4-Dichlorobenzene	ug/g dry	0.05	0.083 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
1,1-Dichloroethane	ug/g dry	0.05	3.5 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
1,2-Dichloroethane	ug/g dry	0.05	0.05 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
1,1-Dichloroethylene	ug/g dry	0.05	0.05 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
cis-1,2-Dichloroethylene	ug/g dry	0.05	3.4 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
trans-1,2-Dichloroethylene	ug/g dry	0.05	0.084 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
1,2-Dichloropropane	ug/g dry	0.05	0.05 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
cis-1,3-Dichloropropylene	ug/g dry	0.05		N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
trans-1,3-Dichloropropylene	ug/g dry	0.05		N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
1,3-Dichloropropene, total	ug/g dry	0.05	0.05 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Ethylbenzene	ug/g dry	0.05	2 ug/g dry	N/A	N/A	0.06	ND (0.05)	ND (0.05)	0.16	ND (0.05)	ND (0.05)
Ethylene dibromide (dibromoethane, 1,2-)	ug/g dry	0.05	0.05 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Hexane	ug/g dry	0.05	2.8 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Methyl Ethyl Ketone (2-Butanone)	ug/g dry	0.50	16 ug/g dry	N/A	N/A	ND (0.50)	ND (0.50)	ND (0.50)	N/A	N/A	N/A
Methyl Isobutyl Ketone	ug/g dry	0.50	1.7 ug/g dry	N/A	N/A	ND (0.50)	ND (0.50)	ND (0.50)	N/A	N/A	N/A
Methyl tert-butyl ether	ug/g dry	0.05	0.75 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Methylene Chloride	ug/g dry	0.05	0.1 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Styrene	ug/g dry	0.05	0.7 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
1,1,1,2-Tetrachloroethane	ug/g dry	0.05	0.058 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
1,1,2,2-Tetrachloroethane	ug/g dry	0.05	0.05 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Tetrachloroethylene	ug/g dry	0.05	0.28 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Toluene	ug/g dry	0.05	2.3 ug/g dry	N/A	N/A	0.05	0.06	ND (0.05)	0.07	ND (0.05)	ND (0.05)
1,1,1-Trichloroethane	ug/g dry	0.05	0.38 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
1,1,2-Trichloroethane	ug/g dry	0.05	0.05 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Trichloroethylene	ug/g dry	0.05	0.061 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Trichlorofluoromethane	ug/g dry	0.05	4 ug/g dry	N/A	N/A	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Vinyl Chloride	ug/g dry	0.02	0.02 ug/g dry	N/A	N/A	ND (0.02)	ND (0.02)	ND (0.02)	N/A	N/A	N/A
m/p-Xylene	ug/g dry	0.05	nv	N/A	N/A	0.15	0.13	ND (0.05)	0.38	ND (0.05)	ND (0.05)
o-Xylene	ug/g dry	0.05	nv	N/A	N/A	0.08	ND (0.05)	ND (0.05)	0.13	ND (0.05)	ND (0.05)
Xylenes, total	ug/g dry	0.05	3.1 ug/g dry	N/A	N/A	0.23	0.13	ND (0.05)	0.50	ND (0.05)	ND (0.05)
Hydrocarbons											
F1 PHCs (C6-C10)	ug/g dry	7	55 ug/g dry	N/A	N/A	20	28	N/A	9	ND (7)	14
F2 PHCs (C10-C16)	ug/g dry	4	98 ug/g dry	N/A	N/A	8	ND (4)	N/A	32	ND (4)	52
F3 PHCs (C16-C34)	ug/g dry	8	300 ug/g dry	N/A	N/A	43	43	N/A	69	ND (8)	51
F4 PHCs (C34-C50)	ug/g dry	6	2800 ug/g dry	N/A	N/A	80	174	N/A	ND (6)	ND (6)	ND (6)
F4G PHCs (gravimetric)	ug/g dry	50	2800 ug/g dry	N/A	N/A	N/A	389	N/A	N/A	N/A	N/A
Semi-Volatiles											
Acenaphthene	ug/g dry	0.02	7.9 ug/g dry	ND (0.02)	ND (0.02)	N/A	N/A	ND (0.02)	N/A	N/A	N/A
Acenaphthylene	ug/g dry	0.02	0.15 ug/g dry	ND (0.02)	0.03	N/A	N/A	0.02	N/A	N/A	N/A
Anthracene	ug/g dry	0.02	0.67 ug/g dry	ND (0.02)	ND (0.02)	N/A	N/A	0.06	N/A	N/A	N/A
Benzo[a]anthracene	ug/g dry	0.02	0.5 ug/g dry	ND (0.02)	0.04	N/A	N/A	0.10	N/A	N/A	N/A
Benzo[a]pyrene	ug/g dry	0.02	0.3 ug/g dry	ND (0.02)	0.04	N/A	N/A	0.14	N/A	N/A	N/A
Benzo[b]fluoranthene	ug/g dry	0.02	0.78 ug/g dry	ND (0.02)	0.07	N/A	N/A	0.09	N/A	N/A	N/A
Benzo[g,h,i]perylene	ug/g dry	0.02	6.6 ug/g dry	ND (0.02)	0.03	N/A	N/A	0.05	N/A	N/A	N/A
Benzo[k]fluoranthene	ug/g dry	0.02	0.78 ug/g dry	ND (0.02)	0.02	N/A	N/A	0.03	N/A	N/A	N/A
Chrysene	ug/g dry	0.02	7 ug/g dry	ND (0.02)	0.07	N/A	N/A	0.10	N/A	N/A	N/A
Dibenzo[a,h]anthracene	ug/g dry	0.02	0.1 ug/g dry	ND (0.02)	ND (0.02)	N/A	N/A	ND (0.02)	N/A	N/A	N/A
Fluoranthene	ug/g dry	0.02	0.69 ug/g dry	0.02	0.09	N/A	N/A	0.20	N/A	N/A	N/A
Fluorene	ug/g dry	0.02	62 ug/g dry	ND (0.02)	ND (0.02)	N/A	N/A	ND (0.02)	N/A	N/A	N/A
Indeno[1,2,3-cd]pyrene	ug/g dry	0.02	0.38 ug/g dry	ND (0.02)	0.03	N/A	N/A	0.05	N/A	N/A	N/A
1-Methylnaphthalene	ug/g dry	0.02	0.99 ug/g dry	ND (0.02)	ND (0.02)	N/A	N/A	ND (0.02)	N/A	N/A	N/A
2-Methylnaphthalene	ug/g dry	0.02	0.99 ug/g dry	0.05	ND (0.02)	N/A	N/A	0.02	N/A	N/A	N/A
Methylnaphthalene (1&2)	ug/g dry	0.04	0.99 ug/g dry	0.05	ND (0.04)	N/A	N/A	0.04	N/A	N/A	N/A
Naphthalene	ug/g dry	0.01	0.6 ug/g dry	0.05	ND (0.01)	N/A	N/A	0.02	N/A	N/A	N/A
Phenanthrene	ug/g dry	0.02	6.2 ug/g dry	0.06	0.05	N/A	N/A	0.16	N/A	N/A	N/A
Pyrene	ug/g dry	0.02	78 ug/g dry	0.02	0.07	N/A	N/A	0.18	N/A	N/A	N/A

Notes

1	MOE, Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act, dated April 2011
BOLD	Concentration above 2011 MOE Table 7 standards for a non-potable groundwater and shallow soil condition for residential land use and coarse-textured soils (April 2011)
ND	Concentration not detected above Method Detection Limit
N/A	Parameter not Analyzed by laboratory
nv	No value

Summary of Groundwater Analysis
Phase Two Environmental Site Assessment
1098 Ogilvie Road and 1178 Cummings Avenue
Ottawa, Ontario

Parameter	Units	MDL	2011 MOE Table 7 Standards[1]	Maximum Soil Concentration	Sample Identification	Sample Depth (mBGS)
Metals						
Antimony	ug/g dry	1.0	7.5 ug/g dry	**7.8**	BH2-SS1	0.1-0.6mBG
Arsenic	ug/g dry	1.0	18 ug/g dry	9.0	BH4-SS1	0.1-0.6mBG
Barium	ug/g dry	1.0	390 ug/g dry	210	BH5-SS1	0.1-0.61mBG
Beryllium	ug/g dry	1.0	4 ug/g dry	0.8	BH2-SS1	0.1-0.6mBG
Boron	ug/g dry	1.0	120 ug/g dry	9.5	BH5-SS1	0.1-0.61mBG
Cadmium	ug/g dry	0.5	1.2 ug/g dry	0.5	BH5-SS1	0.1-0.61mBG
Chromium	ug/g dry	1.0	160 ug/g dry	50.0	DUP1 (duplicate of BH2-SS1)	0.1-0.6mBG
Cobalt	ug/g dry	1.0	22 ug/g dry	12.1	BH4-SS1/BH5-SS1	0.1-0.6mBG
Copper	ug/g dry	1.0	140 ug/g dry	44.8	BH5-SS1	0.1-0.61mBG
Lead	ug/g dry	1.0	120 ug/g dry	42.4	BH3-SS1	0.1-0.6mBG
Molybdenum	ug/g dry	1.0	6.9 ug/g dry	**10.9**	BH5-SS1	0.1-0.61mBG
Nickel	ug/g dry	1.0	100 ug/g dry	53.8	BH5-SS1	0.1-0.61mBG
Selenium	ug/g dry	1.0	2.4 ug/g dry	ND	all	
Silver	ug/g dry	0.5	20 ug/g dry	ND	all	
Thallium	ug/g dry	1.0	1 ug/g dry	ND	all	
Uranium	ug/g dry	1.0	23 ug/g dry	3.1	BH5-SS1	0.1-0.61mBG
Vanadium	ug/g dry	1.0	86 ug/g dry	51.2	DUP1 (duplicate of BH2-SS1)	0.1-0.6mBG
Zinc	ug/g dry	1.0	340 ug/g dry	92.2	BH5-SS1	0.1-0.61mBG
Volatiles						
Acetone	ug/g dry	0.50	16 ug/g dry	ND	all	
Benzene	ug/g dry	0.02	0.21 ug/g dry	ND	all	
Bromodichloromethane	ug/g dry	0.05	13 ug/g dry	ND	all	
Bromoform	ug/g dry	0.05	0.27 ug/g dry	ND	all	
Bromomethane	ug/g dry	0.05	0.05 ug/g dry	ND	all	
Carbon Tetrachloride	ug/g dry	0.05	0.05 ug/g dry	ND	all	
Chlorobenzene	ug/g dry	0.05	2.4 ug/g dry	ND	all	
Chloroform	ug/g dry	0.05	0.05 ug/g dry	ND	all	
Dibromochloromethane	ug/g dry	0.05	9.4 ug/g dry	ND	all	
Dichlorodifluoromethane	ug/g dry	0.05	16 ug/g dry	ND	all	
1,2-Dichlorobenzene	ug/g dry	0.05	3.4 ug/g dry	ND	all	
1,3-Dichlorobenzene	ug/g dry	0.05	4.8 ug/g dry	ND	all	
1,4-Dichlorobenzene	ug/g dry	0.05	0.083 ug/g dry	ND	all	
1,1-Dichloroethane	ug/g dry	0.05	3.5 ug/g dry	ND	all	
1,2-Dichloroethane	ug/g dry	0.05	0.05 ug/g dry	ND	all	
1,1-Dichloroethylene	ug/g dry	0.05	0.05 ug/g dry	ND	all	
cis-1,2-Dichloroethylene	ug/g dry	0.05	3.4 ug/g dry	ND	all	
trans-1,2-Dichloroethylene	ug/g dry	0.05	0.084 ug/g dry	ND	all	
1,2-Dichloropropane	ug/g dry	0.05	0.05 ug/g dry	ND	all	
cis-1,3-Dichloropropylene	ug/g dry	0.05		ND	all	
trans-1,3-Dichloropropylene	ug/g dry	0.05		ND	all	
1,3-Dichloropropene, total	ug/g dry	0.05	0.05 ug/g dry	ND	all	
Ethylbenzene	ug/g dry	0.05	2 ug/g dry	0.16	BH3-SS2	0.76-1.4 mBG
Ethylene dibromide (dibromoeth	ug/g dry	0.05	0.05 ug/g dry	ND	all	
Hexane	ug/g dry	0.05	2.8 ug/g dry	ND	all	
Methyl Ethyl Ketone (2-Butanon	ug/g dry	0.50	16 ug/g dry	ND	all	
Methyl Isobutyl Ketone	ug/g dry	0.50	1.7 ug/g dry	ND	all	
Methyl tert-butyl ether	ug/g dry	0.05	0.75 ug/g dry	ND	all	
Methylene Chloride	ug/g dry	0.05	0.1 ug/g dry	ND	all	
Styrene	ug/g dry	0.05	0.7 ug/g dry	ND	all	
1,1,1,2-Tetrachloroethane	ug/g dry	0.05	0.058 ug/g dry	ND	all	
1,1,2,2-Tetrachloroethane	ug/g dry	0.05	0.05 ug/g dry	ND	all	
Tetrachloroethylene	ug/g dry	0.05	0.28 ug/g dry	ND	all	
Toluene	ug/g dry	0.05	2.3 ug/g dry	0.07	BH3-SS2	0.76-1.4 mBG
1,1,1-Trichloroethane	ug/g dry	0.05	0.38 ug/g dry	ND	all	
1,1,2-Trichloroethane	ug/g dry	0.05	0.05 ug/g dry	ND	all	
Trichloroethylene	ug/g dry	0.05	0.061 ug/g dry	ND	all	
Trichlorofluoromethane	ug/g dry	0.05	4 ug/g dry	ND	all	
Vinyl Chloride	ug/g dry	0.02	0.02 ug/g dry	ND	all	
m/p-Xylene	ug/g dry	0.05		0.38	BH3-SS2	0.76-1.4 mBG
o-Xylene	ug/g dry	0.05		0.13	BH3-SS2	0.76-1.4 mBG
Xylenes, total	ug/g dry	0.05	3.1 ug/g dry	0.50	BH3-SS2	0.76-1.4 mBG
Hydrocarbons						
F1 PHCs (C6-C10)	ug/g dry	7	55 ug/g dry	28	DUP2 (duplicate of BH2-SS3)	1.5-2.1mBG
F2 PHCs (C10-C16)	ug/g dry	4	98 ug/g dry	52	BH5-SS1	0.1-0.61mBG
F3 PHCs (C16-C34)	ug/g dry	8	300 ug/g dry	69	BH3-SS2	0.76-1.4 mBG
F4 PHCs (C34-C50)	ug/g dry	6	2800 ug/g dry	174	DUP2 (duplicate of BH2-SS3)	1.5-2.1mBG
Semi-Volatiles						
Acenaphthene	ug/g dry	0.02	7.9 ug/g dry	ND	all	
Acenaphthylene	ug/g dry	0.02	0.15 ug/g dry	0.03	DUP1 (duplicate of BH2-SS1)	0.1-0.6mBG
Anthracene	ug/g dry	0.02	0.67 ug/g dry	0.06	BH3-SS1	0.1-0.6mBG
Benzo[a]anthracene	ug/g dry	0.02	0.5 ug/g dry	0.10	BH3-SS1	0.1-0.6mBG
Benzo[a]pyrene	ug/g dry	0.02	0.3 ug/g dry	0.14	BH3-SS1	0.1-0.6mBG
Benzo[b]fluoranthene	ug/g dry	0.02	0.78 ug/g dry	0.09	BH3-SS1	0.1-0.6mBG
Benzo[g,h,i]perylene	ug/g dry	0.02	6.6 ug/g dry	0.05	BH3-SS1	0.1-0.6mBG
Benzo[k]fluoranthene	ug/g dry	0.02	0.78 ug/g dry	0.03	BH3-SS1	0.1-0.6mBG
Chrysene	ug/g dry	0.02	7 ug/g dry	0.10	BH3-SS1	0.1-0.6mBG
Dibenzo[a,h]anthracene	ug/g dry	0.02	0.1 ug/g dry	ND	all	
Fluoranthene	ug/g dry	0.02	0.69 ug/g dry	0.20	BH3-SS1	0.1-0.6mBG
Fluorene	ug/g dry	0.02	62 ug/g dry	ND	all	
Indeno[1,2,3-cd]pyrene	ug/g dry	0.02	0.38 ug/g dry	0.05	BH3-SS1	0.1-0.6mBG
1-Methylnaphthalene	ug/g dry	0.02	0.99 ug/g dry	ND	all	
2-Methylnaphthalene	ug/g dry	0.02	0.99 ug/g dry	0.02	BH3-SS1	0.1-0.6mBG
Methylnaphthalene (1&2)	ug/g dry	0.04	0.99 ug/g dry	0.04	BH3-SS1	0.1-0.6mBG
Naphthalene	ug/g dry	0.01	0.6 ug/g dry	0.02	BH3-SS1	0.1-0.6mBG
Phenanthrene	ug/g dry	0.02	6.2 ug/g dry	0.16	BH3-SS1	0.1-0.6mBG
Pyrene	ug/g dry	0.02	78 ug/g dry	0.18	BH3-SS1	0.1-0.6mBG

Notes

1 MOE, Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act, dated April 2011

BOLD - concentration meets or exceeds O.Reg. 153/04 Table 7 (non-potable, shallow soil, residential land use, coarse grained soil) criteria

ND - concentration not detected above Method Detection Limit

Maximum Soil Parameter Concentrations
Phase Two Environmental Site Assessment
1098 Ogilvie Road and 1178 Cummings Avenue
Ottawa, Ontario

			Sample Location	**BH2A**	**BH2A**	**BH3**	**BH4**	**BH5**	**QA/QC Sample**
			Sample Identification	BH2A	DUP	BH3	BH4	BH5	Trip Blank
			Laboratory Identification	1942259-01	1942259-05	1942259-02	1942259-03	1942259-04	1942259-06
			Sample Date	16-Oct-19	16-Oct-19	16-Oct-19	16-Oct-19	16-Oct-19	16-Oct-19
			Screened Interval	1.47 - 3.00 mBGS	1.47 - 3.00 mBGS	2.59 - 3.81 mBGS	2.29 - 3.81 mBGS	3.05 - 6.10 mBGS	
Parameter	**Units**	**MDL**	**2011 MOE Table 7 Standards[1]**						
General Inorganics									
pH	pH Units	0.1		6.9	N/A	N/A	N/A	7.3	N/A
Metals									
Antimony	ug/L	0.5	16000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	N/A	ND (0.5)	N/A
Arsenic	ug/L	1	1500 ug/L	8	7	ND (1)	N/A	ND (1)	N/A
Barium	ug/L	1	23000 ug/L	255	258	192	N/A	186	N/A
Beryllium	ug/L	0.5	53 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	N/A	ND (0.5)	N/A
Boron	ug/L	10	36000 ug/L	73	75	261	N/A	230	N/A
Cadmium	ug/L	0.1	2.1 ug/L	ND (0.1)	ND (0.1)	ND (0.1)	N/A	ND (0.1)	N/A
Chromium	ug/L	1	640 ug/L	2	2	ND (1)	N/A	ND (1)	N/A
Cobalt	ug/L	0.5	52 ug/L	0.8	0.8	ND (0.5)	N/A	ND (0.5)	N/A
Copper	ug/L	0.5	69 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	N/A	ND (0.5)	N/A
Lead	ug/L	0.1	20 ug/L	ND (0.1)	ND (0.1)	ND (0.1)	N/A	ND (0.1)	N/A
Molybdenum	ug/L	0.5	7300 ug/L	19.0	19.4	2.1	N/A	1.1	N/A
Nickel	ug/L	1	390 ug/L	3	3	ND (1)	N/A	ND (1)	N/A
Selenium	ug/L	1	50 ug/L	ND (1)	ND (1)	ND (1)	N/A	ND (1)	N/A
Silver	ug/L	0.1	1.2 ug/L	ND (0.1)	ND (0.1)	ND (0.1)	N/A	ND (0.1)	N/A
Sodium	ug/L	200	1800000 ug/L	48500	49200	68200	N/A	108000	N/A
Thallium	ug/L	0.1	400 ug/L	ND (0.1)	ND (0.1)	ND (0.1)	N/A	ND (0.1)	N/A
Uranium	ug/L	0.1	330 ug/L	6.8	6.8	2.6	N/A	4.0	N/A
Vanadium	ug/L	0.5	200 ug/L	3.4	3.3	ND (0.5)	N/A	0.5	N/A
Zinc	ug/L	5	890 ug/L	7	10	ND (5)	N/A	ND (5)	N/A
Volatiles									
Acetone	ug/L	5.0	100000 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Benzene	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromodichloromethane	ug/L	0.5	67000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromoform	ug/L	0.5	5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromomethane	ug/L	0.5	0.89 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Carbon Tetrachloride	ug/L	0.2	0.2 ug/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Chlorobenzene	ug/L	0.5	140 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Chloroform	ug/L	0.5	2 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Dibromochloromethane	ug/L	0.5	65000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Dichlorodifluoromethane	ug/L	1.0	3500 ug/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,2-Dichlorobenzene	ug/L	0.5	150 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,3-Dichlorobenzene	ug/L	0.5	7600 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,4-Dichlorobenzene	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1-Dichloroethane	ug/L	0.5	11 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,2-Dichloroethane	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1-Dichloroethylene	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
cis-1,2-Dichloroethylene	ug/L	0.5	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
trans-1,2-Dichloroethylene	ug/L	0.5	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,2-Dichloropropane	ug/L	0.5	0.58 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
cis-1,3-Dichloropropylene	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
trans-1,3-Dichloropropylene	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,3-Dichloropropene, total	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylbenzene	ug/L	0.5	54 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylene dibromide (dibromo	ug/L	0.2	0.2 ug/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Hexane	ug/L	1.0	5 ug/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Methyl Ethyl Ketone (2-Butan	ug/L	5.0	21000 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Methyl Isobutyl Ketone	ug/L	5.0	5200 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Methyl tert-butyl ether	ug/L	2.0	15 ug/L	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)
Methylene Chloride	ug/L	5.0	26 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Styrene	ug/L	0.5	43 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,1,2-Tetrachloroethane	ug/L	0.5	1.1 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,2,2-Tetrachloroethane	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Tetrachloroethylene	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Toluene	ug/L	0.5	320 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,1-Trichloroethane	ug/L	0.5	23 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,2-Trichloroethane	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Trichloroethylene	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Trichlorofluoromethane	ug/L	1.0	2000 ug/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Vinyl Chloride	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
m/p-Xylene	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
o-Xylene	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Xylenes, total	ug/L	0.5	72 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Hydrocarbons									
F1 PHCs (C6-C10)	ug/L	25	420 ug/L	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	N/A
F2 PHCs (C10-C16)	ug/L	100	150 ug/L	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	N/A
F3 PHCs (C16-C34)	ug/L	100	500 ug/L	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	N/A
F4 PHCs (C34-C50)	ug/L	100	500 ug/L	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	N/A
Semi-Volatiles									
Acenaphthene	ug/L	0.05	17 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Acenaphthylene	ug/L	0.05	1 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Anthracene	ug/L	0.01	1 ug/L	ND (0.01)	ND (0.01)	ND (0.01)	N/A	N/A	N/A
Benzo[a]anthracene	ug/L	0.01	1.8 ug/L	ND (0.01)	ND (0.01)	ND (0.01)	N/A	N/A	N/A
Benzo[a]pyrene	ug/L	0.01	0.81 ug/L	ND (0.01)	ND (0.01)	ND (0.01)	N/A	N/A	N/A
Benzo[b]fluoranthene	ug/L	0.05	0.75 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Benzo[g,h,i]perylene	ug/L	0.05	0.2 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Benzo[k]fluoranthene	ug/L	0.05	0.4 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Chrysene	ug/L	0.05	0.7 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Dibenzo[a,h]anthracene	ug/L	0.05	0.4 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Fluoranthene	ug/L	0.01	44 ug/L	ND (0.01)	ND (0.01)	ND (0.01)	N/A	N/A	N/A
Fluorene	ug/L	0.05	290 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Indeno[1,2,3-cd]pyrene	ug/L	0.05	0.2 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
1-Methylnaphthalene	ug/L	0.05	1500 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
2-Methylnaphthalene	ug/L	0.05	1500 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Methylnaphthalene (1&2)	ug/L	0.10	1500 ug/L	ND (0.10)	ND (0.10)	ND (0.10)	N/A	N/A	N/A
Naphthalene	ug/L	0.05	7 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Phenanthrene	ug/L	0.05	380 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	N/A	N/A	N/A
Pyrene	ug/L	0.01	5.7 ug/L	ND (0.01)	ND (0.01)	ND (0.01)	N/A	N/A	N/A

Notes

1 MOE, Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act, dated April 2011

BOLD - concentration meets or exceeds O.Reg. 153/04 Table 7 (non-potable, shallow soil, anyl land use, coarse grained soil) criteria

ND - concentration not detected above Method Detection Limit

N/A - Parameter not Analysed by laboratory

Maximum Groundwater Parameter Concentrations
Phase Two Environmental Site Assessment
1098 Ogilvie Road and 1178 Cummings Avenue
Ottawa, Ontario

Parameter	Units	MDL	2011 MOE Table 7 Standards[1]	Maximum Groundwater Concentration	Sample Identification	Location
General Inorganics						
pH	pH Units	0.1		7.3	BH5	BH5
Metals						
Antimony	ug/L	0.5	16000 ug/L	ND	All	All
Arsenic	ug/L	1	1500 ug/L	8	BH2A	BH2A
Barium	ug/L	1	23000 ug/L	258	DUP (duplicate of BH2A)	BH2A
Beryllium	ug/L	0.5	53 ug/L	ND	All	All
Boron	ug/L	10	36000 ug/L	261	BH3	BH3
Cadmium	ug/L	0.1	2.1 ug/L	ND	All	All
Chromium	ug/L	1	640 ug/L	2	DUP (duplicate of BH2A)	BH2A
Cobalt	ug/L	0.5	52 ug/L	0.8	BH2A/DUP (duplicate of BH2A)	BH2A
Copper	ug/L	0.5	69 ug/L	ND	All	All
Lead	ug/L	0.1	20 ug/L	ND	All	All
Molybdenum	ug/L	0.5	7300 ug/L	19.4	DUP (duplicate of BH2A)	BH2A
Nickel	ug/L	1	390 ug/L	3	BH2A/DUP (duplicate of BH2A)	BH2A
Selenium	ug/L	1	50 ug/L	ND	All	All
Silver	ug/L	0.1	1.2 ug/L	ND	All	All
Sodium	ug/L	200	1800000 ug/L	108000	BH5	BH5
Thallium	ug/L	0.1	400 ug/L	ND	All	All
Uranium	ug/L	0.1	330 ug/L	6.8	BH2A/DUP (duplicate of BH2A)	BH2A
Vanadium	ug/L	0.5	200 ug/L	3.4	BH2A	BH2A
Zinc	ug/L	5	890 ug/L	10	DUP (duplicate of BH2A)	BH2A
Volatiles						
Acetone	ug/L	5.0	100000 ug/L	ND	All	All
Benzene	ug/L	0.5	0.5 ug/L	ND	All	All
Bromodichloromethane	ug/L	0.5	67000 ug/L	ND	All	All
Bromoform	ug/L	0.5	5 ug/L	ND	All	All
Bromomethane	ug/L	0.5	0.89 ug/L	ND	All	All
Carbon Tetrachloride	ug/L	0.2	0.2 ug/L	ND	All	All
Chlorobenzene	ug/L	0.5	140 ug/L	ND	All	All
Chloroform	ug/L	0.5	2 ug/L	ND	All	All
Dibromochloromethane	ug/L	0.5	65000 ug/L	ND	All	All
Dichlorodifluoromethane	ug/L	1.0	3500 ug/L	ND	All	All
1,2-Dichlorobenzene	ug/L	0.5	150 ug/L	ND	All	All
1,3-Dichlorobenzene	ug/L	0.5	7600 ug/L	ND	All	All
1,4-Dichlorobenzene	ug/L	0.5	0.5 ug/L	ND	All	All
1,1-Dichloroethane	ug/L	0.5	11 ug/L	ND	All	All
1,2-Dichloroethane	ug/L	0.5	0.5 ug/L	ND	All	All
1,1-Dichloroethylene	ug/L	0.5	0.5 ug/L	ND	All	All
cis-1,2-Dichloroethylene	ug/L	0.5	1.6 ug/L	ND	All	All
trans-1,2-Dichloroethylene	ug/L	0.5	1.6 ug/L	ND	All	All
1,2-Dichloropropane	ug/L	0.5	0.58 ug/L	ND	All	All
cis-1,3-Dichloropropylene	ug/L	0.5		ND	All	All
trans-1,3-Dichloropropylene	ug/L	0.5		ND	All	All
1,3-Dichloropropene, total	ug/L	0.5	0.5 ug/L	ND	All	All
Ethylbenzene	ug/L	0.5	54 ug/L	ND	All	All
Ethylene dibromide (dibromo	ug/L	0.2	0.2 ug/L	ND	All	All
Hexane	ug/L	1.0	5 ug/L	ND	All	All
Methyl Ethyl Ketone (2-Butar	ug/L	5.0	21000 ug/L	ND	All	All
Methyl Isobutyl Ketone	ug/L	5.0	5200 ug/L	ND	All	All
Methyl tert-butyl ether	ug/L	2.0	15 ug/L	ND	All	All
Methylene Chloride	ug/L	5.0	26 ug/L	ND	All	All
Styrene	ug/L	0.5	43 ug/L	ND	All	All
1,1,1,2-Tetrachloroethane	ug/L	0.5	1.1 ug/L	ND	All	All
1,1,2,2-Tetrachloroethane	ug/L	0.5	0.5 ug/L	ND	All	All
Tetrachloroethylene	ug/L	0.5	0.5 ug/L	ND	All	All
Toluene	ug/L	0.5	320 ug/L	ND	All	All
1,1,1-Trichloroethane	ug/L	0.5	23 ug/L	ND	All	All
1,1,2-Trichloroethane	ug/L	0.5	0.5 ug/L	ND	All	All
Trichloroethylene	ug/L	0.5	0.5 ug/L	ND	All	All
Trichlorofluoromethane	ug/L	1.0	2000 ug/L	ND	All	All
Vinyl Chloride	ug/L	0.5	0.5 ug/L	ND	All	All
m/p-Xylene	ug/L	0.5		ND	All	All
o-Xylene	ug/L	0.5		ND	All	All
Xylenes, total	ug/L	0.5	72 ug/L	ND	All	All
Hydrocarbons						
F1 PHCs (C6-C10)	ug/L	25	420 ug/L	ND	All	All
F2 PHCs (C10-C16)	ug/L	100	150 ug/L	ND	All	All
F3 PHCs (C16-C34)	ug/L	100	500 ug/L	ND	All	All
F4 PHCs (C34-C50)	ug/L	100	500 ug/L	ND	All	All
Semi-Volatiles						
Acenaphthene	ug/L	0.05	17 ug/L	ND	All	All
Acenaphthylene	ug/L	0.05	1 ug/L	ND	All	All
Anthracene	ug/L	0.01	1 ug/L	ND	All	All
Benzo[a]anthracene	ug/L	0.01	1.8 ug/L	ND	All	All
Benzo[a]pyrene	ug/L	0.01	0.81 ug/L	ND	All	All
Benzo[b]fluoranthene	ug/L	0.05	0.75 ug/L	ND	All	All
Benzo[g,h,i]perylene	ug/L	0.05	0.2 ug/L	ND	All	All
Benzo[k]fluoranthene	ug/L	0.05	0.4 ug/L	ND	All	All
Chrysene	ug/L	0.05	0.7 ug/L	ND	All	All
Dibenzo[a,h]anthracene	ug/L	0.05	0.4 ug/L	ND	All	All
Fluoranthene	ug/L	0.01	44 ug/L	ND	All	All
Fluorene	ug/L	0.05	290 ug/L	ND	All	All
Indeno[1,2,3-cd]pyrene	ug/L	0.05	0.2 ug/L	ND	All	All
1-Methylnaphthalene	ug/L	0.05	1500 ug/L	ND	All	All
2-Methylnaphthalene	ug/L	0.05	1500 ug/L	ND	All	All
Methylnaphthalene (1&2)	ug/L	0.10	1500 ug/L	ND	All	All
Naphthalene	ug/L	0.05	7 ug/L	ND	All	All
Phenanthrene	ug/L	0.05	380 ug/L	ND	All	All
Pyrene	ug/L	0.01	5.7 ug/L	ND	All	All

Notes

1 MOE, Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act, dated April 2011

BOLD - concentration meets or exceeds O.Reg. 153/04 Table 7 (non-potable, shallow soil, anyl land use, coarse grained soil) criteria

ND - concentration not detected above Method Detection Limit

Appendices

Appendix A
Utility Clearances

USL-1
UNDERGROUND SERVICE LOCATORS INC.

Stan Pedlar
Locate Technician
stanp@usl-1.com
cell 613-986-7226

775 Taylor Creek Drive,
Ottawa ON K1C 1T1
tel 613-226-8750
fax 613-226-8677
toll-free 877-248-3444
www.usl-1.com

DATE: Aug 26 / 2019

Client Name: GHD

Job Location: Cummings Av.

Nature of work: BH's

DESCRIPTION OF PUBLIC LOCATES

BELL:
Utility in work area: Yes / (No) Located ☐ - Marked ☐ - See attached sketch ☑
Notes: Bell is Clear, See Promark Report.

BIRCH TEL:
Birch is Clear, See Promark.

GAS:
Utility in work area: Yes / (No) Located ☐ - Marked ☐ - See attached sketch ☐
Notes: Gas is Clear, See Promark.

HYDRO:
Utility in work area: Yes / (No) Located ☐ - Marked ☐ - See attached sketch ☑
Notes: Hydro Ottawa is Clear, See Promark.

WATER:
Utility in work area: (Yes) / No - Located ☐ - Marked ☑ - See attached sketch ☐
Notes: City Water is Clear, City Sewer is in Work Zone, See City Report.

ROGERS + TELUS:
Utility in work area: Yes / (No) - Located ☐ - Marked ☐ - See attached sketch ☑
Notes: Rogers + Telus are Clear, See Reports.

STREET + TRAFFIC:
Utility in work area: Yes / (No) - Located ☐ - Marked ☐ - See attached sketch ☑
Notes: Street + Traffic are Clear, See Reports.

Utility in work area: Yes / No - Located ☐ - Marked ☐ - See attached sketch ☐
Notes:

Notes:

Locators Name: Stan Pedlar **Signature:**

***** IF THERE ARE ANY QUESTIONS WITH REGARADS TO THIS OR ANY OTHER CLEARANCE SHEET PLEASE CONTACT US IMMEDIATELY *****

Promark telecon
Location of underground infrastructures

UNION GAS EMERGENCY #
Primary Locate Sheet 1-877-969-0999

Fax: 613-723-9277 Toll free: 1-800-371-8866 Email:

Request # **20193222441**
NORMAL

Utilities Located:	Revised Excavation Date	Excavation Date	Status
● Bell ● Gas ● Hydro Ottawa ☐ Hydro One ☐ ZAYO ☐ Lakefront Utilities ● BHTI	**N/A** mm/dd/yyyy	08/16/2019 00:00:00 mm/dd/yyyy	NEGOTIATED Homeowner ☐ Contractor ● Project ☐

Requested by:	Company:	Phone:	Fax/email:
TANIA HOLYER	USL	(613)-226-8750 ext.	(613)-226-8677 **N/A**

Appt Date:	Received Date:	Locate Address: **CUMMINGS AVE**
N/A mm/dd/yyyy	08/09/2019 mm/dd/yyyy	1st Inters.: OGILVIE RD 2nd Inters.: CYRVILLE RD

Type of work: BORE HOLES

City: **OTTAWA**

Caller's Remarks:
MACH. DIG
CORLOT=U EXCAVATIONS THROUGHOUT THE PROPERTIES OF 1178 CUMMINGS AVENUE AND 1098 OGILVIE. CLEAR ENTIRE PROPERTIES AS PER SKETCH PROVIDED.

-75.631679, 45.425067, NB_SEGMENTS::1, NO_PLAN:613 748, BCOE01, OTWASL01, OTWATS01, BHTI01, OTWAWS01, ROGOTT01, TELUSON3, ENOE01, HOT1

Bell Mark | Clear	Enbridge Gas Mark | Clear	Hydro Ottawa Mark | Clear	BHTI Mark | Clear	Lakefront Mark | Clear	Hydro One Mark | Clear	Veridian Mark | Clear	Union Gas Mark | Clear	Videotron Mark | Clear
1	1	1	1	N/A	N/A	N/A	N/A	N/A

LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE.

Records Reference:
_ Map ● LAC MultiViewer ● GMobile
_ Byers ● Datapak: **PMOTTP1461**
Field Notes: **GL129 6N0490-6 6N1485-5**
Other: **N/A**
DPT Remarks: **N/A**

_ Third Party Notification **N/A**

N/A

Apply Sticker Here if Required

Excavator shall notify & receive a clearance from Utility prior to excavation for the following: **N/A**
Telecon ☐ High Priority Cable ☐ Central Office Vicinity

Method of Field Marking: ● Paint ☐ Stakes ● Flags ☐ Offset Flags ☐ Other (Telecom=Orange, Gas=Yellow, Hydro Ott. =Red)

Caution: Locates are VOID after 30 days. Hydro One valid for 60 days. See Disclaimer for the specific Facility Owner's Guidelines.

Caution: Any changes to location or nature of work require new locate. The Excavator must not work outside the Located Area without a new locate. Privately owned services within the located area have not been marked - check with service/property owner. For all Locate requests including remarks contact: Ontario One Call at 1-800-400-2255 or www.on1call.com.

Locator Name: MUSANYA MIKAEL	Start Time: 07:30	_ Mark & Fax _ Left on Site ● Emailed
ID #: 2161	End Time: 09:00	Print: **N/A**
Date 08/22/2019	Total Hours: 1.5 HRS	Signature: **N/A**

A copy of this Primary Locate Sheet and Auxiliary Locate Sheet(s) must be on site and in the hands of the machine operator during work operations. If sketch and markings do not coincide, the Excavator must obtain a new locate.

This form revised December 2016

Promark telecon
Locates of Underground Infrastructures

Auxiliary Locate Sheet

Union Gas Emergency # 1-877-969-0999

Fax: 613-723-9277 Toll free: 1-800-371-8866 Email

Utilities ☐ Bell ☐ Gas ● HydroOttawa ☐ Street Lighting
Located: ☐ Blink ☐ Peel Fibre ☐ ☐

Date Located: mm/dd/yyyy 08/22/2019

Request # 20193222441

Number of Services marked: (Specify building/house numbers) N/A

LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE

FROM: E. FL OF 1092 OGILVIE RD
FROM: N. FC OF 1173 CRYVILLE RD PARKING LOT

TO: E. FL OF 1092 OGILVIE RD
TO: 135.0M N. OF N. FC 1173 CRYVILLE RD PARKING LOT

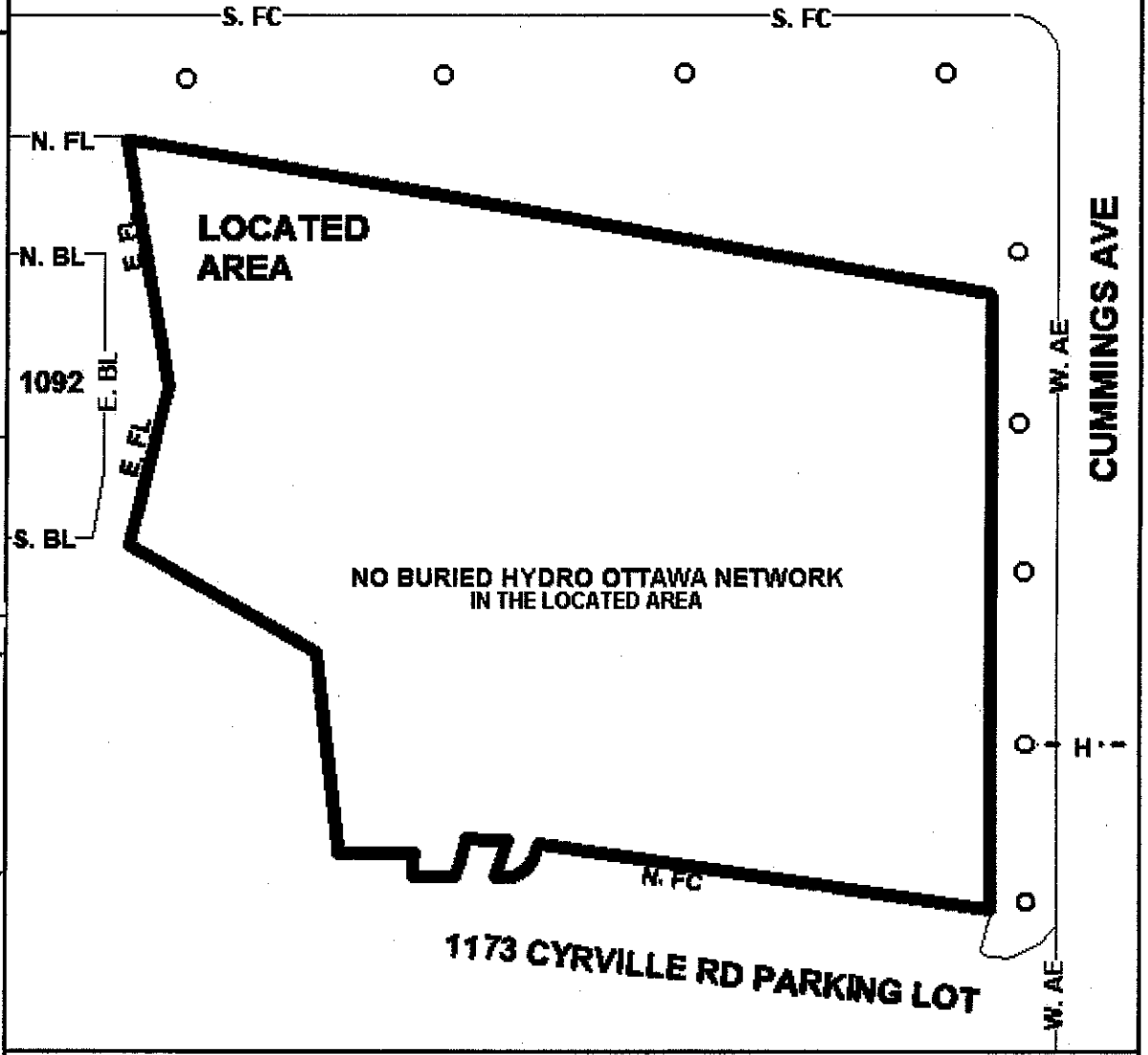
CAUTION: Hand dig within 1.5M as measured horizontally from the field markings to avoid damaging the underground utilities. If you damage the plant, you may be held liable. If you damage underground plant, contact the facility owner immediately. Depth varies and MUST be verified by hand digging or vacuum excavation.

LOCATED AREA HAS BEEN ALTERED AS PER: N/A

HYDRO OUTSIDE LOCATED AREA SHOWN FOR REFERENCE ONLY

Legend

Building Line	— BL —
Fence Line	— FL —
Face of Curb	— FC —
Asphalt Edge	— AE —
Property Line	— PL —
Driveway	— DW —
Catch Basin	CB
Sidewalk	SW
Demarcation	DM
Railway	
Pole	○
Flush to Grade Pedestal	
Pedestal	X
Buried Cable	— B —
Conduit	— C —
Buried Service Wire	— BSW —
Manhole	MH
Fibre Optic Cable	— FO —
Gas Main	— GM —
Gas Service	— GS —
Gas Valve	
Hydrant	
Transformer	
Hydro Ottawa	— H —
Hydro Pole	X
StreetLightCable	— SL —
Street Light	
North	N.
South	S.
East	E.
West	W.



THIS FORM VALID ONLY WITH Primary Locate Form. This sketch is not to scale.
Any privately owned services within the located area have not been marked- check with service/property owner.

A copy of this Auxiliary Locate Sheet(s) and the Primary Locate Sheet must be on site and in the hands of the machine operator during work operations. If sketch and markings do not coincide, the Excavator must obtain a new locate.

Promark telecon
Location of underground infrastructure

Auxiliary Locate Sheet

Union Gas Emergency # 1-877-969-0999

Fax: 613-723-9277 Toll free: 1-800-371-8866 Email

Utilities Located:	Date Located:	Request #
☐ Bell ● Gas ☐ HydroOttawa ☐ Hydro One ☐ Videotron ☐ Peel Fibre ☐ BHTI	mm/dd/yyyy 08/22/2019	20193222441

Number of Services marked: (Specify building/house numbers) **(0)**

LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE

FROM: E. FL OF 1092 OGILVIE RD
FROM: N. FC OF 1173 CRYVILLE RD PARKING LOT
TO: E. FL OF 1092 OGILVIE RD
TO: 135.0M N. OF N. FC 1173 CRYVILLE RD PARKING LOT

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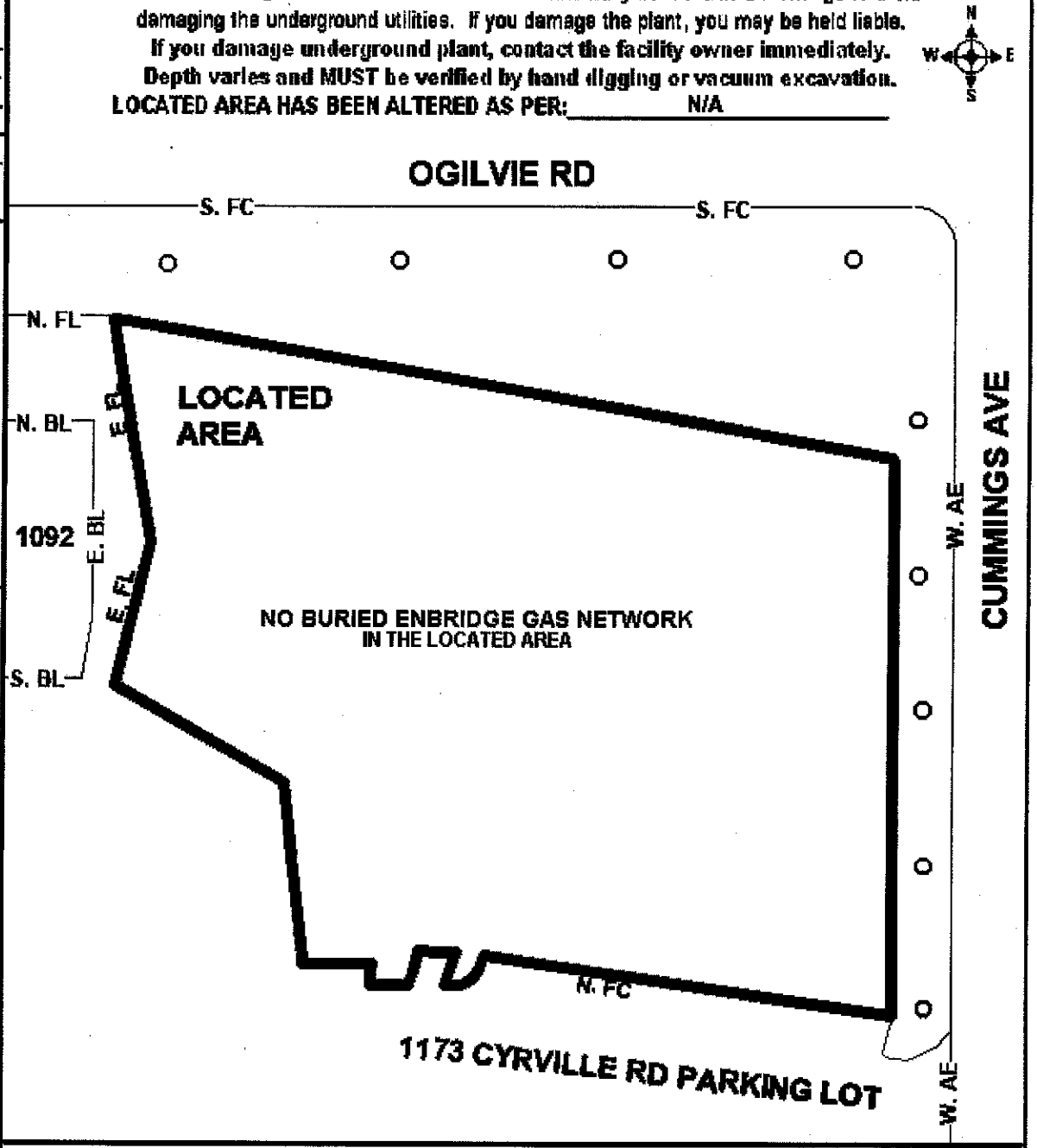
LOCATED AREA HAS BEEN ALTERED AS PER: N/A

Legend

Building Line	BL
Fence Line	FL
Face of Curb	FC
Asphalt Edge	AE
Property Line	PL
Driveway	DW
Catch Basin	CB
Sidewalk	SW
Demarcation	DM
Railway	
Pole	O
Flush to Grade Pedestal	
Pedestal	X
Buried Cable	B
Conduit	C
Buried Service Wire	BSW
Manhole	MH
Fibre Optic Cable	FO
Bell Hydro Service	HS
Gas Main	GM
Gas Service	GS
Gas Valve	
Hydrant	
Transformer	
Hydro	H
Hydro Pole	X
StreetLightCable	SL
Street Light	
North	N.
South	S.
East	E.
West	W.



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Promark telecon
Location of underground infrastructure

Auxiliary Locate Sheet

Union Gas Emergency # 1-877-969-0999

Fax: 613-723-9277 Toll free: 1-800-371-8866 Email

Utilities Located:	Date Located:	Request #
● Bell ☐ Gas ☐ HydroOttawa ☐ Hydro One ☐ Videotron ☐ Peel Fibre ☐ BHTI	mm/dd/yyyy 08/22/2019	20193222441

Number of Services marked: (Specify building/house numbers) **(0)**

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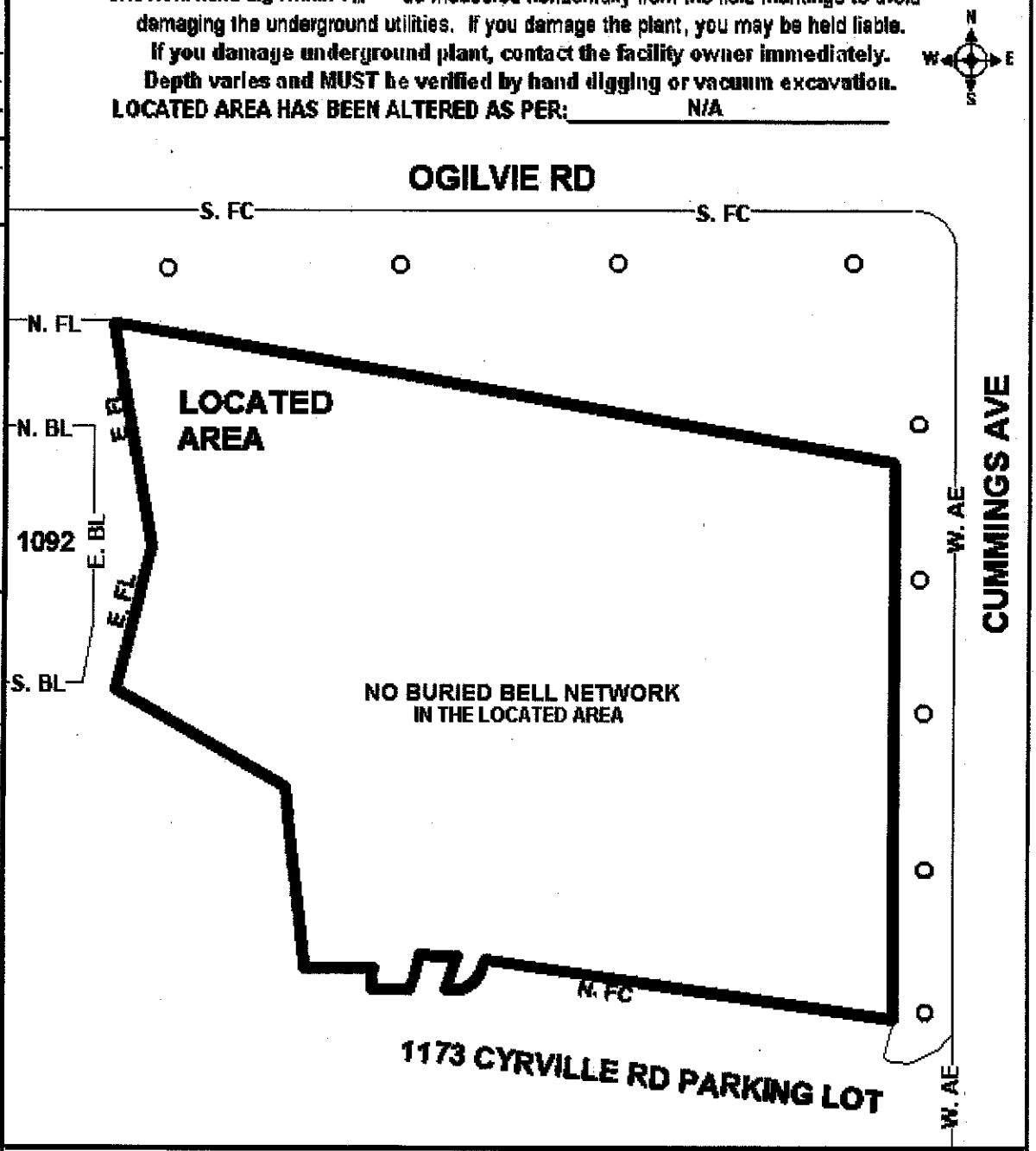
LOCATED AREA HAS BEEN ALTERED AS PER: N/A

Legend

- Building Line — BL
- Fence Line — FL
- Face of Curb — FC
- Asphalt Edge — AE
- Property Line — PL
- Driveway — DW
- Catch Basin — CB
- Sidewalk — SW
- Demarcation — DM
- Railway
- Pole
- Flush to Grade Pedestal
- Pedestal — X
- Buried Cable — B
- Conduit — C
- Buried Service Wire — BSW
- Manhole — MH
- Fibre Optic Cable — FO
- Bell Hydro Service — HS
- Gas Main — GM
- Gas Service — GS
- Gas Valve
- Hydrant
- Transformer
- Hydro — H
- Hydro Pole — X
- Street Light Cable — SL
- Street Light
- North — N.
- South — S.
- East — E.
- West — W.



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Promark telecon
Location of underground infrastructure

Auxiliary Locate Sheet

Union Gas Emergency # 1-877-969-0999

Fax: 613-723-9277 Toll free: 1-800-371-8866 Email

Utilities Located: ☐ Bell ☐ Gas ☐ HydroOttawa ☐ Hydro One ☐ Videotron ☐ Peel Fibre ● BHTI

Date Located: mm/dd/yyyy 08/22/2019

Request # 20193222441

Number of Services marked: (Specify building/house numbers) **(0)**

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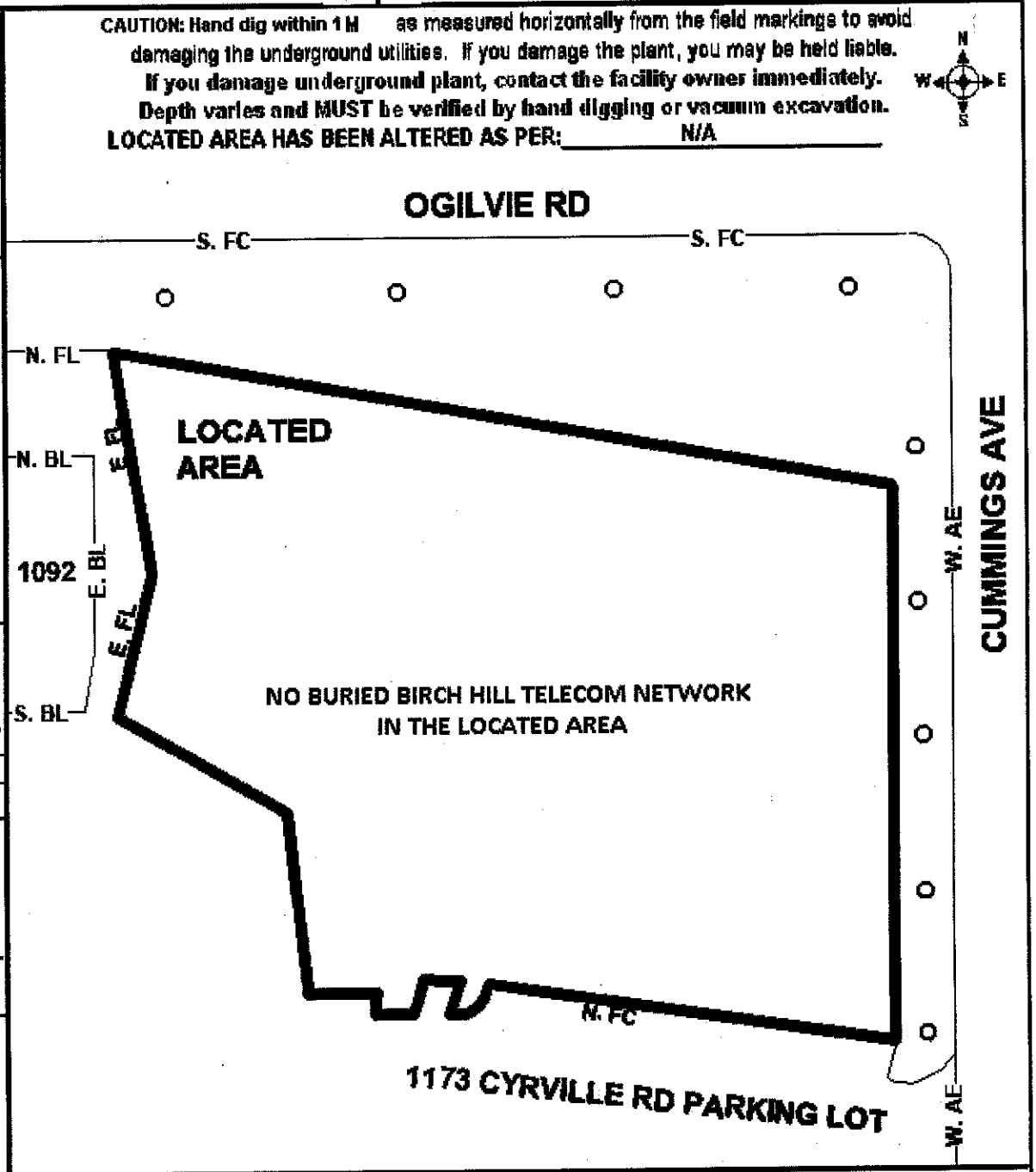
Legend

- Building Line — BL
- Fence Line — FL
- Face of Curb — FC
- Asphalt Edge — AE
- Property Line — PL
- Driveway — DW
- Catch Basin — CB
- Sidewalk — SW
- Demarcation — DM
- Railway
- Pole — O
- Flush to Grade Pedestal
- Pedestal — X
- Buried Cable — B
- Conduit — C
- Buried Service Wire — BSW
- Manhole — MH
- Fibre Optic Cable — FO
- Bell Hydro Service — HS
- Gas Main — GM
- Gas Service — GS
- Gas Valve
- Hydrant
- Transformer
- Hydro — H
- Hydro Pole — X
- Street Light Cable — SL
- Street Light
- North — N.
- South — S.
- East — E.
- West — W.



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A copy of this Auxiliary Locate Sheet(s) and the Primary Locate Sheet must be on site and in the hands of the machine operator during work operations. If sketch and markings do not coincide, the Excavator must obtain a new locate.

Bell

February 9 2015

To all Excavators:

Bell locates are now valid for the life of the excavation project and will not automatically be relocated every 60 days.

Please note the following for the above to apply:

a) Construction within the located area begins within 60 days of the "locate completed" date on the original ticket.

b) The construction company named on the locate remains active on the site.

Bell expects excavators will protect and preserve the paint marks put down on the original locate ticket. If markings are removed due to weather or excavation work the excavator is expected to recreate the markings based on the tie-in measurements provided on the original locate ticket.

If an excavator would like their markings freshened up they can contact Promark (the Bell Canada Locate Service Provider in this area) directly to arrange for them to place fresh markings on the ground however this will be at the excavators expense. Promark can be reached at 613-723-9888.

The locate will be considered officially expired one day after the final day of construction.

Thank you,

Bell Canada

DISCLAIMER

Warning!

The Excavator must have a copy of this locate on the job site during excavation.

Located Area: The Excavator must not work outside the area indicated by the Located Area in the Diagram without a further locate by the Company

Locate the plant: The plant location information provided is the best we have available but constitutes only an estimate. Depth of underground plant varies and the exact location must be determined by hand digging prior to excavation with mechanical equipment.

Mechanical equipment must not be used within one metre of the estimated location of the plant.

Hydro Ottawa must be notified prior to excavation and inspector on site

Expose the plant: Once the plant has been located by hand digging, it must be exposed along its length adjacent to or in the immediate vicinity of the proposed excavation. For this purpose, mechanical equipment must not be used within 0.5 metres of the plant.

Digging around the exposed plant: When the plant has been exposed, any further excavation within 0.3 metres, must only be done by hand digging and not with mechanical equipment.

Support Requirements: If the underground plant is exposed over a distance of more than 1.25 metres, the Facility Owner must be notified. Underground plant must be supported at all times.

O. Reg. 210/01 Oil and Gas Pipeline systems EXCERPTS

9. (1) No person shall dig, bore, trench, grade, excavate or break ground with mechanical equipment or explosives without first ascertaining the location of any pipeline that may be interfered with.

10. No person shall interfere with or damage any pipeline without authority to do so.

Technical Standards & Safety Act 2000 EXCERPT

37 (1) Every person who contravenes or fails to comply with any provision of this act or the regulations; etc... is guility of an offense and on conviction is liable to a fine of not more than $50,000 or to imprisonment for a term of not more than one year, or to both.

Caution: The markings may disappear or be misplaced. Should sketch and markings not coincide, Excavator must obtain a new locate. This is based on information given at the time. Any changes to location or nature of work require a new locate. The Excavator must not work outside the indicated Located Area without a further locate.
Privately owned services within the located area have not been marked - check with service/property owner.

Locate is VOID after 30 days.

For remarks contact Ontario One Call 1-800-400-2255.
or www.on1call.com

ON1CALL
CALL BEFORE YOU DIG

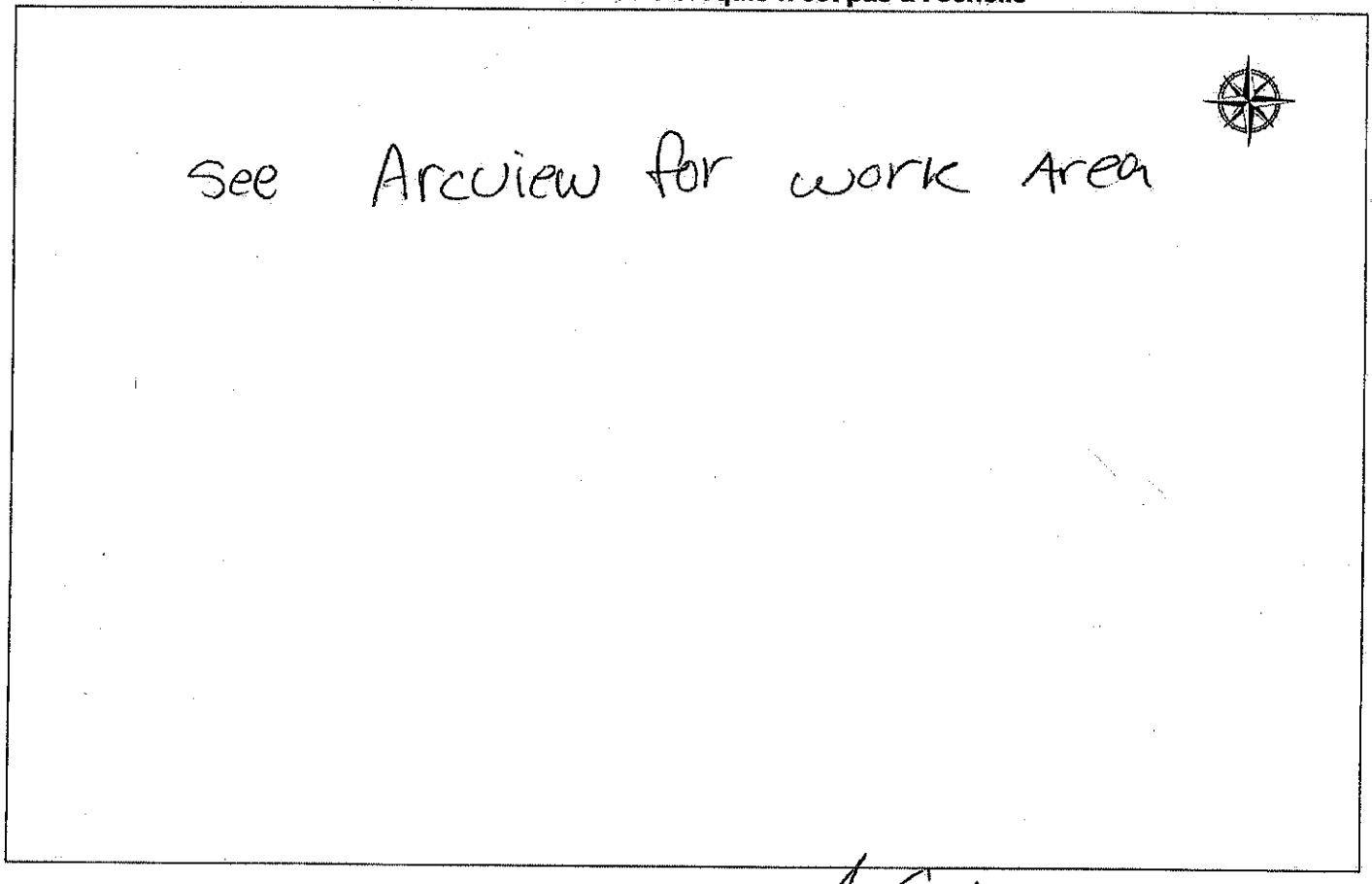
GHD

City of Ottawa Locate Report – Water and Sewer Utilities
Rapport de localisation des conduites d'eau et d'égout d'Ottawa

For more information / Pour de plus amples renseignements : 3-1-1 or/ou (613) 580-2424, ext. (poste) 22336.

Date : Aug 16 / 2019	Work Order # / No d'ordre de travail : 11950463
Location of Work / Lieu de travail : Cummings Ave	ON1CALL # / No d'appel ON1 : 20193222441
Type of Work / Type de travail : Boreholes	☑ ArcView attached Plan ArcView ci-joint
Contractor / Entrepreneur : locates@us1-1.com	Fax / Télécopieur : email

Sketch Not To Scale / Le croquis n'est pas à l'échelle



Contractor signature
Signature de l'entrepreneur

A Gauthier
Locator (please print)
Marqueurs [en lettres moulées]

Method of marking / Méthode de marquage

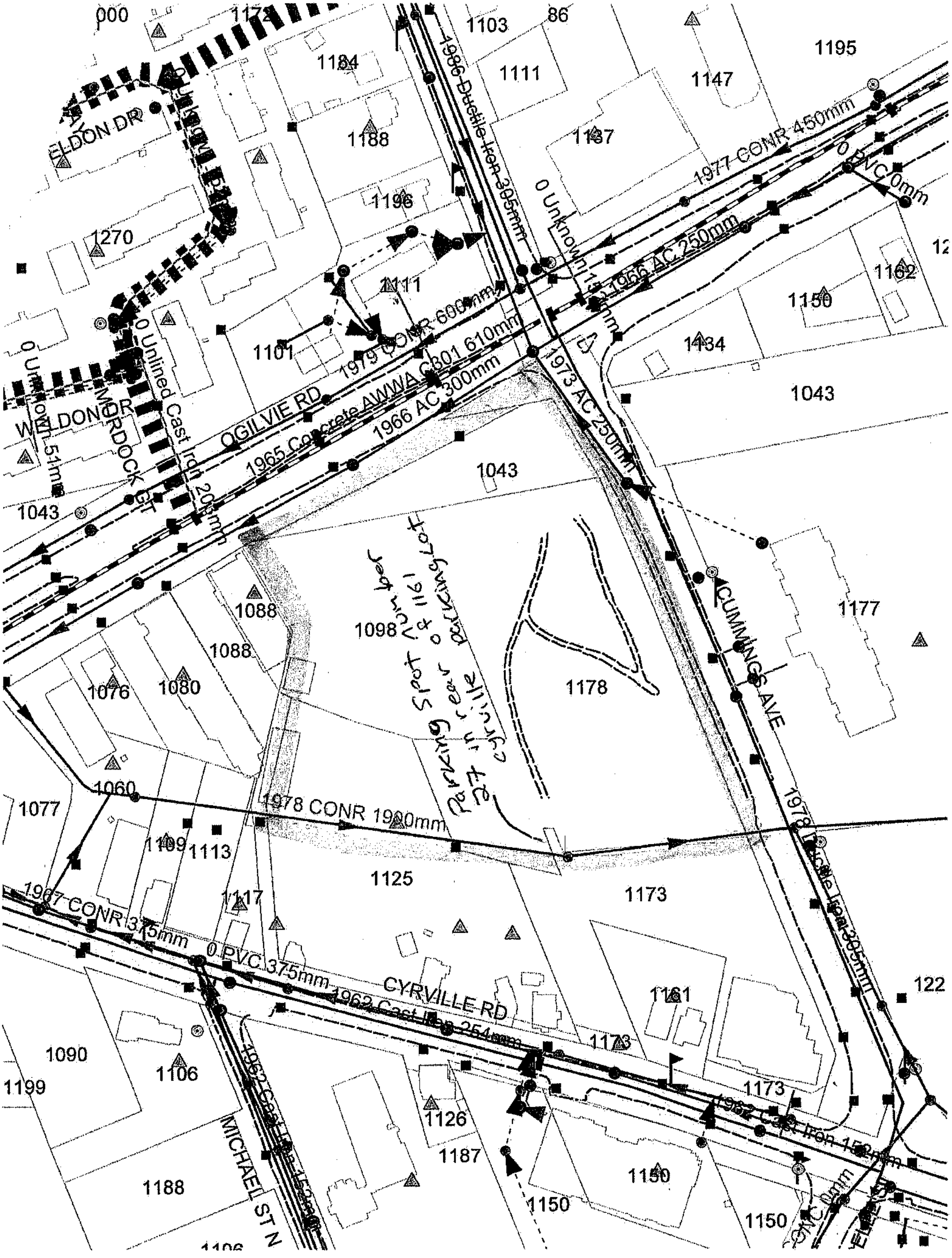
☐ Flags / Drapeaux ☐ Paint / Peinture ☐ Other (specify) / Autre [précisez] :

Remarks / Commentaires : _____

Office copy : White
Copie du bureau : Blanc

Contractor copy: Yellow
Copie de l'entrepreneur : Jaune

Void after 60 days.
Périmé après 60 jours.


OGILVIE RD
CYRVILLE RD
CUMMINGS AVE
MICHAEL ST N
MORDOCK GT
WELDON DR
1979 CONR 600mm
1965 Concrete AWWA C301 610mm
1966 AC 300mm
1977 CONR 450mm
1966 AC 250mm
1973 AC 250mm
1986 Ductile Iron 305mm
1978 CONR 1900mm
1967 CONR 375mm
0 PVC 375mm
1962 Cast Iron 254mm
1962 Cast Iron 152mm
0 Unlined Cast Iron 203mm
Parking Spot number 27 in rear of 1161 cyrville parking lot
1043
1098
1178
1125
1173
1161
1177
1088
1080
1076
1060
1077
1109
1113
1117
1090
1106
1199
1126
1187
1188
1150
1101
1111
1196
1188
1184
1103
1111
1147
1195
1137
1270
1162
1134

DISCLAIMER

The excavator must have a copy of this locate on the job site during excavation.

Locate area: The excavator must not work outside the area indicated in the location of work or located area in the diagram without an updated locate. Stakes or markings may disappear or be displaced. If any delays occur in acting on the stakeout information, or if markings become unclear, a new locate must be obtained.

Locating the plant: The plant location information provided is only an estimate. Depth of underground plant varies and the exact location must be determined by hand digging prior to excavation with mechanical equipment.

Warning: Do not use mechanical equipment within one (1) metre of the estimated location of the water or sewer plant. If the plant is larger than 406mm, mechanical equipment must not be used within three (3) meters.

Digging around exposed plants: Must do any further excavation within 0.3 metres of an exposed water or sewer plant by hand.

Contractors are to perform all work in accordance with applicable City of Ottawa By-laws and any applicable federal and provincial legislation or regulations, including but not limited to the *Public Utilities Act, R.S.O. 1990, c. P.52, s. 56(1)*; *Ontario Regulation 210/01 under the Technical Safety Standards Act, 2000 , S.O. 2000 c. 16*; *Ontario Regulation 213/91 under the Occupational Health and Safety Act, R.S.O. 1990, c. O.1.*

AVIS DE NON-RESPONSABILITÉ

L'opérateur de l'excavatrice doit avoir en sa possession ce rapport de localisation pendant l'excavation.

Zone de localisation : l'opérateur de l'excavatrice ne doit pas creuser en dehors de la zone indiquée sur l'ordre de travail ni à l'extérieur de la zone indiquée sur le diagramme, à moins d'avoir en sa possession un rapport de localisation actualisé. Les piquets ou les marques peuvent disparaître ou être déplacés. S'il y a un retard à intervenir sur la base des données de surveillance ou si le marquage devient imprécis, il faut obtenir un nouveau rapport de localisation.

Déterminer l'emplacement des conduites : les renseignements sur l'emplacement des conduites sont approximatifs. Pour déterminer l'emplacement et la profondeur, on doit creuser manuellement avant d'utiliser une excavatrice.

Avertissement : n'utilisez pas d'équipement mécanique [excavatrice] à moins d'un [1] mètre de l'emplacement supposé de la conduite d'eau ou d'égout. Si la conduite compte plus de 406 mm de diamètre, aucun équipement mécanique ne doit être utilisé à moins [3] de trois mètres de celle-ci.

Creuser autour des conduites exposées : toute excavation à moins de 0,3 m d'une conduite d'eau ou d'égout doit se faire manuellement.

Les entrepreneurs doivent exécuter tous les travaux conformément aux règlements de la Ville d'Ottawa et aux lois et règlements fédéraux ou provinciaux applicables, y compris, mais sans s'y limiter, la *Loi sur les services publics, L.R.O. 1990, chap. P.52, art. 56[1]*; le *Règlement 210/01 de l'Ontario* en vertu de la *Loi de 2000 sur les normes techniques et la sécurité, L.O. 2000, chap. 16*; et le *Règlement 213/91 de l'Ontario* en vertu de la *Loi sur la santé et la sécurité au travail L.R.O. 1990, chap. O.1.*

CHD

CANADIAN LOCATORS INC.
Servicing the Utilities Industry

Ph: (905)479-5674 Email: ontario@canadianlocators.com

ROGERS
Primary Locate Sheet

ON 1 Call Ticket # : 20193222441

Contractor / Excavator : U S L			**Contact Name :** TANIA HOLYER
Tel : 613-226-8750	**Alt. Phone :**	**Email :** locates@usl-1.com	
Received Date : Aug 9 2019	**Excavation Date :** Aug 16 2019	**Revised Excavation Date:**	**Type of Work :** BORE HOLES
Locate Address : CUMMINGS AVE			**City / Municipality :** OTTAWA, ONTARIO
Nearest Intersection : OGILVIE RD & CYRVILLE RD			

Method of Field Marking : ☐ Paint ☐ Stakes ☐ Flags

Caller's Remarks *(Additional Info)* **:**
CORLOT=U Excavations throughout the properties of 1178 Cummings Avenue and 1098 Ogilvie. Clear entire properties as per sketch provided.

Utilities Marked :					**This locate has multiple work areas which are greater than 100 m apart :**
☐ Coaxial Plant	☐ Fibre Optics Plant				☐ Yes ☐ No
Total Length : m	**Total Length :** m				

Field sketch and Located Area shown on auxiliary locate sheet(s)

This locate is for ROGERS plant / infrastructure ONLY !

Apply sticker here if required

CAUTION : Locate is VOID after 60 days !

CAUTION : Hand dig within one (1) meter or 3.28 feet of markings. The Located Area defined on the Auxiliary Locate Sheet(s) contains all known ROGERS infrastructure. Any changes to excavation area or nature of work requires a new locate.

For all cut cable, please call :
1-800-265-9501

Locator's Comments :
ROGERS CABLES CLEAR IN LOCATED AREA

Locator's Name : *(Please Print)*
David Stoddard

Date :	**Start Time :**	**End Time :**
Aug 23 2019	5:30 PM	5:40 PM

A copy of this Primary Locate Sheet and Auxiliary Locate Sheet(s) must be on site and in the hands of the machine operator during work operations. Should sketch and markings not coincide, a new locate MUST be obtained.

CANADIAN LOCATORS INC.
Servicing the Utilities Industry

Ph: (905)479-5674 Email: ontario@canadianlocators.com

ROGERS
Auxiliary Locate Sheet

ON 1 Call Ticket # : 20193222441

Utilities Marked :

☐ Coaxial Plant m ☐ Fibre Optics Plant m

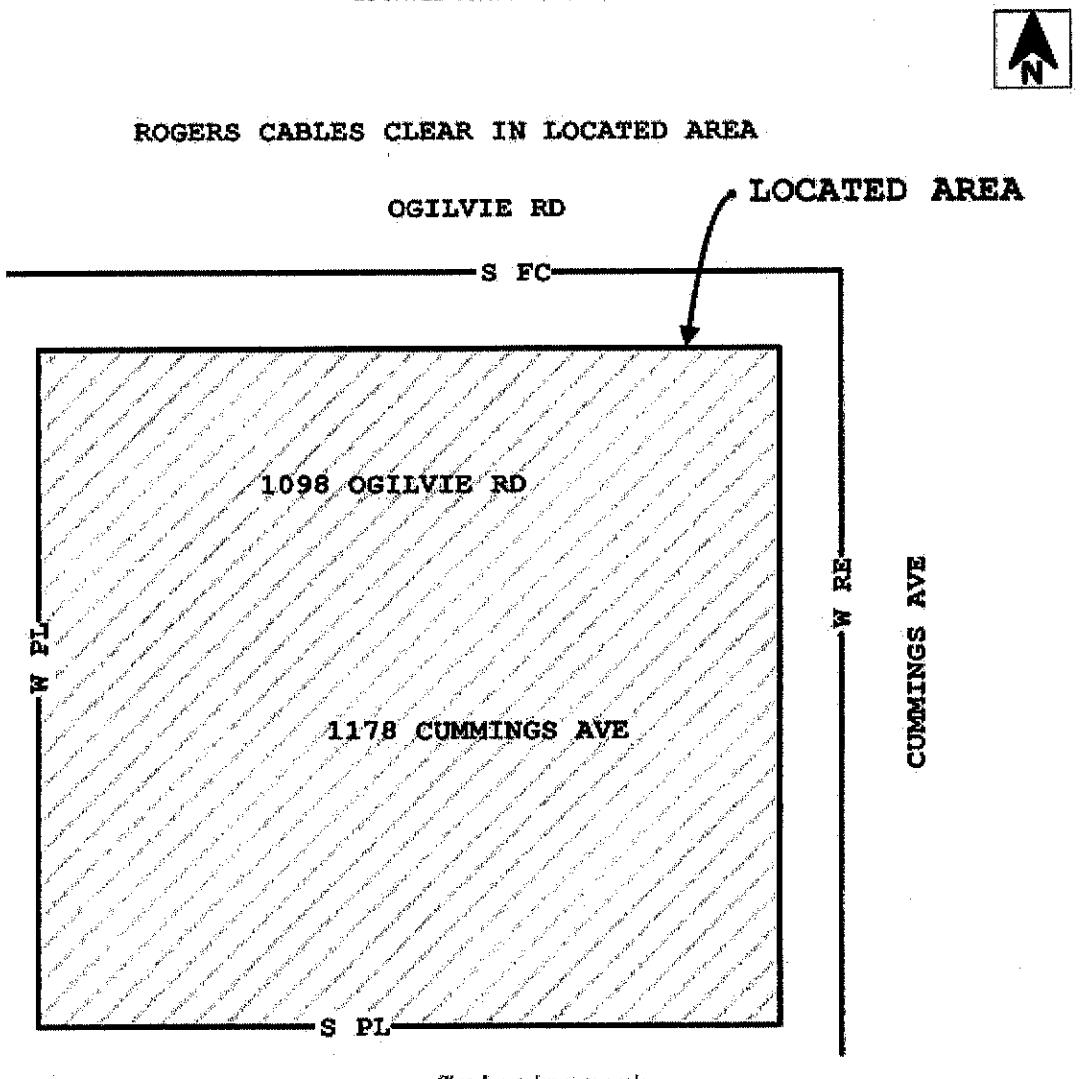
Number of Services Marked : (specify building/house numbers)

NA

LOCATED AREA CONTAINS ALL KNOWN ROGERS INFRASTRUCTURE

FROM :	TO :
10M S OF S FC OF OGILVIE RD	S PL OF 1178 CUMMINGS AVE
FROM :	**TO :**
W PL OF 1098 OGILVIE RD	6M W OF W RE OF CUMMINGS AVE

Hand dig within 1 meter or 3.28 feet as measured horizontally from the field markings to avoid damaging the underground utilities.
If you damage the utilities, you may be held liable. **For all cut cable, please call: 1-800-265-9501 immediately!**
Depth of cable plant varies and **MUST** be determined by hand digging or vacuum excavation.
LOCATED AREA ALTERED AS PER :



Sketch not drawn to scale

LEGEND :

Fibre Optic — FO —	Road Edge — RE —	Property Line — PL —	Tree	Transformer TR	Streetlight SL
Cable / T.V. — CATV —	Bldg Line — BL —	Lot Line — LL —	Pedestal	Manhole	Hand Hole HH
Conduit — C —	North Direction N	Face of Curb — FC —	Pole	Catch Basin CB	Hydrant H
Railway	Sidewalk SW	Driveway — DW —	Valve	North N	East E
Work Area	Measurement	Fence Line — FL —	Vault	South S	West W

A copy of this Auxiliary Locate Sheet(s) and the Primary Locate Sheet must be on site and in the hands of the machine operator during work operations. Should sketch and markings not coincide, a new locate MUST be obtained.

TELUS

Primary Locate Sheet

Ontario One-Call Ticket # : **20193222441**

FACILITIES LOCATED:

☐ YES
☐ NO Telephone

LOCATED BY:

☐ FLAG ☐ PAINT ☐ STAKE

```
Locatorbase.net Ticket
Ontario One Call                Telus/Rogers - Ontario
                                Frontenac/Ottawa Region

Ticket No.: 20193222441  MULTIPLE DIG SITES (STANDARD)

Contractor  : U S L
Contact     : TANIA HOLYER            Phone: (613)226-8750
Alt. Contact: JACQUES DESJARDINS      Phone:
Caller Email: locates@usl-1.com

City: OTTANA     Prov: ONTARIO
Address: CUMMINGS AVE
Nearest Intersection: OGILVIE RD & CYRVILLE RD

Additional Info: CORLOT=U Excavations throughout the
properties of 1178 Cummings Avenue and 1098 Ogilvie. Clear
entire properties as per sketch provided.

Type of Work: BORE HOLES
Depth: 30.480 m       Exc. Size:
Type of Property: PUB/PVT
                  Premarked    Mach. Dig
Work Being Done For: GHD
Station  Codes: ROGERS TELUS
District Codes: ROGOTT01 TELUSON3

Call Date: Aug 09, 19  Time: 3:21 PM  Op: 59
Transmit Date: Aug 12, 19  Time: 11:48 AM  Op: teldig
```

THIS LOCATE IS VOID (EXPIRES) AFTER 30 DAYS

This Primary and all Auxiliary locate sheets **MUST** remain **WITH** the Operator on the **JOB SITE**. The **LOCATION MARKED** is **APPROXIMATE** only. Any facilities involved must be exposed by **HAND DIGGING** or approved **HYDROVAC** method before excavating with **MACHINERY** within 1 meter as measured horizontally from the field markings.

CAUTION: any changes to location or nature of work requires a new locate. Excavator **must not** work outside of the Located Area without a new locate. For all locate requests, including remarks, contact: Ontario One Call 1-800-400-2255 or www.on1call.com

Field sketch and Located Area shown on auxiliary locate sheet(s)

* NOTE * - privately owned facilities may be present in the Locate Area. Any privately owned services have not been marked; check with the service / property owner.

CANADIAN LOCATORS INC. Located by Canadian Locators Inc. For questions and/or clarification regarding this locate, please call 905-479-5674.

LEGEND :

TELUS		Pedestal		North	N
TELUS Fiber		Vault		East	E
Building Line	BL	Transformer		South	S
Road Edge	RE	Manhole	MH	West	W
Property Line	PL	Catch Basin	CB	Tree	
Fence Line	FL	Pole		Work Area	
Face of Curb	FC	Streetlight		North Direction	N
Driveway	DW	Hand Hole	HH		
Railway		Hydrant			
Measurement					

Locator's Name : *(Please Print)* David Stoddard

Date :	Arrival :	Departure :
Aug 23 2019	5:30 PM	5:40 PM

Accepted By : *(Please Print)* TANIA HOLYER

Company : U S L

Locator's Comments : TELUS CABLES CLEAR IN LOCATED AREA

A copy of this Primary Locate Sheet and Auxiliary Locate Sheet(s) must be on site and in the hands of the machine operator during work operations. Should sketch and markings not coincide, a new locate MUST be obtained.

TELUS

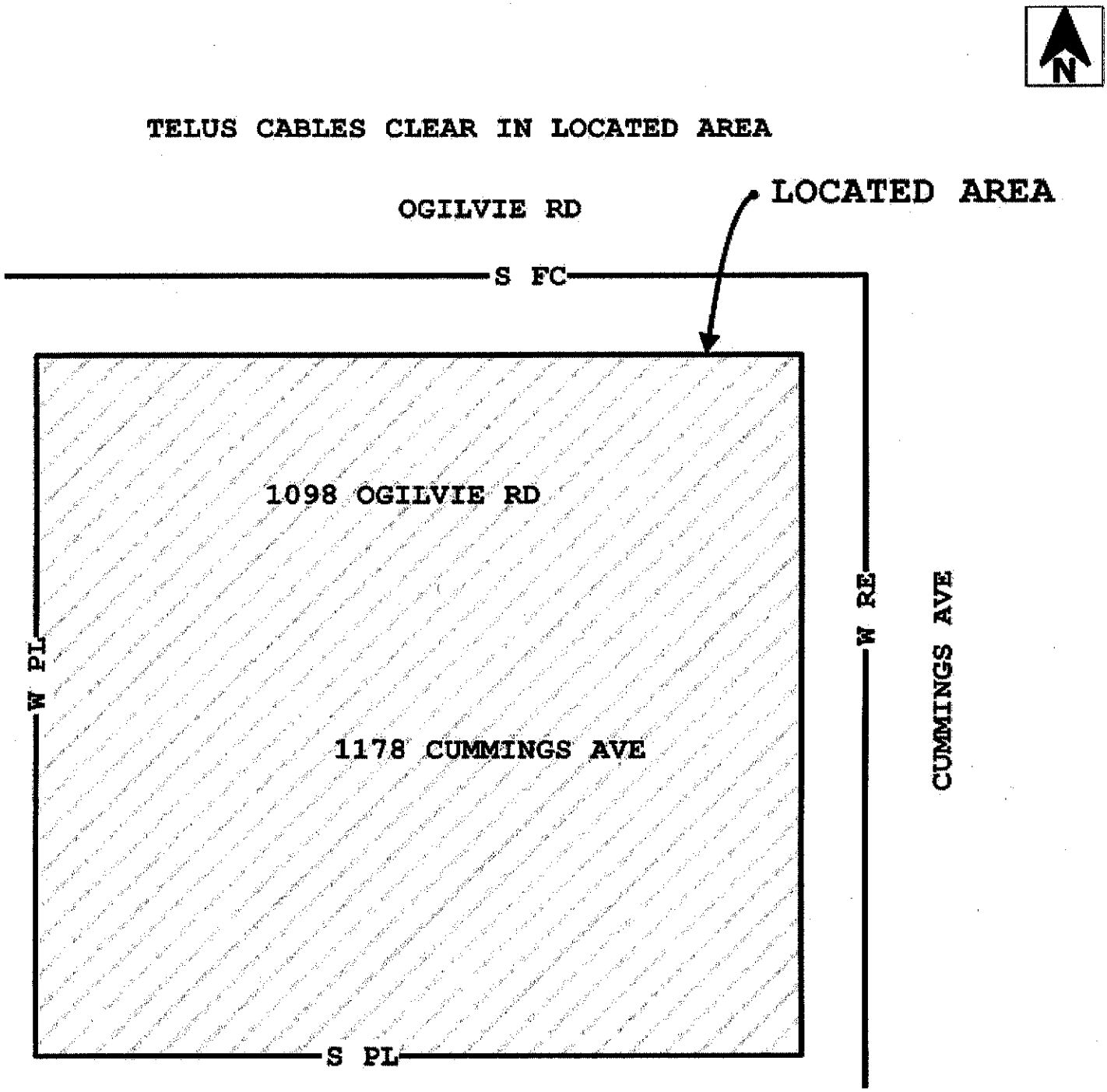
Auxiliary Locate Sheet

Ontario One-Call Ticket # : 20193222441

LOCATED AREA : EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE.

From :	To :
10M S OF S FC OF OGILVIE RD	S PL OF 1178 CUMMINGS AVE
From :	To :
W PL OF 1098 OGILVIE RD	6M W OF W RE OF CUMMINGS AVE

Hand dig within 1.0 m as measured horizontally from the Field Markings.
Depth varies and must be verified by hand digging. Mechanical equipment MUST NOT be used within the 1.0 m buffer zone!
LOCATED AREA ALTERED AS PER :



Sketch not drawn to scale

A copy of this Auxiliary Locate Sheet(s) and the Primary Locate Sheet must be on site and in the hands of the machine operator during work operations. Should sketch and markings not coincide, a new locate MUST be obtained.

640

Ontario One Call TF

City of Ottawa
Street Light Locate

[redacted]
Black&McDonald
[redacted]

NOTICE OF INTENT TO EXCAVATE

Header Code: STANDARD

Request Type: NORMAL

Ticket No: 20193222441

Original Call Date: 08/09/2019 3:53:10 PM
Work To Begin Date: 08/16/2019

Company: U S L
Contact Name: TANIA HOLYER
Contact Phone: (613)-226-8750 ext.
Fax: (613)-226-8677 ext.
Alternate Contact: JACQUES DESJARDINS

Pager:
Cell:
Alt. Phone:

Place: OTTAWA
Street: CUMMINGS AVE
Nearest Intersecting Street: OGILVIE RD
Second Intersecting Street: CYRVILLE RD

Subdivision: OTTAWA

Additional Dig Information:
CORLOT=U EXCAVATIONS THROUGHOUT THE PROPERTIES OF 1178 CUMMINGS AVENUE AND 1098 OGILVIE. CLEAR ENTIRE PROPERTIES AS PER SKETCH PROVIDED. NO_PLAN::613 748

WO/ JOB #: ANYTIME
Type Of Work: BORE HOLES

Remarks:

-75.631879 45.425067 NB_SEGMENTS::1 BCOE01 OTWASL01 OTWATS01 BHTI01 OTWAWS01 ROGOTT01 TELUSON3 ENOE01 HOT1

On1 Call #	20193222441
Date Requested	08/09/2019 3:53:10 PM

City of Ottawa Street Light Locate

Dispatcher: Lisa Bisaillon
Phone: 613-526-1226

[redacted]
Black&McDonald
[redacted]

Company	U S L
Name	TANIA HOLYER
Phone	(613)-226-8750 ext.
FAX	(613)-226-8677 ext.
Site Contact	JACQUES DESJARDINS
Phone	

Instructions
CUMMINGS AVE
CORLOT=U EXCAVATIONS THROUGHOUT THE PROPERTIES OF 1178 CUMMINGS AVENUE AND 1098 OGILVIE. CLEAR ENTIRE PROPERTIES AS PER SKETCH PROVIDED. NO_PLAN::613 748

LOCATOR SKETCH

N

Clear
O-H Service

No City of Ottawa Street Light assets in dig area

—SL— Underground Street Light Cable
Street Light

—OH— Overhead/Aerial Wires
Globe/Decorative Light

Source/Transformer
Hydro Pole

Locator Notes/Comments:

Locate is valid for 60 days. If sketch is different from markings, location or nature of work changes, a new locate must be requested. Hand dig within 1m (3.28ft) on either side of markings. Depth of buried plant varies.

Cette fiche n'est pas valide 60 jours de calendrier apres le reperage. Si les marques ne concordent pas avec celles sur le croquis, un nouveau reperage est requis. Tout changement a l'emplacement ou a la nature du travail necessite un nouveau reperage. Creuser a la main un metre (3.28 pieds) du repere. La profondeur des installation varie d'un endroit a l'autre.

Date Located	08/16/2019
Time of day	
Located by	KRISTOFER LOBO
Signature	

Black & McDonald

Disclaimer

Warning!

The Excavator must have a copy of this locate on the job site during excavation.

Located Area: The Excavator must not work outside the area indicated, by the located area in the diagram, without a further locate completed by **Black & McDonald Limited.**

Locate the Plant: The plant location information provided is the best we have available, but constitutes only an estimate. Depth of underground plant varies and the exact location must be determined by hand digging prior to excavation with mechanical equipment.

Mechanical equipment must not be used within 1.0 meter of the estimated location of the plant.

Valid Documentation: This locate is valid only for the Agency accepting it. Other parties must obtain and accept their respective underground locate from **Ontario 1 Call.**

Excavator Alterations: Under no circumstance shall an Excavator touch or move an underground power cable. Arrangements must be made to have qualified personnel relocate any such cable.

Expose the plant: Once the plant has been located by hand digging, it must be exposed along its length adjacent to or in the immediate vicinity of the proposed excavation. For this purpose, mechanical equipment must not be used within 0.5 meters of the plant.

Digging around the Exposed Plant: When the plant has been exposed, any further excavation within 0.3 meters, must only be done by hand digging and not with mechanical equipment.

Support Requirements: If the underground plant is exposed over a distance of more than 1.25 meters, the Facility Owner must be notified. Underground plant must be supported at all times.

Private Cables: Please be advised that **Black & McDonald Limited** is not responsible for and does not locate private cables

New Cables: Be aware that new cables could be installed at any time after the locate has been completed. It is the Excavator's responsibility to call for new locates if any changes are known or suspected.

Caution: The markings may disappear or be misplaced. Should sketch and markings not coincide, the Excavator must obtain a new locate. This is based on the information given at the time. Any changes to location or nature of work require a new locate. The Excavator must not work outside the indicated located area without a further locate. Privately owned services within the located area have not been marked- check with service/property owner.

Liability: Any person or Excavator who interferes with or damages any underground electrical cable without having obtained a valid locate/clearance from **Black & McDonald Limited,** shall be liable for all cost incurred during the repair of the cable as well as any resulting legal actions.

This locate has been given as accurately as possible, but no locate is guaranteed. Excavators must always dig with extreme caution to prevent the possibility of damaging electrical cables and endangering safety.

Locate is void after 60 days

For remarks contact **Ontario One Call** 1-800-400-2255 or www.on1call.com

ON1CALL
CALL BEFORE YOU DIG

GAD

locates

From: Sigouin, Francois <Francois.Sigouin@ottawa.ca>
Sent: Thursday, August 15, 2019 9:58 AM
To: locates
Subject: 20193222441

20193222441

This Ontario One Ticket is **Clear of Underground Traffic Lights Infrastucture in Proposed Work Area **

"Locates are Valide for 60 Days"

Ce billet Ontario One est ** libre de toute infrastructure souterraine de feux de signalisation dans la zone de travail proposée **

"Les habitants sont valides pendant 60 jours"

Frank Sigouin
City of Ottawa

Traffic U/G Utilities Investigator
Cell: (613)229-0580

Email: francois.sigouin@ottawa.ca <mailto:francois.sigouin@ottawa.ca>

Mon-Fri 7h30 to 16h00

locates

From: Solutions@on1call.com
Sent: Friday, August 09, 2019 3:53 PM
To: locates@usl-1.com
Subject: Request 20193222441
Attachments: MapSelection_09082019_15505312.png; GHD.Cummings_Avenue.png

<https://www.on1call.com/wp-content/themes/ooc/images/ooc-logo-2.png> LOCATE REQUEST CONFIRMATION

TICKET #: 20193222441 REQUEST PRIORITY: STANDARD REQUEST TYPE: REGULAR WORK TO BEGIN DATE: 08/16/2019
Update of Ticket # Project # Transmit date: 08/09/2019 03:52:36 PM

REQUESTOR'S CONTACT INFORMATION
Contractor ID#: 202 Company Phone #: (613) 226-8750
Contact Name: TANIA HOLYER Cell #:
Alternate Contact Name: JACQUES DESJARDINS Fax #: (613) 226-8677
Company name: U S L Email: locates@usl-1.com
Address: 775 TAYLOR CREEK DR Alternate Contact #:

DIG INFORMATION
Region/County: OTTAWA Type of work: BORE HOLES Mark & Fax: NO
Community: Max Depth: 100.00 FT Area is not marked: NO
City: OTTAWA Machine Dig: YES Area is marked: YES
Address: CUMMINGS AVE Hand Dig: NO Site Meet Req.: NO
Directional Drilling: NO Work being done for: GHD
Intersecting Street 1: OGILVIE RD Public Property: YES
Intersecting Street 2: CYRVILLE RD Private Property: YES

DETAILED DESCRIPTION OF WORK REMARKS
CORLOT=U Excavations throughout the properties of 1178 Cummings Avenue and 1098 Ogilvie. Clear enti re properties as per sketch provided.

MEMBERS NOTIFIED: The following owners of underground infrastructure in the area of your excavation site have been notified.
Member name Station Code Initial Status
HYDRO OTTAWA (HOT1) HOT1 Notification sent
PROMARK FOR ENBRIDGE GAS (ENOE01) ENOE01 Notification sent
TELUS (TELUSON3) TELUSON3 Notification sent
CLI FOR ROGERS (ROGOTT01) ROGOTT01 Notification sent
CITY OF OTTAWA WATER/SEWER (OTWAWS01) OTWAWS01 Notification sent
PROMARK FOR BIRCH HILL TELECOM (BHTI01) BHTI01 Notification sent
CITY OF OTTAWA TRAFFIC SIGNALS (OTWATS01) OTWATS01 Notification sent
BLACK AND MC DONALD FOR CITY OF OTTAWA STREET LIGHTS (OTWASL01) OTWASL01 Notification sent
PROMARK FOR BELL CANADA (BCOE01) BCOE01Notification sent

MAP SELECTION: Map Selection provided by the excavator through Ontario One Call's map tool or through agent interpretation by phone

CONTRACTOR'S SKETCH: A file provided directly by the excavator, not generated by Ontario One Call:

IMPORTANT INFORMATION: Please read.

Defining "NC" - Non-Compliant
- Non-compliant members have not met their obligations under section 5 of the Ontario Underground Infrastructure Notification Act.ON1Call has notified these members to ensure they are aware of your excavation. In this circumstance, should the member not respond, the excavator should contact the member directly to obtain their locates or request a status. ON1Call will not be provided with a locate status from the member regarding this ticket and therefore, cannot provide further information at this time.For locate status contact information please refer to our website.

You have a valid locate when...
- You have reviewed your locate request information for accuracy. CONTACT Ontario One Call (ON1Call) IMMEDIATELY if changes are needed and obtain a corrected locate request confirmation.
- You have obtained locates or clearances from all ON1Call members listed in this ticket before beginning your dig.

You've met your obligations when...
- In addition to this locate request, you have DIRECTLY contacted all owners of infrastructure who ARE NOT current members of ON1Call (such as owned buried infrastructure on private property), as well as arranged for contract locates for your private lines on your private property - where applicable. For a list of locate status contacts visit www.on1call.com.
- You respect the marks and instructions provided by the locators and dig with care; the marks and locator instructions MUST MATCH.
- You have obtained any necessary permits from the municipality in whichyou are excavating.

What does "Cleared" mean in the "Initial Status" section?
1. The information that you have provided about your dig will not affect that member's underground infrastructure and they have provided you with a
clearance, if anything about your excavation changes, please ensure that you update your ticket immediately.

What are the images under "Map Selection":
1. A drawing created by an excavator directly within Ontario One Call's web ticket tool, this is expected to be an accurate rendition of the dig site, and it is the excavator's responsibility to ensure the location matches the information they provide under the 'Dig Location' section OR;

2. A drawing created by an Ontario One Call agent, this drawing is based on a verbal description by phone of the area by the excavator. Agents may create drawings that are larger than the proposed dig to minimize risk of interpretation. It is the excavator's responsibility to review these map selections for accuracy. Changes can be made by the excavator through the web ticket tool, to learn how visit www.on1call.com/contractors.

3. All drawings dictate which members are notified.

UNDERGROUND SERVICE LOCATORS - PRIVATE UTILITY REPORT DATE: Aug 26/2019

ONE-CALL SYSTEMS INC.
775 TAYLOR CREEK DRIVE
OTTAWA, ON, K4A 0Z9

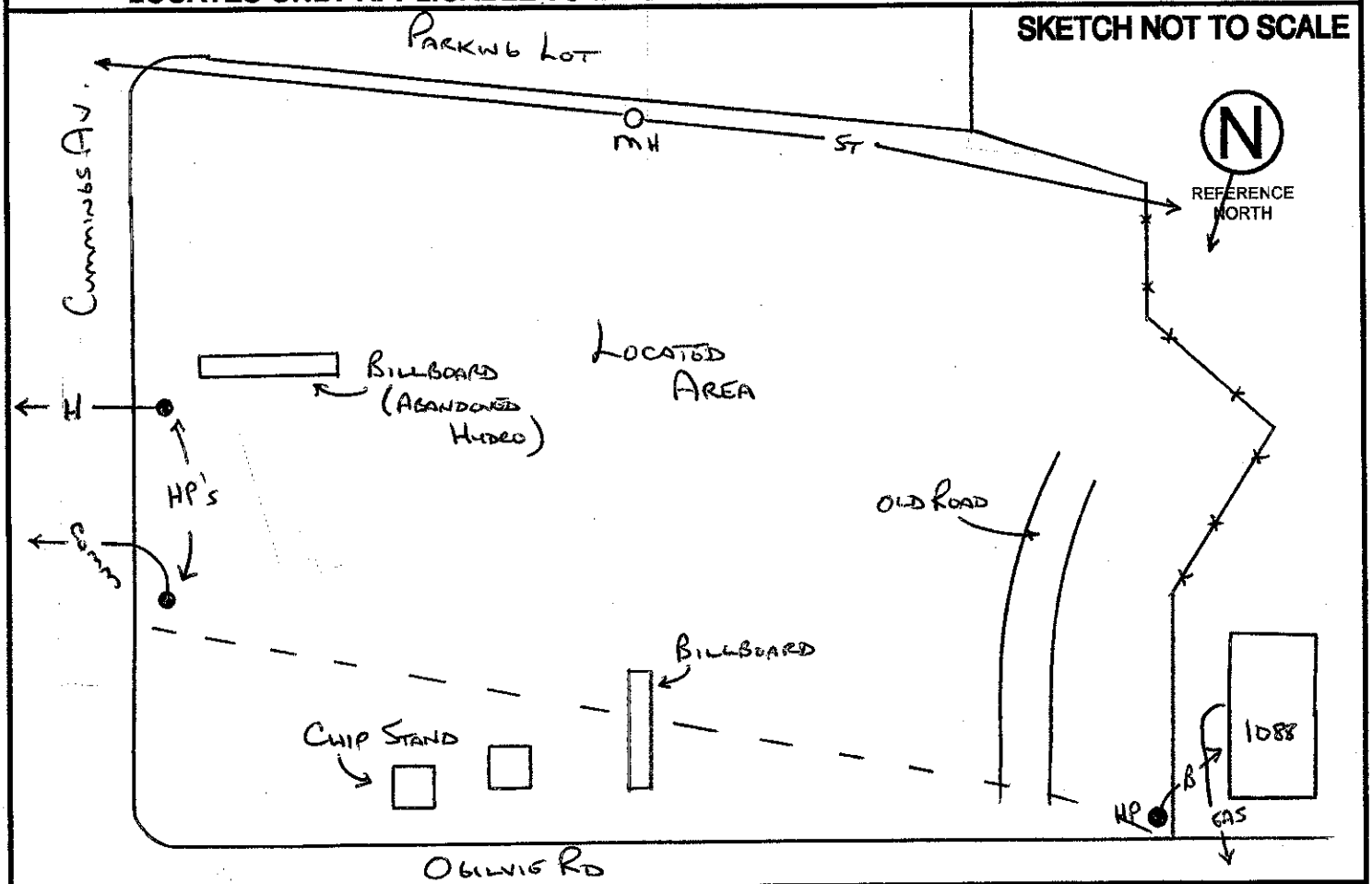
PHONE (613) 226-8750
FAX (613) 226-8677

CUSTOMER: GHD	REQUESTED BY: Banafsheh Vazirbakht
LOCATION OF WORK: Cummings Av.	LIMITS OF WORK: BH's

HYDRO	-- H --	CABLE T.V.	-- T.V. --	STEAM	-- STEAM --
GAS	-- G --	SANITARY	-- SAN --	ELECTRICAL	-- E --
BELL	-- B --	STORM	-- ST --	COMMUNICATIONS	-- COM --
UNIDENTIFIED CABLE	-- UC --	FIBER OPTIC	-- FOC --	OTHER:	
WATER	-- W --				

LOCATES ONLY APPLICABLE TO INFO ABOVE - LOCATES VOID AFTER 30 DAYS!

SKETCH NOT TO SCALE



- USL-1 as a Private utility locator, is not permitted to locate Publicly owned utilities. In some cases, Public utilities may be noted on a sketch, but are FOR REFERENCE ONLY, and under no circumstances shall be used for excavation purposes. It is the contractor's responsibility to verify any Public utilities noted on the USL-1 sketch by referring to the Public utility locate sheets for physical LOCATION AND ACCURACY. USL-1 DOES NOT ASSUME LIABILITY FOR PUBLIC LOCATE INNACCURACIES.
- If the proposed work area is on Private property, it does NOT mean that all buried utilities are Private. Regardless of when you are digging, and what the proposed depth of excavation is, it is the law to notify Ontario One Call (or Info-Excavation in Quebec) to obtain Public utility locates.

COMMENTS: Abandoned Utilities on Site Not Located - Billboards Have Overhead Hydro. Located Area Filled With Trees, Bushes.

THIS SKETCH IS NOT A PUBLIC UTILITY LOCATE/DOCUMENT. PUBLIC UTILITIES SHOWN ARE FOR REFERENCE ONLY. REFER TO USL-1 DISCLAIMER - FORM 101. CONTRACTOR IS RESPONSIBLE TO ENSURE THEY HAVE PUBLIC UTILITY LOCATES BEFORE COMMENCING WORK.

LOCATORS NAME: Stan Pedlar 613-986-7226 SIGNATURE:

LOCATE RECEIVED AND REVIEWED BY _____ (Print Name) _____ (Signature)

CAUTION: HAND DIG WITHIN 1.5 METERS OF MARKINGS

USL-1 DISCLAIMER - FORM 101

- It is our Clients responsibility to fully read and understand this document, prior to any ground disturbance taking place. Should any questions or clarifications be required, contact USL-1 before commencing work
- Locate is VOID after 30 days from the date the locate was completed. Contact USL-1 for remarks and/or new ticket requests, with a minimum notice of 5 business days
- If the scope of work, locate area, or site information changes, contact USL-1 before continuing work. In certain instances, a new ticket request may be required
- Any work within 1.5 metres laterally of a marked utility, must be hand dug or daylighted. Utility depths vary, as does the accuracy of the locate equipment, and therefore depths are typically not provided and should not be used for excavation purposes. Depth of utilities should also be verified by hand digging or daylighting. The best information is provided at the time of the locate, however the accuracy of field markings can vary with regard to equipment accuracy and external interference
- If the paint markings or flags on site differ from that of the sketch provided, please contact USL-1 before commencing work. If possible, the issue will be clarified by USL-1 and/or a site meet may be requested with the appropriate parties
- The "Excavator" is responsible for keeping a current copy of the locates on site, with the operators and in/on the excavation equipment AT ALL TIMES
- It is the "Excavator/Contractor's" responsibility to read ALL locate sheets, both public and private, to ensure they understand what potential hazards or buried utilities exist in their work area
- Special purpose locates such as sewer sondeing, locate surveys, tunnel identification, conduit identification, ground fault detections, ground penetrating radar, well cap location, concrete scanning, or anything else that requires use of more than Radiodetection equipment, must be identified at the time of the original locate request. Should a USL-1 locator identify any special needs services during a normal Private utility locate, the client will be notified for the appropriate course of action
- Not all buried utilities can be traced. In many instances, water and sewer lines, irrigation systems, grounding cables, fibre optic cables, heating cables, protection cables, and communication cables may not be traceable. Typically, sewer lines will be painted and lined up directionally from manhole to manhole where possible. It may not be possible to detect bends in the sewer lines between manholes. If tracer wires have been buried with the utility, they will be used to locate the buried utility where possible. If a buried utility cannot be traced, it will be noted on the USL-1 report. USL-1 is not liable for damage to untraceable utilities
- Public utility locators have maps, plans and as-built diagrams for reference to work from. Private utility locators, for the most part, do not. USL-1 will attempt to locate any Private utilities on a site, using as-built plans provided to them. Building access is mandatory and must be arranged by our client. Any conduits or utilities noted entering or exiting a building will be traced if possible, as well as any other visible utilities observed on site. It is the responsibility of the contractor to provide any and all buried utility information and site contacts that they have. There is no guarantee that USL-1 can find all buried utilities if the property owner does not have records or information regarding their own buried utilities
- USL- 1 cannot be held liable for damage to Private water and/or sewer laterals unless building access is granted, and the utility is locatable
- Thick snow and ice, frozen manhole lids, live traffic, parked cars, construction debris and activities etc, are all factors that can interfere with USL-1's ability to perform Private utility locates. USL-1 cannot guaranty location of all buried utilities when such factors impede the locate process. It is the contractor's responsibility to ensure that the work areas are safe and accessible for locates, prior to USL-1's arrival to site
- USL-1 as a Private utility locator, is not permitted to locate Publicly owned utilities. In some cases, Public utilities may be noted on a sketch, but are FOR REFERENCE ONLY, and under no circumstances shall be used for excavation purposes. It is the contractor's responsibility to verify any Public utilities noted on the USL-1 sketch by referring to the Public utility locate sheets for physical LOCATION AND ACCURACY. USL-1 DOES NOT ASSUME LIABILTY FOR PUBLIC LOCATE INNACCURACIES
- If the proposed work area is on Private property, it does NOT mean that all buried utilities are Private. Regardless of where you are digging, and what the proposed depth of excavation is, it is the law to notify Ontario One Call (or Info-Excavation in Quebec) to obtain Public utility locates
- NCC PROPERTY - assuming the contractor has been issued a Land Access Permit from the NCC, it is typically indicated within the permit that it is the contractor's responsibility to contact NCC for utility locates of their buried utilities

Appendix B
Stratigraphic and Instrumentation Logs

REFERENCE No.: 11201061 ENCLOSURE No.: 1

BOREHOLE No.: BH1

ELEVATION: 100.37 m

BOREHOLE LOG

Page: 1 of 1

CLIENT: 6770967 Canada Inc.

PROJECT: 1098 Ogilvie Road

LOCATION: 1098 Ogilvie Road, Ottawa, ON

DESCRIBED BY: R. Vanden Tillaart CHECKED BY: B.Vazhbakht

DATE (START): 23 September 2019 DATE (FINISH): 24 September 2019

LEGEND

- SS Split Spoon
- GS Auger Sample
- ST Shelby Tube
- Water Level
- Water content (%)
- Atterberg limits (%)
- N Penetration Index based on Split Spoon sample
- N Penetration Index based on Dynamic Cone sample
- Cu Shear Strength based on Field Vane
- Cu Shear Strength based on Lab Vane
- S Sensitivity Value of Soil
- Shear Strength based on Pocket Penetrometer

SCALE		STRATIGRAPHY		MONITOR WELL	SAMPLE DATA					
Depth BGS	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK		State	Type and Number	Recovery	OVC	Penetration Index / RQD	SCALE FOR TEST RESULTS 50kPa 100kPa 150kPa 200kPa 10 20 30 40 50 60 70 80 90
meters	100.37		GROUND SURFACE	101.13			%	ppm	N	
	100.3		**ASPHALT**							
			FILL - Gravelly silty sand, some gravel, compact, brown, damp	0.91		SS1	67		17	
1.0						SS2	71		42	
2.0						SS3	42		16	
	98.1			WL 2.42 10/16/2019		SS4	89		50+	
	97.9		**SANDY CLAY**- very stiff, grey, moist							
3.0	97.5		Spoon refusal encountered at 2.5 mbgs	Riser						
			WEATHERED BEDROCK - SHALE Auger refusal encountered at 2.8 mbgs			RC1	100		52	
4.0										
5.0			**BEDROCK - SHALE**: interbedded limestone, highly weathered and fractured surface, black and grey, fair quality becoming excellent with depth			RC2	100		64	
6.0										
			Mud seam	Bentonite		RC3	100		88	
7.0										
8.0						RC4	100		84	
9.0										
						RC5	100		93	
10.0										
11.0						RC6	100		84	
12.0			Thicker limestone bedding	12.27						
				12.65		RC7	100		92	
13.0				Sand						
14.0			Mud seam	Screen		RC8	100		93	
15.0						RC9	100		91	
	84.7			15.70						
16.0			Borehole terminated at 15.7 mbgs							

NOTES:
mbgs: meters below ground surface

BOREHOLE LOG 11201061-A1-BH LOGS.GPJ INSPEC_SOL.GDT 8/11/19

REFERENCE No.: 11201061 ENCLOSURE No.: 2

BOREHOLE No.: BH2

ELEVATION: 100.81 m

BOREHOLE LOG

Page: 1 of 1

CLIENT: 6770967 Canada Inc.

PROJECT: 1098 Ogilvie Road

LOCATION: 1098 Ogilvie Road, Ottawa, ON

DESCRIBED BY: R. Vanden Tillaart CHECKED BY: B.Vazhbakht

DATE (START): 24 September 2019 DATE (FINISH): 24 September 2019

LEGEND

- SS Split Spoon
- GS Auger Sample
- ST Shelby Tube
- Water Level
- Water content (%)
- Atterberg limits (%)
- N Penetration Index based on Split Spoon sample
- N Penetration Index based on Dynamic Cone sample
- Cu Shear Strength based on Field Vane
- Cu Shear Strength based on Lab Vane
- S Sensitivity Value of Soil
- Shear Strength based on Pocket Penetrometer

SCALE		STRATIGRAPHY		MONITOR WELL	SAMPLE DATA					
Depth BGS	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK		State	Type and Number	Recovery	OVC	Penetration Index / RQD	SCALE FOR TEST RESULTS 50kPa 100kPa 150kPa 200kPa 10 20 30 40 50 60 70 80 90
meters	100.81		GROUND SURFACE	101.62			%	ppm	N	
	100.7		**TOPSOIL**			SS1	83		34	
1.0			**FILL** - Sand and Silt, compact, dark grey, damp	0.91		SS2	21		18	
				Riser		SS3	38		6	
2.0				Bentonite						
	98.5			WL 2.44 10/16/2019		SS4	33		39	
	98.2		**SANDY CLAY**- trace gravel, very stiff, dark grey, moist							
3.0	97.8		**WEATHERED BEDROCK - SHALE** Spoon refusal encountered at 2.7 mbgs Auger refusal encountered at 3.0 mbgs	3.35 3.66		RC1	100		19	
4.0				Sand						
5.0			**BEDROCK - SHALE**: interbedded limestone, highly weathered and fractured surface, black and grey, very poor quality becoming excellent with depth	Screen		RC2	100		53	
6.0				6.10 6.15		RC3	100		93	
7.0										
8.0						RC4	100		88	
9.0			Mud seam Mud seam			RC5	100		65	
10.0										
11.0				Bentonite		RC6	100		93	
12.0			Thicker limestone bedding			RC7	100		100	
13.0										
14.0						RC8	100		92	
15.0						RC9	100		96	
	85.2			15.65						
16.0			Borehole terminated at 15.7 mbgs							

NOTES:
mbgs: meters below ground surface

BOREHOLE LOG 11201061-A1-BH LOGS.GPJ INSPEC_SOL.GDT 8/11/19

REFERENCE No.: 11201061 ENCLOSURE No.: 3

BOREHOLE No.: BH2A

ELEVATION: 100.93 m

BOREHOLE LOG

Page: 1 of 1

CLIENT: 6770967 Canada Inc.

PROJECT: 1098 Ogilvie Road

LOCATION: 1098 Ogilvie Road, Ottawa, ON

DESCRIBED BY: R. Vanden Tillaart CHECKED BY: B.Vazhbakht

DATE (START): 24 September 2019 DATE (FINISH): 24 September 2019

LEGEND

- SS Split Spoon
- GS Auger Sample
- ST Shelby Tube
- Water Level
- Water content (%)
- Atterberg limits (%)
- N Penetration Index based on Split Spoon sample
- N Penetration Index based on Dynamic Cone sample
- Cu Shear Strength based on Field Vane
- Cu Shear Strength based on Lab Vane
- S Sensitivity Value of Soil
- Shear Strength based on Pocket Penetrometer

SCALE		STRATIGRAPHY		MONITOR WELL	SAMPLE DATA				
Depth BGS	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK		State	Type and Number	Recovery	OVC	Penetration Index / RQD
meters	100.93		GROUND SURFACE	101.79			%	ppm	N
				0.30 Riser, Bentonite 1.17, 1.47 Sand, Screen, WL 2.44 10/16/2019, 3.00					
3.0	97.9		Auger to 3.0 mbgs for direct well install						

SCALE FOR TEST RESULTS
50kPa 100kPa 150kPa 200kPa
10 20 30 40 50 60 70 80 90

NOTES:
mbgs: meters below ground surface

BOREHOLE LOG 11201061-A1-BH LOGS.GPJ INSPEC_SOL.GDT 8/11/19

REFERENCE No.: 11201061 ENCLOSURE No.: 4

BOREHOLE No.: BH3

ELEVATION: 100.18 m

BOREHOLE LOG

Page: 1 of 1

CLIENT: 6770967 Canada Inc.

PROJECT: 1098 Ogilvie Road

LOCATION: 1098 Ogilvie Road, Ottawa, ON

DESCRIBED BY: R. Vanden Tillaart CHECKED BY: B.Vazhbakht

DATE (START): 23 September 2019 DATE (FINISH): 23 September 2019

LEGEND

- SS Split Spoon
- GS Auger Sample
- ST Shelby Tube
- Water Level
- Water content (%)
- Atterberg limits (%)
- N Penetration Index based on Split Spoon sample
- N Penetration Index based on Dynamic Cone sample
- Cu Shear Strength based on Field Vane
- Cu Shear Strength based on Lab Vane
- S Sensitivity Value of Soil
- Shear Strength based on Pocket Penetrometer

SCALE		STRATIGRAPHY		MONITOR WELL	SAMPLE DATA					
Depth BGS	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK		State	Type and Number	Recovery	OVC	Penetration Index / RQD
meters	100.18		GROUND SURFACE	100.92			%	ppm	N
	100.1		**TOPSOIL**			SS1	50		29
1.0			**FILL** - Sand, trace to some gravel, compact, brown, damp	Riser		SS2	50		19
	98.6		Spoon refusal encountered at 1.6 mbgs	1.52 WL 1.72 10/16/2019		SS3	100		50+
2.0	97.9		**WEATHERED BEDROCK - SHALE** Auger refusal encountered at 2.3 mbgs	2.29 2.59 Sand Screen		RC1	100		30
3.0									
	96.4		**BEDROCK - SHALE** interbedded limestone, highly weathered and fractured surface, black and grey, very poor to poor quality	3.81					
4.0			Borehole terminated at 3.8 mbgs						
5.0									
6.0									
7.0									
8.0									
9.0									
10.0									
11.0									
12.0									
13.0									
14.0									
15.0									
16.0									

SCALE FOR TEST RESULTS

50kPa 100kPa 150kPa 200kPa

10 20 30 40 50 60 70 80 90

NOTES:
mbgs: meters below ground surface

REFERENCE No.: 11201061 ENCLOSURE No.: 5

BOREHOLE No.: BH4

ELEVATION: 100.76 m

BOREHOLE LOG

Page: 1 of 1

CLIENT: 6770967 Canada Inc.

PROJECT: 1098 Ogilvie Road

LOCATION: 1098 Ogilvie Road, Ottawa, ON

DESCRIBED BY: R. Vanden Tillaart CHECKED BY: B.Vazhbakht

DATE (START): 23 September 2019 DATE (FINISH): 23 September 2019

LEGEND

- SS Split Spoon
- GS Auger Sample
- ST Shelby Tube
- Water Level
- Water content (%)
- Atterberg limits (%)
- N Penetration Index based on Split Spoon sample
- N Penetration Index based on Dynamic Cone sample
- Cu Shear Strength based on Field Vane
- Cu Shear Strength based on Lab Vane
- S Sensitivity Value of Soil
- Shear Strength based on Pocket Penetrometer

SCALE		STRATIGRAPHY		MONITOR WELL	SAMPLE DATA					
Depth BGS	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK		State	Type and Number	Recovery	OVC	Penetration Index / RQD	SCALE FOR TEST RESULTS 50kPa 100kPa 150kPa 200kPa 10 20 30 40 50 60 70 80 90
meters	100.76		GROUND SURFACE	101.50			%	ppm	N	
	100.7		**TOPSOIL**			SS1	75		17	
	100.2		**FILL** - Silty sand, some gravel, compact, brown, damp	Riser						
1.0	99.7		**SILTY SAND**- some gravel, very dense, brown, damp	1.24		SS2	83		69	
	99.3		**WEATHERED BEDROCK - SHALE** Auger refusal encountered at 1.5 mbgs	Bentonite 1.91						
2.0				2.29		RC1	100		44	
				WL 2.59 10/16/2019						
3.0			**BEDROCK - SHALE**: interbedded limestone, highly weathered and fractured surface, black and grey, very poor to poor quality Mud seam	Sand Screen 3.81		RC2	100		47	
	97.0		Borehole terminated at 3.8 mbgs							
4.0										
5.0										
6.0										
7.0										
8.0										
9.0										
10.0										
11.0										
12.0										
13.0										
14.0										
15.0										
16.0										

NOTES:
mbgs: meters below ground surface

REFERENCE No.: 11201061 ENCLOSURE No.: 6

BOREHOLE No.: BH5

ELEVATION: 99.47 m

BOREHOLE LOG

Page: 1 of 1

CLIENT: 6770967 Canada Inc.

PROJECT: 1098 Ogilvie Road

LOCATION: 1098 Ogilvie Road, Ottawa, ON

DESCRIBED BY: R. Vanden Tillaart CHECKED BY: B.Vazhbakht

DATE (START): 25 September 2019 DATE (FINISH): 25 September 2019

LEGEND

- SS Split Spoon
- GS Auger Sample
- ST Shelby Tube
- Water Level
- Water content (%)
- Atterberg limits (%)
- N Penetration Index based on Split Spoon sample
- N Penetration Index based on Dynamic Cone sample
- Cu Shear Strength based on Field Vane
- Cu Shear Strength based on Lab Vane
- S Sensitivity Value of Soil
- Shear Strength based on Pocket Penetrometer

SCALE		STRATIGRAPHY		MONITOR WELL	SAMPLE DATA					
Depth BGS	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK		State	Type and Number	Recovery	OVC	Penetration Index / RQD	SCALE FOR TEST RESULTS 50kPa 100kPa 150kPa 200kPa
meters	99.47		GROUND SURFACE	100.23			%	ppm	N	10 20 30 40 50 60 70 80 90
	99.4		**TOPSOIL**			SS1	83		25	
			FILL - Silty sand, some gravel, compact, brown, damp	0.61 Riser		SS2	100		50+	
1.0	98.4		Spoon refusal encountered at 1.0 mbgs							
	98.1		**WEATHERED BEDROCK - SHALE**	Bentonite		RC1	100		30	
2.0			Auger refusal encountered at 1.4 mbgs	WL 2.26 10/16/2019						
			BEDROCK - SHALE	2.74 3.05						
3.0			interbedded limestone, highly weathered and fractured surface, black and grey, very poor quality becoming excellent with depth	Sand		RC2	100		88	
4.0			Mud seam	Screen						
5.0						RC3	100		90	
6.0				6.10 6.15		RC4	100		90	
7.0										
8.0						RC5	100		63	
9.0										
						RC6	100		100	
10.0										
11.0				Bentonite		RC7	100		98	
12.0			Thicker limestone bedding							
						RC8	100		100	
13.0										
14.0						RC9	100		97	
15.0						RC10	100		96	
	83.7			15.80						
16.0			Borehole terminated at 15.8 mbgs							

NOTES:
mbgs: meters below ground surface

REFERENCE No.: 11201061 ENCLOSURE No.: 7

BOREHOLE No.: BH6

ELEVATION: 99.92 m

BOREHOLE LOG

Page: 1 of 1

CLIENT: 6770967 Canada Inc.

PROJECT: 1098 Ogilvie Road

LOCATION: 1098 Ogilvie Road, Ottawa, ON

DESCRIBED BY: R. Vanden Tillaart CHECKED BY: B.Vazhbakht

DATE (START): 24 September 2019 DATE (FINISH): 25 September 2019

LEGEND

- SS Split Spoon
- GS Auger Sample
- ST Shelby Tube
- Water Level
- Water content (%)
- Atterberg limits (%)
- N Penetration Index based on Split Spoon sample
- N Penetration Index based on Dynamic Cone sample
- Cu Shear Strength based on Field Vane
- Cu Shear Strength based on Lab Vane
- S Sensitivity Value of Soil
- Shear Strength based on Pocket Penetrometer

SCALE		STRATIGRAPHY		MONITOR WELL	SAMPLE DATA					
Depth BGS	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK		State	Type and Number	Recovery	OVC	Penetration Index / RQD
meters	99.92		GROUND SURFACE	100.61			%	ppm	N
	99.8		**TOPSOIL**			SS1	67		9
1.0	98.9		**FILL** - Silty sand, some clay, trace gravel, loose, brown, damp	0.61		SS2	50		8
	98.1		**SILTY SAND**- some clay, trace gravel, very stiff, dark grey, damp	WL 1.15 10/16/2019		SS3	80		50+
2.0	97.9		Spoon refusal encountered at 1.8 mbgs	Riser		RC1	100		16
3.0			**WEATHERED BEDROCK - SHALE**			RC2	100		72
4.0			Auger refusal encountered at 2.0 mbgs						
5.0			**BEDROCK - SHALE** interbedded limestone, highly weathered and fractured surface, black and grey, very poor quality becoming excellent with depth			RC3	100		92
6.0				Bentonite		RC4	100		84
7.0									
8.0						RC5	100		91
9.0									
						RC6	100		89
10.0									
11.0						RC7	100		100
12.0			Thicker limestone bedding						
			Mud seam	12.19 12.50		RC8	100		97
13.0				Sand					
14.0				Screen		RC9	100		100
15.0			Mud seam			RC10	100		90
	84.4		Borehole terminated at 15.5 mbgs	15.54					
16.0									

SCALE FOR TEST RESULTS

50kPa 100kPa 150kPa 200kPa

10 20 30 40 50 60 70 80 90

NOTES:
mbgs: meters below ground surface

BOREHOLE LOG 11201061-A1-BH LOGS.GPJ INSPEC_SOL.GDT 8/11/19

Appendix C
Laboratory Certificates of Analysis

PARACEL LABORATORIES LTD.

TRUSTED.
RESPONSIVE.
RELIABLE.

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

Certificate of Analysis

GHD Limited (Ottawa)

179 Colonnade Road Suite 400
Ottawa, ON K2E7S4
Attn: Luke Lopers

Client PO:
Project: 11201061
Custody: 123280

Report Date: 2-Oct-2019
Order Date: 26-Sep-2019

Order #: 1939472

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

Paracel ID	Client ID
1939472-01	11201061-BH2-SS1
1939472-02	11201061-BH2-SS3
1939472-03	11201061-BH3-SS1
1939472-04	11201061-BH3-SS2
1939472-05	11201061-BH4-SS1
1939472-06	11201061-BH5-SS1
1939472-07	11201061-BH7-SS1
1939472-08	11201061-BH7-SS3

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: GHD Limited (Ottawa)
Client PO:

Report Date: 02-Oct-2019
Order Date: 26-Sep-2019
Project Description: 11201061

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	1-Oct-19	2-Oct-19
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	28-Sep-19	28-Sep-19
PHC F1	CWS Tier 1 - P&T GC-FID	1-Oct-19	2-Oct-19
PHC F4G (gravimetric)	CWS Tier 1 - Extraction Gravimetric	2-Oct-19	2-Oct-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	26-Sep-19	1-Oct-19
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	2-Oct-19	2-Oct-19
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	25-Sep-19	28-Sep-19
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	1-Oct-19	2-Oct-19
Solids, %	Gravimetric, calculation	27-Sep-19	27-Sep-19

Certificate of Analysis
Client: GHD Limited (Ottawa)
Client PO:

Report Date: 02-Oct-2019
Order Date: 26-Sep-2019
Project Description: 11201061

	Client ID:	11201061-BH2-SS1	11201061-BH2-SS3	11201061-BH3-SS1	11201061-BH3-SS2
	Sample Date:	24-Sep-19 15:00	24-Sep-19 15:30	24-Sep-19 11:00	24-Sep-19 11:00
	Sample ID:	1939472-01	1939472-02	1939472-03	1939472-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	84.5	86.5	88.1	94.8
General Inorganics					
pH	0.05 pH Units	7.19	-	7.30	-
Metals					
Antimony	1.0 ug/g dry	7.8	-	<1.0	-
Arsenic	1.0 ug/g dry	4.2	-	3.0	-
Barium	1.0 ug/g dry	139	-	121	-
Beryllium	0.5 ug/g dry	0.8	-	<0.5	-
Boron	5.0 ug/g dry	8.2	-	6.6	-
Cadmium	0.5 ug/g dry	<0.5	-	<0.5	-
Chromium	5.0 ug/g dry	42.6	-	32.4	-
Cobalt	1.0 ug/g dry	10.9	-	7.7	-
Copper	5.0 ug/g dry	29.6	-	23.4	-
Lead	1.0 ug/g dry	28.8	-	42.4	-
Molybdenum	1.0 ug/g dry	3.4	-	1.4	-
Nickel	5.0 ug/g dry	35.8	-	21.7	-
Selenium	1.0 ug/g dry	<1.0	-	<1.0	-
Silver	0.3 ug/g dry	<0.3	-	<0.3	-
Thallium	1.0 ug/g dry	<1.0	-	<1.0	-
Uranium	1.0 ug/g dry	2.1	-	<1.0	-
Vanadium	10.0 ug/g dry	46.8	-	35.2	-
Zinc	20.0 ug/g dry	86.7	-	78.6	-
Volatiles					
Acetone	0.50 ug/g dry	-	<0.50	<0.50	-
Benzene	0.02 ug/g dry	-	<0.02	<0.02	-
Bromodichloromethane	0.05 ug/g dry	-	<0.05	<0.05	-
Bromoform	0.05 ug/g dry	-	<0.05	<0.05	-
Bromomethane	0.05 ug/g dry	-	<0.05	<0.05	-
Carbon Tetrachloride	0.05 ug/g dry	-	<0.05	<0.05	-
Chlorobenzene	0.05 ug/g dry	-	<0.05	<0.05	-
Chloroform	0.05 ug/g dry	-	<0.05	<0.05	-
Dibromochloromethane	0.05 ug/g dry	-	<0.05	<0.05	-
Dichlorodifluoromethane	0.05 ug/g dry	-	<0.05	<0.05	-
1,2-Dichlorobenzene	0.05 ug/g dry	-	<0.05	<0.05	-
1,3-Dichlorobenzene	0.05 ug/g dry	-	<0.05	<0.05	-

Certificate of Analysis
Client: GHD Limited (Ottawa)
Client PO:

Report Date: 02-Oct-2019
Order Date: 26-Sep-2019
Project Description: 11201061

	Client ID:	11201061-BH2-SS1	11201061-BH2-SS3	11201061-BH3-SS1	11201061-BH3-SS2
	Sample Date:	24-Sep-19 15:00	24-Sep-19 15:30	24-Sep-19 11:00	24-Sep-19 11:00
	Sample ID:	1939472-01	1939472-02	1939472-03	1939472-04
	MDL/Units	Soil	Soil	Soil	Soil
1,4-Dichlorobenzene	0.05 ug/g dry	-	<0.05	<0.05	-
1,1-Dichloroethane	0.05 ug/g dry	-	<0.05	<0.05	-
1,2-Dichloroethane	0.05 ug/g dry	-	<0.05	<0.05	-
1,1-Dichloroethylene	0.05 ug/g dry	-	<0.05	<0.05	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	-	<0.05	<0.05	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	-	<0.05	<0.05	-
1,2-Dichloropropane	0.05 ug/g dry	-	<0.05	<0.05	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	-	<0.05	<0.05	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	-	<0.05	<0.05	-
1,3-Dichloropropene, total	0.05 ug/g dry	-	<0.05	<0.05	-
Ethylbenzene	0.05 ug/g dry	-	0.06	<0.05	-
Ethylene dibromide (dibromoethan	0.05 ug/g dry	-	<0.05	<0.05	-
Hexane	0.05 ug/g dry	-	<0.05	<0.05	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	-	<0.50	<0.50	-
Methyl Isobutyl Ketone	0.50 ug/g dry	-	<0.50	<0.50	-
Methyl tert-butyl ether	0.05 ug/g dry	-	<0.05	<0.05	-
Methylene Chloride	0.05 ug/g dry	-	<0.05	<0.05	-
Styrene	0.05 ug/g dry	-	<0.05	<0.05	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	-	<0.05	<0.05	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	-	<0.05	<0.05	-
Tetrachloroethylene	0.05 ug/g dry	-	<0.05	<0.05	-
Toluene	0.05 ug/g dry	-	0.05	<0.05	-
1,1,1-Trichloroethane	0.05 ug/g dry	-	<0.05	<0.05	-
1,1,2-Trichloroethane	0.05 ug/g dry	-	<0.05	<0.05	-
Trichloroethylene	0.05 ug/g dry	-	<0.05	<0.05	-
Trichlorofluoromethane	0.05 ug/g dry	-	<0.05	<0.05	-
Vinyl chloride	0.02 ug/g dry	-	<0.02	<0.02	-
m,p-Xylenes	0.05 ug/g dry	-	0.15	<0.05	-
o-Xylene	0.05 ug/g dry	-	0.08	<0.05	-
Xylenes, total	0.05 ug/g dry	-	0.23	<0.05	-
4-Bromofluorobenzene	Surrogate	-	106%	93.7%	-
Dibromofluoromethane	Surrogate	-	59.7%	111%	-
Toluene-d8	Surrogate	-	98.3%	102%	-
Benzene	0.02 ug/g dry	-	-	-	<0.02
Ethylbenzene	0.05 ug/g dry	-	-	-	0.16
Toluene	0.05 ug/g dry	-	-	-	0.07

Certificate of Analysis
Client: GHD Limited (Ottawa)
Client PO:

Report Date: 02-Oct-2019
Order Date: 26-Sep-2019
Project Description: 11201061

	Client ID:	11201061-BH2-SS1	11201061-BH2-SS3	11201061-BH3-SS1	11201061-BH3-SS2
	Sample Date:	24-Sep-19 15:00	24-Sep-19 15:30	24-Sep-19 11:00	24-Sep-19 11:00
	Sample ID:	1939472-01	1939472-02	1939472-03	1939472-04
	MDL/Units	Soil	Soil	Soil	Soil
m,p-Xylenes	0.05 ug/g dry	-	-	-	0.38
o-Xylene	0.05 ug/g dry	-	-	-	0.13
Xylenes, total	0.05 ug/g dry	-	-	-	0.50
Toluene-d8	Surrogate	-	-	-	103%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	-	20	-	9
F2 PHCs (C10-C16)	4 ug/g dry	-	8	-	32
F3 PHCs (C16-C34)	8 ug/g dry	-	43	-	69
F4 PHCs (C34-C50)	6 ug/g dry	-	80	-	<6
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	-	<0.02	-
Acenaphthylene	0.02 ug/g dry	<0.02	-	0.02	-
Anthracene	0.02 ug/g dry	<0.02	-	0.06	-
Benzo [a] anthracene	0.02 ug/g dry	<0.02	-	0.10	-
Benzo [a] pyrene	0.02 ug/g dry	<0.02	-	0.14	-
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	-	0.09	-
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	-	0.05	-
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	-	0.03	-
Chrysene	0.02 ug/g dry	<0.02	-	0.10	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	-	<0.02	-
Fluoranthene	0.02 ug/g dry	0.02	-	0.20	-
Fluorene	0.02 ug/g dry	<0.02	-	<0.02	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	-	0.05	-
1-Methylnaphthalene	0.02 ug/g dry	<0.02	-	<0.02	-
2-Methylnaphthalene	0.02 ug/g dry	0.05	-	0.02	-
Methylnaphthalene (1&2)	0.04 ug/g dry	0.05	-	0.04	-
Naphthalene	0.01 ug/g dry	0.05	-	0.02	-
Phenanthrene	0.02 ug/g dry	0.06	-	0.16	-
Pyrene	0.02 ug/g dry	0.02	-	0.18	-
2-Fluorobiphenyl	Surrogate	76.0%	-	87.1%	-
Terphenyl-d14	Surrogate	133%	-	84.5%	-

Certificate of Analysis
Client: GHD Limited (Ottawa)
Client PO:

Report Date: 02-Oct-2019
Order Date: 26-Sep-2019
Project Description: 11201061

	Client ID:	11201061-BH4-SS1	11201061-BH5-SS1	11201061-BH7-SS1	11201061-BH7-SS3
	Sample Date:	24-Sep-19 10:00	25-Sep-19 09:15	24-Sep-19 15:00	24-Sep-19 15:30
	Sample ID:	1939472-05	1939472-06	1939472-07	1939472-08
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	90.7	94.9	82.9	87.5
General Inorganics					
pH	0.05 pH Units	6.21	6.79	7.06	-
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Arsenic	1.0 ug/g dry	9.0	8.3	3.0	-
Barium	1.0 ug/g dry	108	210	155	-
Beryllium	0.5 ug/g dry	0.7	0.7	0.5	-
Boron	5.0 ug/g dry	7.9	9.5	5.9	-
Cadmium	0.5 ug/g dry	<0.5	0.5	<0.5	-
Chromium	5.0 ug/g dry	26.9	21.2	50.0	-
Cobalt	1.0 ug/g dry	12.1	12.1	11.2	-
Copper	5.0 ug/g dry	33.7	44.8	24.9	-
Lead	1.0 ug/g dry	38.3	35.0	28.0	-
Molybdenum	1.0 ug/g dry	2.8	10.9	1.2	-
Nickel	5.0 ug/g dry	38.7	53.8	31.6	-
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	-
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Uranium	1.0 ug/g dry	1.2	3.1	1.2	-
Vanadium	10.0 ug/g dry	36.6	31.9	51.2	-
Zinc	20.0 ug/g dry	66.1	92.2	74.9	-
Volatiles					
Acetone	0.50 ug/g dry	-	-	-	<0.50
Benzene	0.02 ug/g dry	-	-	-	<0.02
Bromodichloromethane	0.05 ug/g dry	-	-	-	<0.05
Bromoform	0.05 ug/g dry	-	-	-	<0.05
Bromomethane	0.05 ug/g dry	-	-	-	<0.05
Carbon Tetrachloride	0.05 ug/g dry	-	-	-	<0.05
Chlorobenzene	0.05 ug/g dry	-	-	-	<0.05
Chloroform	0.05 ug/g dry	-	-	-	<0.05
Dibromochloromethane	0.05 ug/g dry	-	-	-	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	-	-	-	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	-	-	-	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	-	-	-	<0.05

Certificate of Analysis
Client: GHD Limited (Ottawa)
Client PO:

Report Date: 02-Oct-2019
Order Date: 26-Sep-2019
Project Description: 11201061

	Client ID:	11201061-BH4-SS1	11201061-BH5-SS1	11201061-BH7-SS1	11201061-BH7-SS3
	Sample Date:	24-Sep-19 10:00	25-Sep-19 09:15	24-Sep-19 15:00	24-Sep-19 15:30
	Sample ID:	1939472-05	1939472-06	1939472-07	1939472-08
	MDL/Units	Soil	Soil	Soil	Soil
1,4-Dichlorobenzene	0.05 ug/g dry	-	-	-	<0.05
1,1-Dichloroethane	0.05 ug/g dry	-	-	-	<0.05
1,2-Dichloroethane	0.05 ug/g dry	-	-	-	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	-	-	-	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	-	-	-	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	-	-	-	<0.05
1,2-Dichloropropane	0.05 ug/g dry	-	-	-	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	-	-	-	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	-	-	-	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	-	-	-	<0.05
Ethylbenzene	0.05 ug/g dry	-	-	-	<0.05
Ethylene dibromide (dibromoethan	0.05 ug/g dry	-	-	-	<0.05
Hexane	0.05 ug/g dry	-	-	-	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	-	-	-	<0.50
Methyl Isobutyl Ketone	0.50 ug/g dry	-	-	-	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	-	-	-	<0.05
Methylene Chloride	0.05 ug/g dry	-	-	-	<0.05
Styrene	0.05 ug/g dry	-	-	-	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	-	-	-	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	-	-	-	<0.05
Tetrachloroethylene	0.05 ug/g dry	-	-	-	<0.05
Toluene	0.05 ug/g dry	-	-	-	0.06
1,1,1-Trichloroethane	0.05 ug/g dry	-	-	-	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	-	-	-	<0.05
Trichloroethylene	0.05 ug/g dry	-	-	-	<0.05
Trichlorofluoromethane	0.05 ug/g dry	-	-	-	<0.05
Vinyl chloride	0.02 ug/g dry	-	-	-	<0.02
m,p-Xylenes	0.05 ug/g dry	-	-	-	0.13
o-Xylene	0.05 ug/g dry	-	-	-	<0.05
Xylenes, total	0.05 ug/g dry	-	-	-	0.13
4-Bromofluorobenzene	Surrogate	-	-	-	104%
Dibromofluoromethane	Surrogate	-	-	-	65.2%
Toluene-d8	Surrogate	-	-	-	99.4%
Benzene	0.02 ug/g dry	<0.02	<0.02	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-

Certificate of Analysis
Client: GHD Limited (Ottawa)
Client PO:

Report Date: 02-Oct-2019
Order Date: 26-Sep-2019
Project Description: 11201061

	Client ID:	11201061-BH4-SS1	11201061-BH5-SS1	11201061-BH7-SS1	11201061-BH7-SS3
	Sample Date:	24-Sep-19 10:00	25-Sep-19 09:15	24-Sep-19 15:00	24-Sep-19 15:30
	Sample ID:	1939472-05	1939472-06	1939472-07	1939472-08
	MDL/Units	Soil	Soil	Soil	Soil
Toluene	0.05 ug/g dry	<0.05	<0.05	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	-	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	-	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	-	-
Toluene-d8	Surrogate	103%	103%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	14	-	28
F2 PHCs (C10-C16)	4 ug/g dry	<4	52	-	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	51	-	43
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	-	174 [1]
F4G PHCs (gravimetric)	50 ug/g dry	-	-	-	389
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	-	-	<0.02	-
Acenaphthylene	0.02 ug/g dry	-	-	0.03	-
Anthracene	0.02 ug/g dry	-	-	<0.02	-
Benzo [a] anthracene	0.02 ug/g dry	-	-	0.04	-
Benzo [a] pyrene	0.02 ug/g dry	-	-	0.04	-
Benzo [b] fluoranthene	0.02 ug/g dry	-	-	0.07	-
Benzo [g,h,i] perylene	0.02 ug/g dry	-	-	0.03	-
Benzo [k] fluoranthene	0.02 ug/g dry	-	-	0.02	-
Chrysene	0.02 ug/g dry	-	-	0.07	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	-	-	<0.02	-
Fluoranthene	0.02 ug/g dry	-	-	0.09	-
Fluorene	0.02 ug/g dry	-	-	<0.02	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	-	-	0.03	-
1-Methylnaphthalene	0.02 ug/g dry	-	-	<0.02	-
2-Methylnaphthalene	0.02 ug/g dry	-	-	<0.02	-
Methylnaphthalene (1&2)	0.04 ug/g dry	-	-	<0.04	-
Naphthalene	0.01 ug/g dry	-	-	<0.01	-
Phenanthrene	0.02 ug/g dry	-	-	0.05	-
Pyrene	0.02 ug/g dry	-	-	0.07	-
2-Fluorobiphenyl	Surrogate	-	-	76.5%	-
Terphenyl-d14	Surrogate	-	-	117%	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
F4G PHCs (gravimetric)	ND	50	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*1.17*		*ug/g*		*88.0*	*50-140*			
Surrogate: Terphenyl-d14	*1.45*		*ug/g*		*109*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	*3.16*		*ug/g*		*98.7*	*50-140*			
Surrogate: Dibromofluoromethane	*2.01*		*ug/g*		*62.8*	*50-140*			
Surrogate: Toluene-d8	*3.29*		*ug/g*		*103*	*50-140*			
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	*3.29*		*ug/g*		*103*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
pH	7.26	0.05	pH Units	7.23			0.4	2.3	
Hydrocarbons									
F1 PHCs (C6-C10)	88	7	ug/g dry	90			2.7	40	
F2 PHCs (C10-C16)	14	4	ug/g dry	50			110.0	30	QR-04
F3 PHCs (C16-C34)	107	8	ug/g dry	150			33.5	30	QR-04
F4 PHCs (C34-C50)	23	6	ug/g dry	44			60.3	30	QR-04
Metals									
Antimony	8.7	1.0	ug/g dry	7.8			11.3	30	
Arsenic	4.2	1.0	ug/g dry	4.2			1.5	30	
Barium	136	1.0	ug/g dry	139			2.1	30	
Beryllium	0.7	0.5	ug/g dry	0.8			13.4	30	
Boron	9.2	5.0	ug/g dry	8.2			12.0	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium	41.0	5.0	ug/g dry	42.6			3.7	30	
Cobalt	10.4	1.0	ug/g dry	10.9			4.3	30	
Copper	28.2	5.0	ug/g dry	29.6			4.9	30	
Lead	24.9	1.0	ug/g dry	28.8			14.5	30	
Molybdenum	4.4	1.0	ug/g dry	3.4			24.5	30	
Nickel	34.7	5.0	ug/g dry	35.8			3.1	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.3	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	2.2	1.0	ug/g dry	2.1			3.1	30	
Vanadium	44.6	10.0	ug/g dry	46.8			4.7	30	
Zinc	83.0	20.0	ug/g dry	86.7			4.3	30	
Physical Characteristics									
% Solids	81.3	0.1	% by Wt.	80.8			0.6	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g dry	ND				40	
Acenaphthylene	ND	0.02	ug/g dry	ND				40	
Anthracene	ND	0.02	ug/g dry	ND				40	
Benzo [a] anthracene	ND	0.02	ug/g dry	ND			0.0	40	
Benzo [a] pyrene	ND	0.02	ug/g dry	ND				40	
Benzo [b] fluoranthene	ND	0.02	ug/g dry	ND				40	
Benzo [g,h,i] perylene	ND	0.02	ug/g dry	ND			0.0	40	
Benzo [k] fluoranthene	ND	0.02	ug/g dry	ND			0.0	40	
Chrysene	ND	0.02	ug/g dry	ND				40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	ND				40	
Fluoranthene	ND	0.02	ug/g dry	ND			0.0	40	
Fluorene	ND	0.02	ug/g dry	ND				40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g dry	ND			0.0	40	
1-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
2-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
Naphthalene	ND	0.01	ug/g dry	ND				40	
Phenanthrene	ND	0.02	ug/g dry	ND			0.0	40	
Pyrene	ND	0.02	ug/g dry	ND			0.0	40	
Surrogate: 2-Fluorobiphenyl	*1.13*		*ug/g dry*		*80.1*	*50-140*			
Surrogate: Terphenyl-d14	*1.59*		*ug/g dry*		*113*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	
Bromodichloromethane	ND	0.05	ug/g dry	ND				50	
Bromoform	ND	0.05	ug/g dry	ND				50	
Bromomethane	ND	0.05	ug/g dry	ND				50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND				50	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Chlorobenzene	0.109	0.05	ug/g dry	ND			0.0	50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Dibromochloromethane	ND	0.05	ug/g dry	ND				50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND				50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Ethylene dibromide (dibromoethane	ND	0.05	ug/g dry	ND				50	
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND				50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND				50	
Methylene Chloride	ND	0.05	ug/g dry	ND				50	
Styrene	ND	0.05	ug/g dry	ND				50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND				50	
Trichloroethylene	ND	0.05	ug/g dry	ND				50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND				50	
Vinyl chloride	ND	0.02	ug/g dry	ND				50	
m,p-Xylenes	ND	0.05	ug/g dry	ND				50	
o-Xylene	0.077	0.05	ug/g dry	0.085			9.1	50	
Surrogate: 4-Bromofluorobenzene	*5.49*		*ug/g dry*		*120*	*50-140*			
Surrogate: Dibromofluoromethane	*3.01*		*ug/g dry*		*65.7*	*50-140*			
Surrogate: Toluene-d8	*4.70*		*ug/g dry*		*103*	*50-140*			
Benzene	ND	0.02	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
m,p-Xylenes	ND	0.05	ug/g dry	ND				50	
o-Xylene	0.077	0.05	ug/g dry	0.085			9.4	50	
Surrogate: Toluene-d8	*4.70*		*ug/g dry*		*103*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	178	7	ug/g		89.0	80-120			
F2 PHCs (C10-C16)	123	4	ug/g	50	86.1	60-140			
F3 PHCs (C16-C34)	418	8	ug/g	150	128	60-140			
F4 PHCs (C34-C50)	197	6	ug/g	44	116	60-140			
F4G PHCs (gravimetric)	950	50	ug/g		95.0	80-120			
Metals									
Antimony	115	1.0	ug/g	7.8	85.5	70-130			
Arsenic	144	1.0	ug/g	4.2	112	70-130			
Barium	279	1.0	ug/g	139	112	70-130			
Beryllium	124	0.5	ug/g	0.8	98.4	70-130			
Boron	126	5.0	ug/g	8.2	93.9	70-130			
Cadmium	135	0.5	ug/g	ND	108	70-130			
Chromium	169	5.0	ug/g	42.6	101	70-130			
Cobalt	134	1.0	ug/g	10.9	98.8	70-130			
Copper	162	5.0	ug/g	29.6	106	70-130			
Lead	153	1.0	ug/g	28.8	99.5	70-130			
Molybdenum	139	1.0	ug/g	3.4	108	70-130			
Nickel	169	5.0	ug/g	35.8	106	70-130			
Selenium	137	1.0	ug/g	ND	110	70-130			
Silver	128	0.3	ug/g	ND	102	70-130			
Thallium	130	1.0	ug/g	ND	104	70-130			
Uranium	139	1.0	ug/g	2.1	110	70-130			
Vanadium	174	10.0	ug/g	46.8	101	70-130			
Zinc	222	20.0	ug/g	86.7	109	70-130			
Semi-Volatiles									
Acenaphthene	0.147	0.02	ug/g	ND	83.4	50-140			
Acenaphthylene	0.136	0.02	ug/g	ND	77.2	50-140			
Anthracene	0.141	0.02	ug/g	ND	80.2	50-140			
Benzo [a] anthracene	0.165	0.02	ug/g	ND	93.6	50-140			
Benzo [a] pyrene	0.132	0.02	ug/g	ND	75.1	50-140			
Benzo [b] fluoranthene	0.217	0.02	ug/g	ND	123	50-140			
Benzo [g,h,i] perylene	0.129	0.02	ug/g	ND	73.5	50-140			QM-06
Benzo [k] fluoranthene	0.167	0.02	ug/g	ND	95.0	50-140			QM-06
Chrysene	0.181	0.02	ug/g	ND	103	50-140			
Dibenzo [a,h] anthracene	0.124	0.02	ug/g	ND	70.4	50-140			
Fluoranthene	0.153	0.02	ug/g	ND	86.8	50-140			QM-06
Fluorene	0.173	0.02	ug/g	ND	98.7	50-140			
Indeno [1,2,3-cd] pyrene	0.125	0.02	ug/g	ND	71.1	50-140			
1-Methylnaphthalene	0.171	0.02	ug/g	ND	97.3	50-140			
2-Methylnaphthalene	0.173	0.02	ug/g	ND	98.6	50-140			
Naphthalene	0.149	0.01	ug/g	ND	84.5	50-140			
Phenanthrene	0.156	0.02	ug/g	ND	89.0	50-140			
Pyrene	0.152	0.02	ug/g	ND	86.6	50-140			QM-06
Surrogate: 2-Fluorobiphenyl	*1.29*		*ug/g*		*92.1*	*50-140*			
Volatiles									
Acetone	5.07	0.50	ug/g		50.7	50-140			
Benzene	2.64	0.02	ug/g		66.0	60-130			
Bromodichloromethane	2.81	0.05	ug/g		70.2	60-130			
Bromoform	4.09	0.05	ug/g		102	60-130			
Bromomethane	3.57	0.05	ug/g		89.2	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Carbon Tetrachloride	2.88	0.05	ug/g		71.9	60-130			
Chlorobenzene	4.08	0.05	ug/g		102	60-130			
Chloroform	2.80	0.05	ug/g		69.9	60-130			
Dibromochloromethane	4.34	0.05	ug/g		108	60-130			
Dichlorodifluoromethane	2.52	0.05	ug/g		63.1	50-140			
1,2-Dichlorobenzene	3.61	0.05	ug/g		90.2	60-130			
1,3-Dichlorobenzene	3.59	0.05	ug/g		89.8	60-130			
1,4-Dichlorobenzene	3.74	0.05	ug/g		93.4	60-130			
1,1-Dichloroethane	2.76	0.05	ug/g		69.1	60-130			
1,2-Dichloroethane	2.59	0.05	ug/g		64.7	60-130			
1,1-Dichloroethylene	3.05	0.05	ug/g		76.2	60-130			
cis-1,2-Dichloroethylene	2.55	0.05	ug/g		63.6	60-130			
trans-1,2-Dichloroethylene	2.57	0.05	ug/g		64.2	60-130			
1,2-Dichloropropane	2.42	0.05	ug/g		60.6	60-130			
cis-1,3-Dichloropropylene	2.81	0.05	ug/g		70.3	60-130			
trans-1,3-Dichloropropylene	2.83	0.05	ug/g		70.7	60-130			
Ethylbenzene	4.03	0.05	ug/g		101	60-130			
Ethylene dibromide (dibromoethane	3.46	0.05	ug/g		86.5	60-130			
Hexane	4.08	0.05	ug/g		102	60-130			
Methyl Ethyl Ketone (2-Butanone)	7.47	0.50	ug/g		74.7	50-140			
Methyl Isobutyl Ketone	7.14	0.50	ug/g		71.4	50-140			
Methyl tert-butyl ether	6.17	0.05	ug/g		61.7	50-140			
Methylene Chloride	2.61	0.05	ug/g		65.3	60-130			
Styrene	3.91	0.05	ug/g		97.7	60-130			
1,1,1,2-Tetrachloroethane	4.59	0.05	ug/g		115	60-130			
1,1,2,2-Tetrachloroethane	3.73	0.05	ug/g		93.3	60-130			
Tetrachloroethylene	4.05	0.05	ug/g		101	60-130			
Toluene	4.59	0.05	ug/g		115	60-130			
1,1,1-Trichloroethane	2.81	0.05	ug/g		70.3	60-130			
1,1,2-Trichloroethane	2.47	0.05	ug/g		61.7	60-130			
Trichloroethylene	2.55	0.05	ug/g		63.8	60-130			
Trichlorofluoromethane	3.34	0.05	ug/g		83.4	50-140			
Vinyl chloride	3.03	0.02	ug/g		75.7	50-140			
m,p-Xylenes	8.14	0.05	ug/g		102	60-130			
o-Xylene	4.08	0.05	ug/g		102	60-130			
Benzene	2.64	0.02	ug/g		66.0	60-130			
Ethylbenzene	4.03	0.05	ug/g		101	60-130			
Toluene	4.59	0.05	ug/g		115	60-130			
m,p-Xylenes	8.14	0.05	ug/g		102	60-130			
o-Xylene	4.08	0.05	ug/g		102	60-130			

Qualifier Notes:

Sample Qualifiers :

1 : GC-FID signal did not return to baseline by C50

QC Qualifiers :

QM-06 : Due to noted non-homogeneity of the QC sample matrix, the spike recoveries were out side the accepted range. Batch data accepted based on other QC.

QR-04 : Duplicate results exceeds RPD limits due to non-homogeneous matrix.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

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

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TF
RE
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Paracel ID: 1939472

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awa, Ontario K1G 4J8
1-800-749-1947
paracel@paracellabs.com

Chain of Custody
(Lab Use Only)
№ 123280

Page ___ of ___

Client Name: GHD Limited	Project Reference: 112061
Contact Name: Luke. Lopes	Quote #
Address: 179 Colonnade Road	PO #
Telephone: 613-727-0511	Email Address: Luke.Lopes@ghd.com

Turnaround Time:
☐ 1 Day ☐ 3 Day
☐ 2 Day ☒ Regular
Date Required: ___

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

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

Required Analyses

Paracel Order Number: 1939472 - Bulk, 1939475 - TCLP

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	pH	TCLP Leachate					
1	112061-BH2-SS1	S		2	Sept 24	15:00			X	X				X						
2	112061-BH2-SS3	S		3	Sept 24	15:30	X	X												
3	112061-BH3-SS1	S		3	Sept 24	11:00		X	X	X				X						
4	112061-BH3-SS2	S		2	Sept 24	11:30	X	X	X											
5	112061-BH4-SS1	S		3	Sept 24	10:00	X			X				X						
6	112061-BH5-SS1	S		3	Sept 25	9:15	X			X				X						
7	112061-TCLP	S		4	Sept 24	14:00									X					
8	112061-BH7-SS1	S		3	Sept 24	15:00			X	X				X						
9	112061-BH7-SS3	S		2	Sept 24	15:30	X	X												
10																				

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Ryan Vodelmeier	Date/Time: 26/09/19 10 51 AM	Date/Time: 09/26/19 12:10	Date/Time: 9-26-19
Date/Time: Sept 26, 2019 9:00	Temperature: °C	Temperature: 11.9 °C	pH Verified ☐ By:

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Certificate of Analysis

GHD Limited (Ottawa)

179 Colonnade Road Suite 400
Ottawa, ON K2E7S4
Attn: Luke Lopers

Client PO:
Project: 11201061
Custody: 123280

Report Date: 2-Oct-2019
Order Date: 26-Sep-2019

Order #: 1939475

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

Paracel ID	Client ID
1939475-01	11201061-TCLP

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: GHD Limited (Ottawa)
Client PO:

Report Date: 02-Oct-2019
Order Date: 26-Sep-2019
Project Description: 11201061

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Flashpoint	ASTM D93 - Pensky-Martens Closed Cup	1-Oct-19	1-Oct-19
REG 558 - Cyanide	MOE E3015- Auto Colour	1-Oct-19	1-Oct-19
REG 558 - Fluoride	EPA 340.2 - ISE	2-Oct-19	2-Oct-19
REG 558 - Mercury by CVAA	EPA 7470A - Cold Vapour AA	1-Oct-19	1-Oct-19
REG 558 - Metals, ICP-MS	TCLP EPA 6020 - Digestion - ICP-MS	1-Oct-19	1-Oct-19
REG 558 - NO3/NO2	EPA 300.1 - IC	1-Oct-19	1-Oct-19
REG 558 - PAHs	EPA 625 - GC-MS	1-Oct-19	2-Oct-19
REG 558 - PCBs	EPA 608 - GC-ECD	2-Oct-19	2-Oct-19
REG 558 - VOCs	EPA 624 - P&T GC-MS	2-Oct-19	2-Oct-19
Solids, %	Gravimetric, calculation	26-Sep-19	26-Sep-19

Certificate of Analysis
Client: GHD Limited (Ottawa)
Client PO:

Report Date: 02-Oct-2019
Order Date: 26-Sep-2019
Project Description: 11201061

	Client ID:	11201061-TCLP	-	-	-
	Sample Date:	25-Sep-19 09:00	-	-	-
	Sample ID:	1939475-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	95.4	-	-	-
Flashpoint	℃	>70	-	-	-
EPA 1311 - TCLP Leachate Inorganics					
Fluoride	0.05 mg/L	0.13	-	-	-
Nitrate as N	1 mg/L	<1	-	-	-
Nitrite as N	1 mg/L	<1	-	-	-
Cyanide, free	0.02 mg/L	<0.02	-	-	-
EPA 1311 - TCLP Leachate Metals					
Arsenic	0.05 mg/L	<0.05	-	-	-
Barium	0.05 mg/L	1.29	-	-	-
Boron	0.05 mg/L	<0.05	-	-	-
Cadmium	0.01 mg/L	<0.01	-	-	-
Chromium	0.05 mg/L	<0.05	-	-	-
Lead	0.05 mg/L	<0.05	-	-	-
Mercury	0.005 mg/L	<0.005	-	-	-
Selenium	0.05 mg/L	<0.05	-	-	-
Silver	0.05 mg/L	<0.05	-	-	-
Uranium	0.05 mg/L	<0.05	-	-	-
EPA 1311 - TCLP Leachate Volatiles					
Benzene	0.005 mg/L	<0.005	-	-	-
Carbon Tetrachloride	0.005 mg/L	<0.005	-	-	-
Chlorobenzene	0.004 mg/L	<0.004	-	-	-
Chloroform	0.006 mg/L	<0.006	-	-	-
1,2-Dichlorobenzene	0.004 mg/L	<0.004	-	-	-
1,4-Dichlorobenzene	0.004 mg/L	<0.004	-	-	-
1,2-Dichloroethane	0.005 mg/L	<0.005	-	-	-
1,1-Dichloroethylene	0.006 mg/L	<0.006	-	-	-
Methyl Ethyl Ketone (2-Butanone)	0.30 mg/L	<0.30	-	-	-
Methylene Chloride	0.04 mg/L	<0.04	-	-	-
Tetrachloroethylene	0.005 mg/L	<0.005	-	-	-
Trichloroethylene	0.004 mg/L	<0.004	-	-	-
Vinyl chloride	0.005 mg/L	<0.005	-	-	-
4-Bromofluorobenzene	Surrogate	103%	-	-	-
Dibromofluoromethane	Surrogate	85.9%	-	-	-
Toluene-d8	Surrogate	78.0%	-	-	-
EPA 1311 - TCLP Leachate Organics					

Certificate of Analysis
Client: GHD Limited (Ottawa)
Client PO:

Report Date: 02-Oct-2019
Order Date: 26-Sep-2019
Project Description: 11201061

	Client ID:	11201061-TCLP	-	-	-
	Sample Date:	25-Sep-19 09:00	-	-	-
	Sample ID:	1939475-01	-	-	-
	MDL/Units	Soil	-	-	-
Benzo [a] pyrene	0.0001 mg/L	<0.0001	-	-	-
Terphenyl-d14	Surrogate	117%	-	-	-
PCBs, total	0.003 mg/L	<0.003	-	-	-
Decachlorobiphenyl	Surrogate	105%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
EPA 1311 - TCLP Leachate Inorganics									
Fluoride	ND	0.05	mg/L						
Nitrate as N	ND	1	mg/L						
Nitrite as N	ND	1	mg/L						
Cyanide, free	ND	0.02	mg/L						
EPA 1311 - TCLP Leachate Metals									
Arsenic	ND	0.05	mg/L						
Barium	ND	0.05	mg/L						
Boron	ND	0.05	mg/L						
Cadmium	ND	0.01	mg/L						
Chromium	ND	0.05	mg/L						
Lead	ND	0.05	mg/L						
Mercury	ND	0.005	mg/L						
Selenium	ND	0.05	mg/L						
Silver	ND	0.05	mg/L						
Uranium	ND	0.05	mg/L						
EPA 1311 - TCLP Leachate Organics									
Benzo [a] pyrene	ND	0.0001	mg/L						
Surrogate: Terphenyl-d14	*0.19*		*mg/L*		*94.7*	*37.1-155.6*			
PCBs, total	ND	0.003	mg/L						
Surrogate: Decachlorobiphenyl	*0.0088*		*mg/L*		*88.1*	*62-138*			
EPA 1311 - TCLP Leachate Volatiles									
Benzene	ND	0.005	mg/L						
Carbon Tetrachloride	ND	0.005	mg/L						
Chlorobenzene	ND	0.004	mg/L						
Chloroform	ND	0.006	mg/L						
1,2-Dichlorobenzene	ND	0.004	mg/L						
1,4-Dichlorobenzene	ND	0.004	mg/L						
1,2-Dichloroethane	ND	0.005	mg/L						
1,1-Dichloroethylene	ND	0.006	mg/L						
Methyl Ethyl Ketone (2-Butanone)	ND	0.30	mg/L						
Methylene Chloride	ND	0.04	mg/L						
Tetrachloroethylene	ND	0.005	mg/L						
Trichloroethylene	ND	0.004	mg/L						
Vinyl chloride	ND	0.005	mg/L						
Surrogate: 4-Bromofluorobenzene	*0.237*		*mg/L*		*87.3*	*83-134*			
Surrogate: Dibromofluoromethane	*0.241*		*mg/L*		*88.5*	*78-124*			
Surrogate: Toluene-d8	*0.295*		*mg/L*		*109*	*76-118*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
EPA 1311 - TCLP Leachate Inorganics									
Fluoride	0.14	0.05	mg/L	0.13			4.0	20	
Nitrate as N	ND	1	mg/L	ND			0.0	20	
Nitrite as N	ND	1	mg/L	ND				20	
Cyanide, free	ND	0.02	mg/L	ND				20	
EPA 1311 - TCLP Leachate Metals									
Arsenic	ND	0.05	mg/L	ND			0.0	29	
Barium	0.529	0.05	mg/L	0.527			0.5	34	
Boron	0.067	0.05	mg/L	0.064			3.7	33	
Cadmium	ND	0.01	mg/L	ND			0.0	33	
Chromium	ND	0.05	mg/L	ND			0.0	32	
Lead	ND	0.05	mg/L	ND			0.0	32	
Mercury	ND	0.005	mg/L	ND			0.0	30	
Selenium	ND	0.05	mg/L	ND			0.0	28	
Silver	ND	0.05	mg/L	ND			0.0	28	
Uranium	ND	0.05	mg/L	ND			0.0	27	
EPA 1311 - TCLP Leachate Organics									
PCBs, total	ND	0.003	mg/L	ND				30	
Surrogate: Decachlorobiphenyl	*0.010*		*mg/L*		*99.6*	*62-138*			
Physical Characteristics									
% Solids	88.0	0.1	% by Wt.	88.2			0.2	25	

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
EPA 1311 - TCLP Leachate Inorganics									
Fluoride	0.54	0.05	mg/L	0.13	81.7	70-130			
Nitrate as N	11	1	mg/L	ND	106	81-112			
Nitrite as N	10	1	mg/L	ND	95.7	76-107			
Cyanide, free	0.051	0.02	mg/L	ND	103	60-136			
EPA 1311 - TCLP Leachate Metals									
Arsenic	51.0		ug/L	0.547	101	83-119			
Barium	99.9		ug/L	52.7	94.4	83-116			
Boron	45.4		ug/L	6.42	78.0	71-128			
Cadmium	46.7		ug/L	0.316	92.7	78-119			
Chromium	53.4		ug/L	0.060	107	80-124			
Lead	44.5		ug/L	0.981	87.0	77-126			
Mercury	0.0346	0.005	mg/L	ND	115	70-130			
Selenium	44.7		ug/L	0.352	88.8	81-125			
Silver	41.5		ug/L	ND	83.0	70-128			
Uranium	45.8		ug/L	0.535	90.6	70-131			
EPA 1311 - TCLP Leachate Organics									
Benzo [a] pyrene	0.0356	0.0001	mg/L		71.3	39-123			
Surrogate: Terphenyl-d14	*0.25*		*mg/L*		*126*	*37.1-155.6*			
PCBs, total	0.057	0.003	mg/L	ND	141	86-145			
EPA 1311 - TCLP Leachate Volatiles									
Benzene	0.031	0.005	mg/L		77.5	55-141			
Carbon Tetrachloride	0.029	0.005	mg/L		72.0	49-149			
Chlorobenzene	0.027	0.004	mg/L		67.3	64-137			
Chloroform	0.024	0.006	mg/L		60.0	58-138			
1,2-Dichlorobenzene	0.029	0.004	mg/L		72.9	60-150			
1,4-Dichlorobenzene	0.030	0.004	mg/L		73.9	63-132			
1,2-Dichloroethane	0.025	0.005	mg/L		62.0	50-140			
1,1-Dichloroethylene	0.032	0.006	mg/L		80.5	43-153			
Methyl Ethyl Ketone (2-Butanone)	0.074	0.30	mg/L		73.9	26-153			
Methylene Chloride	0.024	0.04	mg/L		60.0	58-149			
Tetrachloroethylene	0.026	0.005	mg/L		65.0	51-145			
Trichloroethylene	0.022	0.004	mg/L		54.2	52-135			
Vinyl chloride	0.026	0.005	mg/L		63.9	31-159			

Qualifier Notes:

QC Qualifiers :

QS-02 : Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

PARACEL LABORATORIES LTD.

T R R

Paracel ID: 1939475

Head Office
300-2319 St. Laurent Blvd.
Ottawa, Ontario K1G 4J8
1-800-749-1947
paracel@paracellabs.com

Chain of Custody (Lab Use Only)
№ 123280

Page __ of __

Client Name: GHD Limited	Project Reference: 11200G1
Contact Name: Luke Lopes	Quote #
Address: 179 Colonnade Road	PO #
Telephone: 613-727-0510	Email Address: Luke.Lopes@ghd.com

Turnaround Time: ☐ 1 Day ☐ 3 Day ☐ 2 Day ☒ Regular
Date Required: ______

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

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

Paracel Order Number: 1939472 - Bulk; 1939475 - TCLP

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Date	Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	pH	TCLP Leachate
1	11200G1-BH2-SS1	S		2	Sept 24	15:00			X	X				X	
2	11200G1-BH2-SS3	S		3	Sept 24	15:30	X	X							
3	11200G1-BH3-SS1	S		3	Sept 24	11:00		X	X	X				X	
4	11200G1-BH3-SS2	S		2	Sept 24	11:30	X	X	X						
5	11200G1-BH4-SS1	S		3	Sept 24	10:00	X			X				X	
6	11200G1-BH5-SS1	S		3	Sept 25	9:15	X			X				X	
7	11200G1-TCLP	S		4	Sept 24	14:00									✓
8	11200G1-BH7-SS1	S		3	Sept 24	15:00			X	X				X	
9	11200G1-BH7-SS3	S		2	Sept 24	15:30	X	X							
10															

Comments: Unknown petroleum per Luke

Method of Delivery: Paracel

Relinquished By (Sign): [signature]	Received by Driver/Depot: [signature]	Received at Lab: [signature]	Verified By: [signature]
Relinquished By (Print): Ryan Laker-Millar	Date/Time: 26/09/19 10:51 AM	Date/Time: 09/26/19 12:10	Date/Time: 9-26-19
Date/Time: Sept 26 2019 9:00	Temperature: °C	Temperature: 11.9 °C	pH Verified [ ] By:

PARACEL LABORATORIES LTD.

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Certificate of Analysis

GHD Limited (Ottawa)

179 Colonnade Road Suite 400
Ottawa, ON K2E7S4
Attn: Luke Lopers

Client PO:
Project: 11201061
Custody: 123279

Report Date: 22-Oct-2019
Order Date: 16-Oct-2019

Order #: 1942259

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

Paracel ID	Client ID
1942259-01	11201061-BH2A
1942259-02	11201061-BH3
1942259-03	11201061-BH4
1942259-04	11201061-BH5
1942259-05	11201061-BH7
1942259-06	Trip Blank

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: GHD Limited (Ottawa)
Client PO:

Report Date: 22-Oct-2019
Order Date: 16-Oct-2019
Project Description: 11201061

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Metals, ICP-MS	EPA 200.8 - ICP-MS	18-Oct-19	21-Oct-19
pH	EPA 150.1 - pH probe @25 °C	17-Oct-19	17-Oct-19
PHC F1	CWS Tier 1 - P&T GC-FID	19-Oct-19	20-Oct-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	18-Oct-19	22-Oct-19
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	21-Oct-19	21-Oct-19
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	19-Oct-19	20-Oct-19

Certificate of Analysis
Client: GHD Limited (Ottawa)
Client PO:

Report Date: 22-Oct-2019
Order Date: 16-Oct-2019
Project Description: 11201061

	Client ID:	11201061-BH2A	11201061-BH3	11201061-BH4	11201061-BH5
	Sample Date:	16-Oct-19 10:15	16-Oct-19 12:45	16-Oct-19 14:00	16-Oct-19 15:30
	Sample ID:	1942259-01	1942259-02	1942259-03	1942259-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
pH	0.1 pH Units	6.9	-	-	7.3
Metals					
Antimony	0.5 ug/L	<0.5	<0.5	-	<0.5
Arsenic	1 ug/L	8	<1	-	<1
Barium	1 ug/L	255	192	-	186
Beryllium	0.5 ug/L	<0.5	<0.5	-	<0.5
Boron	10 ug/L	73	261	-	230
Cadmium	0.1 ug/L	<0.1	<0.1	-	<0.1
Chromium	1 ug/L	2	<1	-	<1
Cobalt	0.5 ug/L	0.8	<0.5	-	<0.5
Copper	0.5 ug/L	<0.5	<0.5	-	<0.5
Lead	0.1 ug/L	<0.1	<0.1	-	<0.1
Molybdenum	0.5 ug/L	19.0	2.1	-	1.1
Nickel	1 ug/L	3	<1	-	<1
Selenium	1 ug/L	<1	<1	-	<1
Silver	0.1 ug/L	<0.1	<0.1	-	<0.1
Sodium	200 ug/L	48500	68200	-	108000
Thallium	0.1 ug/L	<0.1	<0.1	-	<0.1
Uranium	0.1 ug/L	6.8	2.6	-	4.0
Vanadium	0.5 ug/L	3.4	<0.5	-	0.5
Zinc	5 ug/L	7	<5	-	<5
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis
Client: GHD Limited (Ottawa)
Client PO:

Report Date: 22-Oct-2019
Order Date: 16-Oct-2019
Project Description: 11201061

	Client ID:	11201061-BH2A	11201061-BH3	11201061-BH4	11201061-BH5
	Sample Date:	16-Oct-19 10:15	16-Oct-19 12:45	16-Oct-19 14:00	16-Oct-19 15:30
	Sample ID:	1942259-01	1942259-02	1942259-03	1942259-04
	MDL/Units	Water	Water	Water	Water
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylene dibromide (dibromoethan	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	106%	113%	111%	108%
Dibromofluoromethane	Surrogate	98.6%	93.8%	94.4%	98.7%
Toluene-d8	Surrogate	89.6%	90.3%	91.9%	90.6%
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	<25
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	<100
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	<100

Certificate of Analysis
Client: GHD Limited (Ottawa)
Client PO:

Report Date: 22-Oct-2019
Order Date: 16-Oct-2019
Project Description: 11201061

	Client ID:	11201061-BH2A	11201061-BH3	11201061-BH4	11201061-BH5
	Sample Date:	16-Oct-19 10:15	16-Oct-19 12:45	16-Oct-19 14:00	16-Oct-19 15:30
	Sample ID:	1942259-01	1942259-02	1942259-03	1942259-04
	MDL/Units	Water	Water	Water	Water
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	<100
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	<0.05	-	-
Acenaphthylene	0.05 ug/L	<0.05	<0.05	-	-
Anthracene	0.01 ug/L	<0.01	<0.01	-	-
Benzo [a] anthracene	0.01 ug/L	<0.01	<0.01	-	-
Benzo [a] pyrene	0.01 ug/L	<0.01	<0.01	-	-
Benzo [b] fluoranthene	0.05 ug/L	<0.05	<0.05	-	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	<0.05	-	-
Benzo [k] fluoranthene	0.05 ug/L	<0.05	<0.05	-	-
Chrysene	0.05 ug/L	<0.05	<0.05	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	-	-
Fluoranthene	0.01 ug/L	<0.01	<0.01	-	-
Fluorene	0.05 ug/L	<0.05	<0.05	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	<0.05	-	-
1-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	-	-
2-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	-	-
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	<0.10	-	-
Naphthalene	0.05 ug/L	<0.05	<0.05	-	-
Phenanthrene	0.05 ug/L	<0.05	<0.05	-	-
Pyrene	0.01 ug/L	<0.01	<0.01	-	-
2-Fluorobiphenyl	Surrogate	101%	90.5%	-	-
Terphenyl-d14	Surrogate	112%	102%	-	-

Certificate of Analysis
Client: GHD Limited (Ottawa)
Client PO:

Report Date: 22-Oct-2019
Order Date: 16-Oct-2019
Project Description: 11201061

	Client ID:	11201061-BH7	Trip Blank	-	-
	Sample Date:	16-Oct-19 10:15	23-Sep-19 09:00	-	-
	Sample ID:	1942259-05	1942259-06	-	-
	MDL/Units	Water	Water	-	-
Metals					
Antimony	0.5 ug/L	<0.5	-	-	-
Arsenic	1 ug/L	7	-	-	-
Barium	1 ug/L	258	-	-	-
Beryllium	0.5 ug/L	<0.5	-	-	-
Boron	10 ug/L	75	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Chromium	1 ug/L	2	-	-	-
Cobalt	0.5 ug/L	0.8	-	-	-
Copper	0.5 ug/L	<0.5	-	-	-
Lead	0.1 ug/L	<0.1	-	-	-
Molybdenum	0.5 ug/L	19.4	-	-	-
Nickel	1 ug/L	3	-	-	-
Selenium	1 ug/L	<1	-	-	-
Silver	0.1 ug/L	<0.1	-	-	-
Sodium	200 ug/L	49200	-	-	-
Thallium	0.1 ug/L	<0.1	-	-	-
Uranium	0.1 ug/L	6.8	-	-	-
Vanadium	0.5 ug/L	3.3	-	-	-
Zinc	5 ug/L	10	-	-	-
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	-	-
Benzene	0.5 ug/L	<0.5	<0.5	-	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	-	-
Bromoform	0.5 ug/L	<0.5	<0.5	-	-
Bromomethane	0.5 ug/L	<0.5	<0.5	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	-	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
Chloroform	0.5 ug/L	<0.5	<0.5	-	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-

Certificate of Analysis
Client: GHD Limited (Ottawa)
Client PO:

Report Date: 22-Oct-2019
Order Date: 16-Oct-2019
Project Description: 11201061

	Client ID:	11201061-BH7	Trip Blank	-	-
	Sample Date:	16-Oct-19 10:15	23-Sep-19 09:00	-	-
	Sample ID:	1942259-05	1942259-06	-	-
	MDL/Units	Water	Water	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Ethylene dibromide (dibromoethar	0.2 ug/L	<0.2	<0.2	-	-
Hexane	1.0 ug/L	<1.0	<1.0	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Styrene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	-	-
4-Bromofluorobenzene	Surrogate	110%	107%	-	-
Dibromofluoromethane	Surrogate	95.3%	96.4%	-	-
Toluene-d8	Surrogate	89.6%	91.0%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	-	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	-	-

Certificate of Analysis
Client: GHD Limited (Ottawa)
Client PO:

Report Date: 22-Oct-2019
Order Date: 16-Oct-2019
Project Description: 11201061

	Client ID:	11201061-BH7	Trip Blank	-	-
	Sample Date:	16-Oct-19 10:15	23-Sep-19 09:00	-	-
	Sample ID:	1942259-05	1942259-06	-	-
	MDL/Units	Water	Water	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	-	-
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	-	-	-
Acenaphthylene	0.05 ug/L	<0.05	-	-	-
Anthracene	0.01 ug/L	<0.01	-	-	-
Benzo [a] anthracene	0.01 ug/L	<0.01	-	-	-
Benzo [a] pyrene	0.01 ug/L	<0.01	-	-	-
Benzo [b] fluoranthene	0.05 ug/L	<0.05	-	-	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	-	-	-
Benzo [k] fluoranthene	0.05 ug/L	<0.05	-	-	-
Chrysene	0.05 ug/L	<0.05	-	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	-	-	-
Fluoranthene	0.01 ug/L	<0.01	-	-	-
Fluorene	0.05 ug/L	<0.05	-	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	-	-	-
1-Methylnaphthalene	0.05 ug/L	<0.05	-	-	-
2-Methylnaphthalene	0.05 ug/L	<0.05	-	-	-
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	-	-	-
Naphthalene	0.05 ug/L	<0.05	-	-	-
Phenanthrene	0.05 ug/L	<0.05	-	-	-
Pyrene	0.01 ug/L	<0.01	-	-	-
2-Fluorobiphenyl	Surrogate	103%	-	-	-
Terphenyl-d14	Surrogate	107%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	*16.9*		*ug/L*		*84.5*	*50-140*			
Surrogate: Terphenyl-d14	*21.2*		*ug/L*		*106*	*50-140*			
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroform	ND	0.5	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Ethylene dibromide (dibromoethane	ND	0.2	ug/L						
Hexane	ND	1.0	ug/L						
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L						
Methyl Isobutyl Ketone	ND	5.0	ug/L						
Methyl tert-butyl ether	ND	2.0	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Styrene	ND	0.5	ug/L						
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L						
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L						
Tetrachloroethylene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
1,1,1-Trichloroethane	ND	0.5	ug/L						
1,1,2-Trichloroethane	ND	0.5	ug/L						
Trichloroethylene	ND	0.5	ug/L						
Trichlorofluoromethane	ND	1.0	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: 4-Bromofluorobenzene	*94.4*		*ug/L*		*118*	*50-140*			
Surrogate: Dibromofluoromethane	*69.1*		*ug/L*		*86.4*	*50-140*			
Surrogate: Toluene-d8	*76.5*		*ug/L*		*95.6*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
pH	7.8	0.1	pH Units	7.9			0.3	3.3	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND				30	
Metals									
Antimony	0.72	0.5	ug/L	ND			0.0	20	
Arsenic	ND	1	ug/L	ND			0.0	20	
Barium	1.9	1	ug/L	1.9			2.6	20	
Beryllium	ND	0.5	ug/L	ND			0.0	20	
Boron	ND	10	ug/L	ND			0.0	20	
Cadmium	ND	0.1	ug/L	ND			0.0	20	
Chromium	ND	1	ug/L	ND			0.0	20	
Cobalt	ND	0.5	ug/L	ND			0.0	20	
Copper	0.95	0.5	ug/L	0.86			10.6	20	
Lead	ND	0.1	ug/L	ND			0.0	20	
Molybdenum	ND	0.5	ug/L	ND			0.0	20	
Nickel	ND	1	ug/L	ND			0.0	20	
Selenium	ND	1	ug/L	ND			0.0	20	
Silver	ND	0.1	ug/L	ND			0.0	20	
Sodium	584	200	ug/L	569			2.5	20	
Thallium	ND	0.1	ug/L	ND			0.0	20	
Uranium	ND	0.1	ug/L	ND			0.0	20	
Vanadium	ND	0.5	ug/L	ND			0.0	20	
Zinc	ND	5	ug/L	ND			0.0	20	
Volatiles									
Acetone	ND	5.0	ug/L	ND				30	
Benzene	ND	0.5	ug/L	ND				30	
Bromodichloromethane	1.26	0.5	ug/L	ND			0.0	30	
Bromoform	ND	0.5	ug/L	ND				30	
Bromomethane	ND	0.5	ug/L	ND				30	
Carbon Tetrachloride	ND	0.2	ug/L	ND				30	
Chlorobenzene	ND	0.5	ug/L	ND				30	
Chloroform	3.25	0.5	ug/L	4.79			38.3	30	
Dibromochloromethane	ND	0.5	ug/L	ND				30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND				30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
1,2-Dichloroethane	ND	0.5	ug/L	ND				30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND				30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
1,2-Dichloropropane	ND	0.5	ug/L	ND				30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Ethylene dibromide (dibromoethane	ND	0.2	ug/L	ND				30	
Hexane	ND	1.0	ug/L	ND				30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND				30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND				30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Styrene	ND	0.5	ug/L	ND				30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
Tetrachloroethylene	ND	0.5	ug/L	ND				30	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Toluene	ND	0.5	ug/L	ND				30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND				30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND				30	
Trichloroethylene	ND	0.5	ug/L	ND				30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: 4-Bromofluorobenzene	*87.3*		*ug/L*		*109*	*50-140*			
Surrogate: Dibromofluoromethane	*73.0*		*ug/L*		*91.2*	*50-140*			
Surrogate: Toluene-d8	*72.5*		*ug/L*		*90.6*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1710	25	ug/L		85.5	68-117			
F2 PHCs (C10-C16)	1280	100	ug/L		80.1	60-140			
F3 PHCs (C16-C34)	4140	100	ug/L		106	60-140			
F4 PHCs (C34-C50)	2030	100	ug/L		82.0	60-140			
Metals									
Antimony	41.4		ug/L	ND	82.3	80-120			
Arsenic	46.7		ug/L	ND	93.0	80-120			
Barium	47.7		ug/L	1.9	91.6	80-120			
Beryllium	46.1		ug/L	ND	92.2	80-120			
Boron	41		ug/L		81.9	80-120			
Cadmium	46.9		ug/L	ND	93.7	80-120			
Chromium	45.9		ug/L	ND	91.8	80-120			
Cobalt	42.8		ug/L	ND	85.6	80-120			
Copper	45.4		ug/L	0.86	89.1	80-120			
Lead	41.7		ug/L	ND	83.4	80-120			
Molybdenum	41.1		ug/L	ND	82.0	80-120			
Nickel	43.8		ug/L	ND	87.5	80-120			
Selenium	46.1		ug/L	ND	92.2	80-120			
Silver	41.4		ug/L		82.8	80-120			
Sodium	9130		ug/L	569	85.6	80-120			
Thallium	41.5		ug/L	ND	83.0	80-120			
Uranium	40.4		ug/L	ND	80.8	80-120			
Vanadium	45.2		ug/L	ND	90.4	80-120			
Zinc	48		ug/L	ND	95.9	80-120			
Semi-Volatiles									
Acenaphthene	4.05	0.05	ug/L		81.0	50-140			
Acenaphthylene	3.75	0.05	ug/L		74.9	50-140			
Anthracene	4.01	0.01	ug/L		80.2	50-140			
Benzo [a] anthracene	4.59	0.01	ug/L		91.7	50-140			
Benzo [a] pyrene	4.11	0.01	ug/L		82.2	50-140			
Benzo [b] fluoranthene	5.85	0.05	ug/L		117	50-140			
Benzo [g,h,i] perylene	3.39	0.05	ug/L		67.8	50-140			
Benzo [k] fluoranthene	5.72	0.05	ug/L		114	50-140			
Chrysene	4.96	0.05	ug/L		99.3	50-140			
Dibenzo [a,h] anthracene	3.72	0.05	ug/L		74.5	50-140			
Fluoranthene	4.59	0.01	ug/L		91.8	50-140			
Fluorene	3.97	0.05	ug/L		79.4	50-140			
Indeno [1,2,3-cd] pyrene	3.78	0.05	ug/L		75.6	50-140			
1-Methylnaphthalene	4.09	0.05	ug/L		81.8	50-140			
2-Methylnaphthalene	4.41	0.05	ug/L		88.2	50-140			
Naphthalene	4.14	0.05	ug/L		82.7	50-140			
Phenanthrene	3.85	0.05	ug/L		76.9	50-140			
Pyrene	4.24	0.01	ug/L		84.7	50-140			
Surrogate: 2-Fluorobiphenyl	*17.5*		*ug/L*		*87.7*	*50-140*			
Volatiles									
Acetone	53.7	5.0	ug/L		53.7	50-140			
Benzene	39.4	0.5	ug/L		98.6	60-130			
Bromodichloromethane	30.4	0.5	ug/L		76.1	60-130			
Bromoform	27.4	0.5	ug/L		68.4	60-130			
Bromomethane	38.8	0.5	ug/L		96.9	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Carbon Tetrachloride	29.1	0.2	ug/L		72.8	60-130			
Chlorobenzene	34.1	0.5	ug/L		85.3	60-130			
Chloroform	34.7	0.5	ug/L		86.7	60-130			
Dibromochloromethane	26.7	0.5	ug/L		66.8	60-130			
Dichlorodifluoromethane	34.7	1.0	ug/L		86.7	50-140			
1,2-Dichlorobenzene	30.9	0.5	ug/L		77.3	60-130			
1,3-Dichlorobenzene	30.9	0.5	ug/L		77.4	60-130			
1,4-Dichlorobenzene	32.2	0.5	ug/L		80.6	60-130			
1,1-Dichloroethane	37.6	0.5	ug/L		93.9	60-130			
1,2-Dichloroethane	27.3	0.5	ug/L		68.2	60-130			
1,1-Dichloroethylene	39.7	0.5	ug/L		99.3	60-130			
cis-1,2-Dichloroethylene	39.2	0.5	ug/L		97.9	60-130			
trans-1,2-Dichloroethylene	39.1	0.5	ug/L		97.7	60-130			
1,2-Dichloropropane	38.5	0.5	ug/L		96.2	60-130			
cis-1,3-Dichloropropylene	32.1	0.5	ug/L		80.2	60-130			
trans-1,3-Dichloropropylene	32.1	0.5	ug/L		80.2	60-130			
Ethylbenzene	31.5	0.5	ug/L		78.7	60-130			
Ethylene dibromide (dibromoethane	29.7	0.2	ug/L		74.2	60-130			
Hexane	47.4	1.0	ug/L		119	60-130			
Methyl Ethyl Ketone (2-Butanone)	93.1	5.0	ug/L		93.1	50-140			
Methyl Isobutyl Ketone	82.0	5.0	ug/L		82.0	50-140			
Methyl tert-butyl ether	76.4	2.0	ug/L		76.4	50-140			
Methylene Chloride	41.5	5.0	ug/L		104	60-130			
Styrene	31.2	0.5	ug/L		78.0	60-130			
1,1,1,2-Tetrachloroethane	29.5	0.5	ug/L		73.8	60-130			
1,1,2,2-Tetrachloroethane	42.3	0.5	ug/L		106	60-130			
Tetrachloroethylene	31.5	0.5	ug/L		78.7	60-130			
Toluene	33.4	0.5	ug/L		83.5	60-130			
1,1,1-Trichloroethane	29.5	0.5	ug/L		73.8	60-130			
1,1,2-Trichloroethane	39.3	0.5	ug/L		98.2	60-130			
Trichloroethylene	30.1	0.5	ug/L		75.2	60-130			
Trichlorofluoromethane	27.2	1.0	ug/L		68.0	60-130			
Vinyl chloride	27.3	0.5	ug/L		68.2	50-140			
m,p-Xylenes	70.8	0.5	ug/L		88.5	60-130			
o-Xylene	31.6	0.5	ug/L		79.0	60-130			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

The Sample Date for lab provided Trip QC samples is based on the date of preparation at the lab.

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

CCME PHC additional information:

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

Paracel ID: 1942259

PARACE LABORATORIES LTD.

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Chain of Custody
(Lab Use Only)
№ 123279

Page ___ of ___

Client Name: GHD	Project Reference: 1120661
Contact Name: Luke Lopers	Quote #
Address: 179 Colonnade Road	PO #
Telephone: 613-727-0570	Email Address: Luke.Lopers@ghd.com

Turnaround Time:
☐ 1 Day ☐ 3 Day
☐ 2 Day ☒ Regular
Date Required: ___

Criteria: ☒ O. Reg. 153/04 (As Amended) Table 7 ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ___ ☐ Other: ___

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

Required Analyses

Paracel Order Number: 1942259

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	pH						
1	1120661-BH2A	GW		8	Oct 16/19	10:15	X	X	X	X				X						
2	1120661-BH3	GW		7	Oct 16/19	12:45	X	X	X	X										
3	1120661-BH4	GW		5	Oct 16/19	14:00	X	X												
4	1120661-BH5	GW		7	Oct 16/19	15:30	X	X		X				X						
5	1120661-BH7	GW		7	Oct 16/19	10:15	X	X	X	X										
6	Trip Blank	GW		1	Sep 23, 26 19			X												
7																				
8																				
9																				
10																				

Comments:

Method of Delivery: Walk-in

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Ryan Vadnais	Date/Time:	Date/Time: Oct 16th 2019 4:02 PM	Date/Time: 17 Oct 19 939
Date/Time: Oct 16, 2019 16:00	Temperature: °C	Temperature: 11.6 °C	pH Verified [ ] by:

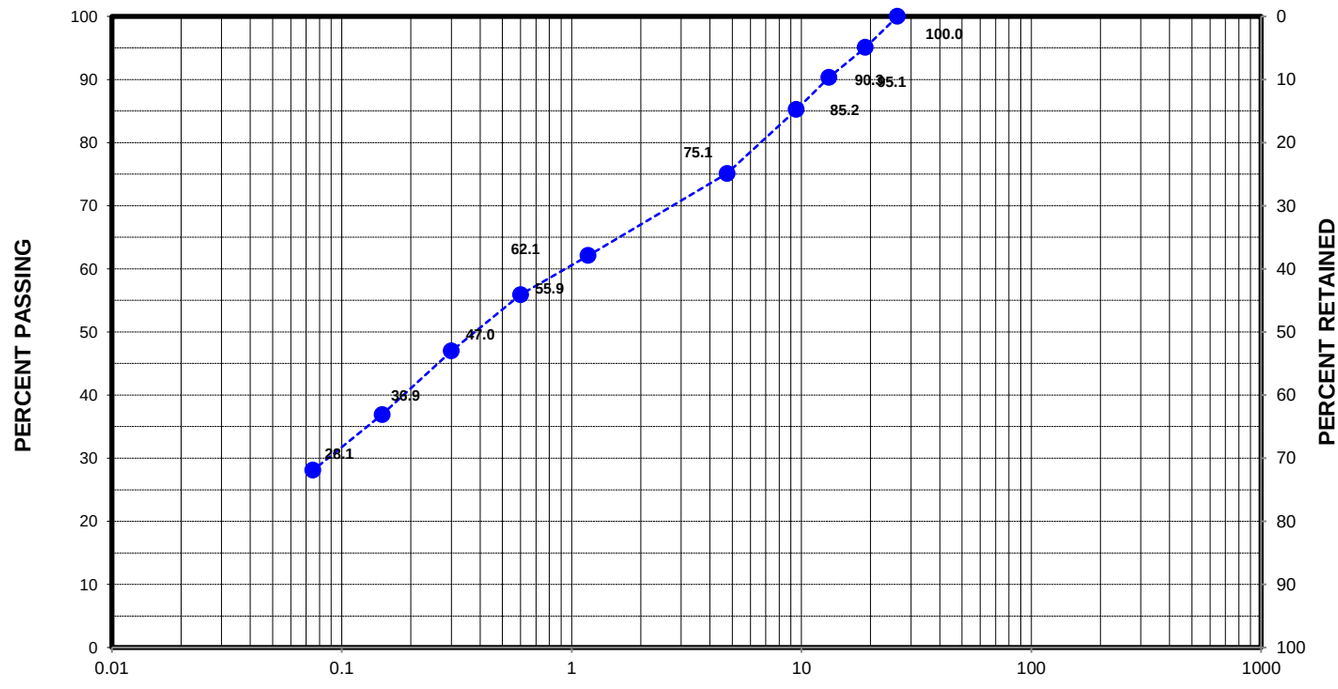
Appendix D
Grain Size Analysis

SIEVE ANALYSIS

CLIENT:	9770967 Canada Inc.	**LAB No.:**	G-19-009
PROJECT/SITE:	1098 Ogilvie Road/1178 Cummings Avenue	**PROJECT No.:**	11201061

BOREHOLE:	BH2	**SAMPLE:**	SS1
DEPTH:	0.0m - 0.6m	**SAMPLE DATE:**	September 23/24, 2019

SIEVE SIZE (mm)	SAMPLE % PASSING	
26.2	100.0	
19.0	95.1	
13.2	90.3	
9.5	85.2	
4.75	75.1	
1.18	62.1	
0.600	55.9	
0.300	47.0	
0.150	36.9	
0.075	28.1	



REMARKS:

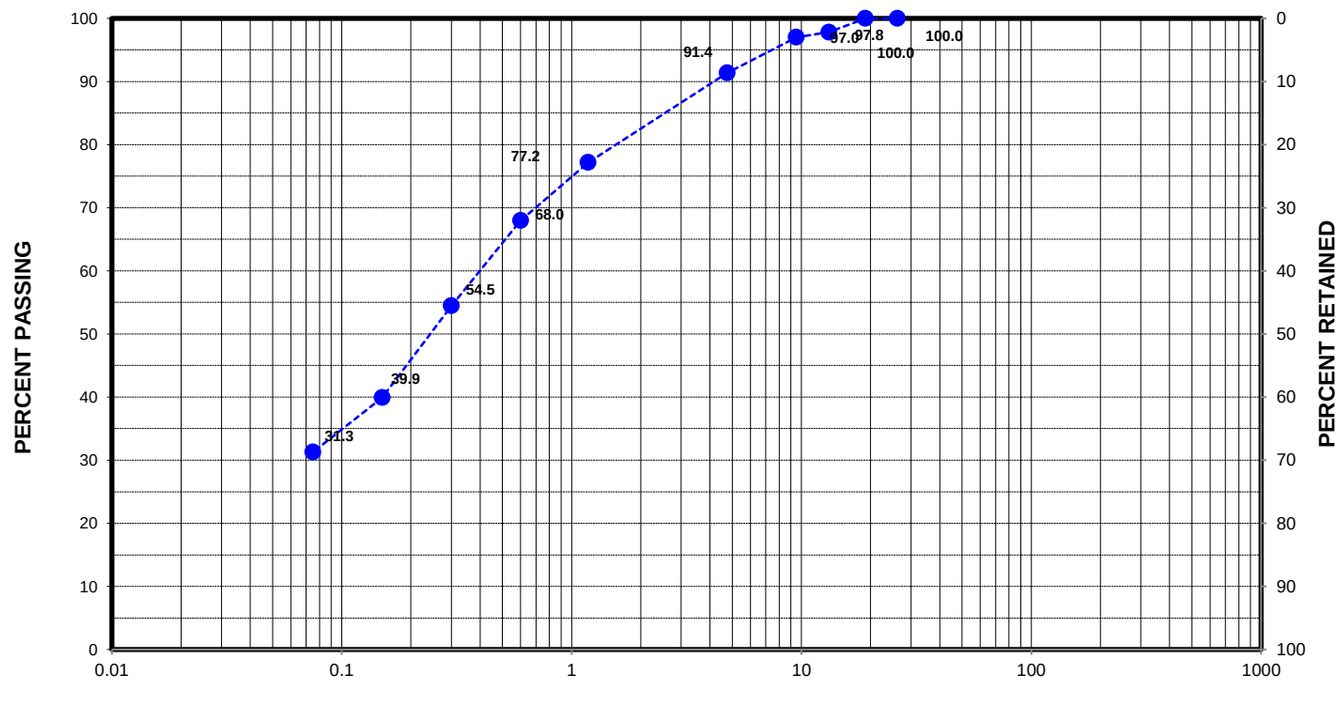
PERFORMED BY:	A. Elhaddad	**DATE:**	October 23, 2019
VERIFIED BY:		**DATE:**	October 23, 2019

SIEVE ANALYSIS

CLIENT:	9770967 Canada Inc.	**LAB No.:**	G-19-009
PROJECT/SITE:	1098 Ogilvie Road/1178 Cummings Avenue	**PROJECT No.:**	11201061

BOREHOLE:	BH6	**SAMPLE:**	SS2
DEPTH:	0.8m - 1.4m	**SAMPLE DATE:**	September 23/24, 2019

SIEVE SIZE (mm)	SAMPLE % PASSING	
26.2	100.0	
19.0	100.0	
13.2	97.8	
9.5	97.0	
4.75	91.4	
1.18	77.2	
0.600	68.0	
0.300	54.5	
0.150	39.9	
0.075	31.3	



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about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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