LOPERS & ASSOCIATES

Phase Two Environmental Site Assessment

265 Catherine Street
Ottawa, Ontario

Prepared for:
11034936 Canada Inc.

September 20, 2021

LOP21-018B

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1. Executive Summary

Lopers & Associates (Lopers) was retained by 11034936 Canada Inc. (Brigil) to complete a Phase Two Environmental Site Assessment (Phase Two ESA) of the commercial property with Civic address No. 265 Catherine Street, Ottawa, Ontario ("Phase Two Property", "Property" or "Site").

This Phase Two ESA is being completed as part of due diligence requirements associated with the submission and filing of a record of site condition (RSC) for the Property, required as part of a change in land use to a more sensitive use. This Phase Two ESA can also be used to support the submission of a Development Application to the City of Ottawa Municipal Planning Department.

Lopers has previously completed a Phase One Environmental Site Assessment (Phase One ESA) (Reference No. LOP21-018A, dated August 20, 2021) for Brigil at the Property. The Phase One ESA identified the presence of three potentially contaminating activities (PCAs) at the Property which were interpreted to represent areas of potential environmental concern (APECs). The presence of a private fuel outlet and associated underground storage tank (UST) represents PCA #1 and is interpreted as APEC #1 for the northeast portion of the Phase One Property. The presence of a service bay (garage), associated historical aboveground storage tank (AST) and suspected UST represents PCA #2 and is interpreted as APEC #2 for the east portion of the Phase One Property. The former presence of residential and commercial structures which historically occupied the majority of the Phase One Property, are suspected to have had their foundations backfilled with poor environmental quality fill material. This fill material (PCA #3) is suspected in areas outside of the current building footprint and represents APEC #3 for the Property.

The contaminants of potential concern associated with fuel storage and fuelling are generally PHCs and BTEXs. Based on historical presence of a service garage at the Property, VOCs are also considered contaminants of potential concern (CPCs) associated with the former service garage operations. The CPCs associated with the historical fill materials are polycyclic aromatic hydrocarbons (PAHs), metals & inorganics. PHCs/BTEXs are also a CPC; considering the date of original development at the Property, there are suspected former heating oil storage tanks associated with the various former residential and commercial properties which now comprise the Phase Two Property.

The scope of work for the Phase Two ESA included drilling five boreholes at the Phase Two Property. Two of the boreholes were instrumented with groundwater monitoring wells with screens installed in the overburden.

Nine soil samples, including two duplicate samples, were submitted for laboratory analysis as part of this Phase Two ESA. The samples were analyzed for a combination of PHCs, BTEXs, volatile organic compounds (VOCs), PAHs, metals and inorganics. Six additional soil samples,

collected and analyzed during historical (2010 & 2020) environmental investigations completed at the Phase Two Property by others, were reviewed and reported as part of this Phase Two ESA.

Groundwater sampling was completed of the two newly installed monitoring wells and six existing groundwater monitoring wells at the Phase Two Property, which were installed as part of historical investigations. A total of 11 groundwater samples, including 8 original samples, 2 duplicate samples and a trip blank, were submitted for laboratory analysis as part of this Phase Two ESA. The samples were analyzed for a combination of PHCs, BTEXs, VOCs, PAHs, metals and inorganics. Three additional groundwater samples, collected and analyzed during historical (2010 & 2020) environmental investigations completed at the Phase Two Property by others, were reviewed and reported as part of this Phase Two ESA.

The applicable sites standard was determined to be the full depth generic site condition standard, in a non-potable groundwater condition, with course textured soil, for residential property use, as specified in Table 3 of the MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

The following soil samples had exceedance concentrations reported compared to their respective Site Condition Standards, as noted in Table 1 as follows:

Table 1: Soil Exceedances

Exceeding Parameter:			F1 Range PHCs	F2 Range PHCs	F3 Range PHCs	Xylenes	Benzo(a)pyrene	Fluoranthene	Vanadium	Sodium Adsorption Ratio	Conductivity
Sample Location	MECP Table 3 Site Condition Standards		55 ug/g	98 ug/g	300 ug/g	3.1 ug/g	0.3 ug/g	0.69 ug/g	86 ug/g	5 ug/g	700 uS/cm
	Sample ID	Sample Depth	Reported Concentration (ug/g)								
BH3-10*	BH3-10-SS2	0.8–1.4 m BGS	77	6230	2450	5.51	-	-	-	-	-
BH6-10*	BH6-10-SS4	2.3–2.9 m BGS	-	1580	-	-	-	-	-	-	-
BH1-20*	BH1-20-SS2	0.8–1.4 m BGS	-	-	-	-	0.49	0.76	-	-	-
BH2-20*	BH2-20-SS2	0.8–1.4 m BGS	-	-	-	-	0.38	-	-	-	-
BH2-21	BH2-21-SS1	0.1–0.6 m BGS	-	-	-	-	-	-	-	-	2540 uS/cm
BH3-21	BH3-21-SS4	1.2–1.8 m BGS	-	-	-	-	-	-	98.6	39.4	7190 uS/cm
BH4-21	BH4-21-SS5	2.4–3.1 m BGS	-	150	-	-	-	-	-	-	-
BH5-21	DUP-2-21	1.2–1.8 m BGS	-	-	-	-	-	-	-	6.07	760 uS/cm
	BH5-21-SS4	1.8–2.4 m BGS	160	2530	837	-			-	-	-
	DUP-1-21	1.8–2.4 m BGS	108	2750	1160	-	-	-	-	-	-

* - Collected as part of historical investigations by others

The following groundwater samples had exceedance concentrations reported compared to their respective Site Condition Standards, as noted in Table 2 as follows:

Table 2: Groundwater Exceedances

Exceeding Parameter:			F2 Range PHCs	F3 Range PHCs	Sodium	Chloride
Sample Location	MECP Table 3 Site Condition Standards		150 ug/L	500 ug/L	2300 mg/L	2300 mg/L
	Sample ID	Sample Date	Reported Concentration			
BH3-10*	BH3-10-GW1	September 1, 2010	362 ug/L	-	-	-
BH1(MW)	BH1(MW)-2021GW1	June 2, 2021	663000 ug/L	345000 ug/L	-	-
	DUP-1-2021GW1	June 2, 2021	686000 ug/L	358000 ug/L	-	-
BH2-20	BH2-20	June 23, 2021	-	-	-	2400 mg/L
BH3-20	BH3-20	June 23, 2021	-	-	-	2440 mg/L
BH4-21	BH4-21-GW1	June 23, 2021	-	-	5230 mg/L	13900 mg/L
	BH14-21-GW1	June 23, 2021	-	-	5220 mg/L	11900 mg/L

* - Collected as part of historical investigations by others

All of the other soil and groundwater results for the Phase Two Property are in compliance with the applicable site condition standards. The Phase Two Property is not in compliance with the site condition standards as of the certification date of June 23, 2021.

An environmental remediation program, including the bulk removal and off-site disposal of soil and groundwater in excess of the site condition standards, is recommended for the Phase Two Property. The submission of a record of site condition will be required since there will be a change of land use of the Phase Two Property to a more sensitive use. These tasks can be completed at the time of decommissioning and demolition of existing structures at the Phase Two Property. The Phase Two ESA could then be updated with confirmatory sample results at that time to show compliance with site condition standards.

Given the scope and timeline for the proposed redevelopment and the requirements for specialized construction techniques to complete remediation of the Phase Two Property to meet the site condition standards, it is recommended that remediation be completed in conjunction with redevelopment of the Property. It should be noted that the proposed redevelopment includes excavation for at least two to three levels of underground parking, which is expected to remove the source zone of the petroleum hydrocarbon impacted soil and groundwater on the Phase Two Property.

Preparation of a soil management plan in accordance with O.Reg. 406/19 will be required as part of the management of excess soil generated as part of construction activities. It is recommended that a remedial action plan be prepared to develop a strategy for remediation, including soil and groundwater management, during redevelopment.

2. Introduction

Lopers & Associates (Lopers) was retained by 11034936 Canada Inc. (Brigil) to complete a Phase Two Environmental Site Assessment (Phase Two ESA) of the commercial property with Civic address No. 265 Catherine Street, Ottawa, Ontario ("Phase Two Property", "Property" or "Site"). The location of the Phase Two Property within the City of Ottawa is presented on Figure 1: Key Plan.

i. Site Description

The Phase Two Property has a Civic address of 265 Catherine Street, Ottawa, Ontario. The Property is legally described as Lots 10 to 12 (West Side of Kent Street) and Lots 22 to 28 (South Side of Arlington Avenue) and Lots 22 to 28 (North Side of Catherine Street) on Registered Plan 30, in the City of Ottawa and has a property identifier number of 04122-0408. The boundaries of the Phase Two Property are presented on Figure 2: Site Plan.

Based on approximate dimensions obtained from the City of Ottawa's GIS mapping tool, the Phase Two Property has an approximate area of 10,345m^2 (1.03 Hectares). The Phase Two Property has a zoning designation of GM [1875] S271, which signifies a general mixed use zone. The Phase Two Property is immediately surrounded by four municipal Right-of-Ways, then residential properties to the north and west, commercial properties to the south and an institution (school) property to the east.

ii. Property Ownership

The Phase Two Property is currently owned by 11034936 Canada Inc., a subsidiary company of Brigil Construction ("Brigil"). This Phase Two ESA was commissioned by Mr. Jean-Luc Rivard, Director of Land Development and Infrastructure for Brigil Construction (Brigil), operating as 11034936 Canada Inc. Brigil has a business address of 98 Rue Lois, Gatineau, Quebec, J8Y 3R7 and a business telephone number of 819-243-7392.

iii. Current and Proposed Future Use

The Phase Two Property is currently vacant; however, the most recent land use was as the Ottawa central bus terminal, which is considered a commercial use.

It is Lopers' understanding that Brigil intends to redevelop the Phase Two Property for residential use, including the current concept for construction of three buildings with adjoining segments ranging from thirty-three to thirty-eight storeys in height, with two to three levels subgrade parking, commercial ground floors and residential units above.

As redevelopment of the Phase Two Property will involve a change in land use to a more stringent use, a record of site condition (RSC) will be required to be filed with the Ministry of Environment, Conservation and Parks (MECP) for the Phase Two Property. This Phase Two ESA

(updated post-remediation) will be used as supporting documentation as part of filing of an RSC.

iv. Applicable Site Condition Standard

Through Ontario Regulation 153/04 (O.Reg. 153/04) the Ministry of Environment, Conservation and Parks (MECP) prescribes the conditions to determine the applicable site condition standard for a property.

The proposed future use of the Phase Two Property is for mixed ground floor commercial and residential use, however residential land use standards have been applied for the purposes of this report as they represent the more environmentally sensitive land use conditions.

The Phase Two Property and all other properties within 250 m of the property boundaries are supplied by the municipal drinking water system. The RSC does not specify agricultural use and there are no wells within 250 m of the property boundaries that are intended for use as a source of water for human consumption or agriculture. As such, the designation of non-potable groundwater setting is determined to be applicable [O.Reg. 153/04, section 35].

The soil and groundwater quality over the full depth of overburden was considered for this Phase Two ESA. The full depth generic site condition standards were selected for comparison for the Phase Two Property [O.Reg. 153/04, sections 36, 37, 38, 39 and 40].

The Phase Two Property is not situated within or adjacent to an area of natural significance and does not include any land within 30 m of an area of natural significance. The pH of the soil was analyzed as part of this Phase Two ESA and was found to range from 7.48 to 7.92. As such, the Phase Two Property is not considered to be an environmentally sensitive area [O.Reg. 153/04, section 41].

A substantial layer of native glacial till, consisting of clayey silty sand and gravel with cobbles and boulders, which would be classified as coarse grained soil, is present underlaying a silty clay unit to full depth to bedrock at the Phase Two Property, while silty sand and gravel fill is present near surface elsewhere at the Property. It is interpreted that greater than 1/3 of the Phase Two Property has coarse grained soil. For the purposes of this Phase Two ESA, the soil conditions are considered to be coarse grained, which provides a more conservative comparison to the MECP site condition standards than the fine-grained values [O.Reg. 153/04, section 42].

Review of the drilling program and borehole/monitoring well logs completed as part of this Phase Two ESA and previous investigations was completed. It was determined that greater than 2/3 of the Phase Two Property has greater than 2 m of overburden soil. The Phase Two Property is not considered a shallow soil property [O.Reg. 153/04, section 43.1].

The Phase Two Property does not include and does not have any land located within 30 m of a water body. The MECP site condition standards for use within 30 m of a water body do not apply [O.Reg. 153/04, section 43.1].

The full depth generic site condition standards, with non-potable groundwater, course textured soil, for residential/parkland/institutional property use, as specified in Table 3 of the MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011 were determined to be the applicable site condition standards for the Phase Two Property as part of this Phase Two ESA.

3. Background Information

i. Physical Setting

No water bodies or areas of natural significance are located at the Phase Two Property or in the Phase One Study Area. There were no areas of natural and scientific interest (ANSIs) or areas of natural significance identified in the Phase One Study Area.

The regional topography in the Phase One Study Area generally slopes gently downward to the north and northeast. The Phase Two Property is generally at grade with the neighbouring properties. The nearest surface water body identified on the mapping is Patterson Creek, located approximately 560 m southeast of the Phase Two Property. The Rideau Canal (man made) is present approximately 850 m east of the Property. The Ottawa River is located approximately 1.8 km north of the Phase Two Property.

The Phase Two Property is 95% covered with impermeable surfaces. Surface water flow is dominated by developed drainage patterns to storm drains, which drain into the municipal stormwater sewer system.

No drinking water wells are located at the Phase Two Property and the Phase One Study Area are serviced by municipally treated drinking water. The Phase Two Property and Study Area are not located in the vicinity of any well-head protection areas or other designation identified by the City of Ottawa in its official plan for the protection of ground water. No private or agricultural water supply wells are located within the Phase One Study Area.

ii. Past Investigations

A Phase One ESA report was prepared concurrently with this Phase Two ESA: "Phase One Environmental Site Assessment, 265 Catherine Street, Ottawa, Ontario" dated August 23, 2021 prepared for 11034936 Canada Inc. by Lopers & Associates. The Phase One ESA identified three potentially contaminating activities (PCAs) at the Phase One Property, which include:

The presence of a private fuel outlet and associated underground storage tank (UST) represents PCA #1 and is interpreted as APEC #1 for the northeast portion of the Phase One Property. The presence of a service bay (garage), associated historical aboveground storage tank (AST) and suspected UST represents PCA #2 and is interpreted as APEC #2 for the east portion of the Phase One Property. The former presence of residential and commercial structures which

historically occupied the majority of the Phase One Property, are suspected to have had their foundations backfilled with poor environmental quality fill material. This fill material (PCA #3) is suspected in areas outside of the current building footprint and represents APEC #3 for the Property.

The contaminants of potential concern (CPCs) associated with fuel storage and fuelling are generally PHCs and BTEXs. Based on historical presence of a service garage at the Property VOCs are also considered CPCs associated with such operations. The CPCs associated with the historical fill materials are polycyclic aromatic hydrocarbons (PAHs), metals & inorganics. PHCs/BTEXs are also a CPC; considering the date of original development at the Property, there are suspected former heating oil storage tanks associated with the various former residential and commercial properties which now comprise the Phase One Property.

Based on the identification of PCAs and APECs at the Phase One Property, a Phase Two Environmental Site Assessment was recommended to be completed to assess the soil groundwater quality in the vicinity of the APECs.

Additional reports and sources were reviewed and/or referenced as part of the aforementioned Phase One ESA, and included:

- "Phase I - Environmental Site Assessment, Existing Bus Terminal, 265 Catherine Street, Ottawa, Ontario", dated October 15, 2020, completed by Paterson Group Inc. for Crerar Silverside Corporation.
- "Phase II Environmental Site Assessment, Existing Bus Terminal, 265 Catherine Street, Ottawa, Ontario", dated October 16, 2020, completed by Paterson Group Inc. for Crerar Silverside Corporation.
- "Remedial Action Plan, 265 Catherine Street, Ottawa, Ontario", dated October 15, 2020, completed by completed by Paterson Group Inc. for Crerar Silverside Corporation.
- "Geotechnical Investigation, Proposed Mixed-Use Development, 265 Catherine Street, Ottawa, Ontario", dated October 7, 2020, completed by Paterson Group Inc. for Crerar Silverside Corporation.

These reports confirm the findings of the Phase One ESA completed by Lopers & Associates in 2021 and provide some additional detail of historical investigation work at the Phase Two Property.

There were no discrepancies identified in review of documentation, information or data from previous investigations. As such, previous investigations are considered to be of adequate quality such that they can be relied upon for the purposes of this Phase Two ESA.

4. Scope of Investigation

i. Overview of Site Investigation

This Phase Two ESA was designed to meet the general requirements of O.Reg. 153/04 as amended, with details of scope presented in Lopers' Letter entitled "Proposal for Designated Substance Survey, Phase One and Phase Two Environmental Site Assessments, Record of Site Condition Submission, Remedial Action Plan and Municipal Brownfields Application Proposed Residential Re-development 265 Catherine Street, Ottawa, ON, 265 Catherine Street, Ottawa, ON", dated May 3, 2021, reference No. PRO-018-21-BRIGIL. The scope of work for investigation was discussed with Brigil and sampling and analysis plan (SAP) was prepared to achieve the objectives of the Phase Two ESA; the SAP is provided in Appendix A. For documentation purposes for an RSC for the Phase Two Property, additional effort, including delineation, remediation and reporting will be required. These activities and confirmatory results are expected to be included as an Appendix to a revised version of this September 2021 Phase Two ESA.

Underground utility locates were completed through Ontario 1-Call to identify any active public services on the Phase Two Property. Following the completion of the public locates, USL-1 Underground Service Locators completed scanning of the Phase Two Property proposed drilling locations to locate privately owned underground services prior to initiating the field program. Various underground utility services, including natural gas, electricity, water and sewers were identified at the Phase Two Property. The natural gas, water and sewer services are present in underground trenches which enter the Property from Arlington Avenue to the north and lead to the commercial building. Electricity enters the property through an underground service trench to the southwest of the north commercial building. Copies of the underground locates are provided in Appendix B.

On June 18, 2021, a total of five boreholes (BH1-21 through BH5-21) were drilled at the Phase Two Property. The boreholes were drilled using a truck mounted CME 55 drill rig operated by George Downing Estate Drilling. Soil samples were collected using stainless steel split spoons. Soil samples recovered during the sampling program were screened in the field for volatile vapour concentrations, as well as visual and olfactory observations.

A total of two groundwater monitoring wells (BH4-21, and BH5-21) were installed on the northeast portion of the Phase Two Property. The boreholes which were instrumented with groundwater monitoring wells were drilled to the localized depths of 4.9 m below ground surface (m BGS) and were screened to straddle the shallow groundwater table. When possible, these groundwater monitoring wells were developed on day of drilling by removing at least three well volumes or by purging the wells dry three times.

A total of six existing groundwater monitoring wells were present at the Phase Two Property prior to undertaking the field program for this Phase Two ESA. The existing monitoring wells were installed as part of past investigations by others. Based on the depths of these wells and the depth to bedrock in boreholes in the vicinity of these wells which were drilled as part of this Phase Two ESA, the existing monitoring wells are suspected to have their screens set within the overburden and may also straddle the shallow groundwater table. All of the existing groundwater monitoring wells were developed on May 19, 2021 by removing at least three well volumes.

The locations of the boreholes/monitoring wells drilled/installed as part of this Phase Two ESA as well as existing monitoring wells at the Phase Two Property are presented on Figure 2: Site Plan. The rationale for the placement of the boreholes/monitoring wells is provided below:

- BH1-21 was drilled in the vicinity of the former suspected residential building on the southeast portion of the Phase Two Property. This borehole was placed in a location to assess fill quality in the footprint of this former building (APEC #3). This borehole location was placed adjacent to an existing borehole which was instrumented with a groundwater monitoring well (BH3-20).
- BH2-21 was drilled in the vicinity of a former suspected residential building on the north portion of the Phase Two Property. This borehole was placed in a location to assess fill quality in the footprint of this former building (APEC #3).
- BH3-21 was drilled in the northeast portion of the Phase Two Property. This borehole was placed in a location to assess potential soil contamination from the former private fuel outlet (APEC #1). This borehole location was placed adjacent to an existing borehole which was instrumented with a groundwater monitoring well (BH1(MW)).
- BH4-21 was drilled in the northeast portion of the Phase Two Property. This borehole was placed in a location to assess potential soil and groundwater contamination from the diesel underground storage tank (APEC #1). This borehole was instrumented with a groundwater monitoring well, with its screen installed within soil which was observed to be wet during the drilling/soil sample collection in an attempt to straddle the shallow groundwater table.
- BH5-21 was drilled in the east portion of the Phase Two Property, near the suspected location of a waste oil underground storage tank. This borehole was placed in a location to assess potential soil and groundwater contamination from the associated on-Site service garage (APEC #2). This borehole was instrumented with a groundwater monitoring well, with its screen installed within soil which was observed to be wet during the drilling/soil sample collection in an attempt to straddle the shallow groundwater table.

Soil samples were selected for laboratory analysis of the contaminants of potential concern (CPCs) based on APECs and CPCs identified in the Phase One ESA, as described in Section 3.ii. above as well as field screening observations.

An initial groundwater monitoring and sampling event of the existing groundwater monitoring wells at the Phase Two Property was completed on June 2, 2021. Groundwater monitoring and sampling of the monitoring wells BH1(MW), BH7(MW), BH3-10 and BH1-21 was completed as part of the initial sampling event.

A second groundwater monitoring and sampling event was completed on June 23, 2021 for monitoring wells installed as part of this Phase Two ESA (BH4-21 and BH5-21) as well as select existing groundwater monitoring wells (BH2-20 and BH3-20).

Static groundwater levels were measured prior to disturbance of the water column. During purging, water quality parameters were measured at regular intervals to monitor groundwater quality stabilization; once groundwater quality parameters stabilized (were within approximately 10% on successive readings), groundwater samples were collected. Groundwater samples were selected for laboratory analysis of select CPCs based on APECs and CPCs identified in the Phase One ESA.

An elevation survey was completed of the boreholes/monitoring wells drilled as part of the Phase Two ESA as well as both existing monitoring wells at the Phase Two Property. The boreholes/monitoring wells were surveyed relative to a temporary benchmark of the top spindle of the City of Ottawa fire hydrant located at the northeast corner of the Catherine Street and Kent Street intersection; this benchmark was assigned a reference elevation of 100.000 m ("Site Datum") for the purposes of this Phase Two ESA.

ii. Media Investigation

Based on the finding of the Phase One ESA, the following media were investigated:

Soil quality at the Phase Two Property was investigated through the collection of soil samples at varying depths facilitated by drilling using a truck mounted CME drill rig with stainless steel split spoon sampling.

Groundwater quality at the Phase Two Property was investigated through the installation of new monitoring wells and sampling of the new and existing groundwater monitoring wells. Two new monitoring wells installed as part of the Phase Two ESA were drilled to the localized depths of 4.9 m below ground surface (m BGS) and were screened to straddle the shallow groundwater table. The six existing monitoring wells at the Phase Two Property were suspected to have monitoring well screens installed within the overburden. Groundwater monitoring wells were sampled using a peristaltic pump.

There were no natural surface water bodies at the Phase Two Property, and as such no sediment sampling was completed as part of the Phase Two ESA.

iii. Phase One Conceptual Site Model

The Phase One Property, which has the same location orientation and property boundaries as the Phase Two Property, is located at Civic No. 265 Catherine Street, Ottawa, Ontario and has an approximate area of 1.03 Hectares.

The Phase One Property was undeveloped prior to the early 1900's when residential development of the north, east and west portions of the Property began; the north, east and west portions of the Property were fully developed for residential use between 1928 and 1965. The Barrett Family began purchasing the south-central portion of the Phase One Property, and the property was used as a lumber storage yard and sales office from at least 1912 to 1965. The Phase One Property was redeveloped with a commercial (Ottawa Central Bus Terminal) in 1973, which operated until June of 2021.

The Property is currently vacant and unoccupied. The Property was most recently used as a bus terminal and had leased commercial and office space prior to 2020. 11034936 Canada Inc. (Brigil) purchased the Phase One Property in 2021, and it is understood that the intended future use is for residential purposes, with potential for commercial use on the ground floor and two to three levels of underground parking. The Phase One Property is immediately surrounded by four municipal Right-of-Ways, then residential properties to the north and west, commercial properties to the south and an institution (school) property to the east.

The Phase One Study Area includes the Phase One Property and properties with the boundaries within 250 m of the Phase One Property limits. Based on a review of the Phase One Property and properties in the Phase One Study Area, their associated historical and/or current uses and operations and physical characteristics of the Phase One Study Area, it was determined that an assessment of properties within 250 m of the Phase One property was sufficient to meet the objectives of the scope of this investigation for a Phase One ESA.

No water bodies or areas of natural significance are located at the Phase One Property or in the Phase One Study Area. No drinking water wells are located at the Phase One Property and the Phase One Study Area is serviced by municipally treated non-potable water. Six existing groundwater monitoring wells were present at the Phase One Property; the locations of these wells are presented on Figure 2.

The regional topography in the Phase One Study Area generally slopes downward to the north and northeast. Surface water flow is dominated by developed drainage patterns to storm drains. The Phase One Property is generally at grade with the neighbouring properties. The nearest surface water body identified on the mapping is Patterson Creek, located approximately 560 m southeast of the Phase One Property. The Rideau Canal (man made, flowing north) is present approximately 850 m east of the Property. The Ottawa River, flowing east, is located approximately 1.8 km north of the Phase One Property.

Based on the historical research, the general stratigraphy of the Phase One Property and Phase One Study Area consists of sand and gravel fill, underlain by silty clay, followed by silty sand and gravel (till). The overburden soil is underlain by interbedded limestone and/or shale bedrock, which was encountered at approximately 8 to 12 m below ground surface. Groundwater is expected at a depth of approximately 2 to 5 m BGS with regional flow in a predominantly northeast direction.

The presence of a private fuel outlet and associated underground storage tank (UST) represents PCA #1 and is interpreted as APEC #1 for the northeast portion of the Phase One Property. The presence of a service bay (garage), associated historical aboveground storage tank (AST) and suspected UST represents PCA #2 and is interpreted as APEC #2 for the east portion of the Phase One Property. The former presence of residential and commercial structures which historically occupied the majority of the Phase One Property, are suspected to have had their foundations backfilled with poor environmental quality fill material. This fill material (PCA #3) is suspected in areas outside of the current building footprint and represents APEC #3 for the Property.

The CPCs associated with fuel storage and fuelling are generally PHCs and BTEXs. Based on historical presence of a service garage at the Property VOCs are also considered CPCs associated with such operations. The CPCs associated with the historical fill materials are polycyclic aromatic hydrocarbons (PAHs), metals & inorganics. PHCs/BTEXs are also a CPC; considering the date of original development at the Property, there are suspected former heating oil storage tanks associated with the various former residential and commercial properties which now comprise the Phase One Property.

Forty-seven additional PCAs were identified at neighbouring properties in the Phase One Study Area; however, these PCAs are located significant distances and/or at down- or cross-gradient orientations with respect to the Phase One Property and are not considered to represent APECs for the Phase One Property.

Previous environmental reports were provided which document the presence of contaminant concentrations that exceed the Site Condition Standards at the Phase One Property; the contaminants are associated with the aforementioned APECs.

Underground utility corridors for sanitary and storm sewers, potable water, private electricity and natural gas lines lead to the building, generally from Catherine Street to the south or from Arlington Avenue to the north. The underground utility corridors have the potential to affect contaminant distribution and transport, as they would create preferential pathways for lateral migration.

iv. Deviations from Sampling and Analysis Plan

There were no deviations to the Sampling and Analysis Plan (SAP) as part of this Phase Two ESA.

v. Impediments

There were no impediments encountered as part of this Phase Two ESA.

5. Investigation Method

i. General

The investigation method for this Phase Two ESA involved an assessment of the soil and/or groundwater quality for the associated CPCs in the vicinity of the APECs identified during the Phase One ESA.

Investigation of soil was completed using a truck mounted CME drill rig, with stainless steel split spoons used to recover soil samples. Soil samples were screened in the field for volatile vapour concentrations, as well as visual and olfactory observations. Select soil samples were submitted for laboratory analysis of the CPCs, based on all the indications mentioned above, as well as to capture representative soil and fill layers, for laboratory analysis for the CPCs.

Groundwater was assessed using the groundwater monitoring wells which were installed as part of this Phase Two ESA drilling program and those which had been installed at the Phase Two Property as part of historical previous investigations. The wells selected for monitoring/sampling were purged during the drilling program. Static groundwater levels were measured in the monitoring wells prior to disturbance of the water column on the day of sampling. Groundwater samples were collected using a peristaltic pump using low-flow procedures and were submitted for laboratory analysis for the CPCs.

An elevation survey of the boreholes and groundwater monitoring wells was completed and was referenced to a temporary benchmark, the top of spindle of a fire hydrant located to the northeast of the Kent Street and Catherine Street intersection, to the southeast of the Phase Two Property.

The following sections provide further detailed information regarding the investigation methodology completed as part of the Phase Two ESA.

ii. Drilling

The drilling field program was completed on June 18, 2021 under full-time supervision by Lopers & Associates personnel. Five boreholes were drilled for the Phase Two ESA by the drilling subcontractor George Downing Estate Drilling, located at 410 Principale Rue, Grenville-Sur-la-Rouge, Quebec, J0V 1B0. The drill rig used for the Phase Two ESA was a truck mounted CME drill, equipped with hollow stem augers and stainless-steel split spoons.

Samples were collected using stainless steel split spoons from the near surface to the full depth of drilling. Split spoon samples, collected in 0.6 m segments, were recovered continuously at 0.6 m intervals.

The split spoons, which were the only media to come into contact with the soil samples, were washed using soap and water and a scrub brush between samples to minimize the potential for cross-contamination among samples. The field technician used sterile nitrile gloves, which were changed prior to the handling of each soil sample to further reduce the potential of cross-contamination. The flights of the hollow stem augers were cleaned manually following each borehole.

iii. Soil Sampling

As described above, soil samples were recovered using stainless steel split spoons.

Soil samples were initially collected in Ziploc bags for initial screening as part of sample selection. Soil samples selected for laboratory analysis were collected in dedicated clear glass jars prepared and provided by the analytical laboratory. Soil samples collected for BTEXs/VOCs and the F1 range of PHCs analysis were collected using a dedicated graduated syringe provided by the laboratory and placed directly into a glass vial with a known quantity of methanol preservative. Analytes and associated preservatives were specified on each jar/vial supplied by the laboratory. Each jar/vial sample set was provided with a unique sample identifier, project number and date of sampling in the field.

Detailed soil descriptions of the stratigraphy for each borehole/monitoring are included on the borehole logs provided in Appendix C. Available borehole logs from previous investigations by others at the Phase Two Property have also been included in Appendix C.

Based on the observations of soil samples collected during the Phase Two ESA field program and previous investigations by others, there were six stratigraphic units identified at the Phase Two Property, which include:

Asphalt

A layer of asphalt, approximately 0.05 to 0.15 m in thickness, was encountered at the ground surface in BH1-21, BH2-21, BH4-21 and BH5-21.

Concrete

A layer of concrete, approximately 0.2 m in thickness, was encountered at the ground surface in BH3-21.

Silty Sand and Gravel (Fill)

A layer of silty sand and gravel fill material, ranging from approximately 0.5 to 2.0 m in thickness, was encountered from ground surface, immediately below the asphalt layer, in boreholes BH1-21, BH2-21, BH4-21 and BH5-21 and was present beneath the sand (fill) layer in BH3-21; all of

which were drilled as part of the Phase Two ESA. This material was identified to consist of silty sand and gravel, and was loose to compact and generally grey. This layer was encountered at varying moisture conditions, generally moist to dry at shallow depths becoming moist with depth; it was not expected that the shallow groundwater table was present within the silty sand and gravel (fill) layer.

Evidence of deleterious fill material, including demolition debris, bricks and black staining was observed in BH5-21 (east side) in this unit at approximate depths ranging from 0.2 to 2.1 m BGS.

Sand (Fill)

A layer of sand fill material, ranging from approximately 1.2 to 1.5 m in thickness, was encountered from near the ground surface in BH3-21 and below a thin layer of silty sand and gravel (fill), in boreholes BH1-21, BH2-21 and BH4-21 drilled as part of the Phase Two ESA. This material was identified to consist of clean, poorly graded (uniform grain size) sand, was loose and brown. This layer was encountered at varying moisture conditions, generally moist to dry at shallow depths becoming moist with depth; it was not expected that the shallow groundwater table was present within the sand (fill) layer.

Petroleum hydrocarbon odours, suspected to be associated with the former private fuel outlet and associated diesel UST were observed in BH4-21 (northeast corner) in this unit at approximate depths ranging from 1.2 to 2.1 m BGS, extending beyond the lowest depth of this material.

Silty Clay

A layer of silty clay, at least 2.1 to 2.8 m in thickness, was encountered immediately below the sand fill layer or silty sand and gravel fill layer in BH3-21, BH4-21 and BH5-21 drilled as part of this Phase Two ESA. This material was identified to consist of silty sand and gravel, was firm becoming soft with depth and was generally grey in colour. This layer was encountered at varying moisture conditions, generally moist at shallow depths becoming wet at depths ranging from 2.4 to 3.1 m BGS.

Petroleum hydrocarbon odours, suspected to be associated with the former private fuel outlet and associated diesel UST were observed in BH3-21 and BH4-21 in this unit at approximate depths ranging from 2.0 to 4.4 m BGS. Petroleum hydrocarbon odours, suspected to be associated with the waste oil UST and service garage operations were observed in BH5-21 in this unit at approximate depths ranging from 2.1 to 4.0 m BGS.

Silty Sand and Gravel (Glacial Till)

A layer of silty sand and gravel material, interpreted to be glacial till, was encountered during the 2020 Geotechnical Investigation by Paterson. The glacial till was encountered below the silty clay layer at depths ranging from approximately 4.2 to 9.1 m BGS. This material was described

to consist of grey clayey silty sand with gravel, cobbles and boulders. This layer was described to be found in wet moisture conditions.

The layer was not encountered during the field investigation for this Phase Two ESA, as the depth of investigation for the APEC and CPCs did not warrant investigation to the depths of the glacial till.

iv. Field Screening Measurements

Initial field screening of the soil samples consisted of visual and olfactory observations made at the time of sample collection during the drilling program.

Additional field screening of the soil samples was completed using an RKI Instruments Model Eagle-2 combustible gas detector ("RKI Eagle"). The RKI Eagle used for soil sample screening as part of this Phase Two ESA was obtained from Maxim Environmental and Safety Inc. and was calibrated by Maxim on June 18, 2021. The RKI Eagle is capable of measuring combustible vapours at concentrations ranging from 0 parts per million (PPM) to 50% of the lower explosive limit (LEL). The RKI Eagle is also capable of measuring VOC vapours at concentrations ranging from 0 ppm to 1000 ppm. The readings of the RKI Eagle are shown on the Borehole Logs in Appendix C. Additional equipment and calibration information for the RKI Eagle is provided on the certificate of calibration included in Appendix D.

Where soil samples were selected in a borehole within an APEC and the SAP identified proposed soil analysis in that borehole, the field screening was used as follows to select the appropriate sample for laboratory analysis.

1. Select sample with evidence of visual and/or olfactory indications of suspected contamination, such as staining, PHC odours or deleterious fill material.
2. Select sample with most significant elevated soil vapour concentration.
3. Select sample based on stratigraphy and/or moisture content, as certain CPCs are generally expected to be found in these defined conditions (i.e. fill material at shallow depths or PHC impacts near the groundwater table interface).

v. Groundwater: Monitoring Well Installation

Installation of monitoring wells in BH4-21 and BH5-21 were completed by George Downing Estate Drilling. The wells were installed using slotted PVC No. 10 monitoring well screens, which were 51 mm in diameter; these screens were installed at depths intended to straddle the shallow groundwater table in each of the aforementioned boreholes. Well screens were 3.0 m in length in both of the monitoring wells installed as part of this Phase Two ESA. The monitoring wells were extended to approximately 0.1 m below the surface grade with PVC riser, also 51 mm in diameter. A threaded PVC end cap was installed at the base of the screen to prevent sediment infiltration, while a J-Plug was installed at the top of the riser to present surface influence.

The annular space in each monitoring well was backfilled with clean silica sand up to approximately 0.3 m above the monitoring well screens. A layer of bentonite chips was then used to make a hydraulic seal above the sand pack to near the ground surface. The monitoring wells were completed with aluminum flushmount protective casings, which were backfilled with sand to allow drainage of any surface water which may infiltrate into the casings.

Development of each of the monitoring wells was completed using dedicated Waterra low density polyethylene (LDPE) tubing and a Waterra footvalve. The existing monitoring wells were developed on May 19, 2020 and the new monitoring wells were developed on June 18, 2021 by purging the wells dry at least three times. The wells were left to stabilize for a period of five days prior to groundwater sampling.

vi. Groundwater: Field Measurement of Water Quality Parameters

Measurements of the groundwater quality field parameters were completed to determine stabilization of these parameters prior to sampling. These measurements were completed using a Horiba U-52 groundwater quality measurement device ("Horiba"). The Horiba used for groundwater quality parameter stabilization measurements as part of this Phase Two ESA was obtained from Maxim Environmental and Safety Inc. and was calibrated on May 31, 2021 and June 21, 2021. The Horiba is capable of measuring temperature, pH, conductivity, turbidity, dissolved oxygen and oxidation reduction potential. Additional equipment and calibration information for the Horiba is provided on the certificate of calibration included in Appendix D.

Field measurement of water quality parameters were collected at regular intervals (0 L, 0.5 well volumes, 1 well volume, 2 well volumes, etc.) during purging of the monitoring wells prior to sampling. The Horiba was placed in a flow-through cell and water quality parameters were measured until they were found to stabilize to within approximately 10% of the previous measurements prior to sample collection.

vii. Groundwater: Sampling

An initial groundwater sampling event of the existing groundwater monitoring wells (BH1(MW), MH7(MW), BH3-10 and BH1-20, which were previously installed at the Phase Two Property within the APECs and in close proximity to APEC #1 / #2, was completed on June 2, 2021. A groundwater sampling event of the newly installed groundwater monitoring wells (BH4-21 and BH5-21) and select existing monitoring wells (BH2-20 and BH3-20) was completed on June 23, 2020 (five days after well installation).

All of these monitoring wells have their screens set in the overburden to straddle the shallow aquifer.

Stabilized groundwater levels were measured in each of the groundwater monitoring wells prior to disturbance of the water column prior to sampling. Where free product was encountered, the thickness of the free product was measured using an interface probe and confirmed using a clear plastic bailer. The dedicated Waterra LDPE tubing and footvalve was removed from each

of the monitoring wells and 6 m Waterra LDPE tubing was placed in each of the monitoring wells. The LDPE tubing was connected to a dedicated length of silicon tubing, run through a peristaltic pump set to low flow (approximately 0.2-0.5 L/minute) during purging and sampling while monitoring groundwater level to minimize the drop in head. The monitoring wells were purged on the day of sampling while water quality parameters were measured as noted above.

Groundwater samples were collected in dedicated amber glass bottles and vials or plastic bottles prepared and provided by the analytical laboratory. Analytes and associated preservatives were specified on each bottle by the laboratory. Each bottle sample set was provided with a unique sample identifier, project number and date of sampling in the field. Samples for PHCs, BTEXs, VOCs, PAHs and general chemistry were unfiltered, while metals samples were field filtered using a dedicated 0.45 µm Waterra filter for each sample.

The field technician changed dedicated sterile nitrile gloves prior to initiating work at each monitoring well and changed gloves prior to sample collection to minimize the potential for cross-contamination.

viii. Sediment: Sampling

There were no natural surface water bodies at the Phase Two Property, and as such no sediment sampling was completed as part of the Phase Two ESA.

ix. Analytical Testing

Soil and groundwater analytical testing was conducted by Paracel Laboratories Ltd. (Paracel). Paracel is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) and the National Institute of Standards and Technology (NIST), Standard Services Division, National Voluntary Laboratory Accreditation Program (NVLAP) for specific environmental and IAQ tests listed in the Scopes of Accreditation registered with each association. For the scope of accreditation under CALA Membership Number 1262, Paracel is accredited for analysis including, but not limited to, metals, organics, conventionals, bacteria, mold, and asbestos in various matrices.

x. Residue Management Procedures

Excess soil cuttings from drilling and monitoring well installations were containerized in steel 205 L drums, which were stored in the in the northeast portion of the Property. These drums were marked with a wax crayon indicating the origin location(s) of the cuttings containerized within each.

Groundwater from well development and purging was initially placed in a graduated plastic bucket for volume measurements and then was transferred to a dedicated plastic 205 L drum, which was stored in the northeast portion of the Property. This drum was marked with a wax crayon indicating the origin location(s) of the water containerized within.

Fluids from equipment cleaning and decontamination were containerized within the purge water drum.

xi. Elevation Surveying

An elevation survey was completed of the boreholes/monitoring wells drilled as part of the Phase Two ESA as well as the two existing monitoring wells at the Phase Two Property. The boreholes/monitoring wells were surveyed relative to a temporary benchmark of the top spindle of the City of Ottawa fire hydrant located at the northeast corner of the Catherine Street and Kent Street intersection; this benchmark was assigned a reference elevation of 100.000 m ("Site Datum") for the purposes of this Phase Two ESA. The reference elevations of each borehole/monitoring well are provided on the borehole logs in Appendix C.

xii. Quality Assurance and Quality Control Measures

Soil samples were collected in dedicated clear glass jars prepared and provided by the analytical laboratory. Soil samples collected for BTEXs/VOCs and the F1 range of PHCs analysis were collected using dedicated graduated syringes provided by the laboratory and placed directly into a glass vial with methanol preservative. Analytes and associated preservatives were specified on each jar/vial by the laboratory. Each jar/vial sample set was provided with a unique sample identifier, project number and date of sampling in the field.

Groundwater samples were collected in dedicated amber glass bottles and vials or plastic bottles prepared and provided by the analytical laboratory. Analytes and associated preservatives were specified on each bottle by the laboratory. Each bottle sample set was provided with a unique sample identifier, project number and date of sampling in the field.

Following sample collection, the soil and groundwater samples were stored in an ice pack chilled cooler to minimize volatilization and begin the cooling process on the day of sampling. On each day of sample collection, following completion of the fieldwork, samples were delivered directly to the analytical laboratory. Standard chain of custody procedures were used to maintain a custody record of soil and groundwater samples between the field technician and the analytical laboratory.

The split spoons, which were the only media to come into contact with the soil samples, were washed using soap and water and a scrub brush between samples to minimize the potential for cross contamination among samples. The field technician used sterile nitrile gloves, which were changed prior to the handling of each soil sample to prevent cross-contamination. The field technician changed dedicated sterile nitrile gloves prior to initiating work at each monitoring well and changed gloves prior to groundwater sample collection to minimize the potential for cross-contamination.

A trip blank water sample for VOCs was submitted for laboratory analysis from the groundwater sampling event completed on June 23, 2021. No detectable VOC concentrations were reported in the trip blank water sample.

The soil samples DUP-1-21 and DUP-2-21 were submitted to the laboratory as blind field duplicate samples of BH5-21-SS4 and BH5-21-SS3, respectively. The ratio of soil duplicate results to original sample results was 0 to 118%, which demonstrates a low to high degree of variability in the analytical results. While some of the soil duplicate ratios observed had higher degrees of variability, it should be noted that where exceedances of the site condition standards were observed for PHCs, they were present in both samples and that the sample results for these parameters are comparable. Additionally, the high degree of heterogeneity in soil samples can attribute to higher levels of variability in analytical ratios. These samples were analyzed for PHCs, VOCs (including BTEXs), PAHs and metals & inorganics, which provide a blind quality assurance and quality control QA/QC validation for all soil parameters analyzed as part of this Phase Two ESA.

The groundwater samples DUP-1-2021GW1 and BH14-21 were submitted to the laboratory as blind field duplicate samples of BH1(MW)-2021GW1 and BH4-21, respectively. The ratio of groundwater duplicate results to original sample results was generally 0 to 19% which meets the required ratio. The groundwater duplicate ratios of PAH parameters was found to range from 0 to 49%; however, the instances of higher variability, the concentrations were generally very low and close to the laboratory method detection limits. The duplicate PAH groundwater sample results are generally comparable. It should be noted that where exceedances of the site condition standards were observed for PHCs, Chloride and Sodium, they were present in both duplicate samples and that the sample results for these parameters are comparable in the duplicate. These samples were analyzed for PHCs, VOCs (including BTEXs), PAHs and metals & inorganics, which provide a blind quality assurance and quality control QA/QC validation for all groundwater parameters analyzed as part of this Phase Two ESA.

No equipment blank of groundwater was required since the groundwater samples were collected using dedicated tubing.

6. Review and Evaluation

i. Geology

Based on the observations of soil samples collected during the Phase Two ESA field program, and as part of a review of previous subsurface investigations at the Phase Two Property, there were six stratigraphic units identified at the Phase Two Property, which include:

Asphalt

A layer of asphalt, approximately 0.05 to 0.15 m in thickness, was encountered at the ground surface in BH1-21, BH2-21, BH4-21 and BH5-21.

Concrete

A layer of concrete, approximately 0.2 m in thickness, was encountered at the ground surface in BH3-21.

Silty Sand and Gravel (Fill)

A layer of silty sand and gravel fill material, ranging from approximately 0.5 to 2.0 m in thickness, was encountered from ground surface, immediately below the asphalt layer, in boreholes BH1-21, BH2-21, BH4-21 and BH5-21 and was present beneath the sand (fill) layer in BH3-21; all of which were drilled as part of the Phase Two ESA. This material was identified to consist of silty sand and gravel, was loose to compact and generally grey. This layer was encountered at varying moisture conditions, generally moist to dry at shallow depths becoming moist with depth; it was not expected that the shallow groundwater table was present within the silty sand and gravel (fill) layer.

Evidence of deleterious fill material, including demolition debris, bricks and black staining was observed in BH5-21 (northeast corner) in this unit at approximate depths ranging from 0.2 to 2.1 m BGS.

Sand (Fill)

A layer of sand fill material, ranging from approximately 1.2 to 1.5 m in thickness, was encountered from near the ground surface in BH3-21 and below a thin layer of silty sand and gravel (fill), in boreholes BH1-21, BH2-21 and BH4-21 drilled as part of the Phase Two ESA. This material was identified to consist of clean, poorly graded (uniform grain size) sand, was loose and brown. This layer was encountered at varying moisture conditions, generally moist to dry at shallow depths becoming moist with depth; it was not expected that the shallow groundwater table was present within the sand (fill) layer.

Petroleum hydrocarbon odours, suspected to be associated with the former private fuel outlet and associated diesel UST were observed in BH4-21 in this unit at approximate depths ranging from 1.2 to 2.1 m BGS, extending beyond the lowest depth of this material.

Silty Clay

A layer of silty clay, at least 2.1 to 2.8 m in thickness, was encountered immediately below the sand fill layer or silty sand and gravel fill layer in BH3-21, BH4-21 and BH5-21 drilled as part of this Phase Two ESA. This material was identified to consist of silty sand and gravel, was firm becoming soft with depth and was generally grey in colour. This layer was encountered at varying moisture conditions, generally moist at shallow depths becoming wet at depths ranging from 2.4 to 3.1 m BGS.

Petroleum hydrocarbon odours, suspected to be associated with the former private fuel outlet and associated diesel UST were observed in BH3-21 and BH4-21 in this unit at approximate depths ranging from 2.0 to 4.4 m BGS. Petroleum hydrocarbon odours, suspected to be associated with the waste oil UST and service garage operations were observed in BH5-21 in this unit at approximate depths ranging from 2.1 to 4.0 m BGS.

Silty Sand and Gravel (Glacial Till)

A layer of silty sand and gravel material, interpreted to be glacial till, was encountered during the 2020 Geotechnical Investigation by Paterson. The glacial till was encountered below the silty clay layer at depths ranging from approximately 4.2 to 9.1 m BGS. This material was described to consist of grey clayey silty sand with gravel, cobbles and boulders. This layer was described to be found in wet moisture conditions.

The layer was not encountered during the field investigation for this Phase Two ESA, as the depth of investigation for the APEC and CPCs did not warrant investigation to the depths of the glacial till.

Aquifer

The shallow (unconfined) aquifer is the aquifer of interest based on the nature of APECs and PCAs identified for the Phase Two Property. Based on observations and measured groundwater monitoring data collected as part of this investigation, the aquifer is present in the native silty clay geological unit.

Based on moisture contents observed in the soil samples collected as part of this Phase Two ESA it is expected that seasonal and annual variability affect the groundwater table elevation in the shallow aquifer.

ii. Groundwater and Elevations and Flow Direction

Based on the nature of the primary CPCs identified for groundwater at the Phase Two Property (including light non-aqueous phase liquids (LNAPLs)), the screened intervals for the

groundwater monitoring wells installed as part of this Phase Two ESA were selected to straddle the shallow groundwater table within the overburden. Based on previous investigations, it was suspected that existing monitoring wells located within the APECs at the Phase Two Property had monitoring well screens that are also installed within the overburden and at least some would be expected to straddle the shallow groundwater table, and are thus in same aquifer as the 2021 monitoring wells and could be used for supplemental sampling as part of this Phase Two ESA.

The boreholes/monitoring wells were surveyed relative to a temporary benchmark of the top of spindle of the City of Ottawa fire hydrant located at the northeast corner of the Catherine Street and Kent Street intersection, southeast of the Phase Two Property; this benchmark was assigned a reference elevation of 100.000 m ("Site Datum") for the purposes of this Phase Two ESA.

The shallow groundwater aquifer was present within the overburden at the Phase Two Property. Given that the groundwater table was found in the silty clay geological unit in the majority of the monitoring wells at the Phase Two Property, it is inferred that the same shallow aquifer exists across this unit and can be used for a determination of localized groundwater flow direction and hydraulic gradient. It was however, observed that variations in depth to groundwater was observed in monitoring wells on the south portion of the Property; it is suspected that a different groundwater regime may be present in these locations as the subsurface soil at the Property has been significantly disturbed through historical development and redevelopment of the Property. Monitoring well construction details are presented in Table 3 below.

Table 3: Monitoring Well Construction Details

Monitoring Well	Ground Surface Elevation (m RSD)	Top of Piezometer Elevation (m RSD)	Screen Elevation (m RSD)	Sand Pack Elevation (m RSD)	Bentonite Seal (m RSD)
BH1-20*	99.14	99.06	94.11 – 97.16	94.11 – 97.46	97.46 – 98.91
BH2-20*	98.86	98.74	93.76 – 96.81	93.76 – 97.11	97.11 – 98.59
BH3-20*	98.64	98.51	91.52 – 94.57	91.52 – 94.87	94.87 – 98.36
BH4-21	99.02	98.86	94.51 – 97.56	94.51 – 97.86	97.86 – 98.71
BH5-21	99.21	99.05	94.68 – 97.73	94.68 – 98.03	98.03 – 98.90
BH3-10*	99.09	98.97	92.02 – 95.07	92.02 – 95.37	95.37 – 98.90
BH1(MW)	99.06	99.00	94.44 - unknown	unknown	unknown
BH7(MW)	99.05	99.01	96.34 - unknown	unknown	unknown

m RSD – metres Below Referenced to Datum

* – Based on field elevation survey and interpreted data from Paterson Group Borehole Logs

On June 23, 2021, following a period of five days for stabilization after drilling and developing the monitoring wells, the groundwater levels were measured and are presented in Table 4.a below. The groundwater table was measured at depths ranging between 2.14 and 4.73 m BGS on June 23, 2021.

Table 4.a: Groundwater Table Elevations Measured on June 23, 2021

Monitoring Well	Ground Surface Elevation (m RSD)	Top of Piezometer Elevation (m RSD)	Depth to Groundwater (m below TOP)	Groundwater Table Elevation (m RSD)	Depth to Groundwater (m BGS)
BH1-20*	99.14	99.06	3.46	95.60	3.54
BH2-20*	98.86	98.74	3.37	95.37	3.49
BH3-20*	98.64	98.51	4.60	94.04	4.73
BH4-21	99.02	98.86	1.99	96.87	2.16
BH5-21	99.21	99.05	4.11	94.94	4.27
BH3-10*	99.09	98.97	4.40	94.57	4.53
BH1(MW)	99.06	99.00	2.12	96.88	2.18
BH7(MW)	99.05	99.01	2.10	96.91	2.14

m RSD – metres Below Referenced to Datum
m BGS – metres below Ground Surface
* – Based on field elevation survey and interpreted data from Paterson Group Borehole Logs

It was inferred that the groundwater level had not stabilized in the monitoring well BH5-21 at the time of the June 23, 2021 groundwater monitoring and sampling event. A follow up groundwater level monitoring of all monitoring wells was completed on September 4, 2021 to collect stabilized groundwater levels; these water levels are summarized in Table 4.b below.

Table 5.b: Groundwater Table Elevations Measured on September 4, 2021

Monitoring Well	Ground Surface Elevation (m RSD)	Top of Piezometer Elevation (m RSD)	Depth to Groundwater (m below TOP)	Groundwater Table Elevation (m RSD)	Depth to Groundwater (m BGS)
BH1-20*	99.14	99.06	3.37	95.82	3.32
BH2-20*	98.86	98.74	3.45	95.29	3.57
BH3-20*	98.64	98.51	4.83	93.68	4.60
BH4-21	99.02	98.86	2.00	96.86**	2.17
BH5-21	99.21	99.05	2.34	96.71**	2.50
BH3-10*	99.09	98.97	4.29	94.68	4.42
BH1(MW)	99.06	99.00	2.12	96.88**	2.18
BH7(MW)	99.05	99.01	2.20	96.81	2.24

m RSD – metres Below Referenced to Datum

m BGS – metres below Ground Surface

* – Based on field elevation survey and interpreted data from Paterson Group Borehole Logs

** – Groundwater Elevation used for determination of Flow Direction

Three groundwater monitoring well water table elevations are required to triangulate groundwater elevations and determine an approximate groundwater flow direction. The groundwater table elevations in BH4-21, BH5-21 and BH1(MW) were used for a determination of groundwater flow direction. These groundwater monitoring wells were the primary monitoring wells used for assessment of the APECs #1 / #2. Based on the measured groundwater table elevations in these monitoring wells, the local groundwater flow direction on the northeast portion of the Phase Two Property is towards the southeast. The interpreted groundwater elevation contours and groundwater flow direction are shown of Figure 3: Groundwater Flow Interpretation. This interpreted local groundwater flow direction is reasonable based on the local topography, which includes a local depression to the southeast, where Kent Street crosses Highway 417 via an underpass. As noted in the Phase One ESA however, it is expected that regional groundwater flow is toward the north and northeast in the direction of the nearest significant surface water body, the Ottawa River, which is 1.8 km to the north of the Phase Two Property.

The water table elevation measured in the other monitoring wells were not considered for the determination of groundwater flow, as it is suspected these groundwater levels may have been influenced by historical development and redevelopment of the Phase Two Property.

Free product was present in BH1(MW) (northeast corner) during the initial groundwater monitoring and development on May 19, 2021, the approximate product thickness was 15 cm as measured with an interface probe. The presence of this free product was confirmed during the initial groundwater sampling event on June 2, 2021, the approximate thickness was again

measured to be 15 cm as measured with an interface probe and confirmed using a plastic bailer. This monitoring well was skimmed using dedicated peristaltic tubing and a peristaltic pump on low flow prior to sampling on June 2, 2021; approximately 5 L of free product was extracted in a 20 L graduated container. An additional 20 L was purged from BH1(MW) prior to sampling; this water was observed to have an oily sheen, however no further significant free phase product was observed during sampling, which was completed using new dedicated tubing. During subsequent monitoring of BH1(MW) on June 23, 2021 and September 4, 2021, no free product was measured on the groundwater surface, again as recorded with an interface probe.

No observations or indications of free product were observed in any of the other monitoring wells accessed as part of this Phase Two ESA, as measured with an interface probe during water level measurements, and through observations of the purge water during development and sampling of the monitoring wells. Sight to strong petroleum hydrocarbon odours, suspected to consist primarily of diesel fuel, were observed in the groundwater samples collected from BH4-21, BH5-21, BH1(MW) and BH3-10.

Underground utility corridors for sanitary and storm sewers, potable water, private electricity and natural gas lines lead to the building, generally from Catherine Street to the south or from Arlington Avenue to the north. The underground utility corridors have the potential to affect contaminant distribution and transport, as they would create preferential pathways for lateral migration in the areas of identified contaminated soil and groundwater. Based on the depth to groundwater observed in the monitoring wells as part of this investigation, observed between 2.14 and 4.73 m BGS, the potential exists for migration of contaminants through underground utility service trenches (generally approximately 2 to 3 m BGS) during periods of seasonally high groundwater table elevations.

iii. Groundwater: Hydraulic Gradients

The horizontal hydraulic gradient was determined by plotting groundwater contours interpreted from groundwater elevations presented in Table 2 and then by dividing the difference in hydraulic head by the lateral separation distance in the groundwater contours. Based on the measured groundwater elevations in BH4-21, BH5-21 and BH1(MW) the horizontal hydraulic gradient at the northeast portion of the Phase Two Property is approximately 0.007 m/m.

iv. Course Grained Soil Texture

A substantial layer of silty sand and gravel (fill) and a layer of sand (fill), which would be classified as coarse grained soil, is present from near ground surface to approximately 2.1 m BGS, extending down to a silty clay unit at the Phase Two Property. It is interpreted that greater than 1/3 of the Phase Two Property has coarse grained soil. For the purposes of this Phase Two ESA, the soil conditions are considered to be coarse grained, which provides a more conservative comparison to the MECP site condition standards than the fine-grained values.

v. Soil Field Screening

Initial field screening of the soil samples consisted of visual and olfactory observations made at the time of sample collection during the drilling program. Petroleum hydrocarbon odours, suspected to be associated with diesel fuel were observed in BH3-21 at depths ranging from approximately 2 to 3 m BGS and in BH4-21 at depths ranging from approximately 1.2 m 4.4 m BGS. Petroleum hydrocarbon odours, suspected to be associated with operations associated with a former service garage, were observed in BH5-21 at depths ranging from 2.1 to 4.0 m BGS.

Additional field screening of the soil samples was completed using an RKI Eagle gas detector. Combustible soil vapour screening concentrations ranging from 10 to 78 ppm were encountered in soil samples recovered from BH3-21, BH4-21 and BH5-21, collected at the depth intervals discussed above as part of the olfactory observations; these soil vapour screening concentrations were suspected to be indicative of PHC contamination. Combustible soil vapour screening concentrations in the other soil samples were found to range from 0 to 1 ppm, which is low and generally not considered indicative of significant PHC contamination.

vi. Soil Quality

Location and Depth of Soil Samples

The following soil samples, which were collected from the boreholes drilled as part of this Phase Two ESA, were submitted for laboratory analysis.

Table 6: Soil Samples Selected for Laboratory Analysis

Sample Location	Sample ID	Sample Depth (m BGS)	Analytical Parameters
BH1-21	BH1-21-SS3	1.2 – 1.8	PAHs, Metals & Inorganics
BH2-21	BH2-21-SS1	0.1 – 0.6	PAHs, Metals & Inorganics
BH3-21	BH3-21-SS4	1.8 – 2.4	PHCs, VOCs, PAHs, Metals & Inorganics
BH4-21	BH4-21-SS5	2.4 – 3.1	PHCs, VOCs
BH4-21	BH4-21-SS8	4.3 – 4.9	PHCs, VOCs
BH5-21	BH5-21-SS3	1.2 – 1.8	PAHs, Metals & Inorganics
Duplicate of BH5-21	DUP-2-21	1.2 – 1.8	PAHs, Metals & Inorganics
BH5-21	BH5-21-SS4	1.8 – 2.4	PHCs, VOCs
Duplicate of BH5-21	DUP-1-21	1.8 – 2.4	PHCs, VOCs

Comparison of Soil Analytical Results to Applicable Site Conditions Standards

The analytical soil results were compared to the full depth generic site condition standards, with non-potable groundwater, course textured soil, for residential property use, as specified in Table

3 of the MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

The aforementioned soil samples selected for laboratory analysis were submitted to Paracel under chain of custody No. 129117 on June 18, 2021. The laboratory certificate of analysis (Paracel Report # 2125646) is provided in Appendix E. Additional soil samples, collected and analyzed during historical (2010 & 2020) environmental investigations completed at the Phase Two Property by others, were reviewed and reported as part of this Phase Two ESA; these analytical certificates of analysis are also included in Appendix E. The following soil samples had exceedance concentrations reported compared to their respective Site Condition Standards, as noted in Table 6 as follows:

Table 7: Soil Exceedances

Exceeding Parameter:			F1 Range PHCs	F2 Range PHCs	F3 Range PHCs	Xylenes	Benzo(a)pyrene	Fluoranthene	Vanadium	Sodium Adsorption Ratio	Conductivity
Sample Location	MECP Table 3 Site Condition Standards		55 ug/g	98 ug/g	300 ug/g	3.1 ug/g	0.3 ug/g	0.69 ug/g	86 ug/g	5 ug/g	700 uS/cm
	Sample ID	Sample Depth	Reported Concentration (ug/g)								
BH3-10*	BH3-10-SS2	0.8–1.4 m BGS	77	6230	2450	5.51	-	-	-	-	-
BH6-10*	BH6-10-SS4	2.3–2.9 m BGS	-	1580	-	-	-	-	-	-	-
BH1-20*	BH1-20-SS2	0.8–1.4 m BGS	-	-	-	-	0.49	0.76	-	-	-
BH2-20*	BH2-20-SS2	0.8–1.4 m BGS	-	-	-	-	0.38	-	-	-	-
BH2-21	BH2-21-SS1	0.1–0.6 m BGS	-	-	-	-	-	-	-	-	2540 uS/cm
BH3-21	BH3-21-SS4	1.2–1.8 m BGS	-	-	-	-	-	-	98.6	39.4	7190 uS/cm
BH4-21	BH4-21-SS5	2.4–3.1 m BGS	-	150	-	-	-	-	-	-	-
BH5-21	DUP-2-21	1.2–1.8 m BGS	-	-	-	-	-	-	-	6.07	760 uS/cm
	BH5-21-SS4	1.8–2.4 m BGS	160	2530	837	-			-	-	-
	DUP-1-21	1.8–2.4 m BGS	108	2750	1160	-	-	-	-	-	-

* - Collected as part of historical investigations by others

All other soil samples were in compliance with the Site Condition Standards. A full summary of the soil analytical results and comparison to the applicable Site Condition Standards are presented in Table 13: Soil Analytical Results following the text of this report. Spatial depiction of the soil exceedances at the Phase Two Property are depicted on Figure 4.

Contaminants of Concern

The presence of a private fuel outlet and associated underground storage tank (UST) represents PCA #1 and is interpreted as APEC #1 for the northeast portion of the Phase One Property. The

presence of a service bay (garage), associated historical aboveground storage tank (AST) and suspected UST represents PCA #2 and is interpreted as APEC #2 for the east portion of the Phase One Property. The former presence of residential and commercial structures which historically occupied the majority of the Phase One Property, are suspected to have had their foundations backfilled with poor environmental quality fill material. This fill material (PCA #3) is suspected in areas outside of the current building footprint and represents APEC #3 for the Property.

The contaminants of potential concern associated with fuel storage and fuelling are generally PHCs and BTEXs. Based on historical presence of a service garage at the Property, VOCs are also considered contaminants of potential concern (CPCs) associated with the former service garage operations. The CPCs associated with the historical fill materials are polycyclic aromatic hydrocarbons (PAHs), metals & inorganics. PHCs/BTEXs are also a CPC; considering the date of original development at the Property, there are suspected former heating oil storage tanks associated with the various former residential and commercial properties which now comprise the Phase Two Property.

The contaminants of concern for a particular sample were based on the relative location and depth of the sample, visual and/or olfactory observations and combustible vapour screening concentrations.

Contaminants Related to Chemical and Biological Transformations

Contaminants related to chemical and biological transformations were not suspected to be present at the Phase Two Property and were not identified as part of the Phase Two ESA soil analysis.

Soil Serving as a Source of Contaminant Mass Contributing to Groundwater

Based on the analytical results, there may be soil that serves as a source of contaminant mass contributing to groundwater at the Phase Two Property. Soil contamination, namely PHCs was encountered at the northeast and east portions of the Phase Two Property (APEC #1 – former private fuel outlet & APEC #2 – former service garage). There are detectable concentrations of PHCs in these areas of the Phase Two Property and it is suspected that soil serving as a source of contaminant mass is contributing to groundwater quality.

Light or Dense Non-Aqueous Phase Liquids

The analytical soil results indicate the potential presence of light non-aqueous phase liquids (LNAPLs) at the Phase Two Property, given that PHCs were identified in excess of the site condition standards. It should be noted that the concentrations of PHCs and BTEXs which exceed the site condition standards in the soil are not themselves indicative of the suspected presence of LNAPL free product at the Phase Two Property.

The analytical soil results do not indicate the suspected presence of dense non-aqueous phase liquids at the Phase Two Property.

vii. Groundwater Quality

Locations and Sample Depth Interval of Groundwater Samples

The groundwater samples were collected using a peristaltic pump with tubing lowered to between the top and approximate (vertical) center of the water column within each monitoring well and withdrawing the water at low flow rates. The groundwater sample locations, screen depths and parameters analyzed are presented in Table 7 below.

Table 8: Groundwater Samples Selected for Laboratory Analysis

Sample Location	Groundwater Table Elevation (m RSD)	Screen Elevation (m RSD)	Analytical Parameters
BH1-20*	95.60	94.11 – 97.16	PHCs, BTEXs
BH2-20*	95.37	93.76 – 96.81	PHCs, VOCs, PAHs, Metals & Inorganics
BH3-20*	94.04	91.52 – 94.57	PHCs, VOCs, PAHs, Metals & Inorganics
BH4-21	96.87	94.51 – 97.56	PHCs, VOCs, PAHs, Metals & Inorganics
Duplicate of BH4-21	96.87	94.51 – 97.56	PHCs, VOCs, PAHs, Metals & Inorganics
BH5-21	94.94	94.68 – 97.73	PHCs, VOCs, PAHs, Metals & Inorganics
BH3-10*	94.57	92.02 – 95.07	PHCs, BTEXs
BH1(MW)	96.88	94.44 - unknown	PHCs, BTEXs
Duplicate of BH1(MW)	96.88	94.44 - unknown	PHCs, BTEXs
BH7(MW)	96.91	96.34 - unknown	PHCs, BTEXs

m RSD – metres Referenced to Site Datum

Field Filtering

Samples for PHCs, BTEXs, VOCs, PAHs and general chemistry were unfiltered, while metals samples were field filtered using a dedicated 0.45 µm Waterra filter for each sample.

Comparison of Groundwater Analytical Results to Applicable Site Conditions Standards

The analytical groundwater results were compared to the full depth generic site condition standards, with non-potable groundwater, course textured soil, as specified in Table 3 of the MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

The groundwater samples selected for laboratory analysis were submitted to Paracel under chain of custody Nos. 61631 and 132337 on June 2 and June 23, 2021, respectively. The laboratory certificates of analysis (Paracel Report #s 2123416 and 2126398) are provided in Appendix E. Additional groundwater samples, collected and analyzed during historical (2010 & 2020) environmental investigations completed at the Phase Two Property by others, were reviewed and reported as part of this Phase Two ESA; these analytical certificates of analysis are also included in Appendix E. The following groundwater samples had exceedance concentrations reported compared to their respective Site Condition Standards, as noted in Table 8 as follows:

Table 9: Groundwater Exceedances

Exceeding Parameter:			F2 Range PHCs	F3 Range PHCs	Sodium	Chloride
Sample Location	MECP Table 3 Site Condition Standards		150 ug/L	500 ug/L	2300 mg/L	2300 mg/L
	Sample ID	Sample Date	Reported Concentration			
BH3-10*	BH3-10-GW1	September 1, 2010	362 ug/L	-	-	-
BH1(MW)	BH1(MW)-2021GW1	June 2, 2021	663000 ug/L	345000 ug/L	-	-
	DUP-1-2021GW1	June 2, 2021	686000 ug/L	358000 ug/L	-	-
BH2-20	BH2-20	June 23, 2021	-	-	-	2400 mg/L
BH3-20	BH3-20	June 23, 2021	-	-	-	2440 mg/L
BH4-21	BH4-21-GW1	June 23, 2021	-	-	5230 mg/L	13900 mg/L
	BH14-21-GW1	June 23, 2021	-	-	5220 mg/L	11900 mg/L

* - Collected as part of historical investigations by others

All the other groundwater samples were in compliance with the Site Condition Standards. A full summary of the groundwater analytical results and comparison to the applicable Site Condition Standards are presented in Table 14: Groundwater Analytical Results following the text of this report. Spatial depiction of the groundwater exceedances at the Phase Two Property are depicted on Figure 5.

Contaminants of Concern

The presence of a private fuel outlet and associated underground storage tank (UST) represents PCA #1 and is interpreted as APEC #1 for the northeast portion of the Phase One Property. The presence of a service bay (garage), associated historical aboveground storage tank (AST) and suspected UST represents PCA #2 and is interpreted as APEC #2 for the east portion of the Phase One Property. The former presence of residential and commercial structures which

historically occupied the majority of the Phase One Property, are suspected to have had their foundations backfilled with poor environmental quality fill material. This fill material (PCA #3) is suspected in areas outside of the current building footprint and represents APEC #3 for the Property.

The contaminants of potential concern associated with fuel storage and fuelling are generally PHCs and BTEXs. Based on historical presence of a service garage at the Property VOCs are also considered contaminants of potential concern (CPCs) associated with the former service garage operations. The CPCs associated with the historical fill materials are polycyclic aromatic hydrocarbons (PAHs), metals & inorganics. PHCs/BTEXs are also a CPC; considering the date of original development at the Property, there are suspected former heating oil storage tanks associated with the former various residential and commercial properties which now comprise the Phase Two Property.

The contaminants of concern for a particular sample were based on the relative location and depth of the sample, visual and/or olfactory observations of soil samples collected which could have come into contact with the groundwater table.

Contaminants Related to Chemical and Biological Transformations

Contaminants related to chemical and biological transformations were not suspected to be present at the Phase Two Property and were not identified as part of the Phase Two ESA groundwater analysis.

Soil Serving as a Source of Contaminant Mass Contributing to Groundwater

Based on the groundwater analytical results, there may be soil that serves as a source of contaminant mass contributing to groundwater at the Phase Two Property. Soil contamination, namely PHCs was encountered at the northeast portion of the Phase Two Property (APEC #1 – former private fuel outlet) and in east portion of the Phase Two Property (APEC #2 – former service garage). There are detectable concentrations of PHCs in soil in these areas of the Phase Two Property, and in the instance of APEC #1 there was identified groundwater contamination, and it is suspected that soil serving as a source of contaminant mass is contributing to groundwater quality.

Light or Dense Non-Aqueous Phase Liquids

The analytical groundwater results indicate the potential presence of light non-aqueous phase liquids (LNAPLs) at the Phase Two Property, given that PHCs were identified in excess of the Site Condition Standards and at significant concentrations in the sample (and duplicate) from the monitoring well installed in BH1(MW). As previously noted, free product was present in BH1(MW) during the initial groundwater monitoring and development on May 19, 2021, the approximate product thickness was 15 cm as measured with an interface probe. The presence of this free product was confirmed during the initial groundwater sampling event on June 2, 2021, the approximate thickness was again measured to be 15 cm as measured with an interface

probe and confirmed using a plastic bailer; a photograph of the free product is presented in Appendix F. This monitoring well was skimmed using dedicated peristaltic tubing and a peristaltic pump on low flow prior to sampling on June 2, 2021; approximately 5 L of free product was extracted in a 20 L graduated container. An additional 20 L was purged from BH1(MW) prior to sampling; this water was observed to have an oily sheen, however no further significant free phase product was observed during sampling. Subsequent monitoring of BH1(MW) on June 23, 2021, no free product was measured on the groundwater surface, again as recorded with an interface probe.

A light sheen and/or PHC odours were observed on the purge water recovered from the monitoring wells installed in BH4-21, BH5-21, BH7(MW) and BH3-20.

The analytical groundwater results do not indicate the suspected presence of dense non-aqueous phase liquids at the Phase Two Property.

viii. Sediment Quality

There were no natural surface water bodies at the Phase Two Property, and as such no sediment sampling was completed as part of the Phase Two ESA.

ix. Quality Assurance and Quality Control Results

Duplicate Samples

The soil samples DUP-1-21 and DUP-2-21 were submitted to the laboratory as blind field duplicate samples of BH5-21-SS4 and BH5-21-SS3, respectively. The ratio of soil duplicate results to original sample results was 0 to 118%, which demonstrates a low to high degree of variability in the analytical results. While some of the soil duplicate ratios observed had higher degrees of variability, it should be noted that where exceedances of the site condition standards were observed for PHCs, they were present in both samples and that the sample results for these parameters are comparable. Additionally, the high degree of heterogeneity in soil samples can attribute to higher levels of variability in analytical ratios. These samples were analyzed for PHCs, VOCs (including BTEXs), PAHs and metals & inorganics, which provide a blind quality assurance and quality control QA/QC validation for all soil parameters analyzed as part of this Phase Two ESA.

The groundwater samples DUP-1-2021GW1 and BH14-21 were submitted to the laboratory as blind field duplicate samples of BH1(MW)-2021GW1 and BH4-21, respectively. The ratio of groundwater duplicate results to original sample results was generally 0 to 19% which meets the required ratio. The groundwater duplicate ratios of PAH parameters was found to range from 0 to 49%; however, the instances of higher variability, the concentrations were generally very low and close to the laboratory method detection limits. The duplicate PAH groundwater sample results are generally comparable. It should be noted that where exceedances of the site condition standards were observed for PHCs, Chloride and Sodium, they were present in both duplicate samples and that the sample results for these parameters are comparable in the

duplicate. These samples were analyzed for PHCs, VOCs (including BTEXs), PAHs and metals & inorganics, which provide a blind quality assurance and quality control QA/QC validation for all groundwater parameters analyzed as part of this Phase Two ESA.

Blanks

A trip blank water sample for VOCs was submitted for laboratory analysis from the groundwater sampling event completed on June 23, 2021. No detectable VOC concentrations were reported in the trip blank water sample.

Laboratory Qualifying Statements

The laboratory made qualifying statements regarding the observation of free product in the groundwater sample analyzed from BH1(MW). The laboratory noted that elevated detection limits were presented for the duplicate groundwater sample from BH1(MW) due to dilution required because of high target analyte concentration.

An additional qualifying statement was made by the laboratory regarding sample DUP-1-21: "Sample - F1/BTEX/VOCs (soil) not submitted according to Reg. 153/04, Amended 2011 - not field preserved". Lopers notes that a field preserve sample was submitted to the laboratory for this sample, however, Lopers was informed by the laboratory on June 21, 2021 (three days after sample submission) that the preserved sample vial was broken by laboratory staff. Lopers instructed the laboratory to sub-sample from the accompanying jar for the same sample. Lopers notes, that while the duplicate results (DUP-1-21) do have lower BTEX and PHC F1 concentrations than the original sample (BH5-21-SS4), there were exceedances for PHC F1 in both samples.

The qualifying remarks in certificates of analysis are not expected to impact the validity of any results qualified.

Data Quality

All certificates of analysis were received pursuant to clause 47 (2) (b) of O.Reg. 153/04 and comply with subsection 47 (3) of O.Reg. 153/04.

The overall quality of the field data from the investigation with respect to the data quality objectives, demonstrate that decision-making was not affected, and the overall objectives of the investigation and the assessment were met.

x. Phase Two Conceptual Site Model

The presence of a private fuel outlet and associated underground storage tank (UST) represents PCA #1 and is interpreted as APEC #1 for the northeast portion of the Phase One Property. The presence of a service bay (garage), associated historical aboveground storage tank (AST) and suspected UST represents PCA #2 and is interpreted as APEC #2 for the east portion of the Phase One Property. The former presence of residential and commercial structures which

historically occupied the majority of the Phase One Property, are suspected to have had their foundations backfilled with poor environmental quality fill material. This fill material (PCA #3) is suspected in areas outside of the current building footprint and represents APEC #3 for the Property.

The contaminants of potential concern associated with fuel storage and fuelling are generally PHCs and BTEXs. Based on historical presence of a service garage at the Property VOCs are also considered contaminants of potential concern (CPCs) associated with the former service garage operations. The CPCs associated with the historical fill materials are polycyclic aromatic hydrocarbons (PAHs), metals & inorganics. PHCs/BTEXs are also a CPC; considering the date of original development at the Property, there are suspected former heating oil storage tanks associated with the various former residential and commercial properties which now comprise the Phase One Property.

Underground utility corridors for sanitary and storm sewers, potable water, private electricity and natural gas lines lead to the building, generally from Catherine Street to the south or from Arlington Avenue to the north. The underground utility corridors have the potential to affect contaminant distribution and transport, as they would create preferential pathways for lateral migration in the areas of identified contaminated soil and groundwater. Based on the depth to groundwater observed in the monitoring wells as part of this investigation, observed between 2.14 and 4.73 m BGS, the potential exists for migration of contaminants through underground utility service trenches (generally approximately 2 to 3 m BGS) during periods of seasonally high groundwater table elevations.

The overburden stratigraphy of the Phase Two Property is present in six geological units, including asphalt or concrete layers at ground surface, silty sand and gravel (fill) layer, sand (fill) layer, a native silty clay layer present across the Property and a native silty sand and gravel (glacial till) layer, found below the silty clay across the Property.

The shallow (unconfined) aquifer is the aquifer of interest based on the nature of APECs and PCAs identified for the Phase Two Property. The shallow aquifer was generally present in the native silty clay layer. The aquifer is expected to have a lower permeability than the more porous overlying stratigraphic units such as the silty sand and gravel fill and sand fill. The silty clay layer is expected to have low permeability and retard the lateral movement of groundwater and migration of associated contaminants.

The overburden soil is underlain by interbedded limestone and/or shale bedrock, which was encountered at approximately 8 to 12 m below ground surface.

The groundwater table was measured at depths ranging between 2.14 and 4.73 m BGS. The shallow groundwater aquifer was present within the overburden at the Phase Two Property. Given that the groundwater table was found in the silty clay geological unit in the majority of the monitoring wells at the Phase Two Property, it is inferred that the same shallow aquifer exists across this unit and can be used for a determination of groundwater flow direction and

hydraulic gradient. It was observed that variations in depth to groundwater was observed in monitoring wells on the south portion of the Property; it is suspected that a different groundwater regime may be present in these locations as the subsurface soil at the Property has been significantly disturbed through historical development and redevelopment of the Property. The horizontal hydraulic gradient on the northeast portion of the Phase Two Property was calculated to be approximately 0.007 m/m with a localized groundwater flow direction towards the southeast.

The proposed redevelopment of the Phase Two Property includes the current concept for construction of three building with adjoining segments ranging from thirty-three to thirty-eight storeys in height, with two to three levels subgrade parking, commercial ground floors and residential units above.

The Phase Two Property and all other properties within 250 m of the property boundaries are supplied by Ottawa's municipal potable water supply system. The RSC does not specify agricultural use and there are no wells within 250 m of the property boundaries that are intended for use as a source of water for human consumption or agriculture. As such, the designation of non-potable groundwater setting is determined to be applicable [O.Reg. 153/04, section 35].

The Phase Two Property is not situated within or adjacent to an area of natural significance and does not include any land within 30 m of an area of natural significance. The pH of the soil was analyzed as part of this Phase Two ESA and was found to range from 7.48 to 7.92. As such, the Phase Two Property is not considered to be an environmentally sensitive area [O.Reg. 153/04, section 41].

Review of the drilling program and borehole/monitoring well logs completed as part of this Phase Two ESA and previous investigations was completed. It was determined that greater than 2/3 of the Phase Two Property has greater than 2 m of overburden soil. The Phase Two Property is not considered a shallow soil property [O.Reg. 153/04, section 43.1].

The Phase Two Property does not include and does not have any land located within 30 m of a water body. The MECP site condition standards for use within 30 m of a water body do not apply [O.Reg. 153/04, section 43.1].

The full depth generic site condition standards, with non-potable groundwater, course textured soil, for residential property use, as specified in Table 3 of the MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011 were determined to be the applicable site condition standards for the Phase Two Property as part of this Phase Two ESA.

The following soil samples had exceedance concentrations reported compared to their respective Site Condition Standards, as noted in Table 9 as follows:

Table 10: Soil Exceedances

Exceeding Parameter:			F1 Range PHCs	F2 Range PHCs	F3 Range PHCs	Xylenes	Benzo(a)pyrene	Fluoranthene	Vanadium	Sodium Adsorption Ratio	Conductivity
Sample Location	MECP Table 3 Site Condition Standards		55 ug/g	98 ug/g	300 ug/g	3.1 ug/g	0.3 ug/g	0.69 ug/g	86 ug/g	5 ug/g	700 uS/cm
	Sample ID	Sample Depth	Reported Concentration (ug/g)								
BH3-10*	BH3-10-SS2	0.8–1.4 m BGS	77	6230	2450	5.51	-	-	-	-	-
BH6-10*	BH6-10-SS4	2.3–2.9 m BGS	-	1580	-	-	-	-	-	-	-
BH1-20*	BH1-20-SS2	0.8–1.4 m BGS	-	-	-	-	0.49	0.76	-	-	-
BH2-20*	BH2-20-SS2	0.8–1.4 m BGS	-	-	-	-	0.38	-	-	-	-
BH2-21	BH2-21-SS1	0.1–0.6 m BGS	-	-	-	-	-	-	-	-	2540 uS/cm
BH3-21	BH3-21-SS4	1.2–1.8 m BGS	-	-	-	-	-	-	98.6	39.4	7190 uS/cm
BH4-21	BH4-21-SS5	2.4–3.1 m BGS	-	150	-	-	-	-	-	-	-
BH5-21	DUP-2-21	1.2–1.8 m BGS	-	-	-	-	-	-	-	6.07	760 uS/cm
	BH5-21-SS4	1.8–2.4 m BGS	160	2530	837	-			-	-	-
	DUP-1-21	1.8–2.4 m BGS	108	2750	1160	-	-	-	-	-	-

* - Collected as part of historical investigations by others

The following groundwater samples had exceedance concentrations reported compared to their respective Site Condition Standards, as noted in Table 10 as follows:

Table 11: Groundwater Exceedances

Exceeding Parameter:			F2 Range PHCs	F3 Range PHCs	Sodium	Chloride
Sample Location	MECP Table 3 Site Condition Standards		150 ug/L	500 ug/L	2300 mg/L	2300 mg/L
	Sample ID	Sample Date	Reported Concentration			
BH3-10*	BH3-10-GW1	September 1, 2010	362 ug/L	-	-	-
BH1(MW)	BH1(MW)-2021GW1	June 2, 2021	663000 ug/L	345000 ug/L	-	-
	DUP-1-2021GW1	June 2, 2021	686000 ug/L	358000 ug/L	-	-
BH2-20	BH2-20	June 23, 2021	-	-	-	2400 mg/L
BH3-20	BH3-20	June 23, 2021	-	-	-	2440 mg/L
BH4-21	BH4-21-GW1	June 23, 2021	-	-	5230 mg/L	13900 mg/L
	BH14-21-GW1	June 23, 2021	-	-	5220 mg/L	11900 mg/L

* - Collected as part of historical investigations by others

All of the other soil and groundwater results for the Phase Two Property are in compliance with the applicable site condition standards. The Phase Two Property is not in compliance with the site condition standards as of the certification date of June 23, 2021.

7. Conclusions

The following soil samples had exceedance concentrations reported compared to their respective Site Condition Standards, as noted in Table 11 as follows:

Table 12: Soil Exceedances

Exceeding Parameter:			F1 Range PHCs	F2 Range PHCs	F3 Range PHCs	Xylenes	Benzo(a)pyrene	Fluoranthene	Vanadium	Sodium Adsorption Ratio	Conductivity
Sample Location	MECP Table 3 Site Condition Standards		55 ug/g	98 ug/g	300 ug/g	3.1 ug/g	0.3 ug/g	0.69 ug/g	86 ug/g	5 ug/g	700 uS/cm
	Sample ID	Sample Depth	Reported Concentration (ug/g)								
BH3-10*	BH3-10-SS2	0.8–1.4 m BGS	77	6230	2450	5.51	-	-	-	-	-
BH6-10*	BH6-10-SS4	2.3–2.9 m BGS	-	1580	-	-	-	-	-	-	-
BH1-20*	BH1-20-SS2	0.8–1.4 m BGS	-	-	-	-	0.49	0.76	-	-	-
BH2-20*	BH2-20-SS2	0.8–1.4 m BGS	-	-	-	-	0.38	-	-	-	-
BH2-21	BH2-21-SS1	0.1–0.6 m BGS	-	-	-	-	-	-	-	-	2540 uS/cm
BH3-21	BH3-21-SS4	1.2–1.8 m BGS	-	-	-	-	-	-	98.6	39.4	7190 uS/cm
BH4-21	BH4-21-SS5	2.4–3.1 m BGS	-	150	-	-	-	-	-	-	-
BH5-21	DUP-2-21	1.2–1.8 m BGS	-	-	-	-	-	-	-	6.07	760 uS/cm
	BH5-21-SS4	1.8–2.4 m BGS	160	2530	837	-			-	-	-
	DUP-1-21	1.8–2.4 m BGS	108	2750	1160	-	-	-	-	-	-

* - Collected as part of historical investigations by others

The following groundwater samples had exceedance concentrations reported compared to their respective Site Condition Standards, as noted in Table 12 as follows:

Table 13: Groundwater Exceedances

Exceeding Parameter:			F2 Range PHCs	F3 Range PHCs	Sodium	Chloride
Sample Location	MECP Table 3 Site Condition Standards		150 ug/L	500 ug/L	2300 mg/L	2300 mg/L
	Sample ID	Sample Date	Reported Concentration			
BH3-10*	BH3-10-GW1	September 1, 2010	362 ug/L	-	-	-
BH1(MW)	BH1(MW)-2021GW1	June 2, 2021	663000 ug/L	345000 ug/L	-	-
	DUP-1-2021GW1	June 2, 2021	686000 ug/L	358000 ug/L	-	-
BH2-20	BH2-20	June 23, 2021	-	-	-	2400 mg/L
BH3-20	BH3-20	June 23, 2021	-	-	-	2440 mg/L
BH4-21	BH4-21-GW1	June 23, 2021	-	-	5230 mg/L	13900 mg/L
	BH14-21-GW1	June 23, 2021	-	-	5220 mg/L	11900 mg/L

* - Collected as part of historical investigations by others

All of the other soil and groundwater results for the Phase Two Property are in compliance with the applicable site condition standards. The Phase Two Property is not in compliance with the site condition standards as of the certification date of June 23, 2021.

An environmental remediation program, including the bulk removal and off-site disposal of soil and groundwater in excess of the site condition standards, is recommended for the Phase Two Property. The submission of a record of site condition will be required since there will be a change of land use of the Phase Two Property to a more sensitive use. These tasks can be completed at the time of decommissioning and demolition of existing structures at the Phase Two Property. The Phase Two ESA could be then updated with confirmatory sample results at that time to show compliance with site condition standards.

Given the scope and timeline for the proposed redevelopment and the requirements for specialized construction techniques to complete remediation of the Phase Two Property to meet the site condition standards, it is recommended that remediation be completed in conjunction with redevelopment of the Property. It should be noted that the proposed redevelopment includes excavation for at least two to three levels of underground parking, which is expected to remove the source zone of the petroleum hydrocarbon impacted soil and groundwater on the Phase Two Property.

Preparation of a soil management plan in accordance with O.Reg. 406/19 will be required as part of management of excess soil generated as part of construction activities. It is

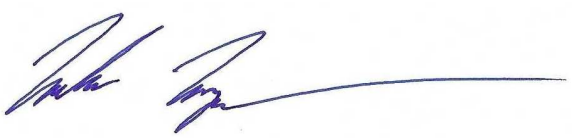
recommended that a remedial action plan be prepared to develop a strategy for remediation, including soil and groundwater management, during redevelopment.

i. Signatures

The Qualified Person for this study is Mr. Luke Lopers, P. Eng. Mr. Lopers has been a Professional Engineer, registered in Ontario since 2012 and has been working on environmental site assessments since 2006. Mr. Lopers has been an author, project manager and/or peer reviewer for hundreds of Phase One ESAs and Phase Two ESAs as well as previously filed RSCs.

The reviewer for this study is Mr. Don Plenderleith, P.Eng. Mr. Plenderleith is a Professional Engineer registered in Ontario since 1994 and has authored and/or reviewed hundreds of Phase One and Two ESAs in Ontario and the rest of Canada. The qualifications of the assessor/Qualified Person and reviewer are included in Appendix G.

Sincerely,



Luke Lopers, P.Eng., QP_{ESA} Don Plenderleith, P.Eng., QP_{ESA}

8. Limitations

The findings and conclusions of this Phase Two ESA are based on the information provided and/or reviewed as part of this study.

This Phase Two ESA has been completed with the standard of care generally expected in the industry for a study of this nature.

This Phase Two ESA has been prepared for the sole use of 11034936 Canada Inc. for the purposes of a due diligence assessment of the potential liabilities which may exist at the Phase Two Property. No other party is permitted to rely on the conclusions or findings of this report without the written consent of Lopers & Associates and 11034936 Canada Inc.

Changes to the physical setting of the Phase Two Property, Phase One Study Area and applicable regulations governing Phase One and Two Environmental Site Assessments have the potential to influence the validity of the conclusions and opinions presented in this Phase Two ESA.

9. References

Legal Survey Plan, Annis, O'Sullivan, Vollebekk Ltd., on June 24, 2021.

City of Ottawa, geoOttawa mapping website, Visited May through August, 2021. http://maps.ottawa.ca/geoottawa/

Google Earth, Visited May through August, 2021.

"Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", produced by the Ontario Ministry of the Environment, dated April 15, 2011.

"Phase One Environmental Site Assessment, 265 Catherine Street, Ottawa, Ontario" dated September 8, 2021 prepared for 11034936 Canada Inc. by Lopers & Associates.

"Phase I - Environmental Site Assessment, Existing Bus Terminal, 265 Catherine Street, Ottawa, Ontario", dated October 15, 2020, completed by Paterson Group Inc. for Crerar Silverside Corporation.

"Phase II Environmental Site Assessment, Existing Bus Terminal, 265 Catherine Street, Ottawa, Ontario", dated October 16, 2020, completed by Paterson Group Inc. for Crerar Silverside Corporation.

"Remedial Action Plan, 265 Catherine Street, Ottawa, Ontario", dated October 15, 2020, completed by completed by Paterson Group Inc. for Crerar Silverside Corporation.

"Geotechnical Investigation, Proposed Mixed-Use Development, 265 Catherine Street, Ottawa, Ontario", dated October 7, 2020, completed by Paterson Group Inc. for Crerar Silverside Corporation.

Paracel Certificate of Analysis – Report # 2125646 - Soil Sample Submission June 18, 2021

Paracel Certificate of Analysis – Report # 2123416 - Groundwater Sample Submission June 2, 2021

Paracel Certificate of Analysis – Report # 2126398 - Groundwater Sample Submission June 23, 2021

Paracel Certificate of Analysis – Report # 1035209 – Soil Sample Submission August 25, 2010

Paracel Certificate of Analysis – Report # 2034610 – Soil Sample Submission August 21, 2020

Paracel Certificate of Analysis – Report # 1036123 - Groundwater Sample Submission September 1, 2010

Paracel Certificate of Analysis – Report # 2036155 - Groundwater Sample Submission August 31, 2020

Paracel Certificate of Analysis – Report # 2036155 - Groundwater Sample Submission September 9, 2020

10. Appendices

Appendix A – Sampling and Analysis Plan

Appendix B – Underground Utility Locates

Appendix C – Borehole Logs

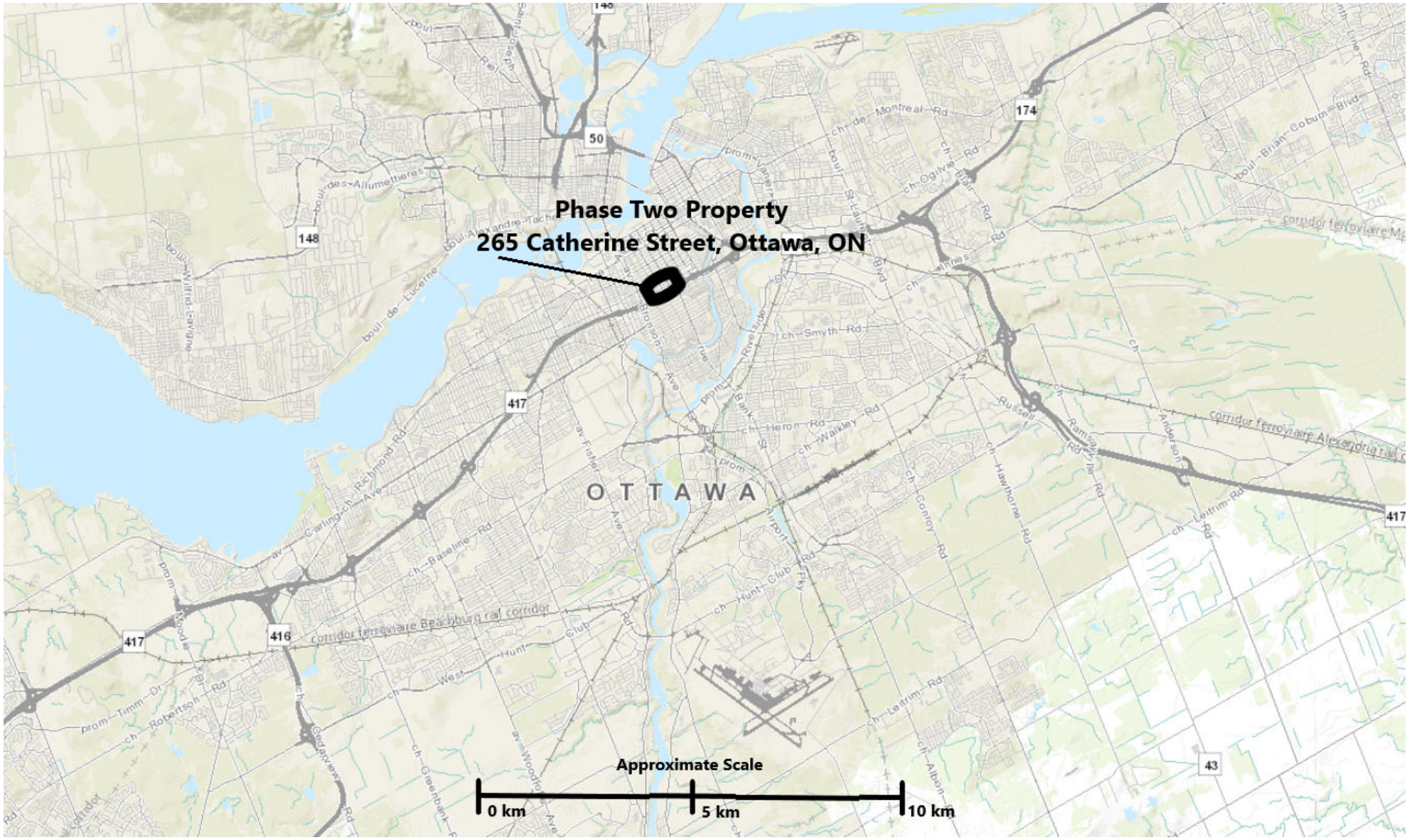
Appendix D – Certificates of Equipment Calibration

Appendix E – Laboratory Certificates of Analysis

Appendix F – Site Photographs

Appendix G – Qualifications of Assessors

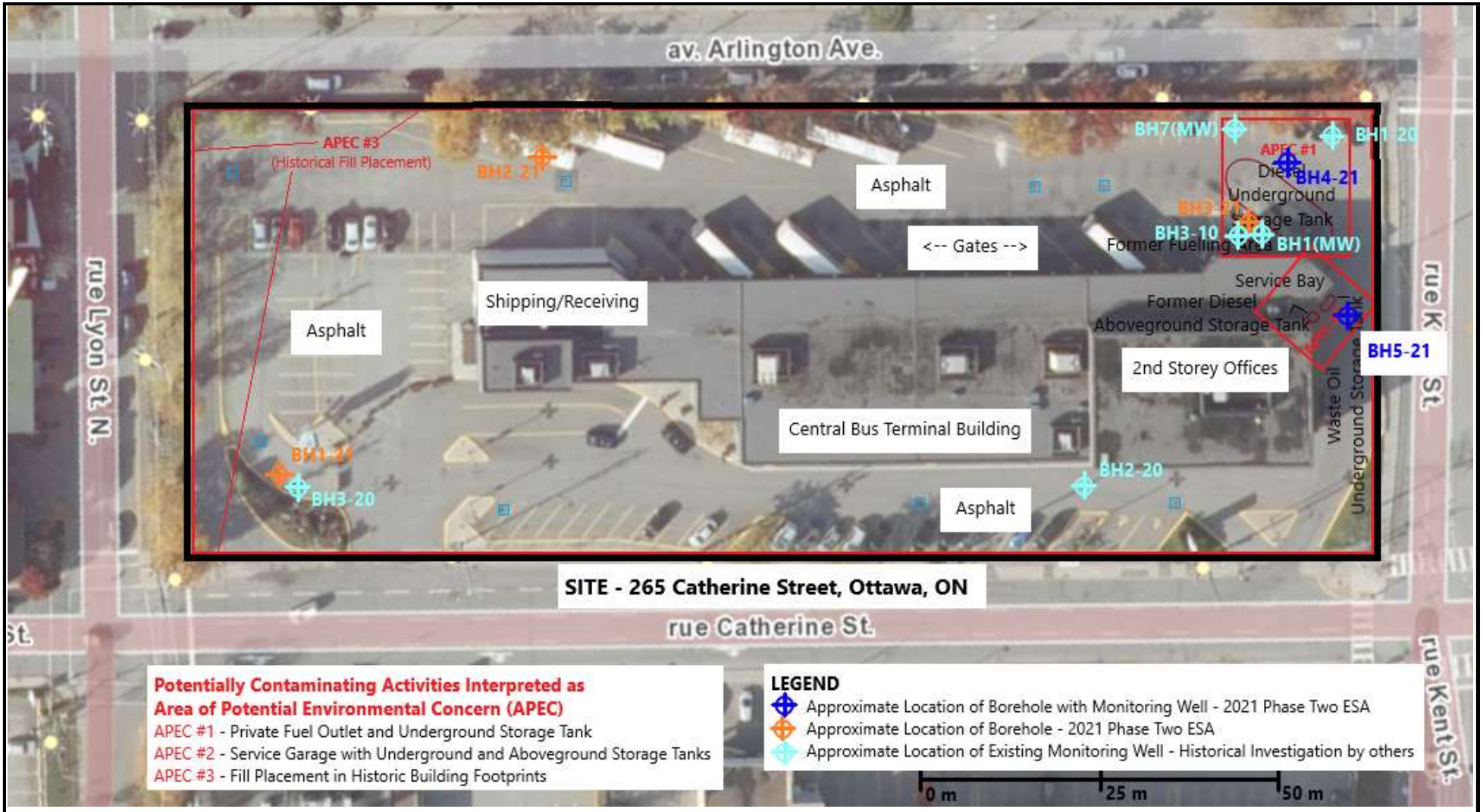
Figures



LOPERS & ASSOCIATES

Figure 1: Key Plan
Phase Two Environmental Site Assessment
265 Catherine Street, Ottawa, Ontario
11034936 Canada Inc.

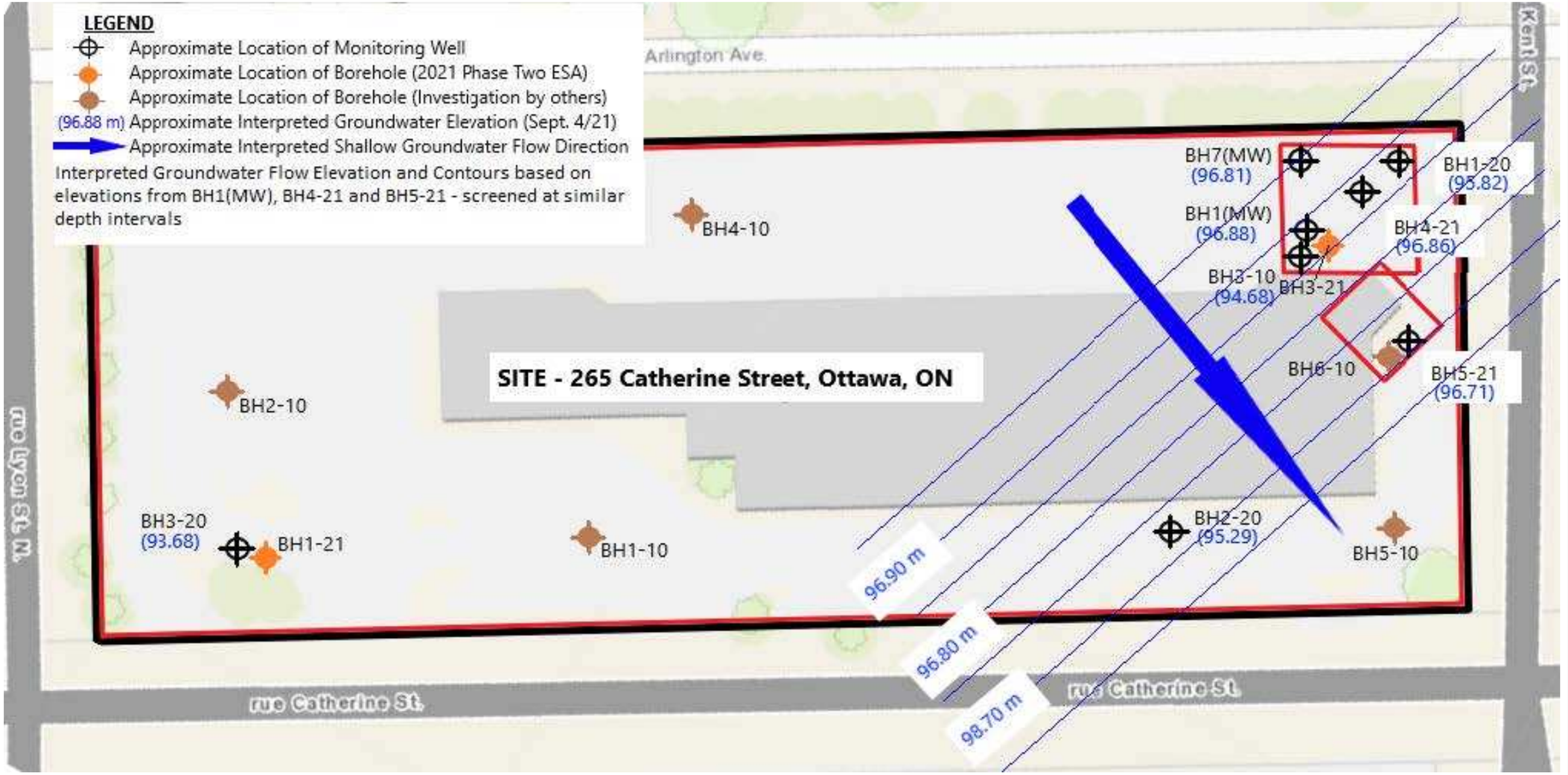
Project Reference No:	LOP21-018B
Drawing No.:	LOP21-018B-1
Date:	August 20, 2021
Author:	L. Lopers
Source:	geoOttawa



LOPERS & ASSOCIATES

Figure 2: Site Plan
Phase Two Environmental Site Assessment
265 Catherine Street, Ottawa, Ontario
11034936 Canada Inc.

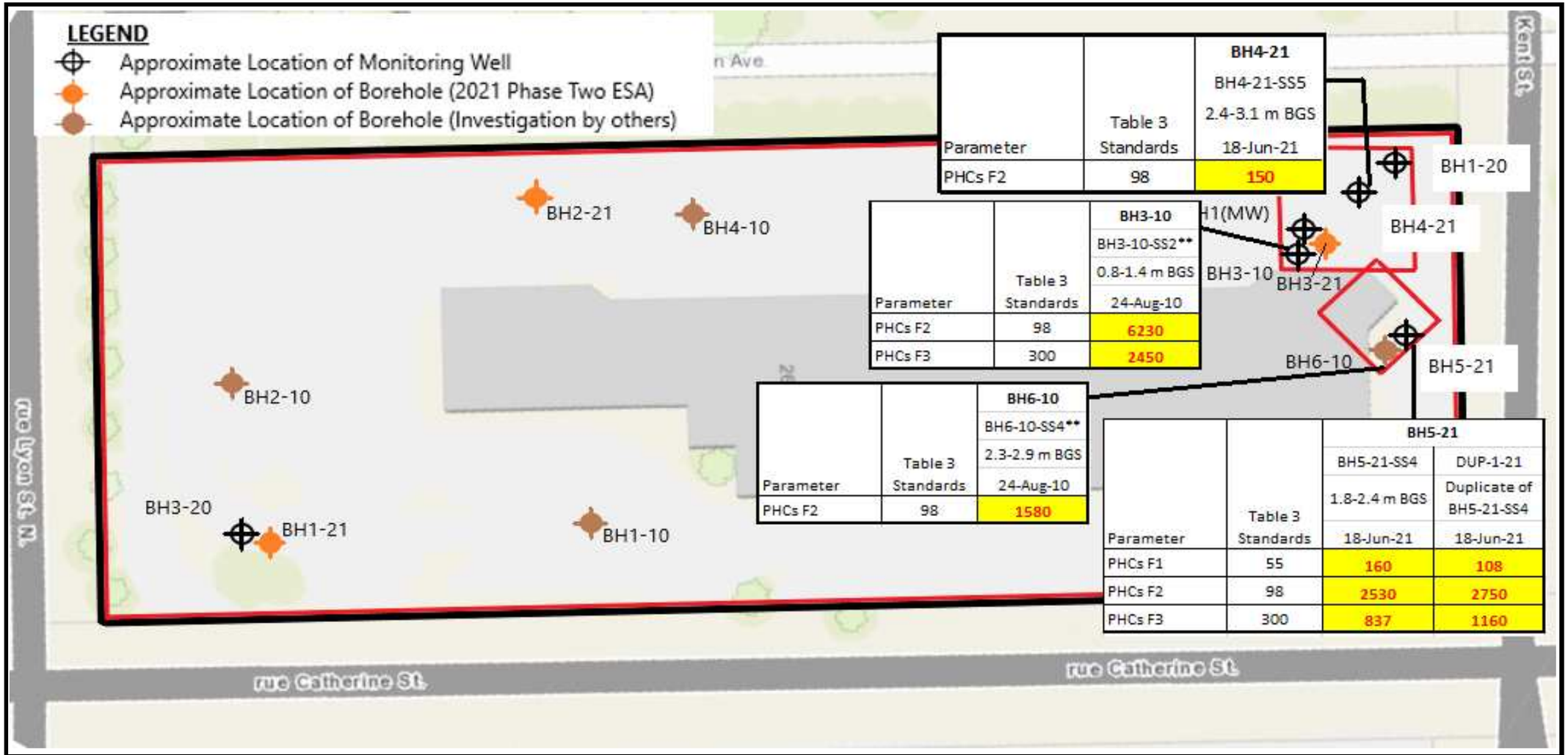
Project Reference No:	LOP21-018B
Drawing No.:	LOP21-018B-1
Date:	September 1, 2021
Author:	L. Lopers
Source:	geoOttawa, 2019 aerial imagery



LOPERS & ASSOCIATES

Figure 3: Groundwater Flow Interpretation
Phase Two Environmental Site Assessment
265 Catherine Street, Ottawa, Ontario
11034936 Canada Inc.

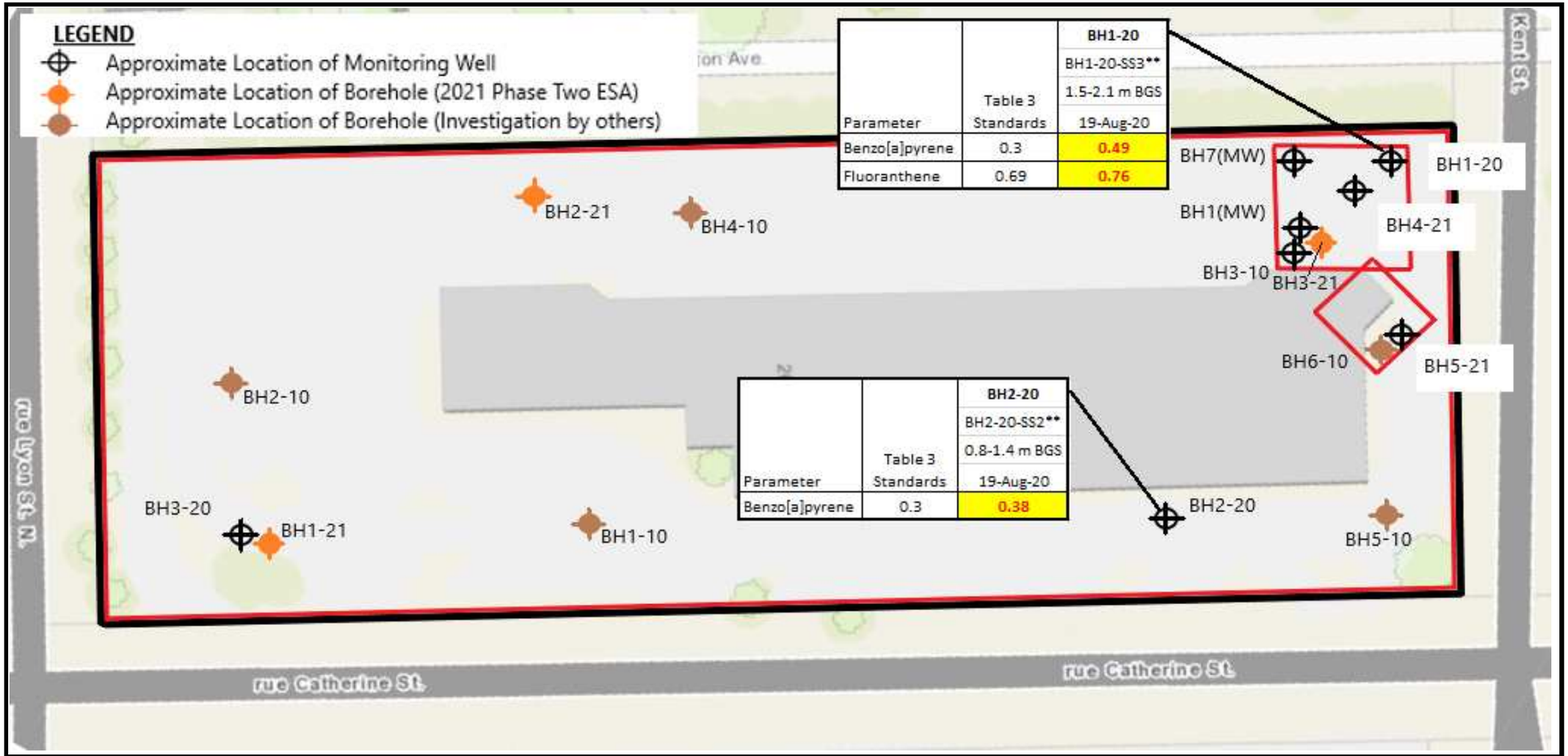
Project Reference No:	LOP21-018B
Drawing No.:	LOP21-018B-3
Date:	September 17, 2021
Author:	L. Lopers
Source:	geoOttawa, base mapping



LOPERS & ASSOCIATES

Figure 4a: Petroleum Hydrocarbon Soil Exceedances
Phase Two Environmental Site Assessment
265 Catherine Street, Ottawa, Ontario
11034936 Canada Inc.

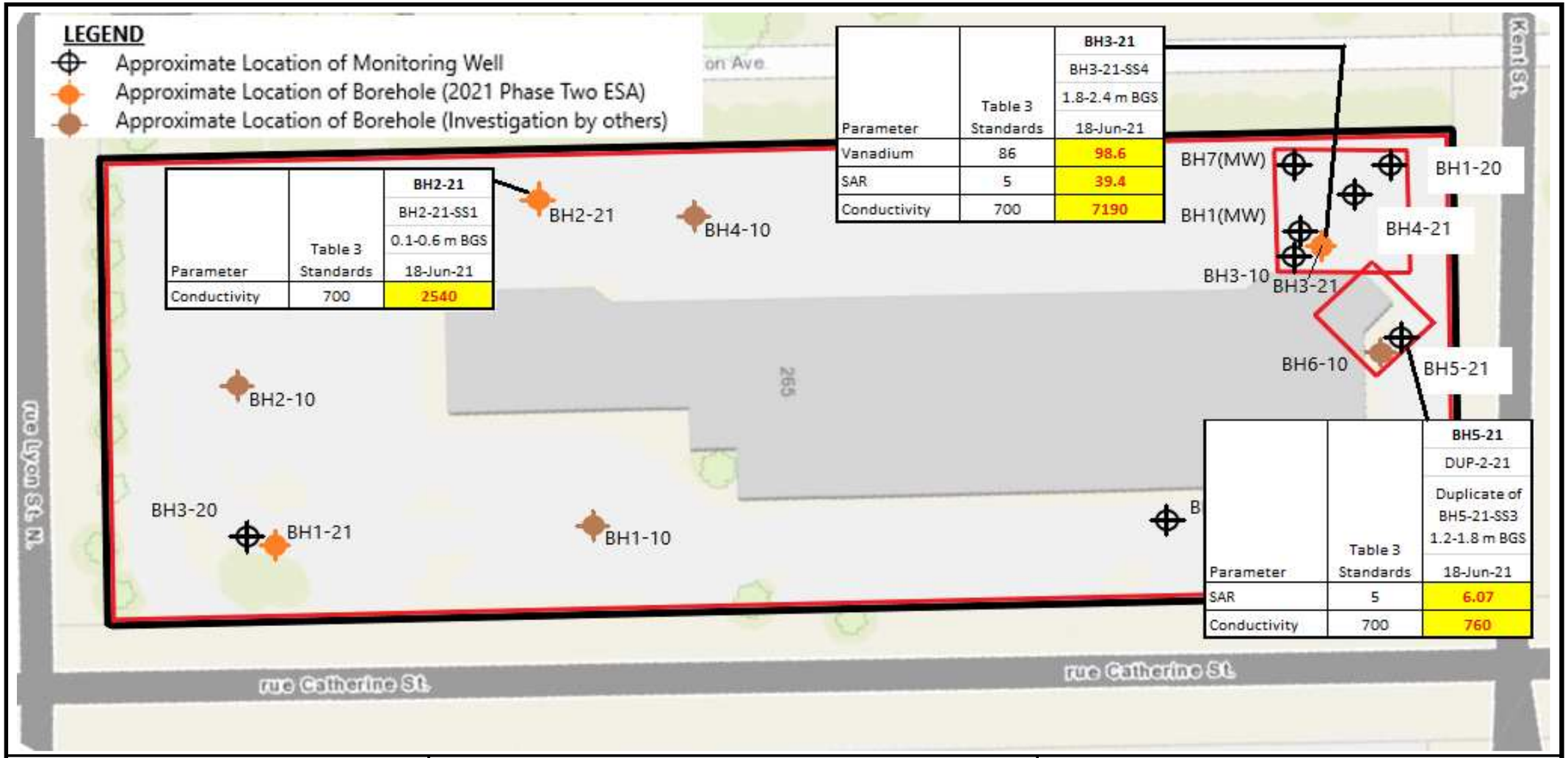
Project Reference No: LOP21-018B
Drawing No.: LOP21-018B-4a
Date: September 17, 2021
Author: L. Lopers
Source: geoOttawa, base mapping



LOPERS & ASSOCIATES

Figure 4b: Poly Aromatic Hydrocarbon Soil Exceedances
Phase Two Environmental Site Assessment
265 Catherine Street, Ottawa, Ontario
11034936 Canada Inc.

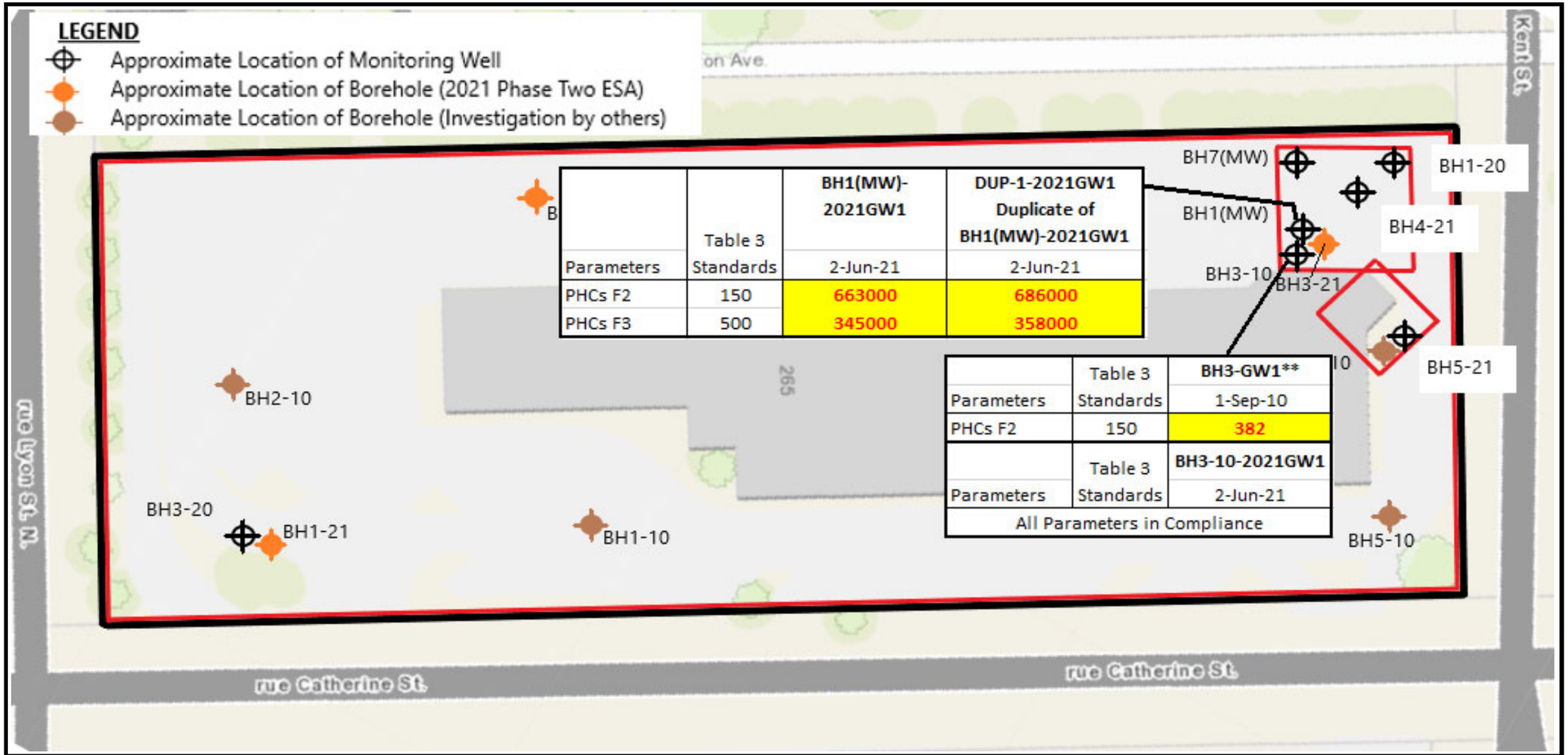
Project Reference No:	LOP21-018B
Drawing No.:	LOP21-018B-4b
Date:	September 17, 2021
Author:	L. Lopers
Source:	geoOttawa, base mapping



LOPERS & ASSOCIATES

Figure 4c: Metals & Inorganics Soil Exceedances
Phase Two Environmental Site Assessment
265 Catherine Street, Ottawa, Ontario
11034936 Canada Inc.

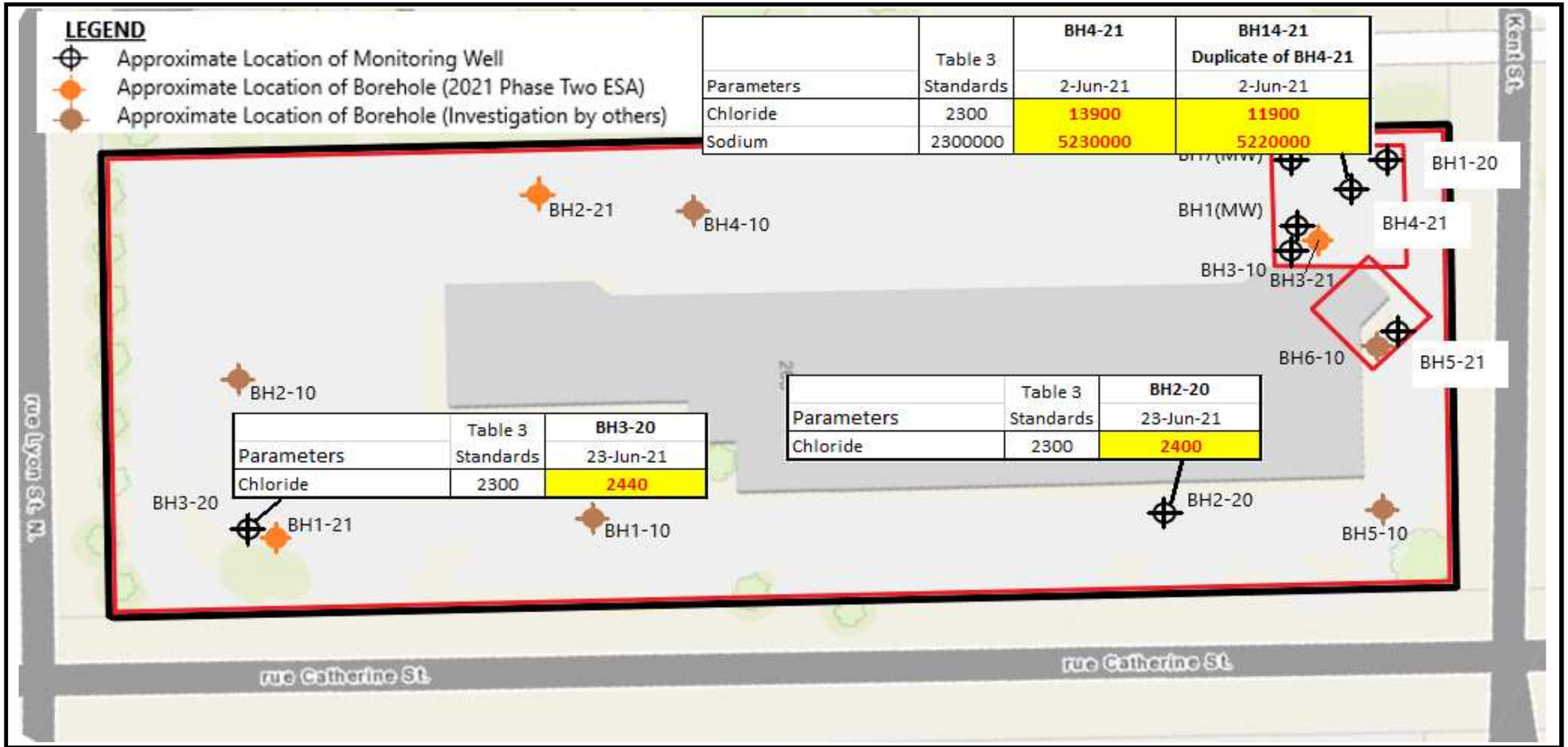
Project Reference No:	LOP21-018B
Drawing No.:	LOP21-018B-4c
Date:	September 17, 2021
Author:	L. Lopers
Source:	geoOttawa, base mapping



LOPERS & ASSOCIATES

Figure 5a: Petroleum Hydrocarbon Groundwater Exceedances
Phase Two Environmental Site Assessment
265 Catherine Street, Ottawa, Ontario
11034936 Canada Inc.

Project Reference No:	LOP21-018B
Drawing No.:	LOP21-018B-5a
Date:	September 17, 2021
Author:	L. Lopers
Source:	geoOttawa, base mapping



LOPERS & ASSOCIATES

Figure 5b: Metals & Inorganics Groundwater Exceedances
Phase Two Environmental Site Assessment
265 Catherine Street, Ottawa, Ontario
11034936 Canada Inc.

Project Reference No:	LOP21-018B
Drawing No.:	LOP21-018B-5b
Date:	September 17, 2021
Author:	L. Lopers
Source:	geoOttawa, base mapping

Tables

Table 13: Soil Analytical Results

265 Catherine Street, Ottawa, Ontario

Parameter	Units	Method Detection Limit (MDL)	MECP Table 3: Residential Property Use Standard Coarse Grain Soil	Sample Location:	BH1-21	BH2-21	BH3-21	BH4-21		BH5-21				BH3-10	BH6-10	BH1-20			BH2-20
				Sample ID:	BH1-21-SS3	BH2-21-SS1	BH3-21-SS4	BH4-21-SS5	BH4-21-SS8	BH5-21-SS3	DUP-2-21	BH5-21-SS4	DUP-1-21	BH3-10-SS2**	BH6-10-SS4**	BH1-20-SS3**	BH1-20-SS2**	BH1-20-SS4**	BH2-20-SS2**
				Sample Depth:	1.2-1.8 m BGS	0.1-0.6 m BGS	1.8-2.4 m BGS	2.4-3.1 m BGS	4.3-4.9 m BGS	1.2-1.8 m BGS	Duplicate of BH5-21-SS3	1.8-2.4 m BGS	Duplicate of BH5-21-SS4	0.8-1.4 m BGS	2.3-2.9 m BGS	1.5-2.1 m BGS	0.8-1.4 m BGS	2.3-2.9 m BGS	0.8-1.4 m BGS
				Sample Date:	June 18, 2021	June 18, 2021	June 18, 2021	June 18, 2021	June 18, 2021	June 18, 2021	June 18, 2021	June 18, 2021	June 18, 2021	August 24, 2010	August 24, 2010	August 19, 2020	August 19, 2020	August 19, 2020	August 19, 2020
				Laborartory Sample ID:	2125646-01	2125646-02	2125646-03	2125646-04	2125646-05	2125646-06	2125646-09	2125646-07	2125646-08	1035209-01	1035209-02	2034610-01	2034610-02	2034610-03	2034610-04
Petroluem Hydrocarbons (PHCs)																			
F1 PHCs (C6-C10)	ug/g	7	55		-	-	51	16	ND	-	-	160	108	77	ND	-	ND	ND	-
F2 PHCs (C10-C16)	ug/g	4	98		-	-	71	150	ND	-	-	2530	2750	6230	1580	-	ND	ND	-
F3 PHCs (C16-C34)	ug/g	8	300		-	-	35	60	ND	-	-	837	1160	2450	293	-	ND	ND	-
F4 PHCs (C34-C50)	ug/g	6	2800		-	-	ND	16	ND	-	-	21	16	ND	ND	-	ND	ND	
F4G PHCs (gravimetric)	ug/g	50	2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Volatile Organic Compounds (VOCs)																			
Acetone	ug/g	0.50	16		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Benzene	ug/g	0.02	0.21		-	-	ND	ND	ND	-	-	ND	ND	ND	ND	-	ND	ND	-
Bromodichloromethane	ug/g	0.05	13		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Bromoform	ug/g	0.05	0.27		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Bromomethane	ug/g	0.05	0.05		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Carbon Tetrachloride	ug/g	0.05	0.05		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Chlorobenzene	ug/g	0.05	2.4		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Chloroform	ug/g	0.05	0.05		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Dibromochloromethane	ug/g	0.05	9.4		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Dichlorodifluoromethane	ug/g	0.05	16		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
1,2-Dichlorobenzene	ug/g	0.05	3.4		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
1,3-Dichlorobenzene	ug/g	0.05	4.8		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
1,4-Dichlorobenzene	ug/g	0.05	0.083		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
1,1-Dichloroethane	ug/g	0.05	3.5		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
1,2-Dichloroethane	ug/g	0.05	0.05		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
1,1-Dichloroethylene	ug/g	0.05	0.05		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
cis-1,2-Dichloroethylene	ug/g	0.05	3.4		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
trans-1,2-Dichloroethylene	ug/g	0.05	0.084		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
1,2-Dichloropropane	ug/g	0.05	0.05		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
cis-1,3-Dichloropropylene	ug/g	0.05			-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
trans-1,3-Dichloropropylene	ug/g	0.05			-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
1,3-Dichloropropene, total	ug/g	0.05	0.05		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Ethylbenzene	ug/g	0.05	2		-	-	0.5	0.07	ND	-	-	0.38	ND	0.55	ND	-	ND	ND	-
Ethylene dibromide (dibromoethane, 1,2-)	ug/g	0.05	0.05		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Hexane	ug/g	0.05	2.8		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Methyl Ethyl Ketone (2-Butanone)	ug/g	0.50	16		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Methyl Isobutyl Ketone	ug/g	0.50	1.7		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Methyl tert-butyl ether	ug/g	0.05	0.75		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Methylene Chloride	ug/g	0.05	0.1		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Styrene	ug/g	0.05	0.7		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
1,1,1,2-Tetrachloroethane	ug/g	0.05	0.058		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Tetrachloroethylene	ug/g	0.05	0.28		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Toluene	ug/g	0.05	2.3		-	-	ND	ND	ND	-	-	ND	0.16	0.17	ND	-	ND	ND	-
1,1,1-Trichloroethane	ug/g	0.05	0.38		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
1,1,2-Trichloroethane	ug/g	0.05	0.05		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Trichloroethylene	ug/g	0.05	0.061		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Trichlorofluoromethane	ug/g	0.05	4		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
Vinyl Chloride	ug/g	0.02	0.02		-	-	ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-
m/p-Xylene	ug/g	0.05	NV		-	-	0.35	ND	ND	-	-	0.94	0.24	3.14	ND	-	ND	ND	-
o-Xylene	ug/g	0.05	NV		-	-	ND	ND	ND	-	-	ND	0.09	2.37	ND	-	ND	ND	-
Xylenes, total	ug/g	0.05	3.1		-	-	0.35	ND	ND	-	-	0.94	0.33	5.51	ND	-	ND	ND	-

Table 13: Soil Analytical Results

265 Catherine Street, Ottawa, Ontario

Parameter	Units	Method Detection Limit (MDL)	MECP Table 3: Residential Property Use Standard Coarse Grain Soil	Sample Location:	BH1-21	BH2-21	BH3-21	BH4-21		BH5-21				BH3-10	BH6-10	BH1-20			BH2-20
				Sample ID:	BH1-21-SS3	BH2-21-SS1	BH3-21-SS4	BH4-21-SS5	BH4-21-SS8	BH5-21-SS3	DUP-2-21	BH5-21-SS4	DUP-1-21	BH3-10-SS2**	BH6-10-SS4**	BH1-20-SS3**	BH1-20-SS2**	BH1-20-SS4**	BH2-20-SS2**
				Sample Depth:	1.2-1.8 m BGS	0.1-0.6 m BGS	1.8-2.4 m BGS	2.4-3.1 m BGS	4.3-4.9 m BGS	1.2-1.8 m BGS	Duplicate of BH5-21-SS3	1.8-2.4 m BGS	Duplicate of BH5-21-SS4	0.8-1.4 m BGS	2.3-2.9 m BGS	1.5-2.1 m BGS	0.8-1.4 m BGS	2.3-2.9 m BGS	0.8-1.4 m BGS
				Sample Date:	June 18, 2021	June 18, 2021	June 18, 2021	June 18, 2021	June 18, 2021	June 18, 2021	June 18, 2021	June 18, 2021	June 18, 2021	August 24, 2010	August 24, 2010	August 19, 2020	August 19, 2020	August 19, 2020	August 19, 2020
				Laborartory Sample ID:	2125646-01	2125646-02	2125646-03	2125646-04	2125646-05	2125646-06	2125646-09	2125646-07	2125646-08	1035209-01	1035209-02	2034610-01	2034610-02	2034610-03	2034610-04
Polycyclic Aromatic Hydrocarbons																			
Acenaphthene	ug/g	0.02	7.9		ND	ND	ND	-	-	0.02	0.03	-	-	-	-	0.04	-	-	0.03
Acenaphthylene	ug/g	0.02	0.15		ND	ND	ND	-	-	ND	0.02	-	-	-	-	0.03	-	-	0.03
Anthracene	ug/g	0.02	0.67		ND	ND	ND	-	-	0.06	0.09	-	-	-	-	0.15	-	-	0.11
Benzo[a]anthracene	ug/g	0.02	0.5		ND	ND	ND	-	-	0.16	0.23	-	-	-	-	0.49	-	-	0.39
Benzo[a]pyrene	ug/g	0.02	0.3		ND	ND	ND	-	-	0.16	0.22	-	-	-	-	0.49	-	-	0.38
Benzo[b]fluoranthene	ug/g	0.02	0.78		ND	ND	ND	-	-	0.18	0.25	-	-	-	-	0.51	-	-	0.39
Benzo[g,h,i]perylene	ug/g	0.02	6.6		ND	ND	ND	-	-	0.11	0.14	-	-	-	-	0.26	-	-	0.21
Benzo[k]fluoranthene	ug/g	0.02	0.78		ND	ND	ND	-	-	0.09	0.12	-	-	-	-	0.28	-	-	0.22
Chrysene	ug/g	0.02	7		ND	ND	ND	-	-	0.16	0.22	-	-	-	-	0.44	-	-	0.36
Dibenzo[a,h]anthracene	ug/g	0.02	0.1		ND	ND	ND	-	-	0.03	0.04	-	-	-	-	0.08	-	-	0.06
Fluoranthene	ug/g	0.02	0.69		ND	0.04	ND	-	-	0.32	0.47	-	-	-	-	0.76	-	-	0.65
Fluorene	ug/g	0.02	62		ND	ND	0.05	-	-	0.03	0.04	-	-	-	-	0.04	-	-	0.03
Indeno[1,2,3-cd]pyrene	ug/g	0.02	0.38		ND	ND	ND	-	-	0.09	0.12	-	-	-	-	0.25	-	-	0.19
1-Methylnaphthalene	ug/g	0.02	0.99		ND	ND	0.15	-	-	ND	ND	-	-	-	-	ND	-	-	ND
2-Methylnaphthalene	ug/g	0.02	0.99		ND	ND	0.07	-	-	ND	ND	-	-	-	-	ND	-	-	ND
Methylnaphthalene (1&2)	ug/g	0.04	0.99		ND	ND	0.22	-	-	ND	ND	-	-	-	-	ND	-	-	ND
Naphthalene	ug/g	0.01	0.6		ND	ND	ND	-	-	0.02	0.02	-	-	-	-	0.02	-	-	0.02
Phenanthrene	ug/g	0.02	6.2		ND	0.02	0.22	-	-	0.30	0.36	-	-	-	-	0.32	-	-	0.38
Pyrene	ug/g	0.02	78		ND	0.03	ND	-	-	0.29	0.39	-	-	-	-	0.66	-	-	0.62
Metals																			
Boron, available	ug/g	0.5	1.5		ND	ND	ND	-	-	1.2	1	-	-	-	-	-	-	-	-
Chromium (VI)	ug/g	0.2	8		0.2	ND	ND	-	-	ND	ND	-	-	-	-	ND	-	-	ND
Mercury	ug/g	0.1	0.27		ND	ND	ND	-	-	0.1	ND	-	-	-	-	ND	-	-	ND
Antimony	ug/g	1.0	7.5		ND	ND	ND	-	-	ND	ND	-	-	-	-	ND	-	-	ND
Arsenic	ug/g	1.0	18		1.2	1.7	3.2	-	-	2.8	2.7	-	-	-	-	3.4	-	-	2.4
Barium	ug/g	1.0	390		29.2	74.4	349	-	-	81.1	72.8	-	-	-	-	228	-	-	55.5
Beryllium	ug/g	0.5	4		ND	ND	0.9	-	-	ND	ND	-	-	-	-	ND	-	-	ND
Boron	ug/g	5.0	120		ND	ND	8.4	-	-	10	9.9	-	-	-	-	5.5	-	-	ND
Cadmium	ug/g	0.5	1.2		ND	ND	ND	-	-	ND	ND	-	-	-	-	ND	-	-	ND
Chromium	ug/g	5.0	160		18.2	8.8	103	-	-	22.8	23.7	-	-	-	-	19.0	-	-	17.9
Cobalt	ug/g	1.0	22		4.1	2.5	21.2	-	-	5.9	6.1	-	-	-	-	4.5	-	-	5.3
Copper	ug/g	5.0	140		6.3	ND	43.4	-	-	15.9	16	-	-	-	-	17.9	-	-	10.9
Lead	ug/g	1.0	120		2.5	9.8	7.1	-	-	28.2	28.7	-	-	-	-	80.6	-	-	36.0
Molybdenum	ug/g	1.0	6.9		ND	1.2	ND	-	-	1	1	-	-	-	-	ND	-	-	ND
Nickel	ug/g	5.0	100		9.5	6.6	56.9	-	-	14.9	15.6	-	-	-	-	22.1	-	-	12.0
Selenium	ug/g	1.0	2.4		ND	ND	ND	-	-	ND	ND	-	-	-	-	ND	-	-	ND
Silver	ug/g	0.3	20		ND	ND	ND	-	-	ND	ND	-	-	-	-	ND	-	-	ND
Thallium	ug/g	1.0	1		ND	ND	ND	-	-	ND	ND	-	-	-	-	ND	-	-	ND
Uranium	ug/g	1.0	23		ND	ND	ND	-	-	ND	ND	-	-	-	-	ND	-	-	ND
Vanadium	ug/g	10.0	86		18.1	ND	98.6	-	-	27	28.1	-	-	-	-	23.7	-	-	23.3
Zinc	ug/g	20.0	340		20.7	ND	119	-	-	42.7	45.1	-	-	-	-	204	-	-	45.4
General Inorganics																			
SAR	N/A	0.01	5		3.68	0.73	39.4	-	-	4.45	6.07	-	-	-	-	-	-	-	-
Conductivity	uS/cm	5	700		517	2540	7190	-	-	497	760	-	-	-	-	-	-	-	-
Cyanide, free	ug/g	0.03	0.051		ND	ND	ND	-	-	ND	ND	-	-	-	-	-	-	-	-
pH	pH Units	0.05	NV		7.56	7.86	7.85	-	-	7.92	7.48	-	-	-	-	-	-	-	-

** - Sample analyzed during previous investigations by others
NV - No value listed in MECP site condition standards
- - Not Analyzed
ND - Not detected above laboratory method detection limits
Exceeds MECP site condition standards

Table 14: Groundwater Analytical Results

265 Catherine Street, Ottawa, Ontario

			Sample Location:	BH1(MW)		BH7(MW)	BH3-10		BH1-20		BH2-20	BH3-20-GW1**		BH4-41		BH5-21	
			Sample ID:	BH1(MW)-2021GW1	DUP-1-2021GW1 Duplicate of BH1(MW)-2021GW1	BH7(MW)-2021GW1	BH3-GW1**	BH3-10-2021GW1	BH1-GW1	BH1-20-2021GW1	BH2-20	BH3-20-GW1**	BH3-20	BH4-21	BH14-21 Duplicate of BH4-21	BH5-21	Trip Blank
			Sample Date:	June 2, 2021	June 2, 2021	June 2, 2021	September 1, 2010	June 2, 2021	September 8, 2020	June 2, 2021	June 23, 2021	August 28, 2020	June 23, 2021	June 23, 2021	June 23, 2021	June 23, 2021	June 23, 2021
			Laborartory Sample ID:	2123416-01	2123416-05	2123416-02	1036123-01	2123416-03	2037189-01	2123416-04	2126398-01	2036155-01	2126398-02	2126398-03	2126398-05	2126398-04	2126398-06
Parameter	Units	Method Detection Limit (MDL)	MECP Table 3 Standards Coarse Grain Soil														
Petroluem Hydrocarbons (PHCs)																	
F1 PHCs (C6-C10)	ug/L	25	750	47	56	ND	ND	ND	ND	ND	ND	ND	ND	39	46	25	-
F2 PHCs (C10-C16)	ug/L	100	150	663000	686000	ND	362	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
F3 PHCs (C16-C34)	ug/L	100	500	345000	358000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
F4 PHCs (C34-C50)	ug/L	100	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Volatile Organic Compounds (VOCs)																	
Acetone	ug/L	5.0	130000	-	-	-	ND	-	ND	-	ND	ND	ND	16.0	19.4	67.3	ND
Benzene	ug/L	0.5	44	15.7	15.8	ND	ND	ND	ND	ND	ND	ND	ND	15.5	15.9	ND	ND
Bromodichloromethane	ug/L	0.5	85000	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Bromoform	ug/L	0.5	380	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ug/L	0.5	5.6	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/L	0.2	0.79	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ug/L	0.5	630	-	-	-	ND	-	ND	-	ND	ND	ND	7.0	7.2	ND	ND
Chloroform	ug/L	0.5	2.4	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ug/L	0.5	82000	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/L	1.0	4400	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ug/L	0.5	4600	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ug/L	0.5	9600	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ug/L	0.5	8	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/L	0.5	320	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/L	0.5	1.6	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/L	0.5	1.6	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/L	0.5	1.6	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/L	0.5	1.6	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/L	0.5	16	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropylene	ug/L	0.5	NV	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropylene	ug/L	0.5	NV	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropene, total	ug/L	0.5	5.2	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ug/L	0.5	2300	27.9	28.3	ND	ND	ND	ND	ND	ND	ND	ND	16.5	16.8	ND	ND
Ethylene dibromide (dibromoethane, 1	ug/L	0.2	0.25	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Hexane	ug/L	1.0	51	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Methyl Ethyl Ketone (2-Butanone)	ug/L	5.0	470000	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Methyl Isobutyl Ketone	ug/L	5.0	140000	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Methyl tert-butyl ether	ug/L	2.0	190	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/L	5.0	610	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Styrene	ug/L	0.5	1300	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ug/L	0.5	3.3	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/L	0.5	3.2	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene	ug/L	0.5	1.6	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/L	0.5	18000	1.0	1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/L	0.5	640	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/L	0.5	4.7	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Trichloroethylene	ug/L	0.5	1.6	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ug/L	1.0	2500	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ug/L	0.5	0.5	-	-	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND
m/p-Xylene	ug/L	0.5	NV	17.0	17.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ug/L	0.5	NV	22.5	22.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes, total	ug/L	0.5	4200	39.5	39.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 14: Groundwater Analytical Results

265 Catherine Street, Ottawa, Ontario

			Sample Location:	BH1(MW)		BH7(MW)	BH3-10		BH1-20		BH2-20	BH3-20-GW1**		BH4-41		BH5-21	
			Sample ID:	BH1(MW)-2021GW1	DUP-1-2021GW1 Duplicate of BH1(MW)-2021GW1	BH7(MW)-2021GW1	BH3-GW1**	BH3-10-2021GW1	BH1-GW1	BH1-20-2021GW1	BH2-20	BH3-20-GW1**	BH3-20	BH4-21	BH14-21 Duplicate of BH4-21	BH5-21	Trip Blank
			Sample Date:	June 2, 2021	June 2, 2021	June 2, 2021	September 1, 2010	June 2, 2021	September 8, 2020	June 2, 2021	June 23, 2021	August 28, 2020	June 23, 2021	June 23, 2021	June 23, 2021	June 23, 2021	June 23, 2021
			Laborartory Sample ID:	2123416-01	2123416-05	2123416-02	1036123-01	2123416-03	2037189-01	2123416-04	2126398-01	2036155-01	2126398-02	2126398-03	2126398-05	2126398-04	2126398-06
Parameter	Units	Method Detection Limit (MDL)	MECP Table 3 Standards Coarse Grain Soil														
Polycyclic Aromatic Hydrocarbons																	
Acenaphthene	ug/L	0.05	600	-	-	-	-	-	-	-	ND	-	ND	1.09	1.8	ND	-
Acenaphthylene	ug/L	0.05	1.8	-	-	-	-	-	-	-	ND	-	ND	0.11	0.18	ND	-
Anthracene	ug/L	0.01	2.4	-	-	-	-	-	-	-	ND	-	ND	0.19	0.12	ND	-
Benzo[a]anthracene	ug/L	0.01	4.7	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	-
Benzo[a]pyrene	ug/L	0.01	0.81	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	-
Benzo[b]fluoranthene	ug/L	0.05	0.75	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	-
Benzo[g,h,i]perylene	ug/L	0.05	0.2	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	-
Benzo[k]fluoranthene	ug/L	0.05	0.4	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	-
Chrysene	ug/L	0.05	1	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	-
Dibenzo[a,h]anthracene	ug/L	0.05	0.52	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	-
Fluoranthene	ug/L	0.01	130	-	-	-	-	-	-	-	ND	-	ND	0.16	0.13	ND	-
Fluorene	ug/L	0.05	400	-	-	-	-	-	-	-	ND	-	ND	0.98	1.56	0.14	-
Indeno[1,2,3-cd]pyrene	ug/L	0.05	0.2	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	-
1-Methylnaphthalene	ug/L	0.05	1800	-	-	-	-	-	-	-	ND	-	ND	36.4	41.2	0.36	-
2-Methylnaphthalene	ug/L	0.05	1800	-	-	-	-	-	-	-	ND	-	ND	2.16	2.36	ND	-
Methylnaphthalene (1&2)	ug/L	0.10	1800	-	-	-	-	-	-	-	ND	-	ND	38.6	43.6	0.36	-
Naphthalene	ug/L	0.05	1400	-	-	-	-	-	-	-	ND	-	ND	1.7	1.93	ND	-
Phenanthrene	ug/L	0.05	580	-	-	-	-	-	-	-	ND	-	ND	1.97	1.76	ND	-
Pyrene	ug/L	0.01	68	-	-	-	-	-	-	-	ND	-	ND	0.15	0.13	0.06	-
Metals																	
Mercury	ug/L	0.1	0.29	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	-
Antimony	ug/L	0.5	20000	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	-
Arsenic	ug/L	1	1900	-	-	-	-	-	-	-	1	-	ND	2	2	ND	-
Barium	ug/L	1	29000	-	-	-	-	-	-	-	193	-	291	1970	1910	518	-
Beryllium	ug/L	0.5	67	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	-
Boron	ug/L	10	45000	-	-	-	-	-	-	-	66	-	62	98	95	133	-
Cadmium	ug/L	0.1	2.7	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	-
Chromium	ug/L	1	810	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	-
Chromium (VI)	ug/L	10	140	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	-
Cobalt	ug/L	0.5	66	-	-	-	-	-	-	-	ND	-	ND	3.6	3.5	2.3	-
Copper	ug/L	0.5	87	-	-	-	-	-	-	-	1.5	-	1.3	0.8	ND	2.4	-
Lead	ug/L	0.1	25	-	-	-	-	-	-	-	ND	-	ND	0.1	0.1	ND	-
Molybdenum	ug/L	0.5	9200	-	-	-	-	-	-	-	9	-	5.3	3.5	3.4	9	-
Nickel	ug/L	1	490	-	-	-	-	-	-	-	5	-	1	30	30	16	-
Selenium	ug/L	1	63	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	-
Silver	ug/L	0.1	1.5	-	-	-	-	-	-	-	ND	-	ND	0.1	ND	ND	-
Sodium	ug/L	200	2300000	-	-	-	-	-	-	-	678000	-	1260000	5230000	5220000	345000	-
Thallium	ug/L	0.1	510	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	-
Uranium	ug/L	0.1	420	-	-	-	-	-	-	-	7.3	-	1.1	2.3	2.1	7.1	-
Vanadium	ug/L	0.5	250	-	-	-	-	-	-	-	3.4	-	0.8	4.1	4.3	0.9	-
Zinc	ug/L	5	1100	-	-	-	-	-	-	-	ND	-	ND	ND	5	6	-
General Inorganics																	
Cyanide, free	ug/L	2	66	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	-
pH	pH Units	0.1	NV	-	-	-	-	-	-	-	7.5	-	7.0	7.3	7.2	2.6	-
Chloride	mg/L	1	2300	-	-	-	-	-	-	-	2400	-	2440	13900	11900	1240	-

** - Sample analyzed during previous investigations by others
NV - No value listed in MECP site condition standards
- - Not Analyzed
ND - Not detected above laboratory method detection limits
ND(250) - Not detected above elevated laboratory method detection limits due to high analyte concentrations. Elevated MDL listed in "( )"
Exceeds MECP site condition standards

Appendix A

Sampling and Analysis Plan

LOPERS & ASSOCIATES

Sampling and Analysis Plan

265 Catherine Street
Ottawa, Ontario

Prepared for:

11034936 Canada Inc.

5/25/2021

Table of Contents

1. Background

Lopers & Associates (Lopers) was retained by 11034936 Canada Inc. (Brigil) to complete a Phase Two Environmental Site Assessment (Phase Two ESA) of the commercial property with Civic address No. 265 Catherine Street, Ottawa, Ontario ("Phase Two Property", "Property" or "Site").

Lopers has previously completed a Phase One Environmental Site Assessment (Phase One ESA) (Reference No. LOP21-018A, dated August 20, 2021) for Brigil at the Property. The Phase One ESA identified the presence of three potentially contaminating activities (PCAs) at the Property which were interpreted to represent areas of potential environmental concern (APECs). The presence of a private fuel outlet and associated underground storage tank (UST) represents PCA #1 and is interpreted as APEC #1 for the northeast portion of the Phase One Property. The presence of a service bay (garage), associated historical aboveground storage tank (AST) and suspected UST represents PCA #2 and is interpreted as APEC #2 for the east portion of the Phase One Property. The former presence of residential and commercial structures which historically occupied the majority of the Phase One Property, are suspected to have had their foundations backfilled with poor environmental quality fill material. This fill material (PCA #3) is suspected in areas outside of the current building footprint and represents APEC #3 for the Property.

The contaminants of potential concern associated with fuel storage and fuelling are generally PHCs and BTEXs. Based on historical presence of a service garage at the Property, VOCs are also considered contaminants of potential concern (CPCs) associated with the former service garage operations. The CPCs associated with the historical fill materials are polycyclic aromatic hydrocarbons (PAHs), metals & inorganics. PHCs/BTEXs are also a CPC; considering the date of original development at the Property, there are suspected former heating oil storage tanks associated with the various former residential and commercial properties which now comprise the Phase Two Property.

The scope of work for the Phase Two ESA includes drilling five boreholes at the Phase Two Property. At least two of the boreholes will be instrumented with groundwater monitoring wells with screens installed in the overburden. Select existing groundwater monitoring wells at the Phase Two Property, which were installed as part of historical investigations, may also be accessed and sampled to supplement the groundwater quality assessment.

In the event that additional contaminants of APECs are identified during the drilling or sampling fieldwork, additional scope of work will be discussed with BRIGIL to complete the Phase Two ESA.

2. Planning Site Investigation - Specific Objectives

The following are the specific objectives for planning a site investigation of the Phase Two Environmental Site Assessment, as defined in O.Reg. 153/04.

1. To plan an investigation that will achieve the general objectives of a Phase Two Environmental Site Assessment,

> i. through the use of an appropriate and complete information base concerning the Phase Two Property, and
>
> ii. through the conduct of an investigation based both on information obtained before the Phase Two Environmental Site Assessment begins and on the incorporation of information obtained during the Phase Two Environmental Site Assessment.

2. To develop a sampling and analysis plan that will adequately assess all areas of the Phase Two Property where contaminants may be present in land or water on, in or under the Property.

3. To develop a quality assurance program that is designed to effectively limit errors and bias in sampling and analysis through implementation of assessment and control measures that will ensure data are useful, appropriate and accurate in the determination of whether the Phase Two Property, or any record of site condition (RSC) property within it, meets applicable site condition standards and any standards specified in a risk assessment.

3. Underground Utility Service Locates

Prior to completing the Phase Two ESA field investigation activities, public underground locates will be coordinated through Ontario One Call. As it is understood that the Site is undeveloped with no active privately owned underground services or infrastructure, private locates have not been included in this mandate.

The locations of the proposed boreholes will be reviewed in relation to the public underground locates and locations will be modified accordingly if conflicts exist between any location or if the location is in close proximity to an active underground service.

A copy of the public underground locates will be retained by Lopers' field personnel during all excavation components of the fieldwork.

4. Planning Site Investigation - Specific Requirements

The qualified person has ensured the following requirements were met in planning a site investigation. The Phase One conceptual site model for the Phase One Environmental Site Assessment report was used in conjunction with other information in determining:

i. Media for Investigation

Soil and groundwater sampling and analysis for the purpose of assessing environmental quality will be completed as part of the Phase Two ESA.

There are no surface water bodies at the Phase Two Property, as such, sediment and surface water quality sampling and analysis will not be completed as part of this Phase Two ESA.

ii. Locations and Depths for Sampling

A total of five borehole locations have been proposed to provide coverage of the APECs identified at the Phase Two Property. Boreholes will be located in the northeast portion of the Property to assess APECs #1 and #2. A distribution of boreholes will be spread over the remaining areas of the Property, with some to be situated in locations of suspected historical fill placement APEC #3.

Sampling depths will include as a minimum, collection of samples in 0.6 m intervals from the ground surface to native soil conditions within the groundwater table. Borehole/monitoring wells depths are proposed to be drilled to approximately 5 m to intercept the groundwater table in APECs were groundwater quality assessment is required. Boreholes are proposed to be drilled to a depth of approximately 3 m where an assessment of the fill quality is required.

iii. Parameters for Laboratory Analysis.

The parameters for laboratory analysis will be selected based on the contaminants of potential concern for each APEC as well as the field screening observations.

The contaminants of potential concern associated with fuel storage and fuelling are generally PHCs and BTEXs. Based on historical presence of a service garage at the Property, VOCs are also considered contaminants of potential concern (CPCs) associated with the former service garage operations. The CPCs associated with the historical fill materials are polycyclic aromatic hydrocarbons (PAHs), metals & inorganics. PHCs/BTEXs are also a CPC; considering the date of original development at the Property, there are suspected former heating oil storage tanks associated with the various former residential and commercial properties which now comprise the Phase Two Property.

The contaminants of concern for a particular sample will be based on the relative location and depth of the sample, visual and/or olfactory observations and combustible vapour screening concentrations.

Information obtained after the completion of the phase one environmental site assessment shall be used to modify the investigation, as appropriate.

5. Quality Assurance and Quality Control

The qualified person has ensured that there is a quality assurance and quality control program, data quality objectives, standard operating procedures and a description of any physical impediments that interfere with or limit the ability to conduct sampling and analysis.

The quality assurance and quality control program includes the following requirements:

5.1 Field Equipment Decontamination

All non-dedicated sampling and monitoring equipment must be cleaned following each use.

The split spoons, which are the only media to come into contact with the soil samples, will be washed using soap and water and a scrub brush between samples to minimize the potential for cross-contamination among samples. The field technician will use sterile nitrile gloves, which are to be changed prior to the handling of each soil sample to further reduce the potential of cross-contamination. The flights of the hollow stem augers are to be cleaned manually following each borehole.

Water level monitoring equipment, including water level meters and interface probes will be decontaminated with an environmentally safe cleaning solution and rinsed with deionized water between water level readings to prevent cross contamination.

The field technician will change dedicated sterile nitrile gloves prior to initiating work at each monitoring well and change gloves prior to sample collection to minimize the potential for cross-contamination.

5.2 Trip Blanks

Since groundwater samples are to be analyzed for volatile organic compounds (VOCs), one trip blank sample shall be submitted for laboratory analysis with each laboratory submission of groundwater samples.

5.3 Field Duplicates

Sufficient field duplicate samples shall be collected in each medium (soil and groundwater) being sampled, so that at least one field duplicate sample can be submitted for laboratory analysis for every ten samples submitted for laboratory analysis.

At least one field duplicate sample shall be submitted for laboratory analysis for every ten samples submitted for laboratory analysis.

One field duplicate will be submitted from each medium sampled for PHCs, VOCs, PAHs and metals & inorganics which are the parameter suites identified as a contaminants of concern in APECs #1 through #3 as part of the previously prepared Phase One ESA.

5.4 Equipment Calibration

Field screening of the soil samples will be completed using an RKI Instruments Model Eagle-2 combustible gas detector ("RKI Eagle"). The RKI Eagle used for soil sample screening as part of this Phase Two ESA will be obtained from Maxim Environmental and Safety Inc. and will be calibrated prior to use.

Measurements of the groundwater quality field parameters will be completed to determine stabilization of these parameters prior to sampling. These measurements will be completed using Horiba U-52 groundwater quality measurement device ("Horiba"). The Horiba used for groundwater quality parameter stabilization measurements as part of this Phase Two ESA will be obtained from Maxim Environmental and Safety Inc. and will be calibrated prior to use.

5.5 Data Quality Objectives

The data quality objectives for all types of field data collected during the Phase Two Environmental Site Assessment field investigation that set the level of uncertainty in environmental data shall be such that,

(a) the decision-making is not affected; and

(b) the overall objectives of the investigation are met.

6. Standard Operating Procedures

Standard operating procedures were developed for all of the following field investigation methods used in the field investigation.

6.1 Borehole Drilling

The drilling field program will be completed under full time supervision of Lopers & Associates personnel. The drilling subcontractor retained for the Phase Two ESA is George Downing Estate

Drilling Ltd., located at 410 Principale Rue, Grenville-Sur-la-Rouge, Quebec, J0V 1B0. The drill rig used for the Phase Two ESA will be a track mounted CME drill, equipped with hollow stem augers and stainless steel split spoons. Operation of the drilling equipment is the responsibility of the drilling subcontractor, who is trained and competent in the operation of this equipment.

The field technician logs the drilling and recovery of soil samples from each borehole, noting the soil type, physical and environmental characteristics at each borehole location on the field borehole logs.

6.2 Soil Sampling

Samples are to be collected from auger cuttings or split spoons at the ground surface for surficial samples (0-0.6 m below ground surface (m BGS)) and then using split spoons for subsequent samples. Split spoon samples are generally not collected from surficial depths, as poor recovery of loose packed fill material does not yield sufficient volume of samples required for field screening or laboratory analysis. Split spoon samples, collected in 0.6 m segments, are to be recovered at continuous 0.76 m intervals; the additional 0.16 m between split spoon samples will be over-drilled to provide undisturbed field measurement of geotechnical parameters (blow counts) and to prevent cave in materials from stratigraphic units above the intended sampling intervals from being collected at unrepresentative depths during sampling.

Soil samples are initially collected in Ziploc bags for initial screening as part of sample selection. Soil samples selected for laboratory analysis are collected in dedicated clear glass jars prepared and provided by the analytical laboratory. Soil samples collected for BTEXs/VOCs and the F1 range of PHCs analysis are collected using a dedicated graduated syringe provided by the laboratory and placed directly into a glass vial with methanol preservative. Analytes and associated preservatives are specified on each jar/vial by the laboratory. Each jar/vial sample set is provided with a unique sample identifier, project number and date of sampling in the field.

6.3 Field Soil Screening Measurements

Initial field screening of the soil samples will consist of visual and olfactory observations made at the time of sample collection during the drilling program.

Additional field screening of the soil samples will be completed using an RKI Instruments Model Eagle-2 combustible gas detector ("RKI Eagle"). The RKI Eagle is capable of measuring combustible vapours at concentrations ranging from 0 parts per million (PPM) to 50% of the lower explosive limit (LEL). The RKI Eagle is also capable of measuring VOC vapours at concentrations ranging from 0 ppm to 1000 ppm.

6.4 Monitoring Well Installation

Installation of monitoring wells in selected boreholes is to be completed by George Downing Estate Drilling Ltd., who is a licensed well driller in accordance with O.Reg. 903. The wells will be installed using slotted PVC No. 10 monitoring well screens, which are 51 mm in diameter; these

screens are to be installed at the base of each of the aforementioned boreholes, directly above the bedrock surface. Well screens can range from 1.5 m to 4.5 m in length. The monitoring wells are extended to approximately 0.15 m below the surface grade with PVC riser, also 51 mm in diameter. A threaded PVC end cap should be installed at the base of the screen to prevent sediment infiltration, while a J-Plug is installed at the top of the riser to present surface influence.

The annular space in each monitoring well is to be backfill with clean silica sand to approximately 0.3 m above the monitoring well screens. A layer of bentonite chips is then used to make a hydraulic seal above the sand pack to near the ground surface. The monitoring wells are to be completed with flushmount aluminum protective casings, which were backfilled with sand to provide drainage from the protective casing.

6.5 Elevation Survey

An elevation survey of all boreholes and monitoring wells will be conducted following the completion of the drilling program. A fixed temporary benchmark should be used as a reference elevation; the top of the spindle of a fire hydrant is preferred for this purpose as geodetic elevations can be obtained for these points. The reference benchmark should be assigned a field site datum of 100.00 m for the purposes of the elevation survey. The ground surface elevation of all boreholes should be surveyed. The top of piezometer of each monitoring well should also be surveyed; this allows for higher accuracy in the interpretation of groundwater elevations.

6.6 Monitoring Well Development;

Groundwater monitoring wells will be developed on the day of drilling using LDPE tubing and a footvalve. At least three and up to ten well volumes will be removed from the monitoring wells in order to remove as much sediment as possible from the wells. In cases where the monitoring well goes dry prior to purging three well volumes, the well should be purged dry a minimum of three times, waiting at least one hour between purging events. The LDPE tubing should be removed from the monitoring wells following well development.

6.7 Field Measurement of Water Quality Indicators

Field measurement of water quality parameters were collected at regular intervals (0 L, 0.5 well volumes, 1 well volume, 2 well volumes, etc.) during purging of the monitoring wells prior to sampling. The Horiba was placed in a flow-through cell and water quality parameters were measured until they were found to stabilize to within approximately 10% of the previous measurements prior to sample collection.

6.8 Groundwater Sampling

Follow a period of stabilization after drilling and monitoring well development (1 week recommended), static groundwater elevations are measured relative to the top of piezometer at

each groundwater monitoring well on the day of sampling, prior to disturbance of the water column.

Following static groundwater elevation measurements, 6 mm LDPE tubing is placed in each of the monitoring wells. The LDPE tubing is connected to silicon tubing, run through a peristaltic pump set to low flow (approximately 0.2-0.5 L/minute) during purging and sampling. The peristaltic pump is used to avoid mixture of sediment into the groundwater column and prevent volatilization during sample collection. The monitoring wells are purged on the day of sampling while water quality parameters were measured and stabilize as noted above.

Groundwater samples are collected in dedicated amber glass bottles and vials or plastic bottles prepared and provided by the analytical laboratory. Analytes and associated preservatives are specified on each bottle by the laboratory. Each bottle sample set will be provided with a unique sample identifier, project number and date of sampling in the field. Samples for PHCs, BTEXs, VOCs, PAHs and general chemistry are unfiltered, while metals samples are to be field filtered using a dedicated 0.45 µm filter for each sample.

Appendix B

Underground Utility Locates

UNDERGROUND SERVICE LOCATORS - PRIVATE UTILITY REPORT DATE: 17 JUNE 2021

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

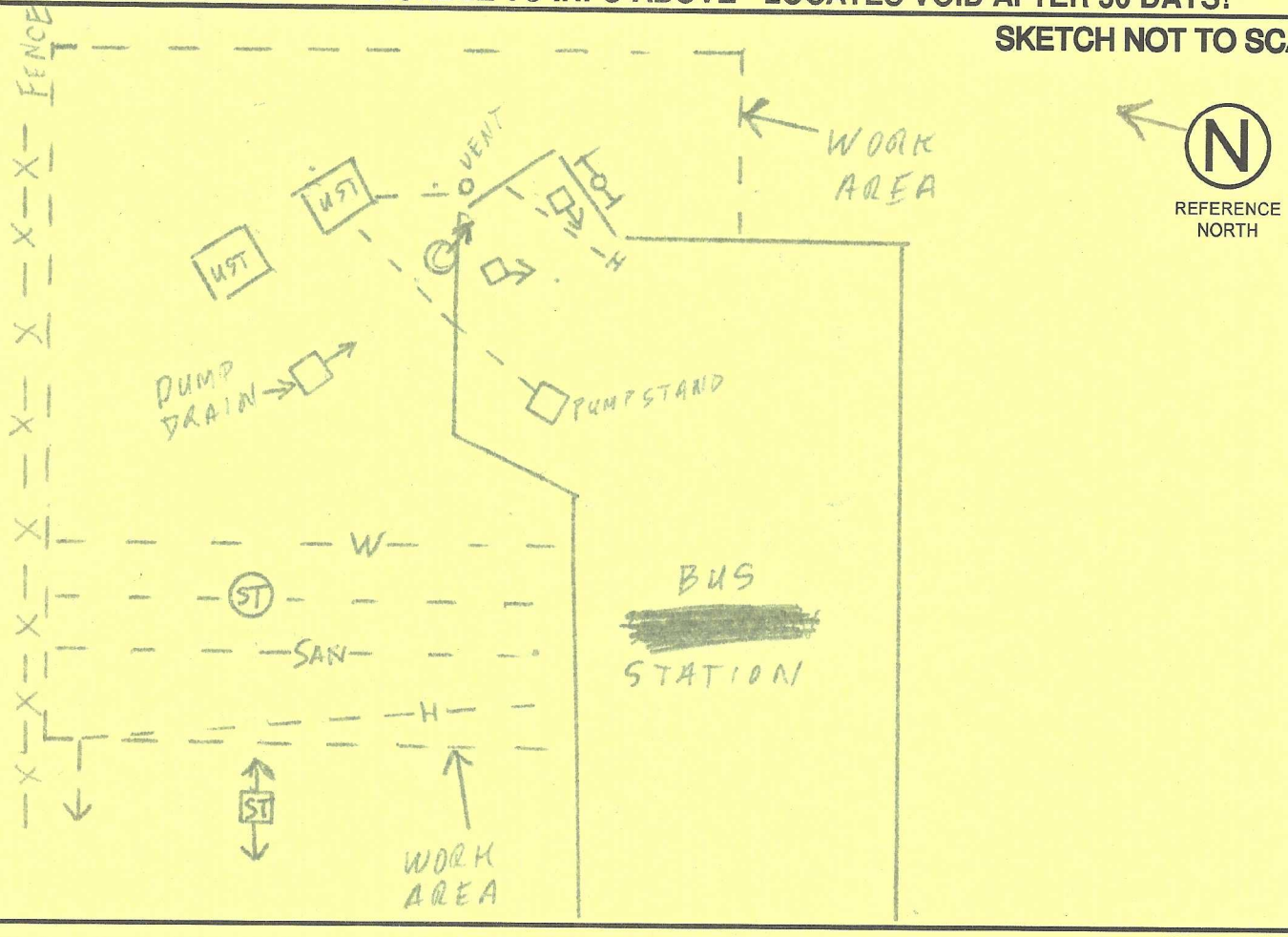
PHONE (613) 226-8750
FAX (613) 226-8677

CUSTOMER: LOPERS & ASSOC.	REQUESTED BY: LUKE LOPERS
LOCATION OF WORK: 265 CATHERN	LIMITS OF WORK: BOREHOLES

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:

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: MIKE THIVIERGE	SIGNATURE:

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

CAUTION: HAND DIG WITHIN 1.5 METERS OF MARKINGS

White = Client Yellow = USL-1 Pink = USL-1 **FORM #103 January 2016**

Luke Lopers

From: solutions@on1call.com
Sent: May 28, 2021 3:43 PM
To: Luke Lopers
Subject: Request 20212226722
Attachments: MapSelection_28052021_15400035.jpg

LOCATE REQUEST CONFIRMATION

TICKET #:	REQUEST PRIORITY:	REQUEST TYPE:	WORK TO BEGIN DATE:
20212226722	**STANDARD**	**REGULAR**	**06/04/2021**
Update of Ticket #	**Project #**		**Transmit date: 05/28/2021 03:42:54 PM**

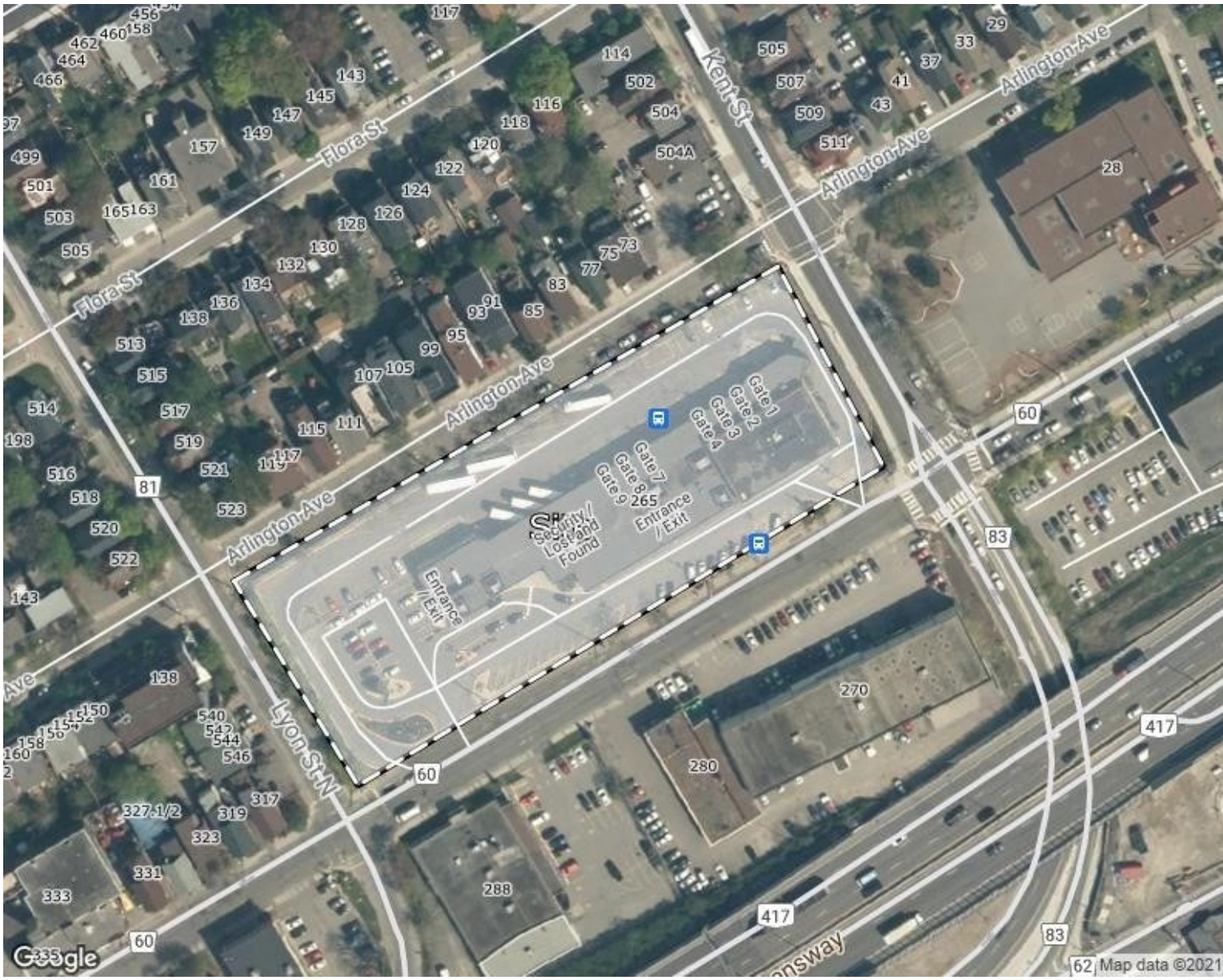
REQUESTOR'S CONTACT INFORMATION	
Contractor ID#: 343253	**Company Phone #:** (613) 327-9073
Contact Name: Luke Lopers	**Cell #:** (613) 327-9073
Alternate Contact Name:	**Fax #:**
Company name: Lopers & Associates	**Email:** Luke@Lopers.ca
Address: 30 Lansfield	**Alternate Contact #:** (613) 327-9073

DIG INFORMATION		
Region/County: OTTAWA	**Type of work:** BORE HOLES	**Mark & Fax:** YES
Community:	**Max Depth:** 30.00 FT	**Area is not marked:** YES
City: OTTAWA	**Machine Dig:** YES	**Area is marked:** NO
Address: 265, CATHERINE ST	**Hand Dig:** YES	**Site Meet Req.:** NO
	Directional Drilling: NO	**Work being done for:**
Intersecting Street 1: KENT ST	**Public Property:** YES	
Intersecting Street 2: LYON ST N	**Private Property:** YES	

DETAILED DESCRIPTION OF WORK	REMARKS
CORLOT=1 Environmental Drilling for delineation of fuel impacts. Borehole locations subject to chan ge. Future work will also include UST removals. Areas not premarked.	Mark and Email instead of fax.

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
CITY OF OTTAWA WATER/SEWER (OTWAWS01)	OTWAWS01	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
CLI FOR ROGERS (ROGOTT01)	ROGOTT01	Notification sent
PROMARK FOR BELL CANADA (BCOE01)	BCOE01	Notification sent

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



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.

Promark telecon
Location of underground infrastructures

Primary Locate Sheet

UNION GAS EMERGENCY #
1-877-969-0999

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

Request #
20212226722
NORMAL

Utilities Located: ● Bell ● Gas ● Hydro Ottawa ☐ Hydro One ☐ Zayo ☐ BHT ☐ Videotron ☐ Lakefront Utilities ☐ Elexicon Energy ☐ 360	Revised Excavation Date: N/A (mm/dd/yyyy)	Excavation Date: 6/4/2021 12:00:00 AM (mm/dd/yyyy)	Status: STANDARD Homeowner ☐ Contractor ● Project ☐
Requested by: LUKE LOPERS	Company: LOPERS & ASSOCIATES	Phone: (613)-327-9073 ext.	Fax/email:
Appt Date: N/A (mm/dd/yyyy)	Received Date: 5/28/2021 3:47:25 PM (mm/dd/yyyy)	Locate Address: **265, CATHERINE ST** 1st Inters.: KENT ST 2nd Inters.: LYON ST N	
Type of work: BORE HOLES		City: **OTTAWA**	

Caller's Remarks:
MARK AND EMAIL INSTEAD OF FAX.
MACH. DIG
CORLOT=1 ENVIRONMENTAL DRILLING FOR DELINEATION OF FUEL IMPACTS. BOREHOLE LOCATIONS SUBJECT TO CHANGE. FUTURE WORK WILL ALSO INCLUDE UST REMOVALS. AREAS NOT PREMARKED.

-75.695091, 45.408665, NB_SEGMENTS::3, NO_PLAN::613 567, BCOE01, ROGOTT01, OTWASL01, OTWATS01, OTWAWS01, ENOE01, HOT1
HOT1 LOOKED UP BY ROBERT BOLDUC

Bell Mark | Clear	Gas Mark | Clear	Hydro Ottawa Mark | Clear	BIRCH HILL Tng Mark | Clear	☐ ZAYO Mark | Clear	Hydro One Mark | Clear	360 Mark | Clear	Elexicon Energy Mark | Clear	Videotron Mark | Clear
1	1	1						

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

Records Reference:
_ Map _ Network X # ●
_ Byers ● Datapak: PMTOTT01832
Field Notes: _ LAC Multiviewer
Other: NE185,6N0052-4
DPT Remarks:

_ Third Party Notification _____

*****Danger - Do Not Proceed*****
Buried high voltages cables located within the area. You must send Locate through hydroottawa.com/locates
If you have questions about the online form, please call 613-738-6418. For urgent matters involving power outages and after hours emergencies, call 613-738-6404

Apply Sticker Here if Required

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

Gas Material Type: ☐ Steel(st) ● Plastic(PE) ☐ Copper(CO)

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

Caution: Bell locate valid for life of excavation see attached document. Hydro One - Hydro Ottawa - Enbridge Gas - Lakefront Utilities - Elexicon Energy valid for 60 days, 360 valid for life of excavation. See disclaimer for Facility Owner 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: LACHAPELLE BRANDEN
ID #: 1792
Date 6/7/2021

Start Time: 8:15
End Time : 8:30
Total Hours: 15MIN

_ Mark & Fax _ Left on Site ● Emailed
Print: N/A
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 September 2019

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 ☐ Elexicon Energy

Date Located: mm/dd/yyyy 6/7/2021

Request # 20212226722

Number of Services marked: (Specify building/house numbers) (1)- 265 CATHERINE ST

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

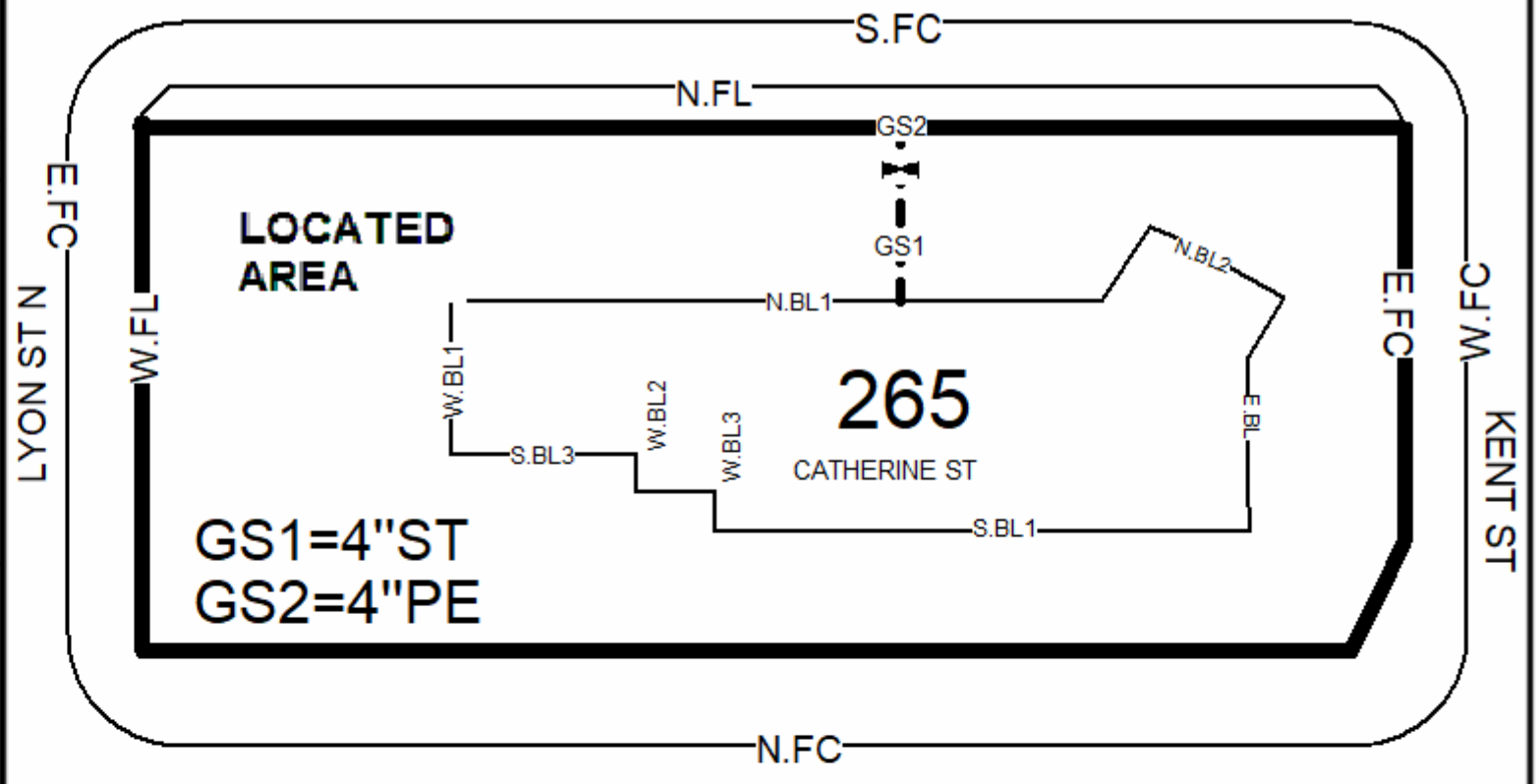
FROM: 4.0M N OF N.FC OF CATHERINE ST
FROM: W.FL OF 265 CATHERINE ST
TO: 2.5M S OF N.FL OF 265 CATHERINE ST
TO: E.FC OF 265 CATHERINE ST

Legend

Building Line	-- BL --
Fence Line	-- FL --
Face of Curb	-- FC --
Asphalt Edge	-- AE --
Sidewalk	SW
Driveway	-- DW --
Manhole	M/H
Pedestal	☒
Flush to Grade Pedestal	FTG
Buried Service Wire	-- BSW --
Buried Cable	-- B --
Conduit	-- C --
Fiber Optic Cable	-- FO --
Bell Hydro Service	-- BH --
Gas Valve	
Gas Service	-- GS --
Gas Main	-- GM --
Transformer	
Demarcation	DM
Hydro	-- H --
Hydro Primary	-- HP --
Hydro Secondary	-- HS --
Catch Basin	CB
Sewer Manhole	
Water Valve	
Hydrant	
Water Valve Chamber	W
Hydro / Bell Pole	
Railway	
End Cap	
Traffic Manhole	T
Street Light Cable	-- SL --
Street Light	
North	N.
East	E.
West	W.
South	S.

CAUTION: Hand dig within 1 M 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 excavatio
LOCATED AREA HAS BEEN ALTERED AS PER: N/A

N
W E
S



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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 ☐ Elexicon Energy

Date Located: mm/dd/yyyy 6/7/2021

Request # 20212226722

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

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

FROM: 4.0M N OF N.FC OF CATHERINE ST
FROM: W.FL OF 265 CATHERINE ST

TO: 2.5M S OF N.FL OF 265 CATHERINE ST
TO: E.FC OF 265 CATHERINE ST

Legend

Building Line	-- BL --
Fence Line	-- FL --
Face of Curb	-- FC --
Asphalt Edge	-- AE --
Sidewalk	SW
Driveway	-- DW --
Manhole	M/H
Pedestal	☒
Flush to Grade Pedestal	FTG
Buried Service Wire	-- BSW --
Buried Cable	-- B --
Conduit	-- C --
Fiber Optic Cable	-- FO --
Bell Hydro Service	-- BH --
Gas Valve	
Gas Service	-- GS --
Gas Main	-- GM --
Transformer	
Demarcation	DM
Hydro	-- H --
Hydro Primary	-- HP --
Hydro Secondary	-- HS --
Catch Basin	CB
Sewer Manhole	
Water Valve	
Hydrant	
Water Valve Chamber	W
Hydro / Bell Pole	
Railway	
End Cap	
Traffic Manhole	T
Street Light Cable	-- SL --
Street Light	
North	N.
East	E.
West	W.
South	S.

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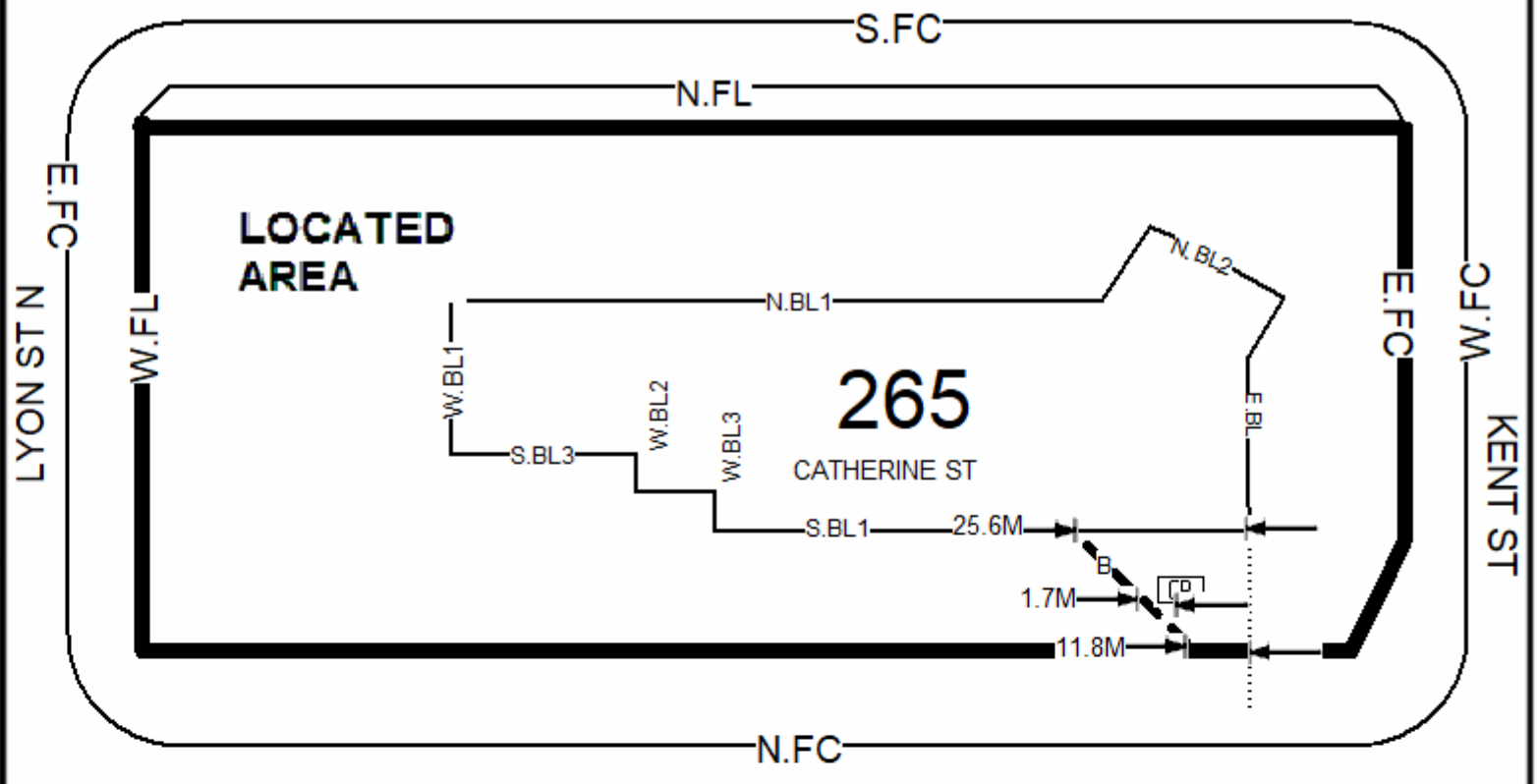
Depth varies and MUST be verified by hand digging or vacuum excavatio
LOCATED AREA HAS BEEN ALTERED AS PER: _____

Bell **CAUTION** Bell
Cables May or May Not Be In Conduit
Bell Bell

N
W E
S



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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 6/7/2021

Request # 20212226722

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: 4.0M N OF N.FC OF CATHERINE ST
FROM: W.FL OF 265 CATHERINE ST

TO: 2.5M S OF N.FL OF 265 CATHERINE ST
TO: E.FC OF 265 CATHERINE ST

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Manhole	M/H
Pedestal	☒
Flush to Grade Pedestal	FTG
Buried Service Wire	-- BSW --
Buried Cable	-- B --
Conduit	-- C --
Fiber Optic Cable	-- FO --
Bell Hydro Service	-- BH --
Gas Valve	
Gas Service	-- GS --
Gas Main	-- GM --
Transformer	
Demarcation	DM
Hydro	-- H --
Hydro Primary	-- HP --
Hydro Secondary	-- HS --
Catch Basin	CB
Sewer Manhole	
Water Valve	
Hydrant	
Water Valve Chamber	W
Hydro / Bell Pole	
Railway	
End Cap	
Traffic Manhole	T
Street Light Cable	-- SL --
Street Light	
North	N.
East	E.
West	W.
South	S.

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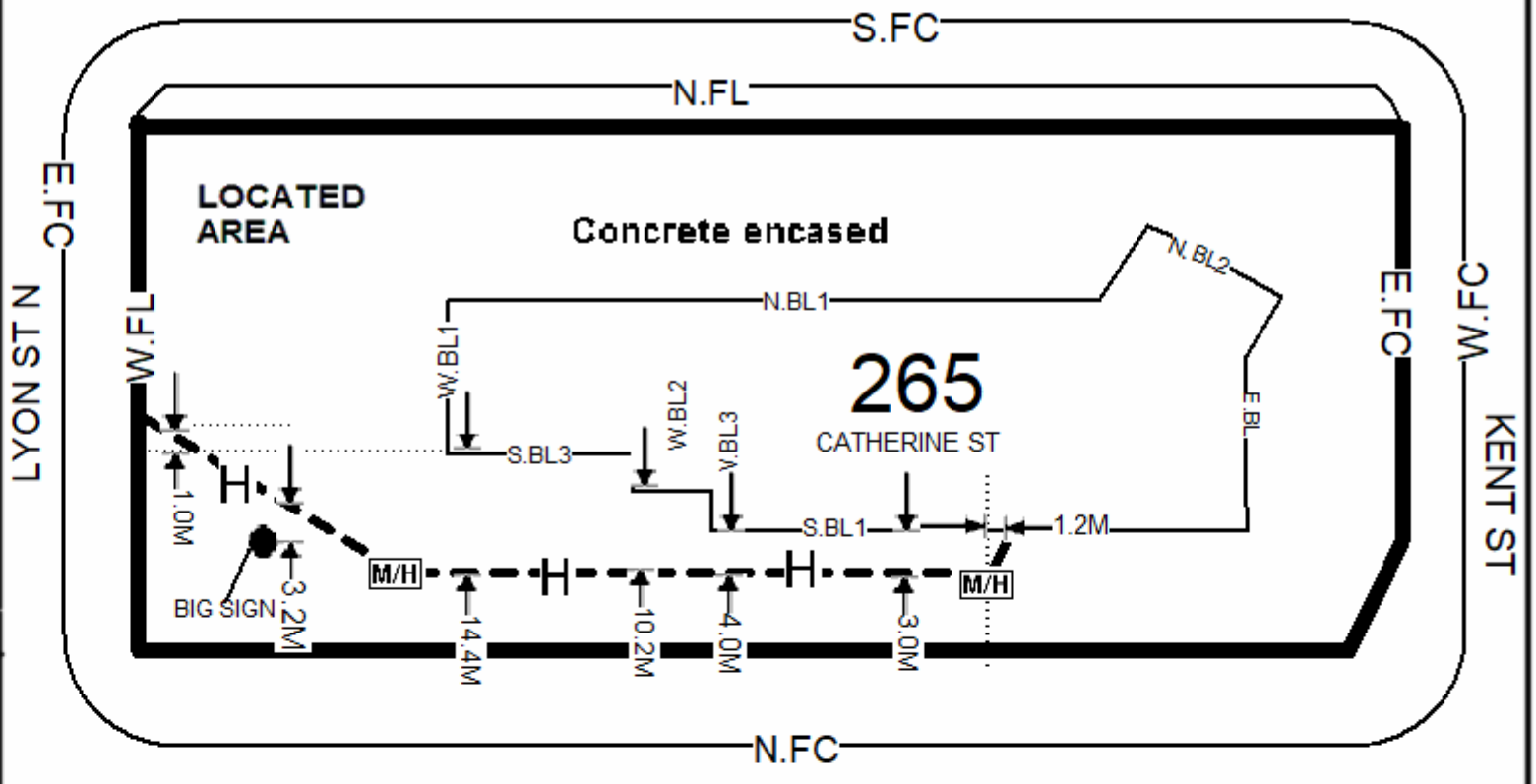
Depth varies and MUST be verified by hand digging or vacuum excavatio
LOCATED AREA HAS BEEN ALTERED AS PER: _____

N
W E
S

ARLINGTON ST



CATHERINE ST

Danger - Do Not Proceed
Buried high voltages cables located within the area. You must send Locate through hydroottawa.com/locates
If you have questions about the online form, please call 613-738-6418. For urgent matters involving power outages and after hours emergencies, call 613-738-0188

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Any privately owned services within the located area have not been marked- check with service/property owner.

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CANADIAN LOCATORS INC.
Servicing the Utilities Industry

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

ROGERS
Primary Locate Sheet

ON 1 Call Ticket # : 20212226722

Contractor / Excavator : Lopers & Associates			**Contact Name :** Luke Lopers
Tel : 613-327-9073	**Alt. Phone :** 613-327-9073	**Email :** Luke@Lopers.ca	
Received Date : Jun 2 2021	**Excavation Date :** Jun 4 2021	**Revised Excavation Date:**	**Type of Work :** BORE HOLES
Locate Address : 265 CATHERINE ST			**City / Municipality :** OTTAWA, ONTARIO
Nearest Intersection : KENT ST & LYON ST N			

Method of Field Marking : ☑ Paint ☐ Stakes ☐ Flags

Caller's Remarks *(Additional Info)* :
CORLOT=1 Environmental Drilling for delineation of fuel impacts. Borehole locations subject to change. Future work will also include UST removals. Areas not premarked.//Mark and Email instead of fax.

Utilities Marked :					**This locate has multiple work areas which are greater than 100 m apart :**
☑ Coaxial Plant	☐ Fibre Optics Plant				☐ Yes ☐ No
Total Length : 10 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 90 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 :

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

Date :	**Start Time :**	**End Time :**
Jun 10 2021	3:15 PM	4:00 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 # : 20212226722

Utilities Marked :

☑ Coaxial Plant 10 m ☐ Fibre Optics Plant m

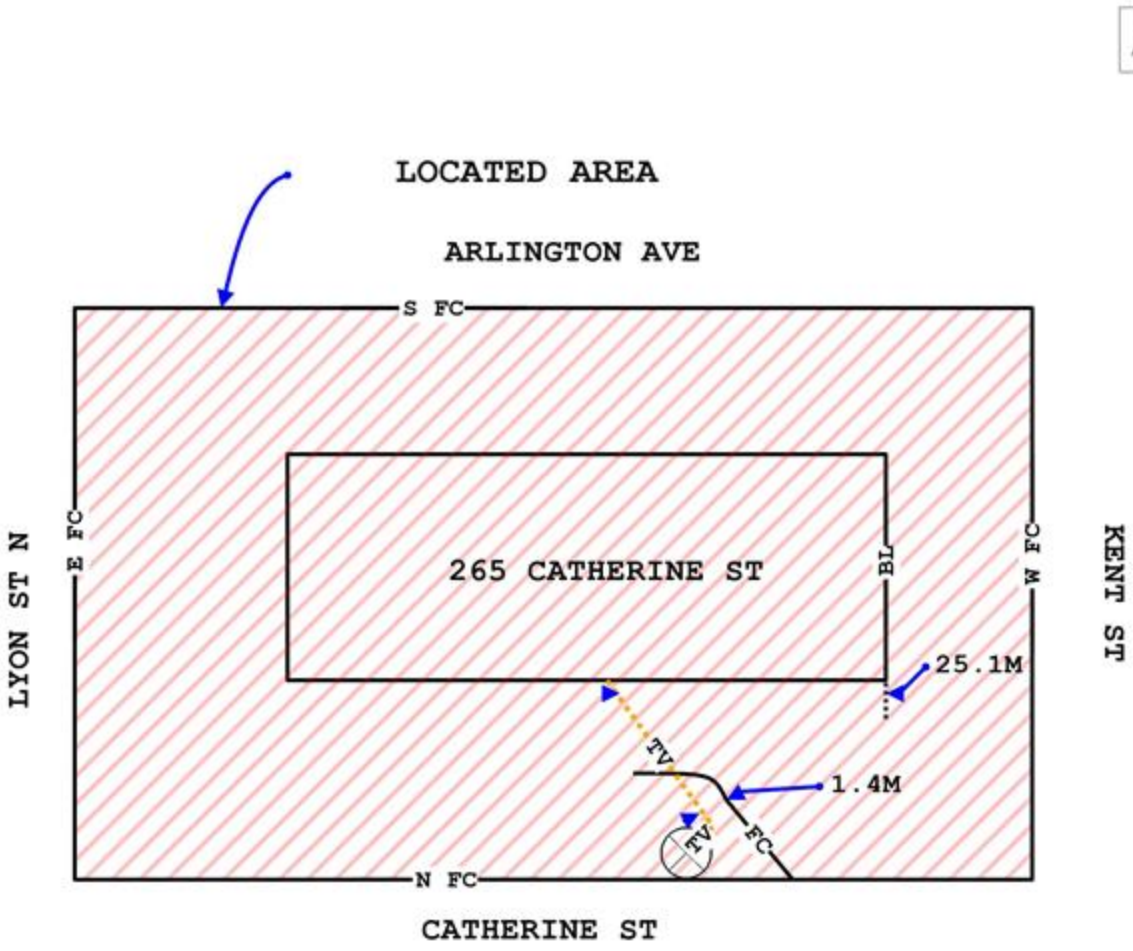
Number of Services Marked : (specify building/house numbers)

NA

LOCATED AREA CONTAINS ALL KNOWN ROGERS INFRASTRUCTURE

FROM : S FC OF ARLINGTON AVE	**TO :** N FC OF CATHERINE ST
FROM : E FC OF LYON ST N	**TO :** W FC OF KENT ST

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 — | Cable / T.V. — CATV — | Conduit — C — | Railway | Work Area

Road Edge — RE — | Bldg Line — BL — | North Direction N | Sidewalk SW | Measurement

Property Line — PL — | Lot Line — LL — | Face of Curb — FC — | Driveway — DW — | Fence Line — FL —

Tree | Pedestal | Pole | Valve | Vault

Transformer TFR | Manhole | Catch Basin CB | North N | South S

Streetlight SL | Hand Hole HH | Hydrant H | East E | 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.

TICKET #: 20212226722

ROGERS™

ROGERS LOCATE SERVICE

8200 Dixie Rd
East Bldg., 2nd Floor
Brampton, Ontario, L6T OC1
Tel.: (855) 232-0342
Fax.: (905) 780-7379

LOCATE CONFIRMATION

LOCATOR: CLI Phone: 905-479-5674

CONFIRMATION DATE: 2021-06-02 2:08:03PM Station Code: ROGOTT01

Requested by Company: Lopers & Associates

Contact Name: Luke Lopers Ph: 6133279073 Fax:

Dig Site Location and Details

Municipality: OTTAWA Call Date: 2021-05-28 3:32:19PM Start Date: 2021-06-04 12:00:00

Address: 265 CATHERINE ST Intersection: KENT ST

Type of Work: BORE HOLES

Remarks (Additional Dig Information):

CORLOT=1 Environmental Drilling for delineation of fuel impacts. Borehole locations subject to change. Future work will also include UST removals. Areas not premarked.

Important Comments to Excavator:

HIGH RISK FIBER IN LIMITS OF LOCATE

YOU WILL BE LIABLE FOR ANY DAMAGES TO ROGERS FACILITIES IF EXCAVATING/ DIGGING PRIOR TO RECEIVING A COMPLETED LOCATE OR CLEARANCE NUMBER FROM ROGERS OR IT'S AGENTS.

PLEASE CALL ROGERS LOCATE SERVICES AT (800) 738-7893. IF THERE ARE ANY CHANGES TO THIS LOCATE REQUEST. LOCATES AND CLEARANCES ARE VALID FOR 90 DAYS ONLY.

CAUTION: Stakes and or markings may disappear or be displaced. Should the sketches and markings not coincide. a new stake out must be obtained.

FOR ALL CUT CABLES CALL
1-800-265-9501

TICKET #: 20212226722

ROGERS™

ROGERS LOCATE SERVICE

8200 Dixie Rd
East Bldg., 2nd Floor
Brampton, Ontario, L6T OC1
Tel.: (855) 232-0342
Fax.: (905) 780-7379

LOCATE CONFIRMATION

LOCATOR: CLI Phone: 905-479-5674

CONFIRMATION DATE: 2021-06-02 2:08:03PM Station Code: ROGOTT01

Requested by Company: Lopers & Associates

Contact Name: Luke Lopers Ph: 6133279073 Fax:

Dig Site Location and Details

Municipality: OTTAWA Call Date: 2021-05-28 3:32:19PM Start Date: 2021-06-04 12:00:00

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CAUTION: Stakes and or markings may disappear or be displaced. Should the sketches and markings not coincide. a new stake out must be obtained.

FOR ALL CUT CABLES CALL
1-800-265-9501

Luke Lopers

From: Barabas, Karoly <karoly.barabas@ottawa.ca>
Sent: May 28, 2021 4:05 PM
To: Luke Lopers
Subject: 20212226722

20212226722

This Ontario One Ticket is **Clear of Underground City of Ottawa / Ville d'Ottawa Traffic Lights Infrastucture in Proposed Work Area **

"Locates are Valide for 60 Days"

Ce billet Ontario One est ** **libre** de toute infrastructure souterraine de la ville d'Ottawa pour les feux de signalisation dans la zone de travail proposée **

"Les habitants sont valides pendant 60 jours"

Charly (Karoly) Barabas
City of Ottawa
Traffic U/G Utilities Investigator
Cell: (613)868-3850
Email: Karoly.barabas@ottawa.ca
Mon-Fri 7h00 to 15h30

'

'

Service Request Details

Service Request **1452531** **Lagan Case ID:** 202122267221

Source: Contractor **Created By:** Ga Maxpusr
Priority: **Reported By:**
Status: RESOLVED **Initiated:** 2021-May-28 3:43 PM

Location Information

Address: 265 CATHERINE ST **Range:** **Unit:**
Between Streets: KENT ST / LYON ST N **Municipality:** OO
Description:

Street Range:265-
Street:CATHERINE ST
Intersect 1:KENT ST
Intersect 2:LYON ST N
Door Numbers:-
Municipality:

The work area is clear of underground water and sewer pipes owned by The City of Ottawa if the excavation is not in the road. The service pipes within the property are privately owned by the property owner and are not the responsibility of The City of Ottawa.
Please note: City of Ottawa locates are valid for sixty (60) days. | S'il-vous-plaît notez: les localisations de la ville d'Ottawa sont valables pendant soixante (60) jours.

Requestor Information

Name: Luke Lopers **Phones**
Address: 30 LANSFIELD WAY **Res:** **Cell:** 6133279073
City: NEPEAN **Bus:** 6133279073 **Ext:**
Postal Code: K2G3V8 **Unit:** **Fax:**

Call Back & Other Assignments

Responsibilities

Service Request	Work Order #	Work Order

Request Details

Start Date: **Appointment Time:** **Service:** ESD
Finish Date: 2021-Jun-02 **Classification:** LOCATES - PROVIDE
Amount Charge to Customer: **Category:**

Structures

Structure ID	District	Description	Location	Qualifier	Unit

Service Request Details

LP : LOCATES - PROVIDE

Attribute Description	Values	Comments
ON1CALL LOCATE ADDRESS	Street Range:265- | Street:CATHERINE ST | Intersect 1:KENT ST | Intersect 2:LYON ST N | Door Numbers:- | Municipality:	
IF THERE IS AN ADDRESS NUMBEF		
ARE YOU A HOMEOWNER, CONTRA	CONTRACTOR	
WHO ARE YOU WORKING FOR?		
WHAT IS THE CALLER'S TITLE?	Principal	
WHAT IS YOUR COMPANY NAME?	Lopers & Associates	
PLEASE PROVIDE A CONTACT PHONE NUMBER	6133279073	
PLEASE PROVIDE AN ALTERNATE (		
PLEASE PROVIDE CONTACT PHONE INFORMATION FOR PERSON ON SITE	6133279073	
PLEASE PROVIDE A FAX NUMBER		
PLEASE PROVIDE AN EMAIL ADDRI	Luke@Lopers.ca	
WHAT TYPE OF WORK ARE YOU DOING?	BORE HOLES	
WHERE ARE YOU WORKING ON THE PROPERTY?	CORLOT=1 Environmental Drilling for delineation of fuel impacts. Borehole locations subject to change. Future work will also include UST removals. Areas not premarked.	
HOW DEEP ARE YOU DIGGING/ EXCAVATING?	9.144000	
WHAT IS THE UNIT OF MEASURE Y	METERS	
ARE YOU DIGGING BY HAND OR B'	Mach. Dig;Hand Dig	
WILL THERE BE DIRECTIONAL DRI		
IS THE AREA MARKED OUT?	Area Not Marked;Mark + Fax;	
IS A SITE MEETING REQUIRED?		
EXTRA MARKING INSTRUCTIONS?	Mark and Email instead of fax.	
EXCAVATION ON PUBLIC PROPERT	Publ. Prop.;Priv. Prop	
WHAT DATE IS THE WORK STARTI	2021-06-04	
OTHER AGENCIES ALSO NOTIFIED	BCOE01; ROGOTT01; OTWASL01; OTWATS01; OTWAWS01; ENOE01; HOT1;	
WHAT TYPE OF REQUEST, IF NOT (		
IF NOT ORIGINAL, THE PREVIOUS		
FURTHER COMMENTS:		

Ontario One Call TF

City of Ottawa
Street Light Locate

Black&McDonald

NOTICE OF INTENT TO EXCAVATE

Header Code: STANDARD

Request Type: NORMAL

Ticket No: 20212226722

Original Call Date: 05/28/2021 3:43:05 PM

Work To Begin Date: 06/04/2021

Company: LOPERS & ASSOCIATES

Contact Name: LUKE LOPERS

Pager:

Contact Phone: (613)-327-9073 ext.

Cell: (613)-327-9073 ext.

Fax:

Alternate Contact:

Alt. Phone: (613)-327-9073 ext.

Place: OTTAWA

Street: 265 CATHERINE ST

Nearest Intersecting Street: KENT ST

Second Intersecting Street: LYON ST N

Subdivision: OTTAWA

Additional Dig Information:

MARK AND EMAIL INSTEAD OF FAX. CORLOT=1 ENVIRONMENTAL DRILLING FOR DELINEATION OF FUEL IMPACTS. BOREHOLE LOCATIONS SUBJECT TO CHANGE. FUTURE WORK WILL ALSO INCLUDE UST REMOVALS. AREAS NOT PREMARKED. NO_PLAN::613 567

WO/ JOB #: 8AM-6PM

Type Of Work: BORE HOLES

Remarks:

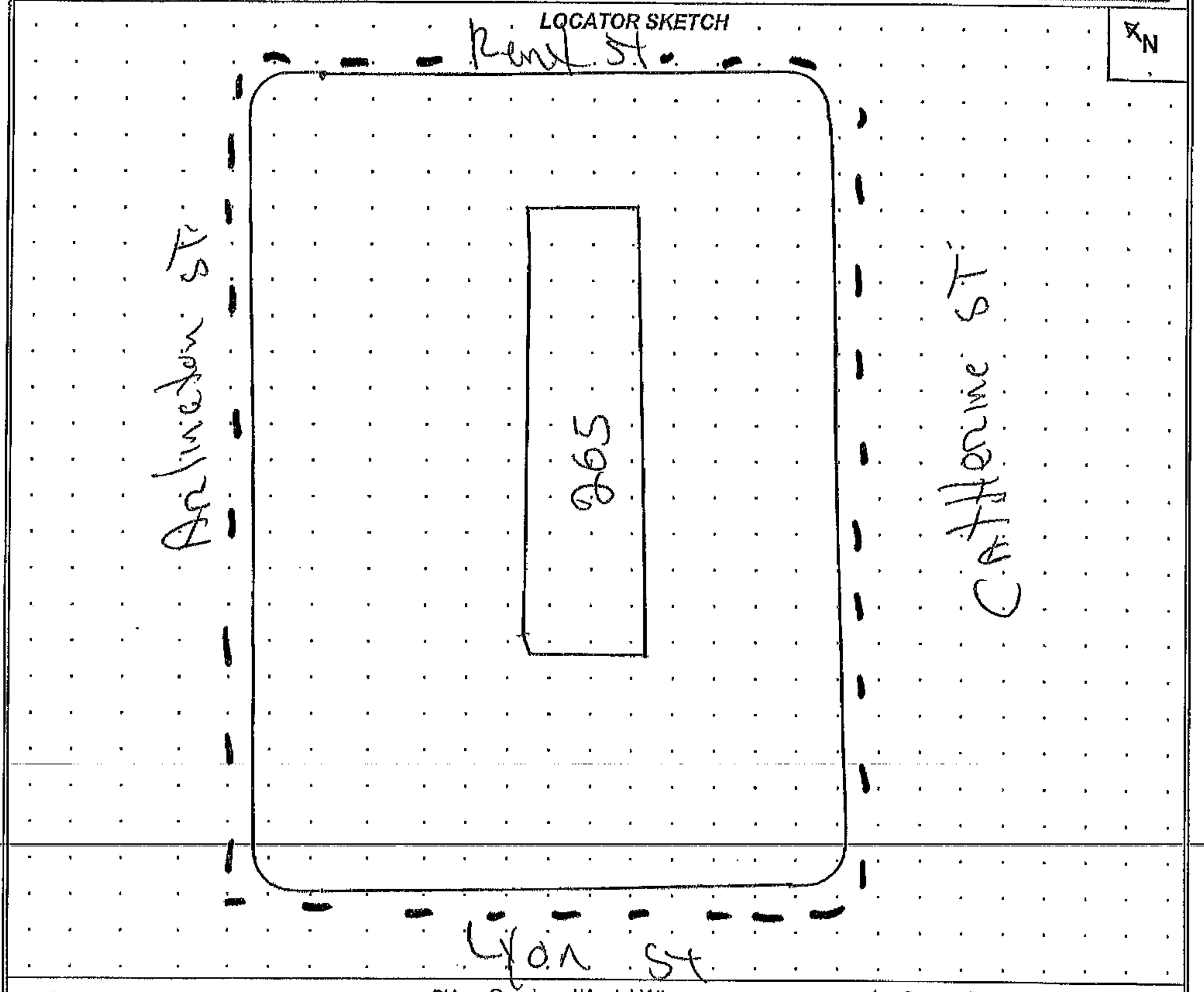
-75.695091 45.408665 NB_SEGMENTS::3 BCOE01 ROGOTT01 OTWASL01 OTWATS01 OTWAWS01 ENOE01 HOT1

Ontario 1 Call	20212207 22

City of Ottawa Street Light Locate

[redacted] Black&McDonald [redacted]

LOCATOR SKETCH



— SL — Street Light Cable
Street Light

—OH— Overhead/Aerial Wires
Globe/Decorative Light

Source/Transformer
Hydro Pole

BL = Building Line FL = Fence Line CL = Face of Curb RE = Road Edge PL = Property Line

ANY MEASUREMENTS FROM A CURB EDGE ARE FROM OUTSIDE CURB EDGE UNLESS STATED OTHERWISE

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 installationvarie d'un endroit a l'autre.

Date Located	1-6-21
Located by	[redacted]

Appendix C

Borehole Logs

LOPERS & ASSOCIATES

Lopers & Associates
30 Lansfield Way
Ottawa, Ontario K2G3V8

BH1-21

CLIENT 11034936 Canada Inc.
PROJECT NAME Phase Two Environmental Site Assessment
PROJECT NUMBER LOP21-018B
PROJECT LOCATION 265 Catherine Street, Ottawa, ON
DATE STARTED 21-6-18 **COMPLETED** 21-6-18
GROUND ELEVATION 97.86 m **HOLE SIZE** 20 cm
DRILLING CONTRACTOR George Downing Estate Drilling
GROUND WATER LEVELS:
DRILLING METHOD Truck Mounted CME 55
AFTER DRILLING ---
LOGGED BY L. Lopers **CHECKED BY** D. Plenderleith
NOTES Site Datum = 100.00 m Top of Spindle of Fire Hydrant SE of Property

DEPTH (m)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
	SS 1	3-7-5-3 (12)	Vapor = 0		0.08 Asphalt 97.78 Silty Sand and Gravel. Brown, loose, dry. 0.60 97.26	
1	SS 2	3-2-2-3 (4)	Vapor = 0		Sand. Brown, loose, moist.	
	SS 3	4-5-7-6 (12)	Vapor = 0		SS3 - Laboratory Analysis for PAHs, Metals 1.83 96.03	

Bottom of hole at 1.83 m.

LOPERS & ASSOCIATES

Lopers & Associates
30 Lansfield Way
Ottawa, Ontario K2G3V8

BH2-21

CLIENT 11034936 Canada Inc.
PROJECT NAME Phase Two Environmental Site Assessment
PROJECT NUMBER LOP21-018B
PROJECT LOCATION 265 Catherine Street, Ottawa, ON
DATE STARTED 21-6-18 **COMPLETED** 21-6-18
GROUND ELEVATION 98.16 m **HOLE SIZE** 20 cm
DRILLING CONTRACTOR George Downing Estate Drilling
GROUND WATER LEVELS:
DRILLING METHOD Truck Mounted CME 55
AFTER DRILLING ---
LOGGED BY L. Lopers **CHECKED BY** D. Plenderleith
NOTES Site Datum = 100.00 m Top of Spindle of Fire Hydrant SE of Property

DEPTH (m)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
	SS 1	5-3-32-34 (35)	Vapor = 1		0.05 Asphalt 98.11 Silty Sand and Gravel. Brown, compact, dry. SS1 - Laboratory Analysis for PAHs, Metals 0.60 97.56	
1	SS 2	7-5-12-10 (17)	Vapor = 0		Sand. Brown, loose, dry to moist.	
	SS 3	4-7-5-4 (12)	Vapor = 0		1.83 96.33	

Bottom of hole at 1.83 m.

BH3-21

LOPERS & ASSOCIATES

Lopers & Associates
30 Lansfield Way
Ottawa, Ontario K2G3V8

CLIENT 11034936 Canada Inc. **PROJECT NAME** Phase Two Environmental Site Assessment

PROJECT NUMBER LOP21-018B **PROJECT LOCATION** 265 Catherine Street, Ottawa, ON

DATE STARTED 21-6-18 **COMPLETED** 21-6-18 **GROUND ELEVATION** 97.94 m **HOLE SIZE** 20 cm

DRILLING CONTRACTOR George Downing Estate Drilling **GROUND WATER LEVELS:**

DRILLING METHOD Truck Mounted CME 55 **AFTER DRILLING** ---

LOGGED BY L. Lopers **CHECKED BY** D. Plenderleith

NOTES Site Datum = 100.00 m Top of Spindle of Fire Hydrant SE of Property

DEPTH (m)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
	SS 1		Vapor = 0		Concrete 0.20 / 97.74 Sand. Brown, loose to compact, moist.	
1	SS 2	5-5-5-6 (10)	Vapor = 0			
	SS 3	5-10-12-7 (22)	Vapor = 0		1.50 / 96.44 Silty Sand and Gravel. Brown, loose, dry.	
2	SS 4	2-3-2-3 (5)	Vapor = 21		SS4 - Laboratory Analysis for PHCs, VOCs, PAHs, Metals 2.13 / 95.81 Silty Clay. Grey, firm and moist becoming soft and wet with depth.	
	SS 5	1-2-0-0 (2)	Vapor = 1		PHC odours from ~ 2 - 3 m BGS	
3					Wet at ~ 3.05 m BGS	
	SS 6	0-0-0-0 (0)	Vapor = 0			
4	SS 7	0-0-0-0 (0)	Vapor = 0		4.27 / 93.67	

Bottom of hole at 4.27 m.

LOPERS & ASSOCIATES

Lopers & Associates
30 Lansfield Way
Ottawa, Ontario K2G3V8

BH4-21

CLIENT 11034936 Canada Inc.
PROJECT NAME Phase Two Environmental Site Assessment
PROJECT NUMBER LOP21-018B
PROJECT LOCATION 265 Catherine Street, Ottawa, ON
DATE STARTED 21-6-18 **COMPLETED** 21-6-18
GROUND ELEVATION 97.89 m **HOLE SIZE** 20 cm
DRILLING CONTRACTOR George Downing Estate Drilling
GROUND WATER LEVELS:
DRILLING METHOD Truck Mounted CME 55
AFTER DRILLING 2.16 m / Elev 95.73 m
LOGGED BY L. Lopers **CHECKED BY** D. Plenderleith
NOTES Site Datum = 100.00 m Top of Spindle of Fire Hydrant SE of Property

DEPTH (m)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
	SS 1	7-36-23-40 (59)	Vapor = 0		0.14 (97.75) Asphalt Silty Sand and Gravel. Brown, loose, dry.	
1	SS 2	4-3-3-3 (6)	Vapor = 0		0.60 (97.29) Sand. Brown, loose to compact, moist.	
	SS 3	2-2-1-2 (3)	Vapor = 0			
2	SS 4	1-1-2-1 (3)	Vapor = 2		2.13 (95.76) Silty Clay. Grey, firm and moist becoming soft and wet with depth. Wet at ~ 2.4 m BGS	Groundwater Level 2.16 m BGS
	SS 5	1-1-1-1 (2)	Vapor = 10		SS5 - Laboratory Analysis for PHCs, VOCs PHC odours from ~ 1.2 - 4.4 m BGS	
3	SS 6	1-1-1-0 (2)	Vapor = 8			
4	SS 7	1-2-4-2 (6)	Vapor = 0			
	SS 8	1-0-1-0 (1)	Vapor = 0		SS8 - Laboratory Analysis for PHCs, VOCs 4.88 (93.01) Bottom of hole at 4.88 m.	

LOPERS & ASSOCIATES

Lopers & Associates
30 Lansfield Way
Ottawa, Ontario K2G3V8

BH5-21

CLIENT 11034936 Canada Inc.
PROJECT NAME Phase Two Environmental Site Assessment
PROJECT NUMBER LOP21-018B
PROJECT LOCATION 265 Catherine Street, Ottawa, ON
DATE STARTED 21-6-18 **COMPLETED** 21-6-18
GROUND ELEVATION 97.84 m **HOLE SIZE** 20 cm
DRILLING CONTRACTOR George Downing Estate Drilling
GROUND WATER LEVELS:
DRILLING METHOD Truck Mounted CME 55
AFTER DRILLING 4.27 m / Elev 93.57 m
LOGGED BY L. Lopers **CHECKED BY** D. Plenderleith
NOTES Site Datum = 100.00 m Top of Spindle of Fire Hydrant SE of Property

DEPTH (m)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	MATERIAL DESCRIPTION
				0.15 Asphalt 97.69
	SS 1	25-6-5-3 (11)	Vapor = 0	Silty Sand and Gravel with trace clay. Brown with black staining, loose, dry.
1	SS 2	3-3-3-2 (6)	Vapor = 0	Poor quality fill material - debris, brick, black staining.
	SS 3	2-2-1-2 (3)	Vapor = 0	SS3 - Laboratory Analysis for PAHs, Metals PHC odours and occasional staining from ~ 2.1 - 4.0 m BGS
2	SS 4	3-2-2-3 (4)	Vapor = 78	SS4 - Laboratory Analysis for PHCs, VOCs 2.13 95.71 Silty Clay. Grey, firm and moist becoming soft and wet with depth. Wet at ~ 2.4 m BGS
3	SS 5	0-0-0-0 (0)	Vapor = 0	
	SS 6	0-0-0-0 (0)	Vapor = 1	
4	SS 7	0-0-0-0 (0)	Vapor = 1	It is suspected that the groundwater level had not reached stabilized conditions at the time of moniotirng.
	SS 8	0-0-0-0 (0)	Vapor = 0	4.88 92.96

WELL DIAGRAM: Groundwater Level 4.27 m BGS

Bottom of hole at 4.88 m.

patersongroup

Consulting Engineers

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Phase I - II Environmental Site Assessment
265 Catherine Street
Ottawa, Ontario

DATUM TBM - Finished floor level at gate 2. Assumed elevation = 100.00m.

FILE NO. PE2073

REMARKS

HOLE NO. BH 3

BORINGS BY CME 45 Power Auger **DATE** 24 Aug 10

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	99.82
Concrete 0.60		AU	1				
FILL: Grey-brown sand		SS	2	50	10	1	98.82
1.45							
FILL: Brown silty sand with gravel, cobbles and boulders		SS	3	58	23	2	97.82
2.21		SS	4	100	2		
		SS	5	92		3	96.82
Stiff, grey **SILTY CLAY**		SS	6	92		4	95.82
		SS	7	92		5	94.82
		SS	8	92		6	93.82
6.70		SS	9	92			
						7	92.82
						8	91.82
						9	90.82
						10	89.82
11.13						11	88.82
End of Borehole							
Practical refusal to augering @ 11.13m depth							
(GWL @ 5.30m-Sept. 16/10)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Lower Explosive Limit %

20 40 60 80

Monitoring Well Construction

100 200 300 400 500

Gastech 1314 Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Prop. High-Rise Building - 265 Catherine Street
Ottawa, Ontario

DATUM Geodetic

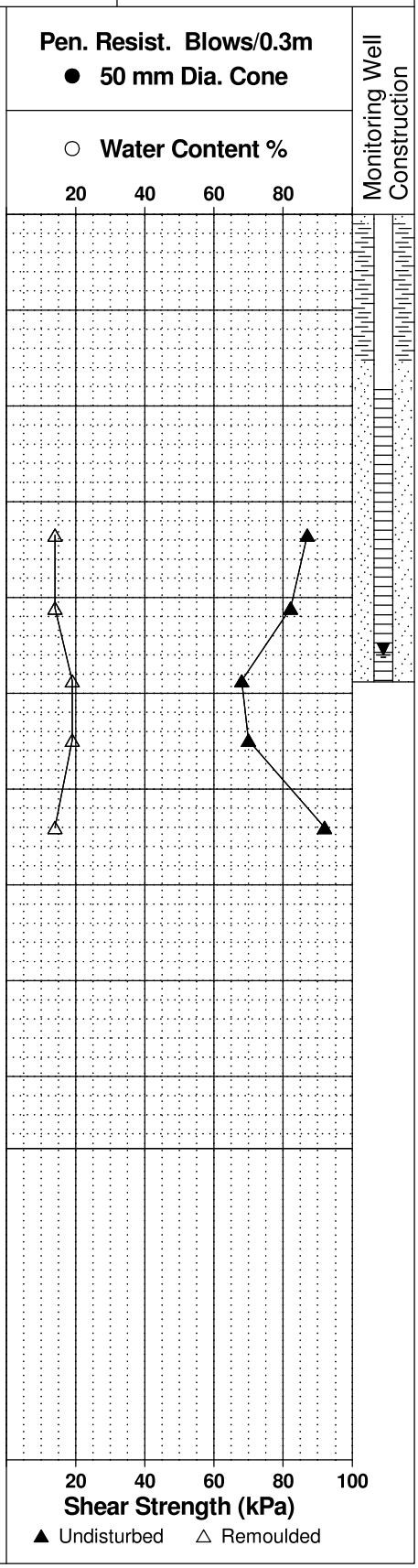
FILE NO. PG5498

REMARKS

HOLE NO. BH 1-20

BORINGS BY CME-55 Low Clearance Drill **DATE** August 19, 2020

SOIL DESCRIPTION		STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							0	68.62
Asphaltic concrete	0.10		AU	1				
FILL: Brown silty sand	0.63		SS	2	75	50+	1	67.62
FILL: Brown silty sand with gravel, cobbles and debris (wood, bricks)			SS	3	58	18	2	66.62
	2.29		SS	4	75	2		
Compact, brown **SILTY SAND**	3.05		SS	5	100	P	3	65.62
							4	64.62
Stiff, grey **SILTY CLAY,** some fine sand seams			SS	6	100	P	5	63.62
			SS	7	38	P	6	62.62
	7.62						7	61.62
Grey **SILTY CLAY,** trace silty sand			SS	8	100	2	8	60.62
							9	59.62
	9.75		SS	9	100	2		
End of Borehole								
(GWL @ 4.60m - Sept. 1, 2020)								



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Prop. High-Rise Building - 265 Catherine Street
Ottawa, Ontario

DATUM Geodetic

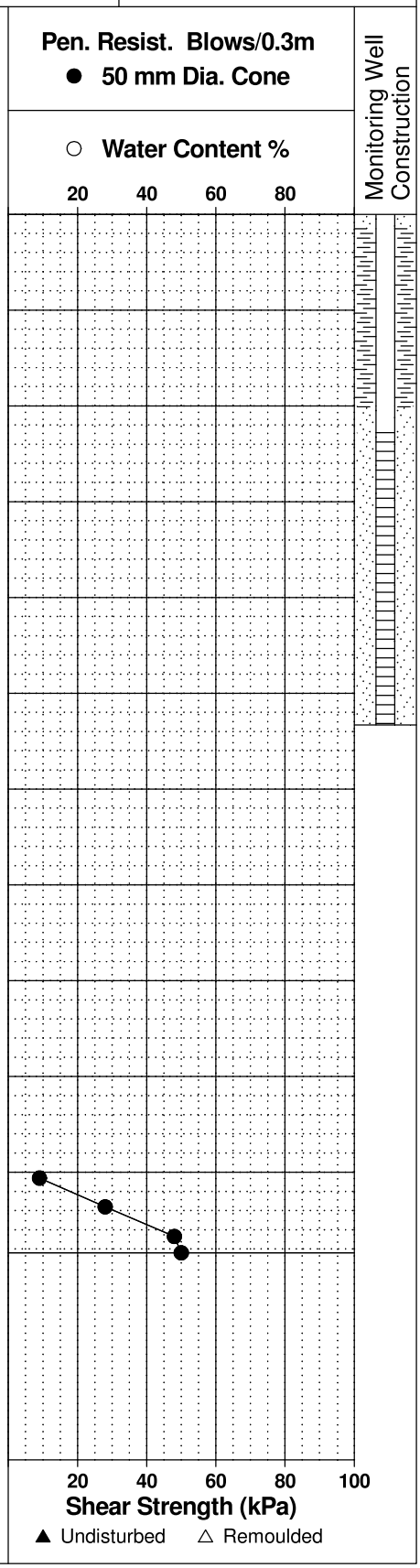
FILE NO. PG5498

REMARKS

HOLE NO. BH 2-20

BORINGS BY CME-55 Low Clearance Drill **DATE** August 19, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							
Asphaltic concrete 0.10		AU	1			0	68.46
FILL: Brown silty sand with crushed stone 0.60		SS	2	54	16	1	67.46
FILL: Brown silty sand with gravel, trace wood and brick 2.13		SS	3	18	9	2	66.46
		SS	4	100	4	3	65.46
		SS	5	100	2		
		SS	6	100	4	4	64.46
		SS	7	100	2	5	63.46
Brown **SILTY CLAY,** trace brown silty sand		SS	8	100	3		
		SS	9	100	4	6	62.46
		SS	10	100	2	7	61.46
9.14						8	60.46
GLACIAL TILL: Grey clayey silty sand with gravel, cobbles and boulders 9.75		SS	11	58	3	9	59.46
Dynamic Cone Penetration Test commenced at 9.75m depth. Inferred **GLACIAL TILL** 10.84						10	58.46
End of Borehole							
Practical DCPT refusal at 10.84m depth.							
(BH dry - Sept. 1, 2020)							



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Prop. High-Rise Building - 265 Catherine Street
Ottawa, Ontario

DATUM Geodetic

FILE NO. PG5498

REMARKS

HOLE NO. BH 3-20

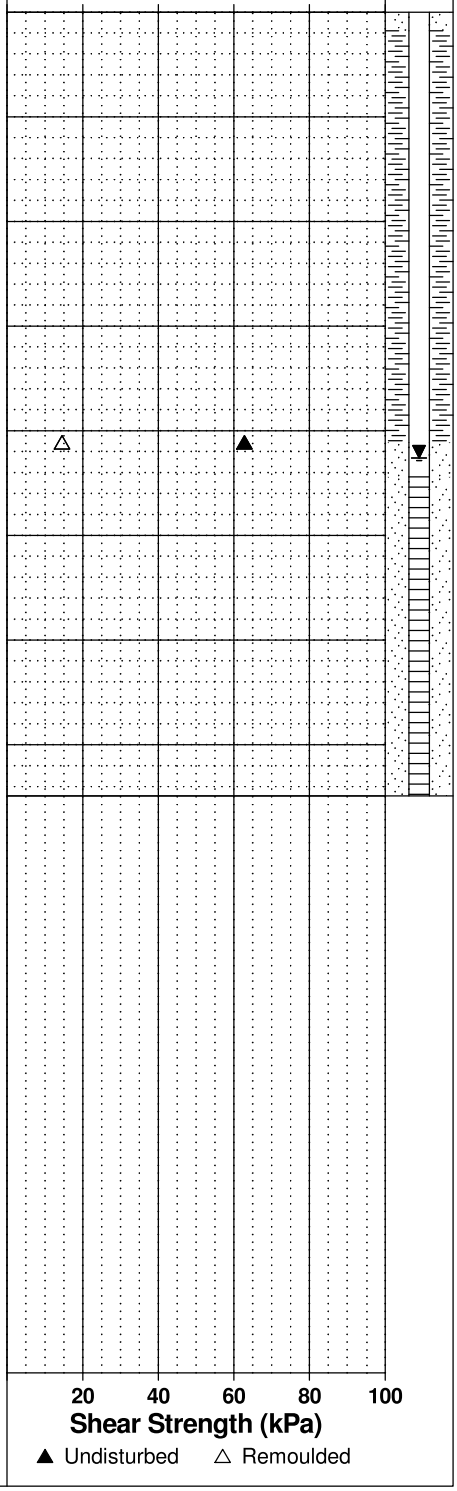
BORINGS BY CME-55 Low Clearance Drill **DATE** August 19, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	68.11
Asphaltic concrete 0.10		AU	1				
FILL: Brown silty sand with silty clay and crushed stone 0.60							
Loose to compact, brown **SILTY SAND,** some organics		SS	2	38	9	1	67.11
2.13		SS	3	67	13	2	66.11
Stiff, grey **SILTY CLAY** with sandy silt		SS	4	100	2		
		SS	5	100	2	3	65.11
4.42		SS	6	100	P	4	64.11
GLACIAL TILL: Compact, grey sandy silt with some clay, gravel and cobbles 5.33		SS	7	42	11	5	63.11
		SS	8	62	4		
GLACIAL TILL: Grey clayey silty sand with gravel, cobbles and boulders		SS	8	46	7	6	62.11
7.49						7	61.11
End of Borehole							
Practical refusal to augering at 7.49m depth.							
(GWL @ 4.26m - August 28, 2020)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

Monitoring Well Construction



Appendix D

Certificates of Equipment Calibration

MAXIM ENVIRONMENTAL AND SAFETY INC.
148 Colonnade Rd, UNIT # 9
Nepean, Ontario, K2E 7R4

Phone: **(613)-224-4747**

CERTIFICATE OF CALIBRATION

The RKI Instruments **Model EAGLE-2** as listed below has been inspected and calibrated following the Manufacturer's published specifications and methods.

Instrument Model: **EAGLE-2** Serial Number: **E2H106** Date of Calibration: June 17, 2021

SENSOR	CALIBRATION GAS STANDARD	CALIBRATION GAS CONCENTRATION	READING PRIOR TO ADJUSTMENT	INSTRUMENT SPAN SETTING	ALARM LEVEL SETTINGS
Combustible	Hexane lot # 1404511	15% LEL	1650 ppm	15% LEL **"Methane Elimination" Mode**	10 & 50% LEL
Combustible	Methane lot # 1248610	50% LEL	<500 PPM	Verification Only **"Methane Elimination" Mode**	
Combustible	Hexane lot # 1404511	15% LEL	1650 ppm	15% LEL **"Methane Response Enabled" Mode**	10 & 50% LEL
VOC	Isobutylene lot # 1395011	100 PPM	100 ppm	100 PPM	400 & 1000 PPM

The calibration gas standard used is considered to be a certified standard and is traceable to the National Institute of Standards and Technology (NIST). Certificate of Analysis is available upon request.

The instrument indicated above is now certified to be operating within the Manufacturer's specifications. **This does not preclude the requirement for regular maintenance and pre-use sensor response checks in order to ensure continued complete and accurate operating condition.**

Certified: _____

RENTALS, SALES, SUPPORT

Maxim

1-888-285-2324

ENVIRONMENTAL AND SAFETY INC.

"Exceptional Customer Service!"

Certificate of Calibration

HORIBA U-52 Serial Number 77A08VAS has been calibrated per the Manufacturers published instructions, using NIST traceable solutions and standards.

2, 2-Point pH	Cond.	Turb,	DO	ORP
4.00, 7.00	4.49 uS/cm	0, 100 NTU	8.91 mg/L @ 21 DegC	240mV
pH 4.0 Lot #0GK004 Exp11/22	Zero checked	Zero checked	Sodium Sulfite Zero	
pH 7.0 Lot# 0GE815 Exp.05/2022	Cond.Standard Lot#1GC833 Exp. 03/2022	StableCal Standard, 100 NTU Lot#A1007 Exp.01/2023	Oakton Zero Oxygen Solution Lot# 709016 Exp.01/2022	ORP Test Solution 240 mV
		Solutions ref. to NIST SRM's		Lot # Lot #5235Exp 04/2025

May 31, 2021

Calibrated

RENTALS, SALES, SERVICE, SUPPORT

9 - 170 AMBASSADOR DR., MISSISSAUGA, ONTARIO L5T 2H9
PHONE: (905) 670-1304 TOLL FREE: (888) 285-2324
E-MAIL: SALES@MAXIMENVIRONMENTAL.COM

9 - 148 COLONNADE RD., OTTAWA, ONTARIO K2E 7R4
PHONE: (613) 224-4747 TOLL FREE: (888) 285-2324
E-MAIL: SALES@MAXIMENVIRONMENTAL.COM

WWW.MAXIMENVIRONMENTAL.COM

RENTALS, SALES, SUPPORT

Maxim

1-888-285-2324

ENVIRONMENTAL AND SAFETY INC.

"Exceptional Customer Service!"

Certificate of Calibration

HORIBA U-52 Serial Number VDUY18TR has been calibrated per the Manufacturers published instructions, using NIST traceable solutions and standards.

2, 2-Point pH	Cond.	Turb,	DO	ORP
4.00, 7.00	4.49 uS/cm	0, 100 NTU	8.74mg/L @ 22 DegC	240mV
pH 4.0 Lot #1GF256 Exp. O6/22	Zero checked	Zero checked	Sodium Sulfite Zero	
pH 7.0 Lot# 1GE237 Exp.05/23	Cond.Standard 1GF256 Exp. O6/22	StableCal Standard, 100 NTU Lot#A1007 Exp.01/2023	Oakton Zero Oxygen Solution Lot# 709016 Exp.01/2022	ORP Test Solution 240 mV
		Solutions ref. to NIST SRM's		Lot # Lot #5235Exp 04/2025

June 21, 2021

Calibrated

RENTALS, SALES, SERVICE, SUPPORT

9 - 170 AMBASSADOR DR., MISSISSAUGA, ONTARIO L5T 2H9
PHONE: (905) 670-1304 TOLL FREE: (888) 285-2324
E-MAIL: SALES@MAXIMENVIRONMENTAL.COM

9 - 148 COLONNADE RD., OTTAWA, ONTARIO K2E 7R4
PHONE: (613) 224-4747 TOLL FREE: (888) 285-2324
E-MAIL: SALES@MAXIMENVIRONMENTAL.COM

WWW.MAXIMENVIRONMENTAL.COM

Appendix E

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

Lopers & Associates

30 Lansfield Way
Ottawa, ON K2G 3V8
Attn: Luke Lopers

Client PO:
Project: LOP21-018
Custody: 129117

Report Date: 24-Jun-2021
Order Date: 18-Jun-2021

Order #: 2125646

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

Paracel ID	Client ID
2125646-01	BH1-21-SS3
2125646-02	BH2-21-SS1
2125646-03	BH3-21-SS4
2125646-04	BH4-21-SS5
2125646-05	BH4-21-SS8
2125646-06	BH5-21-SS3
2125646-07	BH5-21-SS4
2125646-08	DUP-1-21
2125646-09	DUP-2-21

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis

Client: Lopers & Associates

Client PO:

Report Date: 24-Jun-2021

Order Date: 18-Jun-2021

Project Description: LOP21-018

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	23-Jun-21	23-Jun-21
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	21-Jun-21	23-Jun-21
Conductivity	MOE E3138 - probe @25 °C, water ext	22-Jun-21	23-Jun-21
Cyanide, free	MOE E3015 - Auto Colour, water extraction	21-Jun-21	23-Jun-21
Mercury by CVAA	EPA 7471B - CVAA, digestion	23-Jun-21	23-Jun-21
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	23-Jun-21	23-Jun-21
PHC F1	CWS Tier 1 - P&T GC-FID	22-Jun-21	23-Jun-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	21-Jun-21	23-Jun-21
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	23-Jun-21	23-Jun-21
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	21-Jun-21	22-Jun-21
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	22-Jun-21	24-Jun-21
SAR	Calculated	22-Jun-21	23-Jun-21
Solids, %	Gravimetric, calculation	22-Jun-21	22-Jun-21

Certificate of Analysis

Client: **Lopers & Associates**

Client PO:

Report Date: 24-Jun-2021

Order Date: 18-Jun-2021

Project Description: LOP21-018

	Client ID:	BH1-21-SS3	BH2-21-SS1	BH3-21-SS4	BH4-21-SS5
	Sample Date:	18-Jun-21 09:00	18-Jun-21 09:00	18-Jun-21 09:00	18-Jun-21 09:00
	Sample ID:	2125646-01	2125646-02	2125646-03	2125646-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	84.0	96.2	60.2	85.1
General Inorganics					
SAR	0.01 N/A	3.68	0.73	39.4	-
Conductivity	5 uS/cm	517	2540	7190	-
Cyanide, free	0.03 ug/g dry	<0.03	<0.03	<0.03	-
pH	0.05 pH Units	7.56	7.86	7.85	-
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Arsenic	1.0 ug/g dry	1.2	1.7	3.2	-
Barium	1.0 ug/g dry	29.2	74.4	349	-
Beryllium	0.5 ug/g dry	<0.5	<0.5	0.9	-
Boron	5.0 ug/g dry	<5.0	<5.0	8.4	-
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Chromium	5.0 ug/g dry	18.2	8.8	103	-
Chromium (VI)	0.2 ug/g dry	0.2	<0.2	<0.2	-
Cobalt	1.0 ug/g dry	4.1	2.5	21.2	-
Copper	5.0 ug/g dry	6.3	<5.0	43.4	-
Lead	1.0 ug/g dry	2.5	9.8	7.1	-
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	-
Molybdenum	1.0 ug/g dry	<1.0	1.2	<1.0	-
Nickel	5.0 ug/g dry	9.5	6.6	56.9	-
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	<1.0	<1.0	<1.0	-
Vanadium	10.0 ug/g dry	18.1	<10.0	98.6	-
Zinc	20.0 ug/g dry	20.7	<20.0	119	-
Volatiles					
Acetone	0.50 ug/g dry	-	-	<0.50	<0.50
Benzene	0.02 ug/g dry	-	-	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	-	-	<0.05	<0.05
Bromoform	0.05 ug/g dry	-	-	<0.05	<0.05
Bromomethane	0.05 ug/g dry	-	-	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	-	-	<0.05	<0.05

Certificate of Analysis

Client: Lopers & Associates

Client PO:

Report Date: 24-Jun-2021

Order Date: 18-Jun-2021

Project Description: LOP21-018

	Client ID:	BH1-21-SS3	BH2-21-SS1	BH3-21-SS4	BH4-21-SS5
	Sample Date:	18-Jun-21 09:00	18-Jun-21 09:00	18-Jun-21 09:00	18-Jun-21 09:00
	Sample ID:	2125646-01	2125646-02	2125646-03	2125646-04
	MDL/Units	Soil	Soil	Soil	Soil
Chlorobenzene	0.05 ug/g dry	-	-	<0.05	<0.05
Chloroform	0.05 ug/g dry	-	-	<0.05	<0.05
Dibromochloromethane	0.05 ug/g dry	-	-	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	-	-	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	-	-	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	-	-	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	-	-	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	-	-	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	-	-	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	-	-	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	-	-	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	-	-	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	-	-	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	-	-	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	-	-	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	-	-	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	-	-	0.50	0.07
Ethylene dibromide (dibromoethane, 1,2-)	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	-	-	0.35	<0.05
o-Xylene	0.05 ug/g dry	-	-	<0.05	<0.05

Certificate of Analysis

Client: Lopers & Associates

Client PO:

Report Date: 24-Jun-2021

Order Date: 18-Jun-2021

Project Description: LOP21-018

	Client ID:	BH1-21-SS3	BH2-21-SS1	BH3-21-SS4	BH4-21-SS5
	Sample Date:	18-Jun-21 09:00	18-Jun-21 09:00	18-Jun-21 09:00	18-Jun-21 09:00
	Sample ID:	2125646-01	2125646-02	2125646-03	2125646-04
	MDL/Units	Soil	Soil	Soil	Soil
Xylenes, total	0.05 ug/g dry	-	-	0.35	<0.05
4-Bromofluorobenzene	Surrogate	-	-	94.3%	95.8%
Dibromofluoromethane	Surrogate	-	-	93.5%	93.8%
Toluene-d8	Surrogate	-	-	105%	103%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	-	-	51	16
F2 PHCs (C10-C16)	4 ug/g dry	-	-	71	150
F3 PHCs (C16-C34)	8 ug/g dry	-	-	35	60
F4 PHCs (C34-C50)	6 ug/g dry	-	-	<6	16
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	<0.02	0.04	-
Acenaphthylene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Benzo [a] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Benzo [a] pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Chrysene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Fluoranthene	0.02 ug/g dry	<0.02	0.04	<0.02	-
Fluorene	0.02 ug/g dry	<0.02	<0.02	0.05	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	0.15	-
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	0.07	-
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	0.22	-
Naphthalene	0.01 ug/g dry	<0.01	<0.01	<0.01	-
Phenanthrene	0.02 ug/g dry	<0.02	0.02	0.22	-
Pyrene	0.02 ug/g dry	<0.02	0.03	<0.02	-
2-Fluorobiphenyl	Surrogate	77.6%	79.7%	68.9%	-
Terphenyl-d14	Surrogate	108%	93.8%	92.8%	-

Certificate of Analysis

Client: **Lopers & Associates**

Client PO:

Report Date: 24-Jun-2021

Order Date: 18-Jun-2021

Project Description: LOP21-018

	Client ID:	BH4-21-SS8	BH5-21-SS3	BH5-21-SS4	DUP-1-21
	Sample Date:	18-Jun-21 09:00	18-Jun-21 09:00	18-Jun-21 09:00	18-Jun-21 09:00
	Sample ID:	2125646-05	2125646-06	2125646-07	2125646-08
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	60.7	93.5	85.6	82.0
General Inorganics					
SAR	0.01 N/A	-	4.45	-	-
Conductivity	5 uS/cm	-	497	-	-
Cyanide, free	0.03 ug/g dry	-	<0.03	-	-
pH	0.05 pH Units	-	7.92	-	-
Metals					
Antimony	1.0 ug/g dry	-	<1.0	-	-
Arsenic	1.0 ug/g dry	-	2.8	-	-
Barium	1.0 ug/g dry	-	81.1	-	-
Beryllium	0.5 ug/g dry	-	<0.5	-	-
Boron	5.0 ug/g dry	-	10.0	-	-
Boron, available	0.5 ug/g dry	-	1.2	-	-
Cadmium	0.5 ug/g dry	-	<0.5	-	-
Chromium	5.0 ug/g dry	-	22.8	-	-
Chromium (VI)	0.2 ug/g dry	-	<0.2	-	-
Cobalt	1.0 ug/g dry	-	5.9	-	-
Copper	5.0 ug/g dry	-	15.9	-	-
Lead	1.0 ug/g dry	-	28.2	-	-
Mercury	0.1 ug/g dry	-	0.1	-	-
Molybdenum	1.0 ug/g dry	-	1.0	-	-
Nickel	5.0 ug/g dry	-	14.9	-	-
Selenium	1.0 ug/g dry	-	<1.0	-	-
Silver	0.3 ug/g dry	-	<0.3	-	-
Thallium	1.0 ug/g dry	-	<1.0	-	-
Uranium	1.0 ug/g dry	-	<1.0	-	-
Vanadium	10.0 ug/g dry	-	27.0	-	-
Zinc	20.0 ug/g dry	-	42.7	-	-
Volatiles					
Acetone	0.50 ug/g dry	<0.50	-	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	-	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	-	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	-	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	-	<0.05	<0.05

Certificate of Analysis

Client: **Lopers & Associates**

Client PO:

Report Date: 24-Jun-2021

Order Date: 18-Jun-2021

Project Description: LOP21-018

	Client ID:	BH4-21-SS8	BH5-21-SS3	BH5-21-SS4	DUP-1-21
	Sample Date:	18-Jun-21 09:00	18-Jun-21 09:00	18-Jun-21 09:00	18-Jun-21 09:00
	Sample ID:	2125646-05	2125646-06	2125646-07	2125646-08
	MDL/Units	Soil	Soil	Soil	Soil
Chlorobenzene	0.05 ug/g dry	<0.05	-	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	-	<0.05	<0.05
Dibromochloromethane	0.05 ug/g dry	<0.05	-	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	-	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	-	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	-	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	-	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	-	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	-	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	-	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	-	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	-	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	-	0.38	<0.05
Ethylene dibromide (dibromoethane, 1	0.05 ug/g dry	<0.05	-	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	-	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	-	<0.50	<0.50
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	-	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	-	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	-	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	-	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	<0.05	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	-	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	-	<0.05	0.16
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	-	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	-	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	-	<0.05	<0.05
Trichlorofluoromethane	0.05 ug/g dry	<0.05	-	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	-	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	-	0.94	0.24
o-Xylene	0.05 ug/g dry	<0.05	-	<0.05	0.09

Certificate of Analysis

Client: **Lopers & Associates**

Client PO:

Report Date: 24-Jun-2021

Order Date: 18-Jun-2021

Project Description: LOP21-018

	Client ID:	BH4-21-SS8	BH5-21-SS3	BH5-21-SS4	DUP-1-21
	Sample Date:	18-Jun-21 09:00	18-Jun-21 09:00	18-Jun-21 09:00	18-Jun-21 09:00
	Sample ID:	2125646-05	2125646-06	2125646-07	2125646-08
	MDL/Units	Soil	Soil	Soil	Soil
Xylenes, total	0.05 ug/g dry	<0.05	-	0.94	0.33
4-Bromofluorobenzene	Surrogate	98.6%	-	108%	106%
Dibromofluoromethane	Surrogate	92.4%	-	96.4%	127%
Toluene-d8	Surrogate	104%	-	103%	100%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	-	160	108
F2 PHCs (C10-C16)	4 ug/g dry	<4	-	2530	2750
F3 PHCs (C16-C34)	8 ug/g dry	<8	-	837	1160
F4 PHCs (C34-C50)	6 ug/g dry	<6	-	21	16
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	-	0.02	-	-
Acenaphthylene	0.02 ug/g dry	-	<0.02	-	-
Anthracene	0.02 ug/g dry	-	0.06	-	-
Benzo [a] anthracene	0.02 ug/g dry	-	0.16	-	-
Benzo [a] pyrene	0.02 ug/g dry	-	0.16	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	-	0.18	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	-	0.11	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	-	0.09	-	-
Chrysene	0.02 ug/g dry	-	0.16	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	-	0.03	-	-
Fluoranthene	0.02 ug/g dry	-	0.32	-	-
Fluorene	0.02 ug/g dry	-	0.03	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	-	0.09	-	-
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	-	0.02	-	-
Phenanthrene	0.02 ug/g dry	-	0.30	-	-
Pyrene	0.02 ug/g dry	-	0.29	-	-
2-Fluorobiphenyl	Surrogate	-	84.2%	-	-
Terphenyl-d14	Surrogate	-	87.3%	-	-

Certificate of Analysis

Client: **Lopers & Associates**

Client PO:

Report Date: 24-Jun-2021

Order Date: 18-Jun-2021

Project Description: LOP21-018

	Client ID:	DUP-2-21	-	-	-
	Sample Date:	18-Jun-21 09:00	-	-	-
	Sample ID:	2125646-09	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	92.6	-	-	-
General Inorganics					
SAR	0.01 N/A	6.07	-	-	-
Conductivity	5 uS/cm	760	-	-	-
Cyanide, free	0.03 ug/g dry	<0.03	-	-	-
pH	0.05 pH Units	7.48	-	-	-
Metals					
Antimony	1.0 ug/g dry	<1.0	-	-	-
Arsenic	1.0 ug/g dry	2.7	-	-	-
Barium	1.0 ug/g dry	72.8	-	-	-
Beryllium	0.5 ug/g dry	<0.5	-	-	-
Boron	5.0 ug/g dry	9.9	-	-	-
Boron, available	0.5 ug/g dry	1.0	-	-	-
Cadmium	0.5 ug/g dry	<0.5	-	-	-
Chromium	5.0 ug/g dry	23.7	-	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	-	-	-
Cobalt	1.0 ug/g dry	6.1	-	-	-
Copper	5.0 ug/g dry	16.0	-	-	-
Lead	1.0 ug/g dry	28.7	-	-	-
Mercury	0.1 ug/g dry	<0.1	-	-	-
Molybdenum	1.0 ug/g dry	1.0	-	-	-
Nickel	5.0 ug/g dry	15.6	-	-	-
Selenium	1.0 ug/g dry	<1.0	-	-	-
Silver	0.3 ug/g dry	<0.3	-	-	-
Thallium	1.0 ug/g dry	<1.0	-	-	-
Uranium	1.0 ug/g dry	<1.0	-	-	-
Vanadium	10.0 ug/g dry	28.1	-	-	-
Zinc	20.0 ug/g dry	45.1	-	-	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	0.03	-	-	-
Acenaphthylene	0.02 ug/g dry	0.02	-	-	-
Anthracene	0.02 ug/g dry	0.09	-	-	-
Benzo [a] anthracene	0.02 ug/g dry	0.23	-	-	-
Benzo [a] pyrene	0.02 ug/g dry	0.22	-	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	0.25	-	-	-

	Client ID:	DUP-2-21	-	-	-
	Sample Date:	18-Jun-21 09:00	-	-	-
	Sample ID:	2125646-09	-	-	-
	MDL/Units	Soil	-	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	0.14	-	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	0.12	-	-	-
Chrysene	0.02 ug/g dry	0.22	-	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.04	-	-	-
Fluoranthene	0.02 ug/g dry	0.47	-	-	-
Fluorene	0.02 ug/g dry	0.04	-	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.12	-	-	-
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	0.02	-	-	-
Phenanthrene	0.02 ug/g dry	0.36	-	-	-
Pyrene	0.02 ug/g dry	0.39	-	-	-
2-Fluorobiphenyl	Surrogate	89.6%	-	-	-
Terphenyl-d14	Surrogate	105%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Conductivity	ND	5	uS/cm						
Cyanide, free	ND	0.03	ug/g						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	9	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	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, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
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	*1.14*		*ug/g*		*85.3*	*50-140*			
Surrogate: Terphenyl-d14	*1.48*		*ug/g*		*111*	*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						

Certificate of Analysis

Report Date: 24-Jun-2021

Client: Lopers & Associates

Order Date: 18-Jun-2021

Client PO:

Project Description: LOP21-018

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane, 1,2	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	*7.95*		*ug/g*		*99.4*	*50-140*			
Surrogate: Dibromofluoromethane	*8.14*		*ug/g*		*102*	*50-140*			
Surrogate: Toluene-d8	*8.15*		*ug/g*		*102*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
SAR	1.23	0.01	N/A	1.41			13.6	30	
Conductivity	429	5	uS/cm	427			0.5	5	
Cyanide, free	ND	0.03	ug/g dry	ND			NC	35	
pH	7.58	0.05	pH Units	7.56			0.3	2.3	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND			NC	40	
F2 PHCs (C10-C16)	143	4	ug/g dry	71			NC	30	
F3 PHCs (C16-C34)	78	8	ug/g dry	35			NC	30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND			NC	30	
Metals									
Antimony	ND	1.0	ug/g dry	ND			NC	30	
Arsenic	4.7	1.0	ug/g dry	4.6			3.2	30	
Barium	46.7	1.0	ug/g dry	46.6			0.2	30	
Beryllium	0.5	0.5	ug/g dry	0.5			5.8	30	
Boron, available	1.83	0.5	ug/g dry	1.62			12.4	35	
Boron	6.0	5.0	ug/g dry	6.0			0.0	30	
Cadmium	ND	0.5	ug/g dry	ND			NC	30	
Chromium (VI)	ND	0.2	ug/g dry	ND			NC	35	
Chromium	15.3	5.0	ug/g dry	14.9			3.1	30	
Cobalt	5.2	1.0	ug/g dry	5.1			2.4	30	
Copper	13.2	5.0	ug/g dry	12.8			3.2	30	
Lead	13.6	1.0	ug/g dry	12.7			6.9	30	
Mercury	ND	0.1	ug/g dry	ND			NC	30	
Molybdenum	ND	1.0	ug/g dry	ND			NC	30	
Nickel	10.1	5.0	ug/g dry	9.9			1.9	30	
Selenium	ND	1.0	ug/g dry	ND			NC	30	
Silver	ND	0.3	ug/g dry	ND			NC	30	
Thallium	ND	1.0	ug/g dry	ND			NC	30	
Uranium	ND	1.0	ug/g dry	ND			NC	30	
Vanadium	27.5	10.0	ug/g dry	26.9			2.0	30	
Zinc	54.9	20.0	ug/g dry	54.2			1.3	30	
Physical Characteristics									
% Solids	93.4	0.1	% by Wt.	93.2			0.2	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g dry	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g dry	ND			NC	40	
Anthracene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [a] anthracene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [a] pyrene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [b] fluoranthene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [g,h,i] perylene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [k] fluoranthene	ND	0.02	ug/g dry	ND			NC	40	
Chrysene	ND	0.02	ug/g dry	ND			NC	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	ND			NC	40	
Fluoranthene	ND	0.02	ug/g dry	ND			NC	40	
Fluorene	ND	0.02	ug/g dry	ND			NC	40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g dry	ND			NC	40	
1-Methylnaphthalene	ND	0.02	ug/g dry	ND			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g dry	ND			NC	40	
Naphthalene	ND	0.01	ug/g dry	ND			NC	40	
Phenanthrene	ND	0.02	ug/g dry	ND			NC	40	
Pyrene	ND	0.02	ug/g dry	ND			NC	40	
Surrogate: 2-Fluorobiphenyl	*1.09*		*ug/g dry*		*68.5*	*50-140*			
Surrogate: Terphenyl-d14	*1.50*		*ug/g dry*		*94.3*	*50-140*			
Volatiles									

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Acetone	ND	0.50	ug/g dry	ND			NC	50	
Benzene	ND	0.02	ug/g dry	ND			NC	50	
Bromodichloromethane	ND	0.05	ug/g dry	ND			NC	50	
Bromoform	ND	0.05	ug/g dry	ND			NC	50	
Bromomethane	ND	0.05	ug/g dry	ND			NC	50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND			NC	50	
Chlorobenzene	ND	0.05	ug/g dry	ND			NC	50	
Chloroform	ND	0.05	ug/g dry	ND			NC	50	
Dibromochloromethane	ND	0.05	ug/g dry	ND			NC	50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND			NC	50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND			NC	50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND			NC	50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND			NC	50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND			NC	50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND			NC	50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND			NC	50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND			NC	50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND			NC	50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND			NC	50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND			NC	50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g dry	ND			NC	50	
Ethylene dibromide (dibromoethane, 1,2	ND	0.05	ug/g dry	ND			NC	50	
Hexane	ND	0.05	ug/g dry	ND			NC	50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND			NC	50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND			NC	50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND			NC	50	
Methylene Chloride	ND	0.05	ug/g dry	ND			NC	50	
Styrene	ND	0.05	ug/g dry	ND			NC	50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND			NC	50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND			NC	50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND			NC	50	
Toluene	ND	0.05	ug/g dry	0.053			NC	50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND			NC	50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND			NC	50	
Trichloroethylene	ND	0.05	ug/g dry	ND			NC	50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND			NC	50	
Vinyl chloride	ND	0.02	ug/g dry	ND			NC	50	
m,p-Xylenes	0.153	0.05	ug/g dry	0.138			10.3	50	
o-Xylene	ND	0.05	ug/g dry	ND			NC	50	
Surrogate: 4-Bromofluorobenzene	*9.20*		*ug/g dry*		*99.2*	*50-140*			
Surrogate: Dibromofluoromethane	*9.05*		*ug/g dry*		*97.6*	*50-140*			
Surrogate: Toluene-d8	*9.47*		*ug/g dry*		*102*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Cyanide, free	0.282	0.03	ug/g	ND	94.0	70-130			
Hydrocarbons									
F1 PHCs (C6-C10)	210	7	ug/g	ND	105	80-120			
F2 PHCs (C10-C16)	176	4	ug/g	71	78.8	60-140			
F3 PHCs (C16-C34)	332	8	ug/g	35	91.2	60-140			
F4 PHCs (C34-C50)	181	6	ug/g	ND	87.8	60-140			
Metals									
Antimony	50.5	1.0	ug/g	ND	100	70-130			
Arsenic	55.0	1.0	ug/g	1.8	106	70-130			
Barium	71.9	1.0	ug/g	18.7	106	70-130			
Beryllium	51.4	0.5	ug/g	ND	102	70-130			
Boron, available	4.53	0.5	ug/g	1.62	58.2	70-122			QM-07
Boron	49.2	5.0	ug/g	ND	93.6	70-130			
Cadmium	52.6	0.5	ug/g	ND	105	70-130			
Chromium (VI)	5.3	0.2	ug/g	ND	90.0	70-130			
Chromium	60.0	5.0	ug/g	5.9	108	70-130			
Cobalt	54.9	1.0	ug/g	2.0	106	70-130			
Copper	56.2	5.0	ug/g	5.1	102	70-130			
Lead	54.9	1.0	ug/g	5.1	99.6	70-130			
Mercury	1.52	0.1	ug/g	ND	101	70-130			
Molybdenum	52.1	1.0	ug/g	ND	104	70-130			
Nickel	55.8	5.0	ug/g	ND	104	70-130			
Selenium	49.1	1.0	ug/g	ND	97.7	70-130			
Silver	43.1	0.3	ug/g	ND	86.1	70-130			
Thallium	51.7	1.0	ug/g	ND	103	70-130			
Uranium	51.2	1.0	ug/g	ND	102	70-130			
Vanadium	66.0	10.0	ug/g	10.8	110	70-130			
Zinc	73.4	20.0	ug/g	21.7	103	70-130			
Semi-Volatiles									
Acenaphthene	0.152	0.02	ug/g	ND	76.6	50-140			
Acenaphthylene	0.128	0.02	ug/g	ND	64.5	50-140			
Anthracene	0.152	0.02	ug/g	ND	76.3	50-140			
Benzo [a] anthracene	0.125	0.02	ug/g	ND	63.0	50-140			
Benzo [a] pyrene	0.146	0.02	ug/g	ND	73.7	50-140			
Benzo [b] fluoranthene	0.169	0.02	ug/g	ND	85.3	50-140			
Benzo [g,h,i] perylene	0.141	0.02	ug/g	ND	71.1	50-140			
Benzo [k] fluoranthene	0.159	0.02	ug/g	ND	79.9	50-140			
Chrysene	0.160	0.02	ug/g	ND	80.6	50-140			
Dibenzo [a,h] anthracene	0.142	0.02	ug/g	ND	71.7	50-140			
Fluoranthene	0.139	0.02	ug/g	ND	70.0	50-140			
Fluorene	0.136	0.02	ug/g	ND	68.3	50-140			
Indeno [1,2,3-cd] pyrene	0.133	0.02	ug/g	ND	67.2	50-140			
1-Methylnaphthalene	0.154	0.02	ug/g	ND	77.4	50-140			
2-Methylnaphthalene	0.168	0.02	ug/g	ND	84.6	50-140			
Naphthalene	0.166	0.01	ug/g	ND	83.8	50-140			
Phenanthrene	0.143	0.02	ug/g	ND	72.2	50-140			
Pyrene	0.141	0.02	ug/g	ND	71.0	50-140			
Surrogate: 2-Fluorobiphenyl	*1.28*		*ug/g*		*80.5*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Surrogate: Terphenyl-d14	*1.45*		*ug/g*		*91.4*	*50-140*			
Volatiles									
Acetone	10.8	0.50	ug/g	ND	108	50-140			
Benzene	3.49	0.02	ug/g	ND	87.3	60-130			
Bromodichloromethane	3.90	0.05	ug/g	ND	97.6	60-130			
Bromoform	4.24	0.05	ug/g	ND	106	60-130			
Bromomethane	3.50	0.05	ug/g	ND	87.4	50-140			
Carbon Tetrachloride	3.56	0.05	ug/g	ND	89.0	60-130			
Chlorobenzene	3.95	0.05	ug/g	ND	98.7	60-130			
Chloroform	3.63	0.05	ug/g	ND	90.7	60-130			
Dibromochloromethane	4.53	0.05	ug/g	ND	113	60-130			
Dichlorodifluoromethane	3.61	0.05	ug/g	ND	90.2	50-140			
1,2-Dichlorobenzene	3.85	0.05	ug/g	ND	96.3	60-130			
1,3-Dichlorobenzene	3.85	0.05	ug/g	ND	96.3	60-130			
1,4-Dichlorobenzene	3.79	0.05	ug/g	ND	94.6	60-130			
1,1-Dichloroethane	3.56	0.05	ug/g	ND	88.9	60-130			
1,2-Dichloroethane	3.68	0.05	ug/g	ND	92.1	60-130			
1,1-Dichloroethylene	3.52	0.05	ug/g	ND	87.9	60-130			
cis-1,2-Dichloroethylene	3.48	0.05	ug/g	ND	87.1	60-130			
trans-1,2-Dichloroethylene	3.37	0.05	ug/g	ND	84.3	60-130			
1,2-Dichloropropane	3.54	0.05	ug/g	ND	88.4	60-130			
cis-1,3-Dichloropropylene	4.37	0.05	ug/g	ND	109	60-130			
trans-1,3-Dichloropropylene	3.95	0.05	ug/g	ND	98.8	60-130			
Ethylbenzene	3.88	0.05	ug/g	ND	97.1	60-130			
Ethylene dibromide (dibromoethane, 1,2-	3.72	0.05	ug/g	ND	93.1	60-130			
Hexane	3.52	0.05	ug/g	ND	88.1	60-130			
Methyl Ethyl Ketone (2-Butanone)	8.67	0.50	ug/g	ND	86.7	50-140			
Methyl Isobutyl Ketone	8.64	0.50	ug/g	ND	86.4	50-140			
Methyl tert-butyl ether	9.49	0.05	ug/g	ND	94.9	50-140			
Methylene Chloride	3.54	0.05	ug/g	ND	88.6	60-130			
Styrene	3.75	0.05	ug/g	ND	93.7	60-130			
1,1,1,2-Tetrachloroethane	3.63	0.05	ug/g	ND	90.9	60-130			
1,1,2,2-Tetrachloroethane	4.34	0.05	ug/g	ND	108	60-130			
Tetrachloroethylene	3.70	0.05	ug/g	ND	92.5	60-130			
Toluene	4.04	0.05	ug/g	ND	101	60-130			
1,1,1-Trichloroethane	4.00	0.05	ug/g	ND	100	60-130			
1,1,2-Trichloroethane	3.59	0.05	ug/g	ND	89.8	60-130			
Trichloroethylene	3.68	0.05	ug/g	ND	92.0	60-130			
Trichlorofluoromethane	3.35	0.05	ug/g	ND	83.8	50-140			
Vinyl chloride	3.70	0.02	ug/g	ND	92.5	50-140			
m,p-Xylenes	8.45	0.05	ug/g	ND	106	60-130			
o-Xylene	4.19	0.05	ug/g	ND	105	60-130			
Surrogate: 4-Bromofluorobenzene	*8.47*		*ug/g*		*106*	*50-140*			
Surrogate: Dibromofluoromethane	*8.66*		*ug/g*		*108*	*50-140*			
Surrogate: Toluene-d8	*8.00*		*ug/g*		*100*	*50-140*			

Qualifier Notes:

Login Qualifiers :

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

Applies to samples: DUP-1-21

QC Qualifiers :

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

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 LABORATORIES LTD

Paracel ID: 2125646

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2125646	№ 129117

Client Name: LOPERS & ASSOCIATES	Project Ref: LOP21-018	Page __ of __
Contact Name: Luke Lopers	Quote #:	Turnaround Time
Address: 30 Lansfield Way, Ottawa	PO #:	☐ 1 day ☐ 3 day
Telephone: 613-327-9073	E-mail: Luke@Lopers.ca	☐ 2 day ☒ Regular
		Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☒ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☒ Coarse	☐ CCME ☐ MISA
☒ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table ___	Mun:
For RSC: ☒ Yes ☐ No	☐ Other:

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

	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)	Metals & Inorganics
1	BH1-21-SS3	S		1	June 18/21				X					X
2	BH2-21-SS1	S		1					X					X
3	BH3-21-SS4	S		3			X	X	X					X
4	BH4-21-SS5	S		2			X	X						
5	BH4-21-SS8	S		2			X	X						
6	BH5-21-SS3	S		1					X					X
7	BH5-21-SS4	S		2			X	X						
8	Dup-1-21	S		1					X					X
9	Dup-2-21	S		2	↓		X	X						
10														

Comments:

Method of Delivery: Drop Box

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab: BGm	Verified By: BGm
Relinquished By (Print): L. duLopers	Date/Time:	Date/Time: June 18, 2021 16:49	Date/Time: June 18, 2021 17:15
Date/Time: June 18, 2021 / 4:45 PM	Temperature: °C	Temperature: 20.9 °C	pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers
28 Concourse Gate, Unit 1
Nepean, ON K2E 7T7
Attn: Mark D'Arcy

Phone: (613) 226-7381
Fax: (613) 226-6344

Client PO: 9112
Project: PE2073
Custody: 77029

Report Date: 31-Aug-2010
Order Date: 26-Aug-2010
Order #: 1035209

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

Paracel ID	Client ID
1035209-01	BH3-SS2
1035209-02	BH6-SS4

Approved By:

Dale Robertson, BSc
Laboratory Director

PARACEL LABORATORIES LTD.

Order #: 1035209

Certificate of Analysis

Report Date: 31-Aug-2010
Order Date:26-Aug-2010

Client: **Paterson Group Consulting Engineers**
Client PO: 9112 Project Description: PE2073

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX	EPA 8260 - P&T GC-MS	27-Aug-10	29-Aug-10
CCME PHC F1	CWS Tier 1 - P&T GC-FID	27-Aug-10	29-Aug-10
CCME PHC F2 - F4	CWS Tier 1 - GC-FID, extraction	27-Aug-10	29-Aug-10
Solids, %	Gravimetric, calculation	27-Aug-10	27-Aug-10

PARACEL LABORATORIES LTD.

Order #: 1035209

Certificate of Analysis

Report Date: 31-Aug-2010
Order Date:26-Aug-2010

Client: **Paterson Group Consulting Engineers**
Client PO: 9112 Project Description: PE2073

	Client ID:	BH3-SS2	BH6-SS4	-	-
	Sample Date:	24-Aug-10	25-Aug-10	-	-
	Sample ID:	1035209-01	1035209-02	-	-
	MDL/Units	Soil	Soil	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	88.7	62.1	-	-
Volatiles					
Benzene	0.03 ug/g dry	<0.03	<0.03	-	-
Ethylbenzene	0.05 ug/g dry	0.55	<0.05	-	-
Toluene	0.05 ug/g dry	0.17	<0.05	-	-
m,p-Xylenes	0.05 ug/g dry	3.14	<0.05	-	-
o-Xylene	0.05 ug/g dry	2.37	<0.05	-	-
Xylenes, total	0.10 ug/g dry	5.51	<0.10	-	-
Toluene-d8	Surrogate	102%	102%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	10 ug/g dry	77	<10	-	-
F2 PHCs (C10-C16)	10 ug/g dry	6230	1580	-	-
F3 PHCs (C16-C34)	10 ug/g dry	2450	293	-	-
F4 PHCs (C34-C50)	10 ug/g dry	<10	<10	-	-

Certificate of Analysis

Report Date: 31-Aug-2010
Order Date:26-Aug-2010

Client: **Paterson Group Consulting Engineers**
Client PO: 9112 Project Description: PE2073

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	10	ug/g						
F2 PHCs (C10-C16)	ND	10	ug/g						
F3 PHCs (C16-C34)	ND	10	ug/g						
F4 PHCs (C34-C50)	ND	10	ug/g						
Volatiles									
Benzene	ND	0.03	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	0.10	ug/g						
Surrogate: Toluene-d8	*8.11*		*ug/g*		*101*	*76-118*			

Certificate of Analysis

Report Date: 31-Aug-2010
Order Date:26-Aug-2010

Client: **Paterson Group Consulting Engineers**
Client PO: 9112 Project Description: PE2073

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1350	10	ug/g dry	1240			8.1	32	
F2 PHCs (C10-C16)	ND	10	ug/g dry	ND				50	
F3 PHCs (C16-C34)	37	10	ug/g dry	32			13.4	50	
F4 PHCs (C34-C50)	25	10	ug/g dry	23			7.7	50	
Volatiles									
Benzene	11.9	0.03	ug/g dry	15.6			26.9	50	
Ethylbenzene	56.6	0.05	ug/g dry	70.1			21.3	34	
Toluene	79.0	0.05	ug/g dry	109			32.0	32	
m,p-Xylenes	136	0.05	ug/g dry	170			21.8	35	
o-Xylene	82.8	0.05	ug/g dry	101			20.2	50	
Surrogate: Toluene-d8	*9.65*		*ug/g dry*	*ND*	*97.3*	*76-118*			

Certificate of Analysis

Report Date: 31-Aug-2010
Order Date:26-Aug-2010

Client: **Paterson Group Consulting Engineers**
Client PO: 9112 Project Description: PE2073

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	99	10	ug/g	ND	98.9	80-120			
F2 PHCs (C10-C16)	69	10	ug/g	ND	85.7	61-129			
F3 PHCs (C16-C34)	174	10	ug/g	ND	87.1	61-129			
F4 PHCs (C34-C50)	132	10	ug/g	ND	110	61-129			
Volatiles									
Benzene	0.841	0.03	ug/g	ND	90.0	55-141			
Ethylbenzene	2.51	0.05	ug/g	ND	113	61-139			
Toluene	10.0	0.05	ug/g	ND	92.9	54-136			
m,p-Xylenes	7.13	0.05	ug/g	ND	106	61-139			
o-Xylene	3.09	0.05	ug/g	ND	114	60-142			
Surrogate: Toluene-d8	*8.13*		*ug/g*		*102*	*76-118*			

Certificate of Analysis

Report Date: 31-Aug-2010
Order Date:26-Aug-2010

Client: **Paterson Group Consulting Engineers**
Client PO: 9112 Project Description: PE2073

Sample and QC Qualifiers Notes

None

Sample Data Revisions

None

Work Order Revisions/Comments:

None

Other Report Notes:

n/a: not applicable
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

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

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Chain of Custody

(lab use only)

Nº 77029

Reg. Drinking Water

Client Name: PATERSON GROUP	Project Ref: PE 2073	Waterworks Name:	Page 1 of 1
Contact Name: Mark D'Arcy	Quote # N/A	Waterworks Number:	Sample Taken by:
Address: 28 Concourse Gate Unit #1	PO # 9112	Address:	Print Name: Beau Doherty
	E-mail Address: mdarcy@patersongroup.ca	After hours Contact:	Signature:
Telephone: 613-226-6344	Fax:	Public Health Unit:	TAT: [ ] 1-day [ ] 2-day [X] Reg.

Matrix Types: S–Soil/Sed. **GW**–Ground Water **SW**–Surface Water **SS**–Storm/Sanitary Sewer **DW**–Drinking Water **RDW**–Regulated Drinking Water **P**- Paint **A**-Air **O**-Other

Samples submitted under: (Indicate **ONLY** one)
[X] O. Reg 153 (511) Table 3 [ ] O. Reg 170/03 [ ] O. Reg 318/08 [ ] Private well
[ ] CCME ____ [ ] O. Reg 243/07 [ ] O. Reg 319/08 [ ] Other: ____

Type of **DW** Sample: **R** = Raw; **T** = Treated; **D** = Distribution
Location Types: **S** = Surface Water; **G** = Ground Water

Paracel Order Number: 1035209

	Sample ID / Location Name	Matrix	Air Volume	Type of Sample	# of Containers	Sample Taken: Date	Sample Taken: Time	Free / Combined Chlorine Residual mg/L	Required Analyses: PHC's (CF1 to F4) / BTEX
1	BH3 - SS2	S			1	Aug. 24/2010			
2	BH6 - SS4	S			1	Aug. 25/2010			
3									
4									
5									
6									
7									
8									
9									
10									

Comments: J.K.

Preservation Verification: pH ____ Temperature ____
Verified by: ____

Relinquished By (Print & Sign): Beau Doherty

Date/Time: Aug. 25/2010 - 9:00

Lab Use Only:

Received By Driver/Depot: Aug. 26/10	Received at Lab:	Verified By:	
Date/Time: 1:25	Date/Time: Aug 26/10 2:33pm	Date/Time: Aug 26/10 4:41pm	

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 30693
Project: PE2703
Custody: 128097

Report Date: 27-Aug-2020
Order Date: 21-Aug-2020

Order #: 2034610

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

Paracel ID	Client ID
2034610-01	BH1-20-SS2
2034610-02	BH1-20-SS3
2034610-03	BH1-20-SS4
2034610-04	BH2-20-SS2

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Report Date: 27-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Aug-2020

Client PO: 30693

Project Description: PE2703

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	24-Aug-20	24-Aug-20
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	22-Aug-20	27-Aug-20
Mercury by CVAA	EPA 7471B - CVAA, digestion	25-Aug-20	25-Aug-20
PHC F1	CWS Tier 1 - P&T GC-FID	24-Aug-20	24-Aug-20
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	22-Aug-20	24-Aug-20
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	25-Aug-20	25-Aug-20
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	21-Aug-20	22-Aug-20
Solids, %	Gravimetric, calculation	24-Aug-20	25-Aug-20

Certificate of Analysis

Report Date: 27-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Aug-2020

Client PO: 30693

Project Description: PE2703

	Client ID:	BH1-20-SS2	BH1-20-SS3	BH1-20-SS4	BH2-20-SS2
	Sample Date:	19-Aug-20 09:00	19-Aug-20 09:00	19-Aug-20 09:00	19-Aug-20 09:00
	Sample ID:	2034610-01	2034610-02	2034610-03	2034610-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	91.4	83.7	60.7	91.8
Metals					
Antimony	1.0 ug/g dry	<1.0	-	-	<1.0
Arsenic	1.0 ug/g dry	3.4	-	-	2.4
Barium	1.0 ug/g dry	228	-	-	55.5
Beryllium	0.5 ug/g dry	<0.5	-	-	<0.5
Boron	5.0 ug/g dry	5.5	-	-	<5.0
Cadmium	0.5 ug/g dry	<0.5	-	-	<0.5
Chromium	5.0 ug/g dry	19.0	-	-	17.9
Chromium (VI)	0.2 ug/g dry	<0.2	-	-	<0.2
Cobalt	1.0 ug/g dry	4.5	-	-	5.3
Copper	5.0 ug/g dry	17.9	-	-	10.9
Lead	1.0 ug/g dry	80.6	-	-	36.0
Mercury	0.1 ug/g dry	<0.1	-	-	<0.1
Molybdenum	1.0 ug/g dry	<1.0	-	-	<1.0
Nickel	5.0 ug/g dry	22.1	-	-	12.0
Selenium	1.0 ug/g dry	<1.0	-	-	<1.0
Silver	0.3 ug/g dry	<0.3	-	-	<0.3
Thallium	1.0 ug/g dry	<1.0	-	-	<1.0
Uranium	1.0 ug/g dry	<1.0	-	-	<1.0
Vanadium	10.0 ug/g dry	23.7	-	-	23.3
Zinc	20.0 ug/g dry	204	-	-	45.4
Volatiles					
Benzene	0.02 ug/g dry	-	<0.02	<0.02	-
Ethylbenzene	0.05 ug/g dry	-	<0.05	<0.05	-
Toluene	0.05 ug/g dry	-	<0.05	<0.05	-
m,p-Xylenes	0.05 ug/g dry	-	<0.05	<0.05	-
o-Xylene	0.05 ug/g dry	-	<0.05	<0.05	-
Xylenes, total	0.05 ug/g dry	-	<0.05	<0.05	-
Toluene-d8	Surrogate	-	117%	118%	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	-	<7	<7	-
F2 PHCs (C10-C16)	4 ug/g dry	-	<4	<4	-
F3 PHCs (C16-C34)	8 ug/g dry	-	<8	<8	-
F4 PHCs (C34-C50)	6 ug/g dry	-	<6	<6	-

Certificate of Analysis

Report Date: 27-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Aug-2020

Client PO: 30693

Project Description: PE2703

	Client ID:	BH1-20-SS2	BH1-20-SS3	BH1-20-SS4	BH2-20-SS2
	Sample Date:	19-Aug-20 09:00	19-Aug-20 09:00	19-Aug-20 09:00	19-Aug-20 09:00
	Sample ID:	2034610-01	2034610-02	2034610-03	2034610-04
	MDL/Units	Soil	Soil	Soil	Soil
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	0.04	-	-	0.03
Acenaphthylene	0.02 ug/g dry	0.03	-	-	0.03
Anthracene	0.02 ug/g dry	0.15	-	-	0.11
Benzo [a] anthracene	0.02 ug/g dry	0.49	-	-	0.39
Benzo [a] pyrene	0.02 ug/g dry	0.49	-	-	0.38
Benzo [b] fluoranthene	0.02 ug/g dry	0.51	-	-	0.39
Benzo [g,h,i] perylene	0.02 ug/g dry	0.26	-	-	0.21
Benzo [k] fluoranthene	0.02 ug/g dry	0.28	-	-	0.22
Chrysene	0.02 ug/g dry	0.44	-	-	0.36
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.08	-	-	0.06
Fluoranthene	0.02 ug/g dry	0.76	-	-	0.65
Fluorene	0.02 ug/g dry	0.04	-	-	0.03
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.25	-	-	0.19
1-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	<0.02
2-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	-	-	<0.04
Naphthalene	0.01 ug/g dry	0.02	-	-	0.02
Phenanthrene	0.02 ug/g dry	0.32	-	-	0.38
Pyrene	0.02 ug/g dry	0.66	-	-	0.62
2-Fluorobiphenyl	Surrogate	87.0%	-	-	92.7%
Terphenyl-d14	Surrogate	78.4%	-	-	92.3%

Certificate of Analysis

Report Date: 27-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Aug-2020

Client PO: 30693

Project Description: PE2703

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						
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 (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
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	*1.15*		*ug/g*		*86.5*	*50-140*			
Surrogate: Terphenyl-d14	*1.15*		*ug/g*		*86.2*	*50-140*			
Volatiles									
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	*3.79*		*ug/g*		*118*	*50-140*			

Certificate of Analysis

Report Date: 27-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Aug-2020

Client PO: 30693

Project Description: PE2703

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND			NC	40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND			NC	30	
F3 PHCs (C16-C34)	ND	8	ug/g dry	ND			NC	30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND			NC	30	
Metals									
Antimony	ND	1.0	ug/g dry	1.3			NC	30	
Arsenic	11.6	1.0	ug/g dry	11.5			0.5	30	
Barium	371	1.0	ug/g dry	390			5.1	30	
Beryllium	1.2	0.5	ug/g dry	1.2			0.3	30	
Boron	14.5	5.0	ug/g dry	14.4			0.7	30	
Cadmium	ND	0.5	ug/g dry	0.5			NC	30	
Chromium (VI)	ND	0.2	ug/g dry	ND			NC	35	
Chromium	26.2	5.0	ug/g dry	27.1			3.3	30	
Cobalt	9.0	1.0	ug/g dry	9.2			2.8	30	
Copper	56.2	5.0	ug/g dry	59.7			6.0	30	
Lead	359	1.0	ug/g dry	317			12.3	30	
Mercury	ND	0.1	ug/g dry	ND			NC	30	
Molybdenum	2.4	1.0	ug/g dry	2.6			7.6	30	
Nickel	24.9	5.0	ug/g dry	25.0			0.3	30	
Selenium	ND	1.0	ug/g dry	ND			NC	30	
Silver	ND	0.3	ug/g dry	ND			NC	30	
Thallium	ND	1.0	ug/g dry	ND			NC	30	
Uranium	ND	1.0	ug/g dry	ND			NC	30	
Vanadium	31.4	10.0	ug/g dry	31.2			0.4	30	
Zinc	284	20.0	ug/g dry	309			8.2	30	
Physical Characteristics									
% Solids	88.6	0.1	% by Wt.	84.4			4.8	25	
Semi-Volatiles									
Acenaphthene	ND	0.40	ug/g dry	ND			NC	40	GEN09
Acenaphthylene	ND	0.40	ug/g dry	ND			NC	40	GEN09
Anthracene	ND	0.40	ug/g dry	ND			NC	40	GEN09
Benzo [a] anthracene	0.608	0.40	ug/g dry	0.826			30.4	40	
Benzo [a] pyrene	0.694	0.40	ug/g dry	1.01			37.1	40	
Benzo [b] fluoranthene	1.02	0.40	ug/g dry	1.18			15.0	40	
Benzo [g,h,i] perylene	0.518	0.40	ug/g dry	0.701			30.0	40	
Benzo [k] fluoranthene	0.493	0.40	ug/g dry	0.609			21.1	40	
Chrysene	0.714	0.40	ug/g dry	0.985			32.0	40	
Dibenzo [a,h] anthracene	ND	0.40	ug/g dry	ND			NC	40	GEN09
Fluoranthene	1.97	0.40	ug/g dry	2.23			12.5	40	
Fluorene	ND	0.40	ug/g dry	ND			NC	40	GEN09
Indeno [1,2,3-cd] pyrene	0.483	0.40	ug/g dry	0.718			39.2	40	
1-Methylnaphthalene	ND	0.40	ug/g dry	ND			NC	40	GEN09
2-Methylnaphthalene	ND	0.40	ug/g dry	ND			NC	40	GEN09
Naphthalene	0.204	0.20	ug/g dry	0.269			27.3	40	
Phenanthrene	1.06	0.40	ug/g dry	1.29			19.9	40	
Pyrene	1.65	0.40	ug/g dry	2.24			30.4	40	
Surrogate: 2-Fluorobiphenyl	*1.41*		*ug/g dry*		*90.6*	*50-140*			
Surrogate: Terphenyl-d14	*1.54*		*ug/g dry*		*99.5*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g dry	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g dry	ND			NC	50	
Toluene	ND	0.05	ug/g dry	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g dry	ND			NC	50	
o-Xylene	ND	0.05	ug/g dry	ND			NC	50	
Surrogate: Toluene-d8	*4.49*		*ug/g dry*		*117*	*50-140*			

Certificate of Analysis

Report Date: 27-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Aug-2020

Client PO: 30693

Project Description: PE2703

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	161	7	ug/g	ND	80.4	80-120			
F2 PHCs (C10-C16)	97	4	ug/g	ND	89.7	60-140			
F3 PHCs (C16-C34)	287	8	ug/g	ND	108	60-140			
F4 PHCs (C34-C50)	179	6	ug/g	ND	106	60-140			
Metals									
Antimony	46.0	1.0	ug/g	ND	90.9	70-130			
Arsenic	55.7	1.0	ug/g	4.6	102	70-130			
Barium	201	1.0	ug/g	156	89.8	70-130			
Beryllium	50.3	0.5	ug/g	0.5	99.6	70-130			
Boron	49.8	5.0	ug/g	5.7	88.0	70-130			
Cadmium	48.2	0.5	ug/g	ND	95.9	70-130			
Chromium (VI)	0.1	0.2	ug/g	ND	48.0	70-130			QM-05
Chromium	62.6	5.0	ug/g	10.8	103	70-130			
Cobalt	53.9	1.0	ug/g	3.7	100	70-130			
Copper	71.7	5.0	ug/g	23.9	95.8	70-130			
Lead	169	1.0	ug/g	127	84.3	70-130			
Mercury	1.48	0.1	ug/g	ND	98.8	70-130			
Molybdenum	51.3	1.0	ug/g	1.0	100	70-130			
Nickel	60.0	5.0	ug/g	10.0	100	70-130			
Selenium	47.6	1.0	ug/g	ND	94.7	70-130			
Silver	49.6	0.3	ug/g	ND	99.2	70-130			
Thallium	48.2	1.0	ug/g	ND	96.1	70-130			
Uranium	52.0	1.0	ug/g	ND	103	70-130			
Vanadium	64.6	10.0	ug/g	12.5	104	70-130			
Zinc	164	20.0	ug/g	123	81.5	70-130			
Semi-Volatiles									
Acenaphthene	0.152	0.02	ug/g	ND	90.9	50-140			
Acenaphthylene	0.136	0.02	ug/g	ND	81.4	50-140			
Anthracene	0.141	0.02	ug/g	ND	84.7	50-140			
Benzo [a] anthracene	0.122	0.02	ug/g	ND	73.1	50-140			
Benzo [a] pyrene	0.129	0.02	ug/g	ND	77.6	50-140			
Benzo [b] fluoranthene	0.174	0.02	ug/g	ND	104	50-140			
Benzo [g,h,i] perylene	0.133	0.02	ug/g	ND	79.9	50-140			
Benzo [k] fluoranthene	0.159	0.02	ug/g	ND	95.4	50-140			
Chrysene	0.146	0.02	ug/g	ND	87.7	50-140			
Dibenzo [a,h] anthracene	0.138	0.02	ug/g	ND	82.9	50-140			
Fluoranthene	0.150	0.02	ug/g	ND	89.8	50-140			
Fluorene	0.142	0.02	ug/g	ND	85.3	50-140			
Indeno [1,2,3-cd] pyrene	0.140	0.02	ug/g	ND	84.0	50-140			
1-Methylnaphthalene	0.146	0.02	ug/g	ND	87.4	50-140			
2-Methylnaphthalene	0.161	0.02	ug/g	ND	96.4	50-140			
Naphthalene	0.161	0.01	ug/g	ND	96.9	50-140			
Phenanthrene	0.146	0.02	ug/g	ND	87.7	50-140			
Pyrene	0.147	0.02	ug/g	ND	88.5	50-140			
Surrogate: 2-Fluorobiphenyl	*1.02*		*ug/g*		*76.5*	*50-140*			
Surrogate: Terphenyl-d14	*1.36*		*ug/g*		*102*	*50-140*			
Volatiles									
Benzene	3.00	0.02	ug/g	ND	75.0	60-130			

Certificate of Analysis

Report Date: 27-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Aug-2020

Client PO: 30693

Project Description: PE2703

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Ethylbenzene	3.94	0.05	ug/g	ND	98.6	60-130			
Toluene	3.92	0.05	ug/g	ND	98.0	60-130			
m,p-Xylenes	8.15	0.05	ug/g	ND	102	60-130			
o-Xylene	4.31	0.05	ug/g	ND	108	60-130			
Surrogate: Toluene-d8	*2.95*		*ug/g*		*92.2*	*50-140*			

Qualifier Notes:

QC Qualifiers :

GEN09 : Elevated detection limits due to the nature of the sample matrix.

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

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.
NC: Not Calculated

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

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 LABORATORIES LTD

Paracel ID: 2034610

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2034610	Nº 128097

Client Name: Paterson	Project Ref: PE 2703	Page 1 of 1
Contact Name: Mark D'Arcy	Quote #:	Turnaround Time
Address: 154 Colonnade	PO #: 32693	☐ 1 day ☐ 3 day ☐ 2 day ☑ Regular
Telephone: 613 226 7381	E-mail: mdarcy@patersongroup.ca	Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☑ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table ___	Mun:
For RSC: ☐ Yes ☒ No	☐ Other:

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

	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)							
1	BH1-20-SS2	S		1	Aug 19 2020				✓	✓	✓	✓								✓
2	BH1-20-SS3	S		2	Aug 19 2020		✓													✓
3	BH1-20-SS4	S		2	Aug 19 2020		✓													✓
4	BH2-20-SS2	S		1	Aug 19 2020				✓	✓	✓	✓								✓
5																				
6																				
7																				
8																				
9																				
10																				

Comments:

Method of Delivery: PARACEL COURIER

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
G Pat	COURIER	Sunreporn Dahmani	
Relinquished By (Print): Grant Paterson	Date/Time: 21/08/20 2:11	Date/Time: Aug 21, 2020 04.12	Date/Time: Aug 21, 2020 16:19
Date/Time: Aug 21 / 2020	Temperature: °C PH.	Temperature: 8.4 °C	pH Verified: ☐ By:

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Certificate of Analysis

Lopers & Associates

30 Lansfield Way
Ottawa, ON K2G 3V8
Attn: Luke Lopers

Client PO:
Project: LOP21-018
Custody: 61631

Report Date: 9-Jun-2021
Order Date: 3-Jun-2021

Order #: 2123416

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

Paracel ID	Client ID
2123416-01	BH1 (MW)- 2021GW1
2123416-02	BH7 (MW)- 2021GW1
2123416-03	BH3-10- 2021GW1
2123416-04	BH1-20- 2021GW1
2123416-05	DUP-1- 2021GW1

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis

Client: Lopers & Associates

Client PO:

Report Date: 09-Jun-2021

Order Date: 3-Jun-2021

Project Description: LOP21-018

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	5-Jun-21	5-Jun-21
PHC F1	CWS Tier 1 - P&T GC-FID	4-Jun-21	5-Jun-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	8-Jun-21	9-Jun-21

Certificate of Analysis

Client: **Lopers & Associates**

Client PO:

Report Date: 09-Jun-2021

Order Date: 3-Jun-2021

Project Description: LOP21-018

	Client ID:	BH1 (MW)- 2021GW1	BH7 (MW)- 2021GW1	BH3-10- 2021GW1	BH1-20- 2021GW1
	Sample Date:	02-Jun-21 09:00	02-Jun-21 09:00	02-Jun-21 09:00	02-Jun-21 09:00
	Sample ID:	2123416-01	2123416-02	2123416-03	2123416-04
	MDL/Units	Water	Water	Water	Water
Volatiles					
Benzene	0.5 ug/L	15.7	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	27.9	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	1.0	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	17.0	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	22.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	39.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	87.7%	85.7%	86.2%	87.1%
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	47	<25	<25	<25
F2 PHCs (C10-C16)	100 ug/L	663000 [2]	<100	<100	<100
F3 PHCs (C16-C34)	100 ug/L	345000 [2]	<100	<100	<100
F4 PHCs (C34-C50)	100 ug/L	<2000 [1] [2]	<100	<100	<100

	Client ID:	DUP-1- 2021GW1	-	-	-
	Sample Date:	02-Jun-21 09:00	-	-	-
	Sample ID:	2123416-05	-	-	-
	MDL/Units	Water	-	-	-
Volatiles					
Benzene	0.5 ug/L	15.8	-	-	-
Ethylbenzene	0.5 ug/L	28.3	-	-	-
Toluene	0.5 ug/L	1.0	-	-	-
m,p-Xylenes	0.5 ug/L	17.1	-	-	-
o-Xylene	0.5 ug/L	22.5	-	-	-
Xylenes, total	0.5 ug/L	39.6	-	-	-
Toluene-d8	Surrogate	85.9%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	56	-	-	-
F2 PHCs (C10-C16)	100 ug/L	686000 [2]	-	-	-
F3 PHCs (C16-C34)	100 ug/L	358000 [2]	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<2000 [1] [2]	-	-	-

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						
Volatiles									
Benzene	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: Toluene-d8	*71.0*		*ug/L*		*88.8*	*50-140*			

Certificate of Analysis

Client: Lopers & Associates

Client PO:

Report Date: 09-Jun-2021

Order Date: 3-Jun-2021

Project Description: LOP21-018

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: Toluene-d8	*75.0*		*ug/L*		*93.8*	*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)	1730	25	ug/L	ND	86.3	68-117			
F2 PHCs (C10-C16)	1360	100	ug/L	ND	85.2	60-140			
F3 PHCs (C16-C34)	3380	100	ug/L	ND	86.3	60-140			
F4 PHCs (C34-C50)	1790	100	ug/L	ND	72.1	60-140			
Volatiles									
Benzene	37.7	0.5	ug/L	ND	94.3	60-130			
Ethylbenzene	43.7	0.5	ug/L	ND	109	60-130			
Toluene	44.2	0.5	ug/L	ND	110	60-130			
m,p-Xylenes	90.8	0.5	ug/L	ND	114	60-130			
o-Xylene	36.9	0.5	ug/L	ND	92.3	60-130			
Surrogate: Toluene-d8	*62.6*		*ug/L*		*78.2*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

1 : Elevated detection limit due to dilution required because of high target analyte concentration.

2 : Free product was observed in the sample container.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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 LABORATORIES LTD

Paracel ID: 2123416

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2123416	№ 61631

Client Name: LOPERS & ASSOCIATES	Project Ref: LOP21-018
Contact Name: Luke Lopers	Quote #:
Address: 30 Lansfield Way, Ottawa ON	PO #:
Telephone: 613-327-9073 / Call me please	E-mail: Luke@Lopers.ca

Page __ of __

Turnaround Time

☐ 1 day ☐ 3 day
☐ 2 day ☒ Regular
Date Required: _____

☒ REG 153/04 ~~☒~~ REG 406/19 ?

Other Regulation	
☐ REG,558	☐ PWQO
☐ CCME	☐ MISA
☐ SU - Sani	☐ SU - Storm
Mun:	
☐ Other:	

☒ Table 1 ☐ Res/Park ☐ Med/Fine
☐ Table 2 ☐ Ind/Comm ☐ Coarse
☐ Table 3 ☐ Agri/Other
☐ Table
For RSC: ☒ Yes ☐ No

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analysis: PHCs/BTEX
1	BH1 (MW) - 2021GW1	GW		3	June 2, 2021		X
2	BH7 (MW) - 2021GW1	GW		3			X
3	BH3-10 - 2021GW1	GW		3			X
4	BH1-20 - 2021GW1	GW		3			X
5	DUP-1 - 2021GW1	GW		3			X
6							
7							
8							
9							
10							

Comments: Some Samples were noted to have free product → Sample collected after purging product, ~~and from~~ Please Report Sample IDs on COC, ending in "-2021GW1"

Method of Delivery: Drop Off

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab: Jvneepam Dehmai	Verified By:
Relinquished By (Print): Luke Lopers	Date/Time: 2021.6.3 8.30	Date/Time: JUN 03, 2021 12.48	Date/Time: June 3rd, 2021 13:30
Date/Time: June 2, 2021 After Hours	Temperature: 15.3 °C	Temperature: 5.5 °C	pH Verified: ☐ By:

Chain of Custody (Blank) xlsx

Revision 4.0

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Certificate of Analysis

Lopers & Associates

30 Lansfield Way
Ottawa, ON K2G 3V8
Attn: Luke Lopers

Client PO:
Project: LOP21-018
Custody: 132337

Report Date: 29-Jun-2021
Order Date: 23-Jun-2021

Order #: 2126398

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

Paracel ID	Client ID
2126398-01	BH2-20
2126398-02	BH3-20
2126398-03	BH4-21
2126398-04	BH5-21
2126398-05	BH14-21
2126398-06	Trip Blank

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis

Report Date: 29-Jun-2021

Client: Lopers & Associates

Order Date: 23-Jun-2021

Client PO:

Project Description: LOP21-018

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC	24-Jun-21	25-Jun-21
Chromium, hexavalent - water	MOE E3056 - colourimetric	25-Jun-21	25-Jun-21
Cyanide, free	MOE E3015 - Auto Colour	28-Jun-21	28-Jun-21
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	28-Jun-21	28-Jun-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	25-Jun-21	25-Jun-21
pH	EPA 150.1 - pH probe @25 °C	24-Jun-21	24-Jun-21
PHC F1	CWS Tier 1 - P&T GC-FID	25-Jun-21	26-Jun-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	28-Jun-21	29-Jun-21
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	28-Jun-21	28-Jun-21
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	25-Jun-21	26-Jun-21

Certificate of Analysis

Client: Lopers & Associates

Client PO:

Report Date: 29-Jun-2021

Order Date: 23-Jun-2021

Project Description: LOP21-018

	Client ID:	BH2-20	BH3-20	BH4-21	BH5-21
	Sample Date:	23-Jun-21 09:00	23-Jun-21 09:00	23-Jun-21 09:00	23-Jun-21 09:00
	Sample ID:	2126398-01	2126398-02	2126398-03	2126398-04
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
General Inorganics					
Cyanide, free	2 ug/L	<2	<2	<2	<2
pH	0.1 pH Units	7.5	7.0	7.3	2.6
Anions					
Chloride	1 mg/L	2400	2440	13900	1240
Metals					
Mercury	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	1	<1	2	<1
Barium	1 ug/L	193	291	1970	518
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	66	62	98	133
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Chromium	1 ug/L	<1	<1	<1	<1
Chromium (VI)	10 ug/L	<10	<10	<10	<10
Cobalt	0.5 ug/L	<0.5	<0.5	3.6	2.3
Copper	0.5 ug/L	1.5	1.3	0.8	2.4
Lead	0.1 ug/L	<0.1	<0.1	0.1	<0.1
Molybdenum	0.5 ug/L	9.0	5.3	3.5	9.0
Nickel	1 ug/L	5	1	30	16
Selenium	1 ug/L	<1	<1	<1	<1
Silver	0.1 ug/L	<0.1	<0.1	0.1	<0.1
Sodium	200 ug/L	678000	1260000	5230000	345000
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Uranium	0.1 ug/L	7.3	1.1	2.3	7.1
Vanadium	0.5 ug/L	3.4	0.8	4.1	0.9
Zinc	5 ug/L	<5	<5	<5	6
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	16.0	67.3
Benzene	0.5 ug/L	<0.5	<0.5	15.5	<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	7.0	<0.5
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Client: Lopers & Associates

Client PO:

Report Date: 29-Jun-2021

Order Date: 23-Jun-2021

Project Description: LOP21-018

	Client ID:	BH2-20	BH3-20	BH4-21	BH5-21
	Sample Date:	23-Jun-21 09:00	23-Jun-21 09:00	23-Jun-21 09:00	23-Jun-21 09:00
	Sample ID:	2126398-01	2126398-02	2126398-03	2126398-04
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
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	16.5	<0.5
Ethylene dibromide (dibromoethane, 1,2-)	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	105%	104%	103%	102%
Dibromofluoromethane	Surrogate	118%	117%	118%	115%

Certificate of Analysis

Client: **Lopers & Associates**

Client PO:

Report Date: 29-Jun-2021

Order Date: 23-Jun-2021

Project Description: LOP21-018

	Client ID:	BH2-20	BH3-20	BH4-21	BH5-21
	Sample Date:	23-Jun-21 09:00	23-Jun-21 09:00	23-Jun-21 09:00	23-Jun-21 09:00
	Sample ID:	2126398-01	2126398-02	2126398-03	2126398-04
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
Toluene-d8	Surrogate	102%	103%	102%	104%
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	39	25
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	<100
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	<100
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	<100
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	<0.05	1.09	<0.05
Acenaphthylene	0.05 ug/L	<0.05	<0.05	0.11	<0.05
Anthracene	0.01 ug/L	<0.01	<0.01	0.19	<0.01
Benzo [a] anthracene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Benzo [a] pyrene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Benzo [b] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Benzo [k] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Chrysene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.01 ug/L	<0.01	<0.01	0.16	<0.01
Fluorene	0.05 ug/L	<0.05	<0.05	0.98	0.14
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
1-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	36.4	0.36
2-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	2.16	<0.05
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	<0.10	38.6	0.36
Naphthalene	0.05 ug/L	<0.05	<0.05	1.70	<0.05
Phenanthrene	0.05 ug/L	<0.05	<0.05	1.97	<0.05
Pyrene	0.01 ug/L	<0.01	<0.01	0.15	0.06
2-Fluorobiphenyl	Surrogate	104%	105%	99.9%	107%
Terphenyl-d14	Surrogate	114%	115%	112%	111%

Certificate of Analysis

Client: **Lopers & Associates**

Client PO:

Report Date: 29-Jun-2021

Order Date: 23-Jun-2021

Project Description: LOP21-018

	Client ID:	BH14-21	Trip Blank	-	-
	Sample Date:	23-Jun-21 09:00	21-Jun-21 09:00	-	-
	Sample ID:	2126398-05	2126398-06	-	-
	MDL/Units	Ground Water	Ground Water	-	-
General Inorganics					
Cyanide, free	2 ug/L	<2	-	-	-
pH	0.1 pH Units	7.2	-	-	-
Anions					
Chloride	1 mg/L	11900	-	-	-
Metals					
Mercury	0.1 ug/L	<0.1	-	-	-
Antimony	0.5 ug/L	<0.5	-	-	-
Arsenic	1 ug/L	2	-	-	-
Barium	1 ug/L	1910	-	-	-
Beryllium	0.5 ug/L	<0.5	-	-	-
Boron	10 ug/L	95	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Chromium	1 ug/L	<1	-	-	-
Chromium (VI)	10 ug/L	<10	-	-	-
Cobalt	0.5 ug/L	3.5	-	-	-
Copper	0.5 ug/L	<0.5	-	-	-
Lead	0.1 ug/L	0.1	-	-	-
Molybdenum	0.5 ug/L	3.4	-	-	-
Nickel	1 ug/L	30	-	-	-
Selenium	1 ug/L	<1	-	-	-
Silver	0.1 ug/L	<0.1	-	-	-
Sodium	200 ug/L	5220000	-	-	-
Thallium	0.1 ug/L	<0.1	-	-	-
Uranium	0.1 ug/L	2.1	-	-	-
Vanadium	0.5 ug/L	4.3	-	-	-
Zinc	5 ug/L	5	-	-	-
Volatiles					
Acetone	5.0 ug/L	19.4	<5.0	-	-
Benzene	0.5 ug/L	15.9	<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	7.2	<0.5	-	-
Chloroform	0.5 ug/L	<0.5	<0.5	-	-

Certificate of Analysis

Client: Lopers & Associates

Client PO:

Report Date: 29-Jun-2021

Order Date: 23-Jun-2021

Project Description: LOP21-018

	Client ID:	BH14-21	Trip Blank	-	-
	Sample Date:	23-Jun-21 09:00	21-Jun-21 09:00	-	-
	Sample ID:	2126398-05	2126398-06	-	-
	MDL/Units	Ground Water	Ground Water	-	-
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	-	-
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	16.8	<0.5	-	-
Ethylene dibromide (dibromoethane, 1	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	102%	107%	-	-

Certificate of Analysis

Client: **Lopers & Associates**

Client PO:

Report Date: 29-Jun-2021

Order Date: 23-Jun-2021

Project Description: LOP21-018

	Client ID:	BH14-21	Trip Blank	-	-
	Sample Date:	23-Jun-21 09:00	21-Jun-21 09:00	-	-
	Sample ID:	2126398-05	2126398-06	-	-
	MDL/Units	Ground Water	Ground Water	-	-
Dibromofluoromethane	Surrogate	117%	114%	-	-
Toluene-d8	Surrogate	104%	103%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	46	-	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	-	-
Semi-Volatiles					
Acenaphthene	0.05 ug/L	1.80	-	-	-
Acenaphthylene	0.05 ug/L	0.18	-	-	-
Anthracene	0.01 ug/L	0.12	-	-	-
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	0.13	-	-	-
Fluorene	0.05 ug/L	1.56	-	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	-	-	-
1-Methylnaphthalene	0.05 ug/L	41.2	-	-	-
2-Methylnaphthalene	0.05 ug/L	2.36	-	-	-
Methylnaphthalene (1&2)	0.10 ug/L	43.6	-	-	-
Naphthalene	0.05 ug/L	1.93	-	-	-
Phenanthrene	0.05 ug/L	1.76	-	-	-
Pyrene	0.01 ug/L	0.13	-	-	-
2-Fluorobiphenyl	Surrogate	109%	-	-	-
Terphenyl-d14	Surrogate	111%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
General Inorganics									
Cyanide, free	ND	2	ug/L						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium (VI)	ND	10	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
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	*19.9*		*ug/L*		*99.7*	*50-140*			
Surrogate: Terphenyl-d14	*21.7*		*ug/L*		*109*	*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						

Certificate of Analysis

Client: Lopers & Associates

Client PO:

Report Date: 29-Jun-2021

Order Date: 23-Jun-2021

Project Description: LOP21-018

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroform	ND	0.5	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Ethylene dibromide (dibromoethane, 1,2	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	*82.1*		*ug/L*		*103*	*50-140*			
Surrogate: Dibromofluoromethane	*85.7*		*ug/L*		*107*	*50-140*			
Surrogate: Toluene-d8	*82.8*		*ug/L*		*103*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L	11900			NC	10	
General Inorganics									
Cyanide, free	ND	2	ug/L	ND			NC	20	
pH	8.0	0.1	pH Units	8.0			0.5	3.3	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Metals									
Mercury	ND	0.1	ug/L	ND			NC	20	
Antimony	ND	0.5	ug/L	ND			NC	20	
Arsenic	ND	1	ug/L	ND			NC	20	
Barium	23.0	1	ug/L	24.1			4.5	20	
Beryllium	ND	0.5	ug/L	ND			NC	20	
Boron	21	10	ug/L	20			4.9	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Chromium (VI)	ND	10	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	1.15	0.5	ug/L	1.08			6.1	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Molybdenum	2.23	0.5	ug/L	2.02			10.2	20	
Nickel	ND	1	ug/L	ND			NC	20	
Selenium	ND	1	ug/L	ND			NC	20	
Silver	ND	0.1	ug/L	ND			NC	20	
Sodium	16400	200	ug/L	14300			13.7	20	
Thallium	ND	0.1	ug/L	ND			NC	20	
Uranium	ND	0.1	ug/L	ND			NC	20	
Vanadium	ND	0.5	ug/L	ND			NC	20	
Zinc	9	5	ug/L	10			12.2	20	
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	ND	0.5	ug/L	ND			NC	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroform	ND	0.5	ug/L	ND			NC	30	
Dibromochloromethane	ND	0.5	ug/L	ND			NC	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Ethylene dibromide (dibromoethane, 1,2-	ND	0.2	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	0.53			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*83.6*		*ug/L*		*104*	*50-140*			
Surrogate: Dibromofluoromethane	*85.3*		*ug/L*		*107*	*50-140*			
Surrogate: Toluene-d8	*81.7*		*ug/L*		*102*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	8.91	1	mg/L	ND	89.1	85-115			
General Inorganics									
Cyanide, free	29.8	2	ug/L	ND	99.3	70-130			
Hydrocarbons									
F1 PHCs (C6-C10)	2070	25	ug/L	ND	104	68-117			
F2 PHCs (C10-C16)	1670	100	ug/L	ND	104	60-140			
F3 PHCs (C16-C34)	4180	100	ug/L	ND	107	60-140			
F4 PHCs (C34-C50)	2830	100	ug/L	ND	114	60-140			
Metals									
Mercury	3.55	0.1	ug/L	ND	118	70-130			
Antimony	51.4	0.5	ug/L	ND	103	80-120			
Arsenic	53.4	1	ug/L	ND	106	80-120			
Barium	74.9	1	ug/L	24.1	102	80-120			
Beryllium	52.8	0.5	ug/L	ND	106	80-120			
Boron	71	10	ug/L	20	104	80-120			
Cadmium	51.8	0.1	ug/L	ND	104	80-120			
Chromium (VI)	185	10	ug/L	ND	92.5	70-130			
Chromium	52.3	1	ug/L	ND	104	80-120			
Cobalt	52.4	0.5	ug/L	ND	105	80-120			
Copper	50.1	0.5	ug/L	1.08	98.1	80-120			
Lead	44.4	0.1	ug/L	ND	88.7	80-120			
Molybdenum	49.9	0.5	ug/L	2.02	95.8	80-120			
Nickel	50.4	1	ug/L	ND	100	80-120			
Selenium	50.5	1	ug/L	ND	101	80-120			
Silver	50.2	0.1	ug/L	ND	100	80-120			
Sodium	26600	200	ug/L	14300	123	80-120			QM-07
Thallium	48.3	0.1	ug/L	ND	96.5	80-120			
Uranium	43.1	0.1	ug/L	ND	86.1	80-120			
Vanadium	53.1	0.5	ug/L	ND	106	80-120			
Zinc	57	5	ug/L	10	94.2	80-120			
Semi-Volatiles									
Acenaphthene	4.66	0.05	ug/L	ND	93.3	50-140			
Acenaphthylene	4.13	0.05	ug/L	ND	82.6	50-140			
Anthracene	4.78	0.01	ug/L	ND	95.5	50-140			
Benzo [a] anthracene	4.76	0.01	ug/L	ND	95.2	50-140			
Benzo [a] pyrene	5.05	0.01	ug/L	ND	101	50-140			
Benzo [b] fluoranthene	5.80	0.05	ug/L	ND	116	50-140			
Benzo [g,h,i] perylene	4.25	0.05	ug/L	ND	85.1	50-140			
Benzo [k] fluoranthene	6.54	0.05	ug/L	ND	131	50-140			
Chrysene	5.19	0.05	ug/L	ND	104	50-140			
Dibenzo [a,h] anthracene	4.87	0.05	ug/L	ND	97.4	50-140			
Fluoranthene	4.30	0.01	ug/L	ND	86.0	50-140			
Fluorene	4.18	0.05	ug/L	ND	83.7	50-140			
Indeno [1,2,3-cd] pyrene	4.78	0.05	ug/L	ND	95.5	50-140			
1-Methylnaphthalene	4.45	0.05	ug/L	ND	88.9	50-140			
2-Methylnaphthalene	4.79	0.05	ug/L	ND	95.8	50-140			
Naphthalene	4.50	0.05	ug/L	ND	90.0	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Phenanthrene	4.59	0.05	ug/L	ND	91.7	50-140			
Pyrene	4.38	0.01	ug/L	ND	87.7	50-140			
Surrogate: 2-Fluorobiphenyl	*19.4*		*ug/L*		*97.1*	*50-140*			
Surrogate: Terphenyl-d14	*22.9*		*ug/L*		*114*	*50-140*			
Volatiles									
Acetone	112	5.0	ug/L	ND	112	50-140			
Benzene	36.0	0.5	ug/L	ND	89.9	60-130			
Bromodichloromethane	41.2	0.5	ug/L	ND	103	60-130			
Bromoform	43.7	0.5	ug/L	ND	109	60-130			
Bromomethane	40.0	0.5	ug/L	ND	99.9	50-140			
Carbon Tetrachloride	41.0	0.2	ug/L	ND	103	60-130			
Chlorobenzene	38.2	0.5	ug/L	ND	95.5	60-130			
Chloroform	38.0	0.5	ug/L	ND	95.0	60-130			
Dibromochloromethane	40.2	0.5	ug/L	ND	101	60-130			
Dichlorodifluoromethane	41.6	1.0	ug/L	ND	104	50-140			
1,2-Dichlorobenzene	36.3	0.5	ug/L	ND	90.7	60-130			
1,3-Dichlorobenzene	36.4	0.5	ug/L	ND	91.0	60-130			
1,4-Dichlorobenzene	35.8	0.5	ug/L	ND	89.5	60-130			
1,1-Dichloroethane	37.1	0.5	ug/L	ND	92.7	60-130			
1,2-Dichloroethane	38.0	0.5	ug/L	ND	94.9	60-130			
1,1-Dichloroethylene	33.4	0.5	ug/L	ND	83.5	60-130			
cis-1,2-Dichloroethylene	36.1	0.5	ug/L	ND	90.2	60-130			
trans-1,2-Dichloroethylene	37.2	0.5	ug/L	ND	92.9	60-130			
1,2-Dichloropropane	34.8	0.5	ug/L	ND	87.1	60-130			
cis-1,3-Dichloropropylene	41.0	0.5	ug/L	ND	102	60-130			
trans-1,3-Dichloropropylene	45.6	0.5	ug/L	ND	114	60-130			
Ethylbenzene	35.9	0.5	ug/L	ND	89.8	60-130			
Ethylene dibromide (dibromoethane, 1,2-	38.3	0.2	ug/L	ND	95.8	60-130			
Hexane	43.4	1.0	ug/L	ND	108	60-130			
Methyl Ethyl Ketone (2-Butanone)	84.9	5.0	ug/L	ND	84.9	50-140			
Methyl Isobutyl Ketone	83.0	5.0	ug/L	ND	83.0	50-140			
Methyl tert-butyl ether	99.2	2.0	ug/L	ND	99.2	50-140			
Methylene Chloride	32.4	5.0	ug/L	ND	80.9	60-130			
Styrene	39.5	0.5	ug/L	ND	98.7	60-130			
1,1,1,2-Tetrachloroethane	36.4	0.5	ug/L	ND	91.0	60-130			
1,1,2,2-Tetrachloroethane	33.8	0.5	ug/L	ND	84.4	60-130			
Tetrachloroethylene	37.5	0.5	ug/L	ND	93.8	60-130			
Toluene	38.9	0.5	ug/L	ND	97.3	60-130			
1,1,1-Trichloroethane	38.7	0.5	ug/L	ND	96.8	60-130			
1,1,2-Trichloroethane	36.4	0.5	ug/L	ND	90.9	60-130			
Trichloroethylene	39.3	0.5	ug/L	ND	98.3	60-130			
Trichlorofluoromethane	33.1	1.0	ug/L	ND	82.8	60-130			
Vinyl chloride	39.2	0.5	ug/L	ND	98.0	50-140			
m,p-Xylenes	75.7	0.5	ug/L	ND	94.6	60-130			
o-Xylene	37.7	0.5	ug/L	ND	94.2	60-130			
Surrogate: 4-Bromofluorobenzene	*86.5*		*ug/L*		*108*	*50-140*			
Surrogate: Dibromofluoromethane	*91.7*		*ug/L*		*115*	*50-140*			
Surrogate: Toluene-d8	*80.7*		*ug/L*		*101*	*50-140*			

Qualifier Notes:

QC Qualifiers :

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

Sample Data Revisions

None

Work Order Revisions / Comments:

Insufficient volume in general chemistry bottle. Sub-sampled from PAH and PHC for additional sample.

Other Report Notes:

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

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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Paracel ID: 2126398

Chain Of Custody
(Lab Use Only)
№ 132337

Client Name: Lopers & Associates	Project Ref: LOP21-018	Page __ of __
Contact Name: Luke Lopers	Quote #:	Turnaround Time
Address: 30 Leishfield Way, Ottawa	PO #:	☐ 1 day ☐ 3 day
	E-mail: Luke@Lopers.ca	☐ 2 day ☒ Regular
Telephone: 613-327-9073		Date Required:

Regulation 153/04: ☐ Table 1 ☒ Res/Park ☐ Med/Fine ☐ Table 2 ☐ Ind/Comm ☒ Coarse ☒ Table 3 ☐ Agri/Other ☐ Table ___ For RSC: ☒ Yes ☐ No

Other Regulation: ☐ REG 558 ☐ PWQO ☐ CCME ☐ MISA ☐ SU - Sani ☐ SU - Storm Mun: ___ ☐ Other:

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

Required Analysis

	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)	Metals + Inorganics
1	BH2-20	GW		9	June 23, 2021		X	X	X					X
2	BH3-20	GW		9			X	X	X					X
3	BH4-21	GW		9			X	X	X					X
4	BH5-21	GW		9			X	X	X					X
5	BH14-21	GW		9			X	X	X					X
6	Trip Blank	GW		2				X						
7														
8														
9														
10														

Comments: Metals have been field filtered

Method of Delivery: Drop Box

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Luke Lopers	Date/Time:	Date/Time: June 23/21 15:25	Date/Time: June 24/21, 12:05pm
Date/Time: June 23, 2021 / 3:07PM	Temperature: °C	Temperature: 18.9 °C	pH Verified: ☐ By: SC

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Certificate of Analysis

Paterson Group Consulting Engineers
28 Concourse Gate, Unit 1
Nepean, ON K2E 7T7
Attn: Luke Lopers

Phone: (613) 226-7381
Fax: (613) 226-6344

Client PO: 9151
Project: PE2073
Custody: 71568

Report Date: 8-Sep-2010
Order Date: 1-Sep-2010
Order #: 1036123

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

Paracel ID	Client ID
1036123-01	BH3-GW1

Approved By: Mark Foto

Mark Foto, M.Sc. For Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Report Date: 08-Sep-2010

Client: **Paterson Group Consulting Engineers**

Order Date:1-Sep-2010

Client PO: 9151 Project Description: PE2073

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
CCME PHC F1	CWS Tier 1 - P&T GC-FID	3-Sep-10	7-Sep-10
CCME PHC F1 to F4 + VOC	[CALC]	2-Sep-10	7-Sep-10
CCME PHC F2 - F4	CWS Tier 1 - GC-FID, extraction	2-Sep-10	3-Sep-10
VOCs	EPA 624 - P&T GC-MS	3-Sep-10	7-Sep-10

Certificate of Analysis

Report Date: 08-Sep-2010

Client: **Paterson Group Consulting Engineers**

Order Date:1-Sep-2010

Client PO: 9151

Project Description: PE2073

	Client ID:	BH3-GW1	-	-	-
	Sample Date:	01-Sep-10	-	-	-
	Sample ID:	1036123-01	-	-	-
	MDL/Units	Water	-	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	-	-	-
Bromodichloromethane	0.4 ug/L	<0.4	-	-	-
Bromoform	0.5 ug/L	<0.5	-	-	-
Bromomethane	0.7 ug/L	<0.7	-	-	-
Carbon Tetrachloride	0.5 ug/L	<0.5	-	-	-
Chlorobenzene	0.4 ug/L	<0.4	-	-	-
Chloroethane	1.0 ug/L	<1.0	-	-	-
Chloroform	0.5 ug/L	<0.5	-	-	-
Chloromethane	3.0 ug/L	<3.0	-	-	-
Dibromochloromethane	0.5 ug/L	<0.5	-	-	-
1,2-Dibromoethane	1.0 ug/L	<1.0	-	-	-
1,2-Dichlorobenzene	0.4 ug/L	<0.4	-	-	-
1,3-Dichlorobenzene	0.4 ug/L	<0.4	-	-	-
1,4-Dichlorobenzene	0.4 ug/L	<0.4	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
cis-1,2-Dichloroethylene	0.4 ug/L	<0.4	-	-	-
trans-1,2-Dichloroethylene	1.0 ug/L	<1.0	-	-	-
1,2-Dichloroethylene, total	1.4 ug/L	<1.4	-	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	-	-	-
cis-1,3-Dichloropropylene	0.4 ug/L	<0.4	-	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
1,3-Dichloropropene, total	0.9 ug/L	<0.9	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Methylene Chloride	4.0 ug/L	<4.0	-	-	-
Styrene	0.4 ug/L	<0.4	-	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
1,1,2,2-Tetrachloroethane	0.6 ug/L	<0.6	-	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
1,1,1-Trichloroethane	0.4 ug/L	<0.4	-	-	-
1,1,2-Trichloroethane	0.6 ug/L	<0.6	-	-	-

Certificate of Analysis

Report Date: 08-Sep-2010

Client: **Paterson Group Consulting Engineers**

Order Date:1-Sep-2010

Client PO: 9151

Project Description: PE2073

	Client ID:	BH3-GW1	-	-	-
	Sample Date:	01-Sep-10	-	-	-
	Sample ID:	1036123-01	-	-	-
	MDL/Units	Water	-	-	-
Trichloroethylene	0.4 ug/L	<0.4	-	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	-	-	-
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	-	-	-
Vinyl chloride	0.4 ug/L	<0.4	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-
Xylenes, total	1.0 ug/L	<1.0	-	-	-
4-Bromofluorobenzene	Surrogate	98.3%	-	-	-
Dibromofluoromethane	Surrogate	104%	-	-	-
Toluene-d8	Surrogate	98.4%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	200 ug/L	<200	-	-	-
F2 PHCs (C10-C16)	100 ug/L	362	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	-	-
F1 + F2 PHCs	300 ug/L	362	-	-	-
F3 + F4 PHCs	200 ug/L	<200	-	-	-

Certificate of Analysis

Report Date: 08-Sep-2010

Client: **Paterson Group Consulting Engineers**

Order Date:1-Sep-2010

Client PO: 9151 Project Description: PE2073

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	200	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						
Volatiles									
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.4	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.7	ug/L						
Carbon Tetrachloride	ND	0.5	ug/L						
Chlorobenzene	ND	0.4	ug/L						
Chloroethane	ND	1.0	ug/L						
Chloroform	ND	0.5	ug/L						
Chloromethane	ND	3.0	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
1,2-Dibromoethane	ND	1.0	ug/L						
1,2-Dichlorobenzene	ND	0.4	ug/L						
1,3-Dichlorobenzene	ND	0.4	ug/L						
1,4-Dichlorobenzene	ND	0.4	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	0.4	ug/L						
trans-1,2-Dichloroethylene	ND	1.0	ug/L						
1,2-Dichloroethylene, total	ND	1.4	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.4	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.9	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	4.0	ug/L						
Styrene	ND	0.4	ug/L						
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L						
1,1,2,2-Tetrachloroethane	ND	0.6	ug/L						
Tetrachloroethylene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
1,1,1-Trichloroethane	ND	0.4	ug/L						
1,1,2-Trichloroethane	ND	0.6	ug/L						
Trichloroethylene	ND	0.4	ug/L						
Trichlorofluoromethane	ND	1.0	ug/L						
1,3,5-Trimethylbenzene	ND	0.5	ug/L						
Vinyl chloride	ND	0.4	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	1.0	ug/L						
Surrogate: 4-Bromofluorobenzene	*82.3*		*ug/L*		*103*	*83-134*			
Surrogate: Dibromofluoromethane	*79.3*		*ug/L*		*99.1*	*78-124*			
Surrogate: Toluene-d8	*70.9*		*ug/L*		*88.6*	*76-118*			

Certificate of Analysis

Report Date: 08-Sep-2010

Client: **Paterson Group Consulting Engineers**

Order Date:1-Sep-2010

Client PO: 9151 Project Description: PE2073

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	200	ug/L	ND				32	
Volatiles									
Benzene	ND	0.5	ug/L	ND				20	
Bromodichloromethane	ND	0.4	ug/L	ND				25	
Bromoform	ND	0.5	ug/L	ND				25	
Bromomethane	ND	0.7	ug/L	ND				25	
Carbon Tetrachloride	ND	0.5	ug/L	ND				25	
Chlorobenzene	ND	0.4	ug/L	ND				25	
Chloroethane	ND	1.0	ug/L	ND				25	
Chloroform	ND	0.5	ug/L	ND				19	
Chloromethane	ND	3.0	ug/L	ND				25	
Dibromochloromethane	ND	0.5	ug/L	ND				25	
1,2-Dibromoethane	ND	1.0	ug/L	ND				25	
1,2-Dichlorobenzene	ND	0.4	ug/L	ND				25	
1,3-Dichlorobenzene	ND	0.4	ug/L	ND				25	
1,4-Dichlorobenzene	ND	0.4	ug/L	ND				25	
1,1-Dichloroethane	ND	0.5	ug/L	ND				21	
1,2-Dichloroethane	ND	0.5	ug/L	ND				25	
1,1-Dichloroethylene	ND	0.5	ug/L	ND				21	
cis-1,2-Dichloroethylene	ND	0.4	ug/L	ND				20	
trans-1,2-Dichloroethylene	ND	1.0	ug/L	ND				25	
1,2-Dichloropropane	ND	0.5	ug/L	ND				25	
cis-1,3-Dichloropropylene	ND	0.4	ug/L	ND				25	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND				25	
Ethylbenzene	ND	0.5	ug/L	ND				35	
Methylene Chloride	ND	4.0	ug/L	ND				25	
Styrene	ND	0.4	ug/L	ND				25	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND				25	
1,1,2,2-Tetrachloroethane	ND	0.6	ug/L	ND				25	
Tetrachloroethylene	ND	0.5	ug/L	ND				31	
Toluene	ND	0.5	ug/L	ND				30	
1,1,1-Trichloroethane	ND	0.4	ug/L	ND				25	
1,1,2-Trichloroethane	ND	0.6	ug/L	ND				25	
Trichloroethylene	ND	0.4	ug/L	ND				30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				25	
1,3,5-Trimethylbenzene	ND	0.5	ug/L	ND				20	
Vinyl chloride	ND	0.4	ug/L	ND				25	
m,p-Xylenes	ND	0.5	ug/L	ND				34	
o-Xylene	ND	0.5	ug/L	ND				32	
Surrogate: 4-Bromofluorobenzene	*82.3*		*ug/L*	*ND*	*103*	*83-134*			
Surrogate: Dibromofluoromethane	*81.7*		*ug/L*	*ND*	*102*	*78-124*			
Surrogate: Toluene-d8	*71.0*		*ug/L*	*ND*	*88.8*	*76-118*			

Certificate of Analysis

Report Date: 08-Sep-2010

Client: **Paterson Group Consulting Engineers**

Order Date:1-Sep-2010

Client PO: 9151 Project Description: PE2073

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1800	200	ug/L	ND	89.8	68-117			
F2 PHCs (C10-C16)	1520	100	ug/L	ND	95.2	61-129			
F3 PHCs (C16-C34)	3920	100	ug/L	ND	98.0	61-129			
F4 PHCs (C34-C50)	2900	100	ug/L	ND	121	61-129			
Volatiles									
Benzene	35.1	0.5	ug/L	ND	87.7	55-141			
Bromodichloromethane	36.0	0.4	ug/L	ND	90.0	52-139			
Bromoform	39.5	0.5	ug/L	ND	98.8	52-170			
Bromomethane	41.6	0.7	ug/L	ND	104	32-138			
Carbon Tetrachloride	41.2	0.5	ug/L	ND	103	49-149			
Chlorobenzene	34.6	0.4	ug/L	ND	86.4	64-137			
Chloroethane	29.1	1.0	ug/L	ND	72.6	39-152			
Chloroform	36.1	0.5	ug/L	ND	90.3	58-138			
Chloromethane	42.6	3.0	ug/L	ND	106	24-163			
Dibromochloromethane	38.6	0.5	ug/L	ND	96.6	61-153			
1,2-Dibromoethane	38.7	1.0	ug/L	ND	96.7	61-145			
1,2-Dichlorobenzene	33.5	0.4	ug/L	ND	83.6	60-150			
1,3-Dichlorobenzene	32.9	0.4	ug/L	ND	82.2	62-149			
1,4-Dichlorobenzene	34.2	0.4	ug/L	ND	85.5	63-132			
1,1-Dichloroethane	35.0	0.5	ug/L	ND	87.5	51-156			
1,2-Dichloroethane	38.5	0.5	ug/L	ND	96.3	50-140			
1,1-Dichloroethylene	32.0	0.5	ug/L	ND	80.0	43-153			
cis-1,2-Dichloroethylene	39.4	0.4	ug/L	ND	98.6	58-145			
trans-1,2-Dichloroethylene	43.6	1.0	ug/L	ND	109	51-145			
1,2-Dichloropropane	33.7	0.5	ug/L	ND	84.2	56-136			
cis-1,3-Dichloropropylene	38.0	0.4	ug/L	ND	95.1	54-141			
trans-1,3-Dichloropropylene	42.5	0.5	ug/L	ND	106	61-140			
Ethylbenzene	31.6	0.5	ug/L	ND	79.0	61-139			
Methylene Chloride	33.2	4.0	ug/L	ND	83.0	58-149			
Styrene	28.3	0.4	ug/L	ND	70.6	63-143			
1,1,1,2-Tetrachloroethane	41.7	0.5	ug/L	ND	104	61-148			
1,1,2,2-Tetrachloroethane	38.1	0.6	ug/L	ND	95.2	50-157			
Tetrachloroethylene	32.0	0.5	ug/L	ND	79.9	51-145			
Toluene	36.8	0.5	ug/L	ND	92.0	54-136			
1,1,1-Trichloroethane	36.2	0.4	ug/L	ND	90.4	55-140			
1,1,2-Trichloroethane	39.4	0.6	ug/L	ND	98.6	63-144			
Trichloroethylene	36.9	0.4	ug/L	ND	92.2	52-135			
Trichlorofluoromethane	36.9	1.0	ug/L	ND	92.2	37-155			
1,3,5-Trimethylbenzene	32.6	0.5	ug/L	ND	81.5	61-151			
Vinyl chloride	41.3	0.4	ug/L	ND	103	31-159			
m,p-Xylenes	65.1	0.5	ug/L	ND	81.4	61-139			
o-Xylene	33.0	0.5	ug/L	ND	82.6	60-142			
Surrogate: 4-Bromofluorobenzene	*77.6*		*ug/L*		*97.0*	*83-134*			
Surrogate: Dibromofluoromethane	*75.3*		*ug/L*		*94.1*	*78-124*			
Surrogate: Toluene-d8	*81.2*		*ug/L*		*102*	*76-118*			

Sample and QC Qualifiers Notes

None

Sample Data Revisions

None

Work Order Revisions/Comments:

None

Other Report Notes:

n/a: not applicable
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.

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e: paracel@paracellabs.com

Chain of Custody
(lab use only)

Nº 71568

Reg. Drinking Water

Client Name: Paterson Group	Project Ref: PE2073	Waterworks Name:	Page 1 of 1
Contact Name: Luke Lopers	Quote #	Waterworks Number:	Sample Taken by:
Address: 28 Concourse Gate	PO # 9151	Address:	Print Name: Tyler Robinson
	E-mail Address: llopers@patersongroup.ca	After hours Contact:	Signature:
Telephone: 226-7381	Fax: 226-6344	Public Health Unit:	TAT: [ ] 1-day [ ] 2-day [✓] Reg.

Matrix Types: S–Soil/Sed. GW–Ground Water SW–Surface Water SS–Storm/Sanitary Sewer DW-Drinking Water RDW-Regulated Drinking Water P- Paint A-Air O-Other

Samples submitted under: (Indicate **ONLY** one)
[✓] O. Reg 153 (511) Table 3 [ ] O. Reg 170/03 [ ] O. Reg 318/08 [ ] Private well
[ ] CCME ____ [ ] O. Reg 243/07 [ ] O. Reg 319/08 [ ] Other: ____

Type of DW Sample: R = Raw; T = Treated; D = Distribution
Location Types: S = Surface Water; G = Ground Water

Paracel Order Number: 1036123

	Sample ID / Location Name	Matrix	Air Volume	Type of Sample	# of Containers	Sample Taken: Date	Sample Taken: Time	Free / Combined Chlorine Residual mg/L	Required Analyses: PHCs	Required Analyses: VOCs							
1	BH3-GW1	GW			3	September 1, 2010			X	X							
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Comments: J.K.

Preservation Verification: pH _____ Temperature _____
Verified by: _____

Relinquished By (Print & Sign): [signature]
Date/Time: September 1, 2010

Lab Use Only:

Received By Driver/Depot: 3:40	Received at Lab: [signature]	Verified By: [signature]	
Date/Time: SEP 1/10	Date/Time: Sept 1/10 4:30pm	Date/Time: Sept 1/10 4:34pm	

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 30715
Project: PE2073
Custody: 128120

Report Date: 4-Sep-2020
Order Date: 31-Aug-2020

Order #: 2036155

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

Paracel ID	Client ID
2036155-01	BH3-20-GW1

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Report Date: 04-Sep-2020

Client: Paterson Group Consulting Engineers

Order Date: 31-Aug-2020

Client PO: 30715

Project Description: PE2073

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PHC F1	CWS Tier 1 - P&T GC-FID	1-Sep-20	2-Sep-20
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	4-Sep-20	4-Sep-20
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	1-Sep-20	2-Sep-20

Certificate of Analysis

Report Date: 04-Sep-2020

Client: **Paterson Group Consulting Engineers**

Order Date: 31-Aug-2020

Client PO: **30715**

Project Description: **PE2073**

	Client ID:	BH3-20-GW1	-	-	-
	Sample Date:	28-Aug-20 09:00	-	-	-
	Sample ID:	2036155-01	-	-	-
	MDL/Units	Water	-	-	-
Volatiles					
Acetone	5.0 ug/L	<5.0	-	-	-
Benzene	0.5 ug/L	<0.5	-	-	-
Bromodichloromethane	0.5 ug/L	<0.5	-	-	-
Bromoform	0.5 ug/L	<0.5	-	-	-
Bromomethane	0.5 ug/L	<0.5	-	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	-	-	-
Chlorobenzene	0.5 ug/L	<0.5	-	-	-
Chloroform	0.5 ug/L	<0.5	-	-	-
Dibromochloromethane	0.5 ug/L	<0.5	-	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	-	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	-	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Ethylene dibromide (dibromoethane, 1,2-)	0.2 ug/L	<0.2	-	-	-
Hexane	1.0 ug/L	<1.0	-	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	-	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	-	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-
Styrene	0.5 ug/L	<0.5	-	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Report Date: 04-Sep-2020

Client: Paterson Group Consulting Engineers

Order Date: 31-Aug-2020

Client PO: 30715

Project Description: PE2073

	Client ID:	BH3-20-GW1	-	-	-
	Sample Date:	28-Aug-20 09:00	-	-	-
	Sample ID:	2036155-01	-	-	-
	MDL/Units	Water	-	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	-	-	-
Trichloroethylene	0.5 ug/L	<0.5	-	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-
Xylenes, total	0.5 ug/L	<0.5	-	-	-
4-Bromofluorobenzene	Surrogate	119%	-	-	-
Dibromofluoromethane	Surrogate	76.2%	-	-	-
Toluene-d8	Surrogate	119%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	-	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	-	-

Certificate of Analysis

Report Date: 04-Sep-2020

Client: Paterson Group Consulting Engineers

Order Date: 31-Aug-2020

Client PO: 30715

Project Description: PE2073

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						
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroform	ND	0.5	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Ethylene dibromide (dibromoethane, 1,2	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	*97.5*		*ug/L*		*122*	*50-140*			
Surrogate: Dibromofluoromethane	*66.0*		*ug/L*		*82.5*	*50-140*			
Surrogate: Toluene-d8	*96.0*		*ug/L*		*120*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	ND	0.5	ug/L	ND			NC	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroform	ND	0.5	ug/L	ND			NC	30	
Dibromochloromethane	ND	0.5	ug/L	ND			NC	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Ethylene dibromide (dibromoethane, 1,2-	ND	0.2	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*99.1*		*ug/L*		*124*	*50-140*			
Surrogate: Dibromofluoromethane	*62.4*		*ug/L*		*78.0*	*50-140*			
Surrogate: Toluene-d8	*91.0*		*ug/L*		*114*	*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)	2040	25	ug/L	ND	102	68-117			
F2 PHCs (C10-C16)	1690	100	ug/L	ND	105	60-140			
F3 PHCs (C16-C34)	4620	100	ug/L	ND	118	60-140			
F4 PHCs (C34-C50)	2990	100	ug/L	ND	121	60-140			
Volatiles									
Acetone	73.6	5.0	ug/L	ND	73.6	50-140			
Benzene	25.7	0.5	ug/L	ND	64.3	60-130			
Bromodichloromethane	30.6	0.5	ug/L	ND	76.4	60-130			
Bromoform	32.7	0.5	ug/L	ND	81.7	60-130			
Bromomethane	28.6	0.5	ug/L	ND	71.5	50-140			
Carbon Tetrachloride	25.8	0.2	ug/L	ND	64.4	60-130			
Chlorobenzene	28.9	0.5	ug/L	ND	72.2	60-130			
Chloroform	32.7	0.5	ug/L	ND	81.7	60-130			
Dibromochloromethane	30.8	0.5	ug/L	ND	77.0	60-130			
Dichlorodifluoromethane	32.5	1.0	ug/L	ND	81.2	50-140			
1,2-Dichlorobenzene	26.4	0.5	ug/L	ND	66.0	60-130			
1,3-Dichlorobenzene	28.5	0.5	ug/L	ND	71.2	60-130			
1,4-Dichlorobenzene	24.0	0.5	ug/L	ND	60.1	60-130			
1,1-Dichloroethane	27.7	0.5	ug/L	ND	69.3	60-130			
1,2-Dichloroethane	28.1	0.5	ug/L	ND	70.2	60-130			
1,1-Dichloroethylene	34.8	0.5	ug/L	ND	86.9	60-130			
cis-1,2-Dichloroethylene	35.2	0.5	ug/L	ND	88.1	60-130			
trans-1,2-Dichloroethylene	35.4	0.5	ug/L	ND	88.5	60-130			
1,2-Dichloropropane	26.0	0.5	ug/L	ND	65.1	60-130			
cis-1,3-Dichloropropylene	31.0	0.5	ug/L	ND	77.5	60-130			
trans-1,3-Dichloropropylene	35.1	0.5	ug/L	ND	87.8	60-130			
Ethylbenzene	28.0	0.5	ug/L	ND	69.9	60-130			
Ethylene dibromide (dibromoethane, 1,2-	27.0	0.2	ug/L	ND	67.5	60-130			
Hexane	27.2	1.0	ug/L	ND	68.0	60-130			
Methyl Ethyl Ketone (2-Butanone)	68.2	5.0	ug/L	ND	68.2	50-140			
Methyl Isobutyl Ketone	56.2	5.0	ug/L	ND	56.2	50-140			
Methyl tert-butyl ether	54.1	2.0	ug/L	ND	54.1	50-140			
Methylene Chloride	25.0	5.0	ug/L	ND	62.5	60-130			
Styrene	29.3	0.5	ug/L	ND	73.4	60-130			
1,1,1,2-Tetrachloroethane	27.7	0.5	ug/L	ND	69.3	60-130			
1,1,2,2-Tetrachloroethane	25.6	0.5	ug/L	ND	64.0	60-130			
Tetrachloroethylene	29.1	0.5	ug/L	ND	72.8	60-130			
Toluene	44.9	0.5	ug/L	ND	112	60-130			
1,1,1-Trichloroethane	27.4	0.5	ug/L	ND	68.4	60-130			
1,1,2-Trichloroethane	44.1	0.5	ug/L	ND	110	60-130			
Trichloroethylene	28.7	0.5	ug/L	ND	71.8	60-130			
Trichlorofluoromethane	24.4	1.0	ug/L	ND	61.0	60-130			
Vinyl chloride	27.0	0.5	ug/L	ND	67.6	50-140			
m,p-Xylenes	59.5	0.5	ug/L	ND	74.4	60-130			
o-Xylene	27.9	0.5	ug/L	ND	69.8	60-130			
Surrogate: 4-Bromofluorobenzene	*82.9*		*ug/L*		*104*	*50-140*			
Surrogate: Dibromofluoromethane	*72.2*		*ug/L*		*90.2*	*50-140*			
Surrogate: Toluene-d8	*90.8*		*ug/L*		*113*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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 LABORATORIES LTD.

Paracel ID: 2036155

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2036155	Nº 128120

Client Name: PATERSON	Project Ref: PE2073	Page 1 of 1
Contact Name: MARK DARCY	Quote #:	**Turnaround Time**
Address: 1584 COLONNADE Rd. S OTTAWA, ONT.	PO #: 30715	☐ 1 day ☐ 3 day ☐ 2 day ☑ Regular
Telephone: (613) 226-7381	E-mail: MDARCY@PATERSONGROUP.CA	Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☑ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table ___	Mun:
For RSC: ☐ Yes ☑ No	☐ Other:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)						
1	BH3-20-GW1	GW	—	3	AUG 28/20	—	✓	✓											✓
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Comments:

Method of Delivery: Drop Box

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): DOMINIC LANDRY	Date/Time:	Date/Time: AUG 31, 20 18:15	Date/Time: Sept 1, 2020 12:14
Date/Time: AUG 31ST/2020	Temperature: °C	Temperature: 20.3 °C	pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 30739
Project: PE2073
Custody: 128124

Report Date: 11-Sep-2020
Order Date: 9-Sep-2020

Order #: 2037189

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

Paracel ID	Client ID
2037189-01	BH1-GW1

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 30739

Report Date: 11-Sep-2020

Order Date: 9-Sep-2020

Project Description: PE2073

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PHC F1	CWS Tier 1 - P&T GC-FID	9-Sep-20	10-Sep-20
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	10-Sep-20	10-Sep-20
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	9-Sep-20	10-Sep-20

Certificate of Analysis

Report Date: 11-Sep-2020

Client: **Paterson Group Consulting Engineers**

Order Date: 9-Sep-2020

Client PO: **30739**

Project Description: PE2073

	Client ID:	BH1-GW1	-	-	-
	Sample Date:	08-Sep-20 15:00	-	-	-
	Sample ID:	2037189-01	-	-	-
	MDL/Units	Water	-	-	-
Volatiles					
Acetone	5.0 ug/L	<5.0	-	-	-
Benzene	0.5 ug/L	<0.5	-	-	-
Bromodichloromethane	0.5 ug/L	<0.5	-	-	-
Bromoform	0.5 ug/L	<0.5	-	-	-
Bromomethane	0.5 ug/L	<0.5	-	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	-	-	-
Chlorobenzene	0.5 ug/L	<0.5	-	-	-
Chloroform	0.5 ug/L	<0.5	-	-	-
Dibromochloromethane	0.5 ug/L	<0.5	-	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	-	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	-	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Ethylene dibromide (dibromoethane, 1,2-)	0.2 ug/L	<0.2	-	-	-
Hexane	1.0 ug/L	<1.0	-	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	-	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	-	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-
Styrene	0.5 ug/L	<0.5	-	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Report Date: 11-Sep-2020

Client: **Paterson Group Consulting Engineers**

Order Date: 9-Sep-2020

Client PO: **30739**

Project Description: **PE2073**

	Client ID:	BH1-GW1	-	-	-
	Sample Date:	08-Sep-20 15:00	-	-	-
	Sample ID:	2037189-01	-	-	-
	MDL/Units	Water	-	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	-	-	-
Trichloroethylene	0.5 ug/L	<0.5	-	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-
Xylenes, total	0.5 ug/L	<0.5	-	-	-
4-Bromofluorobenzene	Surrogate	101%	-	-	-
Dibromofluoromethane	Surrogate	99.2%	-	-	-
Toluene-d8	Surrogate	104%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	-	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	-	-

Certificate of Analysis

Report Date: 11-Sep-2020

Client: Paterson Group Consulting Engineers

Order Date: 9-Sep-2020

Client PO: 30739

Project Description: PE2073

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						
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroform	ND	0.5	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Ethylene dibromide (dibromoethane, 1,2	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	*81.7*		*ug/L*		*102*	*50-140*			
Surrogate: Dibromofluoromethane	*76.9*		*ug/L*		*96.1*	*50-140*			
Surrogate: Toluene-d8	*83.9*		*ug/L*		*105*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	ND	0.5	ug/L	ND			NC	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroform	13.1	0.5	ug/L	13.1			0.5	30	
Dibromochloromethane	ND	0.5	ug/L	ND			NC	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Ethylene dibromide (dibromoethane, 1,2-	ND	0.2	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*82.3*		*ug/L*		*103*	*50-140*			
Surrogate: Dibromofluoromethane	*80.1*		*ug/L*		*100*	*50-140*			
Surrogate: Toluene-d8	*83.4*		*ug/L*		*104*	*50-140*			

Certificate of Analysis

Report Date: 11-Sep-2020

Client: Paterson Group Consulting Engineers

Order Date: 9-Sep-2020

Client PO: 30739

Project Description: PE2073

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1900	25	ug/L	ND	95.0	68-117			
F2 PHCs (C10-C16)	1660	100	ug/L	ND	104	60-140			
F3 PHCs (C16-C34)	4100	100	ug/L	ND	105	60-140			
F4 PHCs (C34-C50)	2700	100	ug/L	ND	109	60-140			
Volatiles									
Acetone	90.3	5.0	ug/L	ND	90.3	50-140			
Benzene	39.3	0.5	ug/L	ND	98.3	60-130			
Bromodichloromethane	38.4	0.5	ug/L	ND	96.1	60-130			
Bromoform	38.3	0.5	ug/L	ND	95.6	60-130			
Bromomethane	41.0	0.5	ug/L	ND	103	50-140			
Carbon Tetrachloride	41.6	0.2	ug/L	ND	104	60-130			
Chlorobenzene	41.4	0.5	ug/L	ND	103	60-130			
Chloroform	40.7	0.5	ug/L	ND	102	60-130			
Dibromochloromethane	40.0	0.5	ug/L	ND	100	60-130			
Dichlorodifluoromethane	47.8	1.0	ug/L	ND	120	50-140			
1,2-Dichlorobenzene	41.9	0.5	ug/L	ND	105	60-130			
1,3-Dichlorobenzene	42.9	0.5	ug/L	ND	107	60-130			
1,4-Dichlorobenzene	42.6	0.5	ug/L	ND	107	60-130			
1,1-Dichloroethane	39.7	0.5	ug/L	ND	99.3	60-130			
1,2-Dichloroethane	37.8	0.5	ug/L	ND	94.6	60-130			
1,1-Dichloroethylene	40.4	0.5	ug/L	ND	101	60-130			
cis-1,2-Dichloroethylene	44.7	0.5	ug/L	ND	112	60-130			
trans-1,2-Dichloroethylene	39.9	0.5	ug/L	ND	99.8	60-130			
1,2-Dichloropropane	39.3	0.5	ug/L	ND	98.2	60-130			
cis-1,3-Dichloropropylene	36.0	0.5	ug/L	ND	89.9	60-130			
trans-1,3-Dichloropropylene	34.1	0.5	ug/L	ND	85.4	60-130			
Ethylbenzene	39.2	0.5	ug/L	ND	98.1	60-130			
Ethylene dibromide (dibromoethane, 1,2-	38.6	0.2	ug/L	ND	96.6	60-130			
Hexane	43.4	1.0	ug/L	ND	108	60-130			
Methyl Ethyl Ketone (2-Butanone)	97.2	5.0	ug/L	ND	97.2	50-140			
Methyl Isobutyl Ketone	92.1	5.0	ug/L	ND	92.1	50-140			
Methyl tert-butyl ether	90.2	2.0	ug/L	ND	90.2	50-140			
Methylene Chloride	38.8	5.0	ug/L	ND	97.0	60-130			
Styrene	41.9	0.5	ug/L	ND	105	60-130			
1,1,1,2-Tetrachloroethane	40.6	0.5	ug/L	ND	102	60-130			
1,1,2,2-Tetrachloroethane	28.6	0.5	ug/L	ND	71.4	60-130			
Tetrachloroethylene	41.0	0.5	ug/L	ND	102	60-130			
Toluene	40.7	0.5	ug/L	ND	102	60-130			
1,1,1-Trichloroethane	40.8	0.5	ug/L	ND	102	60-130			
1,1,2-Trichloroethane	37.5	0.5	ug/L	ND	93.7	60-130			
Trichloroethylene	47.7	0.5	ug/L	ND	119	60-130			
Trichlorofluoromethane	44.4	1.0	ug/L	ND	111	60-130			
Vinyl chloride	43.0	0.5	ug/L	ND	107	50-140			
m,p-Xylenes	81.4	0.5	ug/L	ND	102	60-130			
o-Xylene	40.8	0.5	ug/L	ND	102	60-130			
Surrogate: 4-Bromofluorobenzene	*83.6*		*ug/L*		*104*	*50-140*			
Surrogate: Dibromofluoromethane	*83.1*		*ug/L*		*104*	*50-140*			
Surrogate: Toluene-d8	*81.8*		*ug/L*		*102*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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 LABORATORIES LTD

Paracel ID: 2037189

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2037189	№ 128124

Client Name: PATERSON	Project Ref: PE 2073	Page 1 of 1
Contact Name: MARK D'ARCY	Quote #:	Turnaround Time
Address: 154 COLONNADE Rd. S. OTTAWA, ONT.	PO #: 30739	☐ 1 day ☐ 3 day ☑ 2 day ☐ Regular
Telephone: (613) 226-7381	E-mail: mdarcy@PATERSONGROUP.ca	Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☑ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table ___	Mun:
For RSC: ☐ Yes ☑ No	☐ Other:

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

	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)						
1	BH1-GW1	GW	1	3	SEPT. 08/20	3:00p	✓	✓											✓
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			

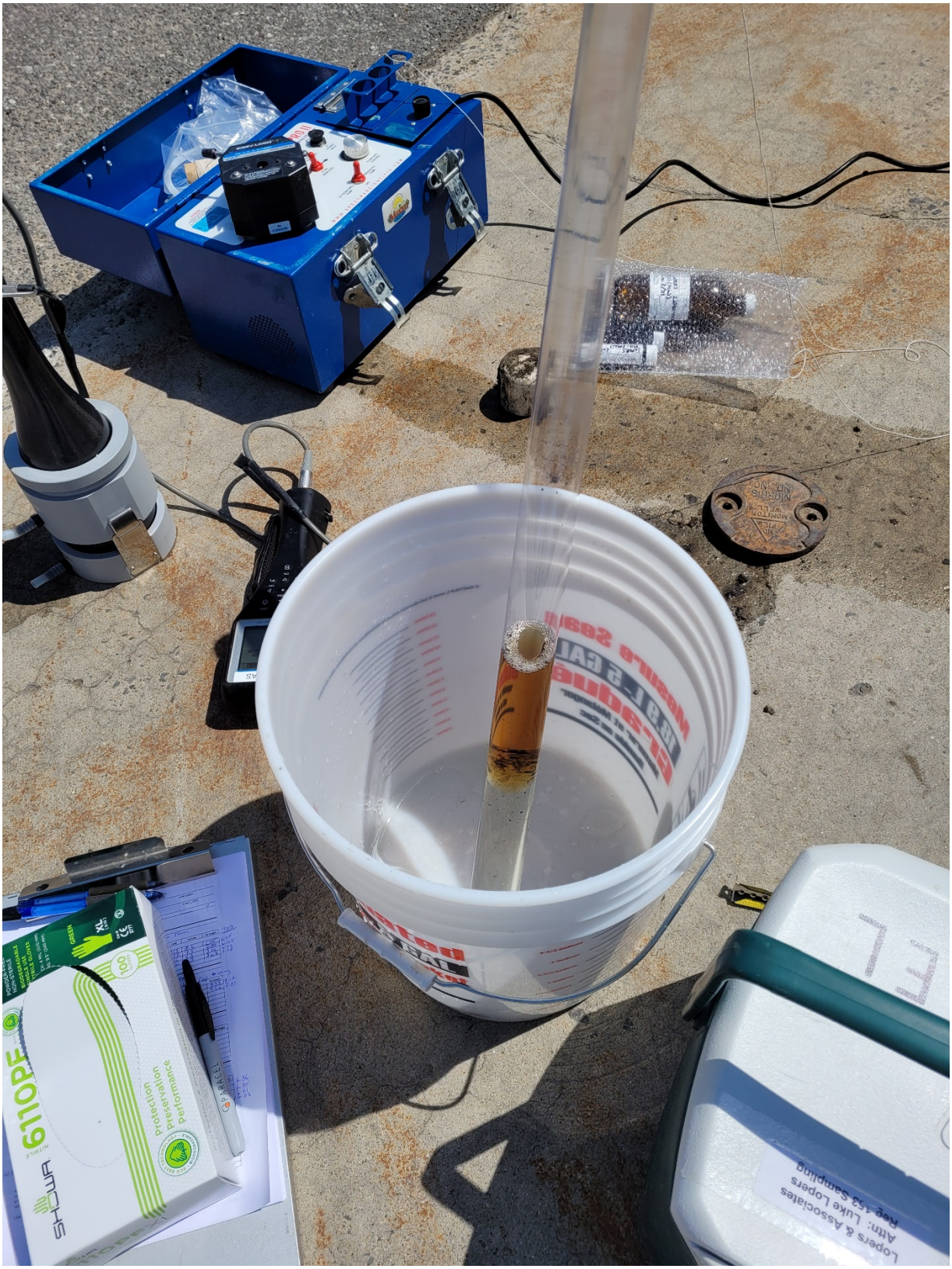
Comments:

Method of Delivery: PACACEL COURIER

Relinquished By (Sign):	Received By Driver/Depot: M. TOUSE	Received at Lab: Jurreeporn Dokmai	Verified By:
Relinquished By (Print): DOMINIC LANDRY	Date/Time: 09/09/20 11:43	Date/Time: Sep 09, 2020 01.25	Date/Time: 9-9-20 13:47
Date/Time: SEPT. 09/20	Temperature: °C AM	Temperature: 8.8 °C	pH Verified: ☐ By:

Appendix F

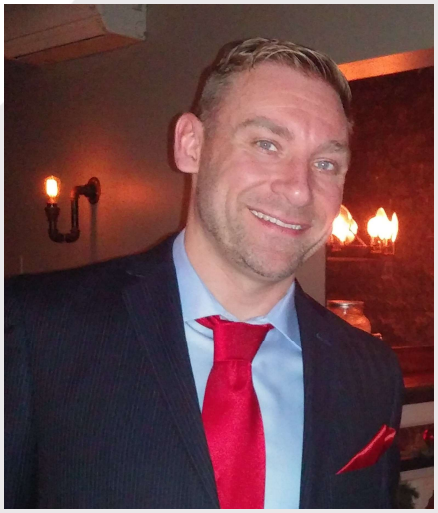
Site Photographs



Photograph 1: View of the free product present on top of the water column in BH1(MW) prior to well development and sampling on June 2, 2021.

Appendix G

Qualifications of Assessors



PROFILE

Mr. Lopers is an environmental engineer with over 12 years of experience in environmental engineering specializing in due diligence investigations. Mr. Lopers has extensive experience in Phase I and II Environmental Site Assessments; environmental remediation, and investigations; record of site condition submissions; asset inventory, designated substance surveys and abatement projects; environmental expertise on legal issues; and coordination of various monitoring programs (groundwater, surface water, air).

Mr. Lopers has participated in various Property Condition and Building Envelope mandates at various residential and commercial properties throughout Ontario.

Mr. Lopers has a strong commitment to health and safety, having experience leading a regional health and safety committee as a certified employee representative. Mr. Lopers has extensive training including OSHA 40-hour HAZWOPER, ASP Health and Safety on Construction Sites in Quebec, Ontario Working at Heights, Emergency First Aid/CPR and WHMIS.

CONTACT

EMAIL:
Luke@Lopers.ca

LUKE LOPERS

Principal
LOPERS & ASSOCIATES

EDUCATION

University of Waterloo,
B.A.Sc., Honours Environmental Engineering
Management Science Option Designation - 2002 - 2008

PROFESSIONAL EXPERIENCE

Lopers & Associates, Principal, Project Manager, Senior Environmental Engineer
Ottawa, Ontario - 2020–Present
Responsible for the management, coordination, supervision, completion and delivery of Phase I/1 and II/2 Environmental Site Assessments, Environmental Remediation Programs, Environmental litigation support, Designated Substance Surveys, scope of work development, cost estimates and proposals

GHD Limited, Project Manager, Senior Environmental Engineer
Ottawa, Ontario - 2013–2020
Responsible for the management, senior technical review, coordination, supervision, completion and delivery of Phase I/1 and II/2 Environmental Site Assessments, Environmental Remediation Programs, Environmental litigation support, Designated Substance Surveys, scope of work development, cost estimates and proposals
Office Safety Captain and Joint Health and Safety Committee team leader

Paterson Group Inc., Project Manager, Environmental Engineer
Ottawa, Ontario - 2009–2013
Responsible for supervision, completion and review for Phase I/1 and II/2 Environmental Site Assessments, Environmental Remediation Programs, Designated Substance Surveys

NEXT Environmental Inc., Site Investigation Staff
Burnaby, British Columbia - 2008–2009
Responsible for fieldwork and reporting for Stage/Phase I and II Environmental Site Assessments, Environmental Remediation Programs

PROFESSIONAL DESIGNATIONS

Licensed Professional Engineer (P.Eng.) with Professional Engineers Ontario (PEO) since 2012

Qualified Person (QP), Environmental Site Assessments with Ontario Ministry of the Environment, Conservation and Parks

PROJECT EXPERIENCE

Environmental Site Assessments

Project Engineer/Manager
Phase 1 Environmental Site Assessment | Various Clients | Ontario, Quebec and British Columbia | 2006-2020

Project Engineer/Manager for Phase I Environmental Site Assessments in support of acquisition/divestiture/regulatory requirements for various properties in Ontario, Quebec and British Columbia, including the following:

- Canadian Tire Retail Store and Gas Bar, CTR 417 - 2560 Princess Street, Kingston, Ontario
- Former Automotive Dealership and Service Garage, North Vancouver, British Columbia
- Former Philips Cable Plant, Brockville, Ontario
- Former Cornwall Cotton Mill, Cornwall, Ontario
- Retail Fuel Outlet and Automotive Service Garage, Ottawa, Ontario
- Jack Garland Airport Land, North Bay, Ontario
- Various Commercial/Residential Properties, Ontario and British Columbia
- Various Residential Properties, Ontario, Quebec and British Columbia
- Rochester Heights (811, 818 Gladstone Avenue), Ottawa, Ontario

Project Engineer/Manager
Phase Two Environmental Site Assessments | Various Clients | Various Locations | 2008-2020

Project Engineer/Manager for the following field investigation and/or regulatory reporting requirements for Phase II ESAs and other Site Investigations:

- Proposed Canadian Tire Development, CTR 693P - Terry Fox Drive at Eagleson Road, Stittsville, Ontario
- Former Retail/Private Fuel Outlets, Ottawa/North Bay/Vancouver, Canada
- Operational/Former Industrial Facilities, Ottawa/Cornwall/Sarnia/Brockville/Gananoque, Ontario
- Existing Dry Cleaning Facilities, Ottawa/Arnprior, Ontario
- Automotive Service Garages, Ottawa/Vancouver, Canada
- Various Commercial/Residential Properties, Eastern Ontario
- Tetrachloroethylene Groundwater Plume, Commercial Property, Ottawa, Ontario
- Rochester Heights (811, 818 Gladstone Avenue), Ottawa, Ontario

Project Manager
Phase One, Phase Two Environmental Site Assessments, Environmental Delineation Quality Assurance Program | Costco Wholesale | Ottawa, ON | 2014-2019

Project Manager for the completion of a Phase One ESA for the potential acquisition of a commercial property. Upon discovery of APECs at the Site and significant data gaps in previous investigations, completed a Phase Two ESA to evaluate soil and groundwater quality at the Site. Further oversight of original owner's environmental consultants was completed to ensure adequate delineation and characterization of a dNAPL groundwater plume at the Site, present at significant depths in shale bedrock, which originated as a result of a former on-Site dry-cleaning operation.

Environmental Remediation Programs

Project Engineer
Underground Fuel Storage Tank Removals and Environmental Remediation Programs in Vicinity of Active Underground Services | Ottawa, ON | 2010, 2012

Project Engineer for removal of underground heating oil storage tanks adjacent to residential buildings. Completed excavation supervision of contaminated soil around and below active underground services, including hydro, water and natural gas infrastructure at residential properties. Activities included oversight of removal of petroleum, impacted soil, and field screening and collection of confirmatory soil and groundwater samples for petroleum hydrocarbon analysis. Prepared Phase I, II and III Environmental Site Assessment reports.

Project Engineer
Retail Fuel Outlet Decommissioning and Remediation | Ottawa, ON | 2012

Project Engineer for UST removal and confirmatory soil sampling at former ESSO gas station in Ottawa, Ontario. Activities included oversight of removal of USTs and product lines, oversight of removal of petroleum-impacted soil and groundwater encountered and backfilling operations, and field screening and collection of confirmatory soil and groundwater samples for petroleum hydrocarbon analysis.

Project Engineer/Manager
Former Fuel Outlet Investigation and Remediation | Merrickville, ON | 2016-2017

Project Engineer for confirmatory soil and groundwater sampling following UST removal at former Shell gas station. Activities included oversight of removal of petroleum-impacted soil, pumping of groundwater encountered and backfilling operations, and field screening and collection of confirmatory soil and groundwater samples for petroleum hydrocarbon analysis. Additional borehole/monitoring well drilling also completed.

Record of Site Conditions

Project Manager/Engineer
Residential Redevelopment | Environmental Remediation Program and Record of Site Condition Submission | Ottawa | 2015

Project Manager for delineation of soil contamination and groundwater sampling for a former automotive garage and gas station property in Ottawa, Ontario. Presented and implemented remedial action plan to remediate on-Site contamination. Directed staff in collection of post remediation confirmatory soil and groundwater samples for contaminants of concern. Prepared remediation closure report and record of site condition supporting documentation for submission to the Ministry of the Environment and Climate Change.

Project Manager/Engineer
Industrial Development | Environmental Assessment and Record of Site Condition Submission | Township of Edwardsburgh/Cardinal | 2015

Project Manager for environmental assessments for a proposed industrial business park, in an existing industrial area within the Township of Edwardsburgh/Cardinal, Ontario. Prepared environmental assessment reports and record of site condition supporting documentation for submission to the Ministry of the Environment and Climate Change.

Excess Soil Management

Project Engineer/Manager
Management of Excess Soil | CTREL, Brigil, Ottawa Community Housing Corporation | Ottawa and Pembroke, Ontario | 2016, 2018

Project Engineer/Manager for sampling, analytical testing, development of soil management plans and monitoring during removal of excess soil generated as part of construction activities, including the following properties/facilities:

- Rochester Heights (811, 818 Gladstone Avenue), Ottawa, Ontario
- Residential redevelopment, 121 Parkdale Avenue, Ottawa, Ontario
- CTR 079, 1104 Pembroke Street East, Pembroke, Ontario
- CTR 297, 2010 Ogilvie Road, Ottawa, Ontario

Designated Substance Surveys

Project Manager

Designated Substance Surveys and Hazardous Building Materials Assessment | Ottawa, Pembroke, Southeastern Ontario | 2010-2020

Project Manager for asbestos containing material (ACM) surveys, designated substance surveys (DSSs), Hazardous Building Materials Assessments (HBMAs) or mould assessments at the following sites:

- DSSs at various municipal facilities for the City of Pembroke, Pembroke, Ontario. Preparation of Asbestos Management Plan.
- HBMAs at various institutional buildings for the Catholic District School Board of Eastern Ontario, Southeastern Ontario.
- DSSs and ACM surveys at various residential, buildings (dwellings and apartment buildings) for private residential clients, Ottawa, Ontario.
- DSS and abatement oversight during demolition, residential buildings (townhouses) for Ottawa Community Housing Corporation, 818 Gladstone Avenue, Ottawa, Ontario.

Environmental Litigation Support

Project Manager, Field Engineer, Expert Witness

Ottawa, Ontario | 2014-2020

Project Manager, Field Engineer and Expert Witness for a fuel spill, remediation program, groundwater monitoring program and litigation review for redevelopment of a residential property adjacent to a central heating plant at an institutional facility.

Education

BEng Geological Engineering, École Polytechnique de Montreal, Montreal, Quebec, 1990

MSc Geophysics, University of British Columbia, Vancouver, British Columbia, 1983

BSc Geophysics, Honours, University of British Columbia, Vancouver, British Columbia, 1980

Certifications

Registered as PMP with Project Management Institute since 2012, requalified in 2018

Qualified Person (QP) for Environmental Site Assessments with Ontario Ministry of Environment and Conservation and Parks

Professional Affiliations

Licensed as P.Eng. with the Professional Engineers of Ontario (PEO) since 1994

Licensed as Ing. with l'Ordre des ingénieurs du Québec (OIQ), 1992

Licensed as P.Eng. with NAPEG (NWT and Nunavut), since 2009.

Licensed as P.Eng with Engineers Yukon since 2018

Federal Clearance Level

Secret ID # 95251065

DON PLENDERLEITH

Senior Environmental Engineer and Project Manager

PROFESSIONAL SUMMARY

Mr. Plenderleith has been an environmental engineer for 30 years. From 1990 to 2000 he worked at specialty firms in Montreal and Ottawa where he gained field and reporting experience in site assessment and remediation of retail fuel outlets and railway yards. In 1991 and 1992 he worked on a CIDA sponsored project to assess additional water resource potential in two provinces in Indonesia. He worked for Golder for 19 years on projects in Ottawa, the North and overseas.

His expertise covers all steps in contaminated site management: Phase I, II and III environmental site assessments (ESAs), risk assessments, remedial options evaluations, remedial action plans, tender plans and specifications, remediation project oversight, long-term monitoring and project closure. He has largely concentrated on federal sites since 2002 and was Golder's initial point of contact on the Environmental Standing Offer Agreement with PSPC in the National Capital over that time.

Don led Golder's national client service team for Federal government and was responsible to Golder's management for maintaining strong relations with the federal government. Locally, he provided project management and technical direction of a variety of environmental projects from the Ottawa office. Don mentored several junior professionals. His site portfolio included: military bases, Northern sites, navigational sites, correctional facilities, research labs, commercial buildings and Canadian embassies abroad. On several multi-year projects (Kingston Penitentiary and Connaught Ranges landfill) he directed all steps of site management from initial investigations, through to site closure.

Don is equally experienced at providing strategic and portfolio-level assistance to clients as well as site-specific level work. He has written contaminated sites management plans for several federal Departments. He helped to develop components of the FCSAP project manager's tool kit and has trained federal project managers in its use. He has provided program-level assistance to the FCSAP Secretariat for funding demand forecasting and long-term strategy and risk management. For nine years he led a multi-disciplinary team that performed contaminated site liability peer reviews for the Office of the Auditor General of Canada.

Don completed his engineering degree in French and is licensed to practice in Quebec. He frequently coordinates the French language component at bilingual meetings and workshops.

PROJECT EXPERIENCE – STANDING OFFER MANAGER

Public Services and Procurement Canada, National Capital Region, Environmental Engineering Standing Offer (2002-2019).

Don managed Golder's Environmental Standing Offer Agreement (SOA) with PSPC in the National Capital Region from 2002 to 2019. He was the first point of contact with PSPC for new call-ups. He formed project teams from the approved resources and reviewed the work plans under each call-up. He was responsible and accountable for Golder's overall project performance to PSPC.

PROJECT EXPERIENCE – SENIOR PROJECT MANAGER

Phase I, II, and III and Remediation at Pittsburgh Institution and Kingston Penitentiary for PSPC/CSC near Kingston, Ontario

Environmental Site Assessment, Remediation Planning and Implementation for the Pittsburgh Institution and Kingston Penitentiary, Kingston, Ontario from 2007 to 2015 - Don was the Senior Project Manager and project reviewer for the Phase I, II and III of contaminated sites on two similar projects at these federal penitentiaries. Don performed project management and provided technical direction during the full suite of services from site assessment through to remediation. Federal project management tools, and FCSAP technical tools (GOST) were used to assist with procedural compliance. Don assisted PSPC with the tender specification for both remediation projects and performed on-site supervision during the fast-track remediation work at Pittsburgh. Don also performed senior review of the draft and final reports.

Peer Review and Liability Review of US Steel Site in Hamilton Harbour for PSPC and Transport Canada (July-August 2016)

Don was the Senior Project Manager for a Peer Review of reports pertaining to the US Steel site on Hamilton Harbour that the Hamilton Port Authority (HPA) was considering purchasing. TC requested the peer review and liability review in its oversight role over the HPA. Don brought a senior expert in at steel industry at Golder onto the project team. With his input some important gaps in the previous site assessments, management plans and liability estimates were identified to TC.

Contaminated Site Reporting and Review for Department of National Defence Ottawa, Ontario, Canada

Don has managed several projects for DND's Director General Environment, related to the financial reporting of DND's contaminated sites. He managed the EcoNet validation project in 2006, in which the systems and procedures by which site cost and liability information are input to DND's Contaminated Site database, Econet. Several of DND's major projects being run out of headquarters were reviewed in that exercise. In 2008 he assisted DND by producing the 2008 update of their Contaminated Sites Management Plan (CSMP) for Treasury Board submission. Nine divisional CSMPs were reviewed, summarized and incorporated into the departmental CSMP.

PROGRAM LEVEL WORK – FEDERAL CONTAMINATED SITES

Project Management Tools for Contaminated Sites, Ottawa, Ontario, Canada

Mr. Plenderleith developed two of the FCSAP Project Management Tools: Status Reporting and Project Risk Management. He has provided training in the tools to federal project managers country-wide. He has delivered training sessions at RPIC National Contaminated Sites workshops on several occasions on the PM Tools, the Sustainable Development Tool (SDAT), and Guidance Tool for Selection of Technologies Tools (GOST).

Assistance to FCSAP for program-level Risk Management, PWGSC/ECCC Ottawa, Ontario

Don has led a team at Golder that provided assistance to the FCSAP Secretariat from 2013 to 2019 in the areas of cost projections for funding demand estimates. He devised a method of projecting the costs of unassessed sites based on closure costs of similar sites. This tool was used to estimate the funding demand for FCSAP Phase III and past Phase III. Don assisted the Secretariat with Long-Term Strategic planning for FSCAP post 2020 when the 15-year program is due to sunset.

Secondments to Federal Departments

Mr. Plenderleith has been seconded from Golder to the Department of Foreign Affairs and International Trade (now Global Affairs Canada "GAC") on three occasions to develop their Contaminated Sites Management Plans and to fill in while GAC was staffing their full-time environmental engineer position. Through these secondments he has developed a greater understanding of the role of federal custodians in managing their programs.

PROJECT EXPERIENCE – NORTHERN SITES

DEW Line Site Monitoring, Baffin Region, DND

(2015-19)

Mr. Plenderleith was the project director of Golder's DEW Line Monitoring contract with DND from four years 2015 to 2019. He was responsible for overall program quality and liaison with the client and management of Inuit subcontractors. The project was multi-disciplinary, involving geotechnical and environmental components. Mr. Plenderleith has developed a very positive working relationship with the hamlet of Qikiqtarjuaq and the Inuit staff from that community, many of whom have returned to work with Golder every year. All Inuit Participation Targets were exceeded.

Tundra Mine Remediation Monitoring PSPC/INAC (2016-2018)

Don was the Senior project director for Golder's Remediation Monitoring of Tundra Mine (NWT) for PSPC and INAC. This project is multi-disciplinary involving surface water and groundwater environmental monitoring and aquatic monitoring for the final stages of the remediation of Tundra Mine. Don has reviewed the monthly and annual monitoring reports produced for the Water Licence. His earlier experience with the RAP for Tundra has been valuable on this project.

Remedial Options Review and Remedial Action Planning Former Water Tanker Base, Inuvik Airport, NWT 2010-12

From 2010 to 2012, Mr. Plenderleith was the technical director for the Phase III ESA detailed site assessment and remediation planning of the former Water Tanker Base at the Inuvik Airport in NWT. The work included determining the contaminants of concern, delineation of contaminated soil and seasonal groundwater areas, and assessing remedial options. The remedial action plan reviewed chemical oxidation and removal & disposal options within the constraints of northern work season, and the distance to a disposal facility. Descriptions, costs, advantages and limitations were provided for several options. GNWT performed the remediation with own forces.