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Phase II Environmental Site Assessment

2390 and 2410 Stevenage Drive
Ottawa, Ontario

Prepared For

Sysco Corporation

August 10, 2018

Report: PE4373-2

TABLE OF CONTENTS

List of Figures

List of Appendices

EXECUTIVE SUMMARY

Assessment

A Phase II ESA was conducted for the properties addressed as 2390 and 2410 Stevenage Drive, in the City of Ottawa, Ontario. The purpose of the Phase II ESA was to address potentially contaminating activities (PCAs) that were identified during the Phase I ESA and considered to result in areas of potential environmental concern (APECs) on the Phase I and Phase II Property. The subsurface investigation was carried out in conjunction with a Geotechnical Investigation and consisted of drilling 11 boreholes three of which were constructed with groundwater monitoring wells.

Soil samples were obtained from the boreholes and screened using visual observations and organic vapour measurements. A total of three soil samples were submitted for laboratory analysis of a combination of benzene, toluene, ethylbenzene and xylenes (BTEX) and petroleum hydrocarbons (PHCs, F_1-F_4). All soil samples are in compliance with the MOECP Table 3 Standards.

Groundwater samples from monitoring wells installed in BH4, BH6, and BH11 were recovered and analysed for VOC and PHC parameters. No contaminant concentrations were identified above the laboratory method detection limits. The groundwater is in compliance with the MOECP Table 3 standards.

Conclusion

Based on the findings of the Phase II ESA, the soil and groundwater on the subject site is in compliance with the MOECP Standards. No further work is required.

It is expected that groundwater monitoring wells will be abandoned in accordance with O.Reg.903, at the time of construction excavation. It is recommended that the integrity of the monitoring wells be maintained, prior to future construction, for possible future groundwater monitoring purposes.

1.0 INTRODUCTION

At the request of Sysco Corporation, Paterson Group (Paterson) conducted a Phase II Environmental Site Assessment of 2390 and 2410 Stevenage Drive, in the City of Ottawa, Ontario. The purpose of this Phase II ESA has been to address areas of potential environmental concern (APECs) identified on the Phase II Property, during the Phase I ESA conducted by Paterson in July 2018.

1.1 Site Description

Address:	2390 and 2410 Stevenage Drive, Ottawa, Ontario.
Property Identification Numbers:	04165-0559, 04165-1035, 04165-0558, 041651037
Location:	The subject site is located on the south side of Stevenage Drive, in Ottawa, Ontario.
Latitude and Longitude:	45° 22' 49" N, 75° 36' 25" W
Configuration:	Irregular
Site Area:	11.7 ha (approximate)

1.2 Property Ownership

Paterson was retained to complete this Phase II ESA by Florin Stanescu of Sysco Corporation. Mr. Stanescu can be contacted by telephone at 613-977-4515.

1.3 Current and Proposed Future Uses

The Phase II Property is currently occupied by industrial buildings and associated parking areas along Stevenage Drive. The rear portion of the site is vacant and partially treed. It is our understanding that the Phase II Property will be redeveloped with a large trucking terminal.

1.4 Applicable Site Condition Standard

The site condition standards for the property were obtained from Table 3 of the document entitled “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act”, prepared by the Ontario Ministry of the Environment, Conservation and Parks (MOECP), April 2011. The MOECP selected Table 3 Standards are based on the following considerations:

- ❒ Coarse-grained soil conditions
- ❒ Full depth generic site conditions
- ❒ Non-potable groundwater conditions
- ❒ Commercial land use

The commercial standards were selected based on the current and proposed future use of the subject site.

2.0 BACKGROUND INFORMATION

2.1 Physical Setting

The Phase II Property is located in an industrial park, with residential development to the south of the site. Site topography is relatively flat and at grade with the surrounding roadways. The regional topography generally slopes gently towards the south. Site drainage consists primarily of sheet flow to catch basins on the subject site and along adjacent streets and infiltration on the undeveloped portion of the subject site. The Phase II Property is situated within a municipally serviced area.

2.2 Past Investigations

Paterson completed a Phase I ESA, dated August 7, 2018, for the Phase II-ESA property which is provided under a separate cover. A summary of the Phase I ESA report follows;

Based on a review of available historical sources, the subject property and neighbouring properties were originally developed in the early 1970's and 1980's for industrial purposes. Historical research indicated that both on-site establishments have been in operations since 1980's.

Several PCAs were identified, however two (2) are considered a potential environmental concern to the Phase I Property. One on-site PCA, Thermo King (truck repair shop) was considered to result in an APEC and has been operating since 1994. An off-site PCA considered to result in an APEC on the Phase I Property included a metal fabrication facility, which has been operating since 2000. Other off-site PCAs were not considered to represent APECs on the Phase I Property based on their separation distances and/or orientations with respect to the subject land.

Following the historical review, a site visit was conducted. The previously identified onside PCA was found on the Phase I Property as well as two off-site PCAs (commercial trucking companies – Penske and Ryder), located approximately 20 m north of the Phase I Property. Based on the suspected orientation, cross-gradient from the subject site, both PCAs were not considered to represent an APEC on the Phase I Property.

Based on the findings of the Phase I ESA it was recommended that a Phase II ESA be conducted for the subject site.

3.0 SCOPE OF INVESTIGATION

3.1 Overview of Site Investigation

The subsurface investigation was conducted during on July 11, 2018, in conjunction with a Geotechnical Investigation. The field program consisted of drilling 11 boreholes, three of which were instrumented groundwater monitoring wells. Boreholes were drilled to depths of approximately 6m below the existing grade or auger refusal.

3.2 Media Investigated

During the subsurface investigation, soil samples and groundwater samples were obtained and submitted for laboratory analysis. The rationale for sampling and analyzing these media is based on the Contaminants of Potential Concern identified in the Phase I ESA.

Contaminants of concern for soil and groundwater include petroleum hydrocarbons (PHCs, fractions F_1-F_4), benzene, toluene, ethylbenzene and xylenes (BTEX), and volatile organic compounds (VOCs).

3.3 Phase I Conceptual Site Model

Geological and Hydrogeological Setting

The Geological Survey of Canada website on the Urban Geology of the National Capital Area was consulted as part of this assessment. Based on this information, bedrock in the area of the site consists of shale of the Carlsbad Formation. Overburden thickness across the Phase I Property ranged from 5 to 15 meters and consisted of offshore marine deposits of clay and silt.

The regional topography slopes down to the south east, however the topography in the immediate vicinity of the Phase I Property slopes down to the south towards McEwan Creek.

Contaminants of Potential Concern

The CPCs identified for the soil and/or groundwater beneath the Phase I Property include BTEX, VOCs and PHCs.

Existing Buildings and Structures

The Phase I Property is occupied by two (2) slab-on-grade building structures; one large, office/warehouse building on 2390 Stevenage Drive and a garage on 2410 Stevenage Drive.

Water Bodies

There are no water bodies on the Phase II ESA property or within 250m of the Phase II Property. The former alignment of McEwen Creek, as identified in the Phase I ESA is present approximately 20m to the south of the subject site, however in the area of the subject site the creek is encased in a sewer line. McEwen creek is no longer considered a water body in the area of the subject site.

Areas of Natural Significance

No areas of natural significance were identified on the Phase I Property or within the Phase I Study Area.

Drinking Water Wells

No drinking water wells are located on the Phase I Property or within the Phase I Study Area.

Groundwater Monitoring Wells

Two (2) monitoring wells were observed on the Phase I Property at the time of the site visit.

Well records for all drilled wells within the Phase I Study Area were obtained from the MOECC website. Based on the results of the well records search, there are a total of seventeen (17) well records within the 250 m study area. Six (6) monitoring well records were identified on the Phase I Property (2390 and 2410 Stevenage Drive). Eleven (11) monitoring well and well abandonment records were obtained for the following properties within the Phase I Study Area: 2450 Stevenage Drive (3 abandoned wells and 2 monitoring wells); 2320 Stevenage Drive (5 monitoring wells); and, 2373 Stevenage Drive (1 monitoring well).

Fill Material

No evidence of fill material was observed at the time of the site visit.

Neighbouring Land Use

Neighbouring land use in the Phase I study area is primarily light to medium industrial use with occasional commercial (restaurants). Land use is shown on Drawing PE4373-2 - Surrounding Land Use Plan in the Phase I ESA.

Potentially Contaminating Activities and Areas of Potential Environmental Concern

As per Table 4 in Section 7.1, one (1) on-site PCA and seven (7) off-site PCAs have resulted in two (2) APECs on the Phase I Property.

Additional historical PCAs were identified within the Phase I Study Area, however these activities were not considered to represent APECs on the Phase I Property based on their respective separation distances and/or orientations with respect to the Phase I Property, in combination with the extensive development of the neighbouring properties and information contained in our files.

Assessment of Uncertainty and/or Absence of Information

The information available for review as part of the preparation of the Phase I ESA is considered to be sufficient to conclude that there are areas of potential environmental concern on the subject site resulting from historical uses of the

site and neighbouring properties. The presence of potentially contaminating activities was confirmed by a variety of independent sources. The conclusions of this report are not affected by uncertainty which may be present with respect to the individual sources.

3.4 Deviations from Sampling and Analysis Plan

The Sampling and Analysis Plan for this project is included in Appendix 1 of this report. There were no deviations from the Sampling and Analysis Plan.

3.5 Impediments

Physical impediments encountered during the field portion of the Phase II ESA include the tree canopy which prevented the placement of BH11 closer to the adjacent metals fabrication facility. No other physical impediments were encountered.

4.0 INVESTIGATION METHOD

4.1 Subsurface Investigation

The subsurface investigation was conducted on July 11, 2018, in conjunction with a Geotechnical Investigation, and consisted of drilling 11 boreholes on the Phase II Property. Three of the boreholes were instrumented with groundwater monitoring wells for environmental purposes. The boreholes were placed to address the aforementioned areas of potential environmental concern (APECs) and to provide coverage of the site from a geotechnical perspective. The boreholes were drilled with either a track or a truck mounted CME 55 power auger drill rig. Both drill rigs were provided by George Downing Estate Drilling of Hawkesbury, Ontario. Borehole locations are shown on Drawing PE4373-3 – Test Hole Location Plan, appended to this report.

4.2 Soil Sampling

A total of 17 soil samples were obtained from the environmental boreholes and an additional 46 soil samples were obtained from the geotechnical boreholes by means of sampling from shallow auger flights and split spoon sampling. The depths at which auger samples and split spoon samples were obtained from the boreholes are shown as “**AU**” and “**SS**” on the Soil Profile and Test Data Sheets, appended to this report.

Site soils consist of a pavement structure underlain by fill material and native silty clay. Fill material present beneath the pavement structure extended to a depth of approximately 0.4m below the existing grade and generally consisted of silty sand with crushed stone. Topsoil was identified in the undeveloped portions of the subject site.

4.3 Field Screening Measurements

All soil samples collected from the boreholes were monitoring wells were installed were subjected to a preliminary screening procedure, which included visual screening for colour and evidence of metals, as well as soil vapour screening with a MiniRAE 2000 Portable VOC Monitor.

The soil vapours were measured by inserting the analyzer probe into the nominal headspace above the soil sample. Samples were then agitated/manipulated gently as the measurements were taken. The peak reading registered within the first 15 seconds was recorded as the vapour measurement.

The vapour readings were found to range from 0 ppm to 22.3ppm. Vapour readings are noted on the Soil Profile and Test Data Sheets in Appendix 1.

4.4 Groundwater Monitoring Well Installation

Three groundwater monitoring wells were installed on the Phase II Property as part of the current Phase II investigation. The monitoring wells consisted of 51 mm diameter Schedule 40 threaded PVC risers and screens. Monitoring well construction details are listed below in Table 1 and are also presented on the Soil Profile and Test Data Sheets provided in Appendix 1.

Table 1: Monitoring Well Construction Details

Well ID	Ground Surface Elevation	Total Depth (m BGS)	Screened Interval (m BGS)	Sand Pack (m BGS)	Bentonite Seal (m BGS)	Casing Type
BH4	82.62	6.71	3.71-6.71	3.60-6.71	0.30-5.79	Flushmount
BH6	82.68	6.71	3.71-6.71	3.60-6.71	0.30-5.84	Flushmount
BH11	80.86	4.52	1.47-4.52	1.25-4.52	0.30-6.80	Stickup

4.5 Field Measurement of Water Quality Parameters

Groundwater sampling was conducted at BH4, BH6, and BH11 on July 31, 2018. At this time, the measurement of water quality parameters was attempted in the field using a multi-parameter analyzer. Parameters to be measured in the field

included temperature, pH and electrical conductivity. Suspected erroneous results were obtained by the groundwater probe and the measurement of water quality parameters was abandoned. The abandonment of water quality parameters is not expected to affect the analytical results obtained from the boreholes. The remaining guidelines, as listed within the sampling and analysis plan, were adhered to.

4.6 Groundwater Sampling

Groundwater sampling protocols were followed using the MOECC document entitled “Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario”, dated May 1996. Groundwater samples were obtained from each monitoring well, using dedicated sampling equipment. Standing water was purged from each well prior to sampling. Samples were stored in coolers to reduce analyte volatilization during transportation. Details of our standard operating procedure for groundwater sampling are provided in the Sampling and Analysis Plan in Appendix 1.

4.7 Analytical Testing

Based on the guidelines outlined in the Sampling and Analysis Plan appended to this report, the following soil and groundwater samples were submitted for analysis:

Table 2: Soil Samples Submitted

Sample ID	Sample Depth/ Stratigraphic Unit	Parameters Analyzed		Rationale
		BTEX	PHCs (F_1-F_4)	
BH4-SS5	3.04-3.66m (Native Silty Clay)	X	X	Assess potential soil impacts relating to APEC 1
BH6-SS5	3.04-3.66m (Native Silty Clay)	X	X	
BH11-SS5	3.81-4.41m (Native Glacial Till)	X	X	Assess potential soil impacts relating to APEC2

Table 3: Groundwater Samples Submitted				
Sample ID	Screened Interval/ Stratigraphic Unit	Parameters Analyzed		Rationale
		VOCs	PHCs (F_1-F_4)	
BH4-GW1	3.71-6.71m (Native silty clay)	X	X	Assess potential groundwater impacts relating to APEC 1 and APEC 2
BH6-GW1	3.71-6.71m (Native silty clay)	X	X	
BH11-GW1	1.52-4.52m (Native silty clay)	X	X	Assess potential groundwater impacts relating to APEC2

Paracel Laboratories (Paracel), of Ottawa, Ontario, performed the laboratory analysis on the samples submitted for analytical testing. Paracel is a member of the Standards Council of Canada/Canadian Association for Laboratory Accreditation (SCC/CALA). Paracel is accredited and certified by SCC/CALA for specific tests registered with the association.

4.8 Residue Management

All excavated soil, purge water and fluids from equipment cleaning were retained on-site.

4.9 Elevation Surveying

An elevation survey of all borehole locations was completed by Paterson at the time of the subsurface investigation. All borehole elevations are relative to the top spindle of the fire hydrant on the south side of Stevenage Drive, with geodetic elevation 83.60m above sea level (m asl) provided by Annis O'Sullivan Vollebeck.

4.10 Quality Assurance and Quality Control Measures

A summary of quality assurance and quality control (QA/QC) measures, including sampling containers, preservation, labelling, handling, and custody, equipment cleaning procedures, and field quality control measurements is provided in the Sampling and Analysis Plan in Appendix 1.

5.0 REVIEW AND EVALUATION

5.1 Geology

Site soils generally consist of a pavement structure over fill material in the developed portion of the subject site, underlain by native silty clay. Practical refusal to augering was encountered on the western portion of the subject site.

Groundwater was encountered within the silty clay at depths ranging from approximately 1.37 to 2.50m below existing grade.

5.2 Groundwater Elevations, Flow Direction, and Hydraulic Gradient

Groundwater levels were measured during the groundwater sampling event on July 31, 2018, using an electronic water level meter. Groundwater levels are summarized below in Table 4. All borehole elevations are relative to the top spindle of the fire hydrant on the south side of Stevenage Drive, with geodetic elevation 83.60m above sea level (m asl).

Table 4: Groundwater Level Measurements

Borehole Location	Ground Surface Elevation (m)	Water Level Depth (m below grade)	Water Level Elevation (m ASL)	Date of Measurement
BH4	82.62	1.37	81.25	July 31, 2018
BH6	82.68	1.41	81.27	July 31, 2018
BH11	80.86	2.50	78.36	July 31, 2018

Based on the groundwater elevations measured during the July 2018 sampling event, groundwater contour mapping was completed. Groundwater contours are shown on Drawing PE4373-3 – Test Hole Location Plan. Based on the contour mapping, groundwater flow beneath the Phase II Property appears to flow towards the southeast. A horizontal hydraulic gradient of approximately 0.018 m/m was calculated.

5.3 Fine-Coarse Soil Texture

Coarse-grained soil standards were selected for the subject site as a conservative approach.

5.4 Soil: Field Screening

Field screening of the soil samples collected during drilling resulted in vapour readings ranging from 0ppm to 1.8ppm. No visual or olfactory indications of

potential contamination were identified in the soil samples at the time of the field program. The field screening results of each individual soil sample are provided on the Soil Profile and Test Data Sheets appended to this report.

5.5 Soil Quality

Three (3) soil samples were submitted for PHCs (F1-F4) and BTEX analysis. The results of the analytical testing are presented below in Tables 5. The laboratory certificates of analysis are provided in Appendix 1.

Table 5: Analytical Test Results – Soil – BTEX, PHCs (F1-F4)

Parameter	MDL (µg/g)	Soil Samples (µg/g) July 26, 2018			MOECP Table 3 Commercial Standards (µg/g)
		BH4-SS5	BH6-SS5	BH11-SS5	
Benzene	0.02	nd	nd	nd	0.32
Ethylbenzene	0.05	nd	nd	nd	9.5
Toluene	0.05	nd	nd	nd	68
Xylenes (Total)	0.05	nd	nd	nd	26
PHC F1	7	nd	nd	nd	55
PHC F2	4	nd	nd	8	230
PHC F3	8	nd	nd	173	1700
PHC F4	6	nd	nd	138	3300

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL

No BTEX parameters were identified above the laboratory method detection limits. PHC F2 – F4 were identified above the detection limits of the laboratory in BH11-SS5, but below the MOECP Table 3 Standards. The soil results are in compliance with the selected standards.

The maximum concentrations of analyzed parameters in the soil at the site are summarized below in Table 6.

Table 6: Maximum Concentrations – Soil

Parameter	Maximum Concentration (µg/g)	Borehole	Depth Interval (m BGS)
PHC F2	8	BH11-SS5	3.81-4.41
PHC F3	173	BH11-SS5	3.81-4.41
PHC F4	138	BH11-SS5	3.81-4.41

Notes:
- **Bold and Underlined** – Value exceeds MOECC Table 3 standards

All other parameter concentrations were below laboratory detection limits.

5.6 Groundwater Quality

Groundwater samples from monitoring wells installed in BH4, BH6, and BH11 were submitted for laboratory analysis of VOC and PHC parameters. The groundwater samples were obtained from the screened intervals noted on Table 2. The results of the analytical testing are presented below in Table 7 and 8. The laboratory certificates of analysis are provided in Appendix 1.

Table 7: Analytical Test Results – Groundwater (PHCs (F1-F4))

Parameter	MDL (µg/L)	Groundwater Samples (µg/L)			MOECP Table 3 Standards (µg/L)
		July 31, 2018			
		BH4-GW1	BH6-GW1	BH11-GW1	
PHC F1	25	nd	nd	nd	750
PHC F2	100	nd	nd	nd	150
PHC F3	100	nd	nd	nd	500
PHC F4	100	nd	nd	nd	500

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL

No PHC parameters were detected above the laboratory method detection limits in any of the groundwater samples submitted for analytical testing. The results are considered to be in compliance with the MOECP Table 3 standards.

Table 8: Analytical Test Results – Groundwater (VOCs)

Parameter	MDL (µg/L)	Groundwater Samples (µg/L)			MOECP Table 3 Standards (µg/L)
		July 31, 2018			
		BH4-GW1	BH6-GW1	BH11-GW1	
Acetone	5	nd	nd	nd	130000
Benzene	0.5	nd	nd	nd	44
Bromodichloromethane	0.5	nd	nd	nd	85000
Bromoform	0.5	nd	nd	nd	380
Bromomethane	0.5	nd	nd	nd	5.6
Carbon Tetrachloride	0.5	nd	nd	nd	0.79
Chlorobenzene	0.5	nd	nd	nd	630
Chloroform	0.5	nd	nd	nd	2.4
Dibromochloromethane	0.5	nd	nd	nd	82000
Dichlorodifluoromethane	1.0	nd	nd	nd	4400
1,2-Dichlorobenzene	0.5	nd	nd	nd	4600
1,3-Dichlorobenzene	0.5	nd	nd	nd	9600
1,4-Dichlorobenzene	0.5	nd	nd	nd	8
1,1-Dichloroethane	0.5	nd	nd	nd	320
1,2-Dichloroethane	0.5	nd	nd	nd	1.6
1,1-Dichloroethylene	0.5	nd	nd	nd	1.6
cis-1,2-Dichloroethylene	0.5	nd	nd	nd	1.6
trans-1,2-Dichloroethylene	0.5	nd	nd	nd	1.6
1,3-Dichloropropene, total	0.5	nd	nd	nd	5.2
Ethylbenzene	0.5	nd	nd	nd	2300

Table 8: Analytical Test Results – Groundwater (VOCs)

Parameter	MDL (µg/L)	Groundwater Samples (µg/L)			MOECP Table 3 Standards (µg/L)
		July 31, 2018			
		BH4-GW1	BH6-GW1	BH11-GW1	
Ethylene dibromide	0.2	nd	nd	nd	0.25
Hexane	1.0	nd	nd	nd	51
Methyl Ethyl Ketone	5	nd	nd	nd	470000
Methyl Isobutyl Ketone	5	nd	nd	nd	140000
Methyl tert-butyl ether	2	nd	nd	nd	190
Methylene Chloride	5	nd	nd	nd	610
Styrene	0.5	nd	nd	nd	1300
1,1,1,2-Tetrachloroethane	0.5	nd	nd	nd	3.3
1,1,2,2-Tetrachloroethane	0.5	nd	nd	nd	3.2
Tetrachloroethylene	0.5	nd	nd	nd	1.6
Toluene	0.5	nd	nd	nd	18000
1,1,1-Trichloroethane	0.5	nd	nd	nd	640
1,1,2-Trichloroethane	0.5	nd	nd	nd	4.7
Trichloroethylene	0.5	nd	nd	nd	1.6
Trichlorofluoromethane	1	nd	nd	nd	2500
Vinyl Chloride	0.5	nd	nd	nd	0.5
Xylenes, total	0.5	nd	nd	nd	4200

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL

No VOC parameters were detected above the laboratory method detection limits in any of the groundwater samples submitted for analytical testing. The results are considered to be in compliance with the MOECP Table 3 standards.

5.7 Quality Assurance and Quality Control Results

All samples submitted as part of the July 2018 sampling event were handled in accordance with the Analytical Protocol with respect to holding time, preservation method, storage requirement, and container type.

As per Subsection 47(3) of O.Reg. 153/04 as amended by O.Reg. 269/11, a Certificate of Analysis has been received for each sample submitted for analysis and all Certificates of Analysis are appended to this report.

Overall, the quality of the field data collected during this Phase II ESA is considered to be sufficient to meet the overall objectives of this assessment.

5.8 Phase II Conceptual Site Model

The following section has been prepared in accordance with the requirements of O.Reg. 269/11 amending O.Reg. 153/04 - Record of Site Condition regulation, made under the Environmental Protection Act. Conclusions and recommendations are discussed in a subsequent section.

Site Description

Potentially Contaminating Activity and Areas of Potential Environmental Concern

As indicated in the Phase I-ESA report and Section 2.2 of this report, the following PCAs were considered to result in APECs on the Phase I and Phase II Property:

- 2410 Stevenage Drive – Existing truck repair garage – Item 52 - Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems
- 2420 Stevenage Drive – Existing metal fabrication facility – Item 34- Metal Fabrication.

Contaminants of potential concern associated with the aforementioned PCAs include a combination of PHCs (F1-F4), BTEX, and/or VOCs, in the groundwater and/or soil.

Subsurface Structures and Utilities

Underground service locates were completed prior to the subsurface investigation. Underground utilities on the Phase II Property include natural gas, electrical, communications, water, and septic services. No private wells or septic systems are present on the Phase II Property or within the Phase I Study Area.

Physical Setting

Site Stratigraphy

The site stratigraphy, from ground surface to the deepest aquifer or aquitard investigated consists of:

- Pavement structure consisting of approximately 0.10m of asphaltic concrete over crushed stone with silt and sand, extending to depths of

approximately 0.4m below grade. The site was not entirely paved at the time of the assessment.

- Fill material generally consisting of brown silty sand with crushed stone, was identified throughout the developed portion of the property, extending to a depth of approximately 0.4m below grade.
- Topsoil was identified in the undeveloped portions of the subject site. The topsoil extended approximately 0.3m below the existing grade in these areas.
- Silty Clay was identified beneath the fill material (or topsoil). Clay transitions from brown to grey at approximately the depth of the water table. Silty clay extends to near the bedrock surface as inferred by the dynamic cone penetration test (DCPT) carried out for geotechnical purposes.

Hydrogeological Characteristics

Groundwater at the Phase II Property was encountered within the silty clay. This unit is interpreted to function as a local aquifer at the subject site.

Water levels were measured at the subject site on August 7, 2018, at depths ranging from 1.37 to 2.50m below grade. Based on the groundwater elevations measured during this monitoring event, groundwater contour mapping was completed and the horizontal hydraulic gradient for the subject site was calculated. Groundwater flow at the subject site was in a southeasterly direction, with a hydraulic gradient of approximately 0.018 m/m. This is interpreted to be approximately the regional groundwater flow direction.

Approximate Depth to Bedrock

Practical refusal to augering was encountered in BH7 at 4.32m. Bedrock was not encountered in all boreholes.

Approximate Depth to Water Table

Depth to water table at the subject site varies between approximately 1.37 to 2.50m below existing grade.

Sections 41 and 43.1 of the Regulation

Section 41 of the Regulation (Site Condition Standards, Environmentally Sensitive Areas) does not apply to the subject site.

Section 43.1 of the Regulation does not apply to the subject site in that the subject site is not a Shallow Soil Property.

Fill Placement

Fill material was identified in the developed portions of the Phase II Property as part of the pavement structure. The pavement structure is suspected to have been placed on the subject site at during the 1970s, when the property was first developed.

Proposed Buildings and Other Structures

It is our understanding that the development on the Phase II Property will be consist of an expansion of the existing warehouse facility.

Existing Buildings and Structures

The Phase I Property was occupied by two (2) buildings, located at 2390 Stevenage Drive (Tannis) and 2410 Stevenage Drive (Thermo King).

The Tannis building is a two storey warehouse fronting onto Stevenage Drive. The building was constructed in the early 1970's, with two additions, one extending the length of main building (late 1980's to early 1990's), and the other east section of the current building (between 1995 – 1999). The building is constructed with a slab on grade foundation and finished with beige metal siding and metal roof.

Thermo King operates as a transportation repair garage. The building was constructed in the early 1970's. The building is constructed with a slab on grade foundation and is finished with beige and white metal siding and metal roof.

Water Bodies

There are no water bodies on the Phase II ESA property or within 250m of the Phase II Property. The former alignment of McEwen Creek, as identified in the Phase I ESA is present approximately 20m to the south of the subject site, however in the area of the subject site the creek is encased in a sewer line. McEwen creek is no longer considered a water body in the area of the subject site.

Areas of Natural Significance

No areas of natural significance are present on or within the vicinity of the Phase II Property.

6.0 CONCLUSIONS

Assessment

A Phase II ESA was conducted for the properties addressed as 2390 and 2410 Stevenage Drive, in the City of Ottawa, Ontario. The purpose of the Phase II ESA was to address potentially contaminating activities (PCAs) that were identified during the Phase I ESA and considered to result in areas of potential environmental concern (APECs) on the Phase I and Phase II Property. The subsurface investigation was carried out in conjunction with a Geotechnical Investigation and consisted of drilling 11 boreholes three of which were constructed with groundwater monitoring wells.

Soil samples were obtained from the boreholes and screened using visual observations and organic vapour measurements. A total of three soil samples were submitted for laboratory analysis of a combination of benzene, toluene, ethylbenzene and xylenes (BTEX) and petroleum hydrocarbons (PHCs, F_1-F_4). All soil samples are in compliance with the MOECP Table 3 Standards.

Groundwater samples from monitoring wells installed in BH4, BH6, and BH11 were recovered and analysed for VOC and PHC parameters. No contaminant concentrations were identified above the laboratory method detection limits. The groundwater is in compliance with the MOECP Table 3 standards.

Conclusion

Based on the findings of the Phase II ESA, the soil and groundwater on the subject site is in compliance with the MOECP Standards. No further work is required.

It is expected that groundwater monitoring wells will be abandoned in accordance with O.Reg.903, at the time of construction excavation. It is recommended that the integrity of the monitoring wells be maintained, prior to future construction, for possible future groundwater monitoring purposes.

7.0 STATEMENT OF LIMITATIONS

This Phase II - Environmental Site Assessment report has been prepared in general accordance with O.Reg. 153/04 as amended by O.Reg. 269/11, and meets the requirements of CSA Z769-00. The conclusions presented herein are based on information gathered from a limited sampling and testing program. The test results represent conditions at specific test locations at the time of the field program.

The client should be aware that any information pertaining to soils and all test hole logs are furnished as a matter of general information only and test hole descriptions or logs are not to be interpreted as descriptive of conditions at locations other than those of the test holes themselves.

Should any conditions be encountered at the subject site and/or historical information that differ from our findings, we request that we be notified immediately in order to allow for a reassessment.

This report was prepared for the sole use of Sysco Corporation. Notification from Sysco Corporation and Paterson Group will be required to release this report to any other party.

Paterson Group Inc.

Michael Beaudoin, P.Eng.

Mark S. D'Arcy, P.Eng.

Report Distribution:

- Sysco Corporation
- Paterson Group

FIGURES

FIGURE 1 – KEY PLAN

DRAWING PE4373-3 – TEST HOLE LOCATION PLAN

DRAWING PE4373-4 – ANALYTICAL TESTING PLAN

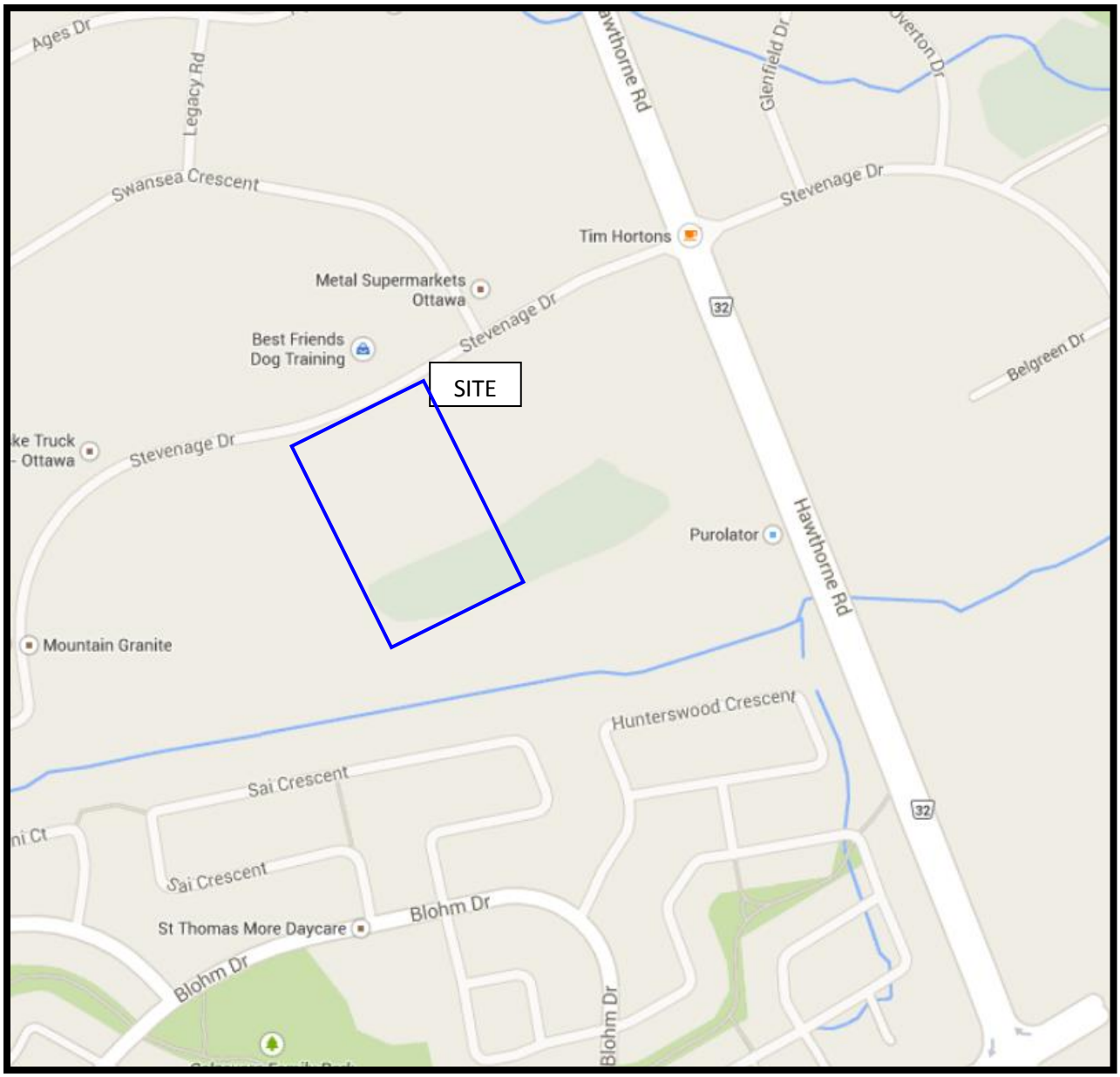
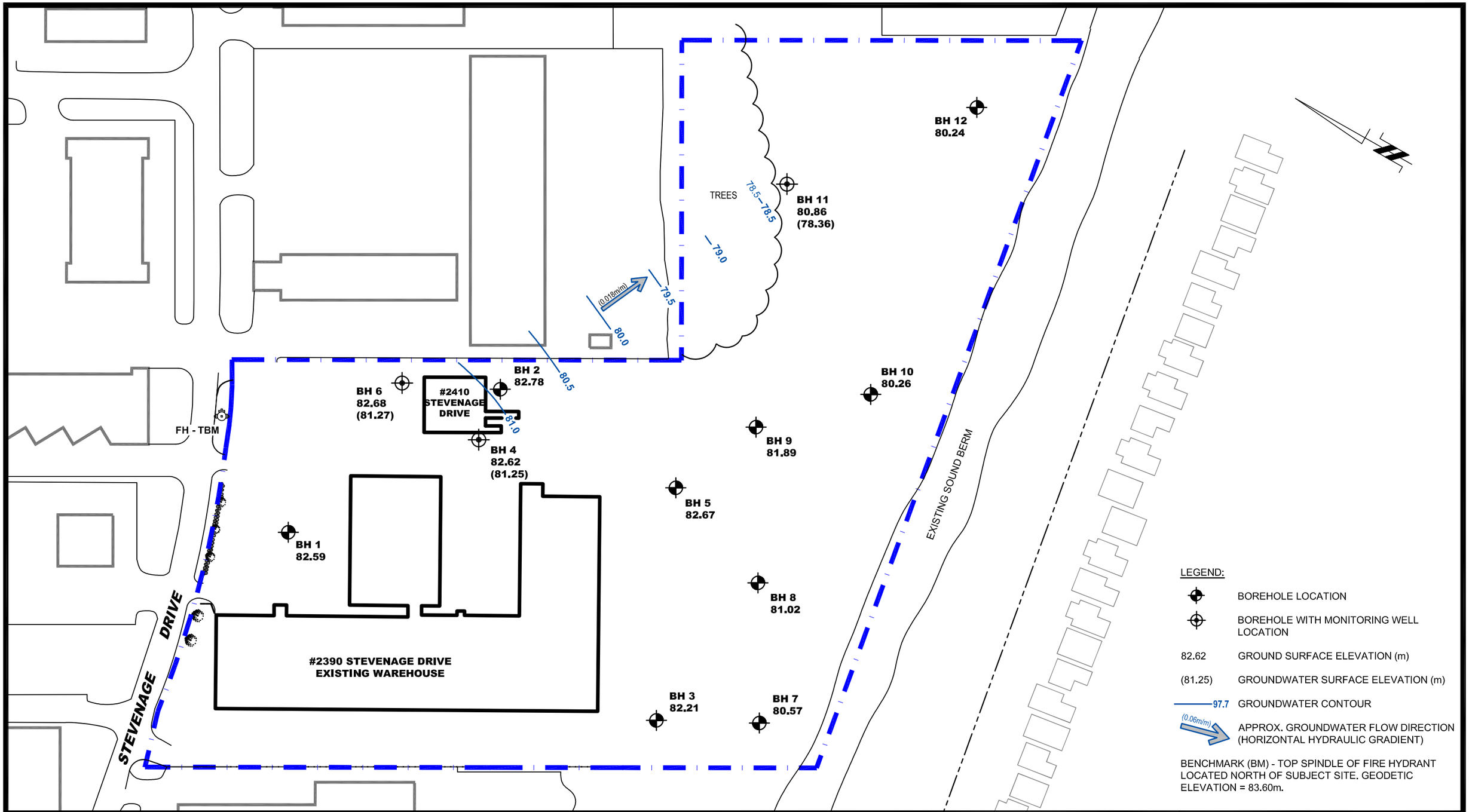


FIGURE 1

KEY PLAN



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NO.	REVISIONS	DATE	INITIAL
0			

SYSCO CORP.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
2390 & 2410 STEVENAGE DRIVE

OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:1500	Date: 08/2018
Drawn by: MPG	Report No.: PE4373-2
Checked by: MB	Dwg. No.: PE4373-3
Approved by: MSD	Revision No.: 0

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BH11-SS5 (3.81-4.41m) - July 11, 2018
BTEX and PHCs comply with MOECP Table 3 Standard
BH11-GW1 (1.52-4.52m) - July 31, 2018
VOCs and PHCs comply with MOECP Table 3 Standard

BH4-SS5 (3.04-3.66m) - July 11, 2018
BTEX and PHCs comply with MOECP Table 3 Standard
BH4-GW1 (3.71-6.71m) - July 31, 2018
VOCs and PHCs comply with MOECP Table 3 Standard

BH6-SS5 (3.04-3.66m) - July 11, 2018
BTEX and PHCs comply with MOECP Table 3 Standard
BH6-GW1 (3.71-6.71m) - July 31, 2018
VOCs and PHCs comply with MOECP Table 3 Standard

TREES

BH 12
80.24

BH 11
80.86
(78.36)

BH 10
80.26

BH 2
82.78

BH 6
82.68
(81.27)

#2410
STEVENAGE DRIVE

FH - TBM

BH 4
82.62
(81.25)

BH 9
81.89

EXISTING SOUND BERM

BH 5
82.67

BH 1
82.59

BH 8
81.02

#2390 STEVENAGE DRIVE
EXISTING WAREHOUSE

BH 3
82.21

BH 7
80.57

STEVENAGE DRIVE

LEGEND:

SOIL PARAMETERS COMPLY WITH MOECP TABLE 3 STANDARDS

GROUNDWATER PARAMETERS COMPLY WITH MOECP TABLE 3 STANDARDS

- BOREHOLE LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION
- 82.62 GROUND SURFACE ELEVATION (m)
- (81.25) GROUNDWATER SURFACE ELEVATION (m)

BENCHMARK (BM) - TOP SPINDLE OF FIRE HYDRANT LOCATED NORTH OF SUBJECT SITE. GEODETIC ELEVATION = 83.60m.

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NO.	REVISIONS	DATE	INITIAL
0			

SYSCO CORP.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
2390 & 2410 STEVENAGE DRIVE

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN

Scale: 1:1500	Date: 08/2018
Drawn by: MPG	Report No.: PE4373-2
Checked by: MB	Dwg. No.: PE4373-4
Approved by: MSD	Revision No.: 0

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APPENDIX 1

SAMPLING AND ANALYSIS PLAN

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

LABORATORY CERTIFICATES OF ANALYSIS

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
2390 Stevenage Drive
Ottawa, Ontario

DATUM BM - Top spindle of fire hydrant located just east of subject site. Geodetic elevation = 83.60m.

FILE NO. PE4373

REMARKS

HOLE NO. BH 1

BORINGS BY CME 55 Power Auger **DATE** July 11, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: Volatile Organic Rdg. (ppm) / Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE									
Asphaltic concrete 0.10						0	82.59		
FILL: Brown silty sand with gravel 0.43		AU	1						
		SS	2	58	7	1	81.59		
		SS	3	83	8	2	80.59		
Very stiff to stiff, brown **SILTY CLAY**		SS	4	96	4	3	79.59		
- grey by 3.0m depth		SS	5	100	2	4	78.59		
						5	77.59		
		SS	6	96	1	6	76.59		
						7	75.59		
7.47									
Dynamic Cone Penetration Test commenced at 7.47m depth						8	74.59		
8.53									
End of Borehole									
Practical DCPT refusal at 8.53m depth									

Lower Explosive Limit %: 20 40 60 80

RKI Eagle Rdg. (ppm): 100 200 300 400 500

▲ Full Gas Resp. △ Methane Elim.

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
2390 Stevenage Drive
Ottawa, Ontario

DATUM BM - Top spindle of fire hydrant located just east of subject site. Geodetic elevation = 83.60m.

FILE NO. PE4373

REMARKS

HOLE NO. BH 2

BORINGS BY CME 55 Power Auger **DATE** July 11, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: Volatile Organic Rdg. (ppm) / Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE						0	82.78		
FILL: Crushed stone		AU	1						
0.63									
		SS	2	33	11	1	81.78		
		SS	3	88	10	2	80.78		
Very stiff to stiff, brown **SILTY CLAY**		SS	4	92	7	3	79.78		
- grey by 3.0m depth		SS	5		3	4	78.78		
						5	77.78		
		SS	6	96	1	6	76.78		
						7	75.78		
7.47									
End of Borehole									

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)
○ Lower Explosive Limit %
20 40 60 80
100 200 300 400 500
RKI Eagle Rdg. (ppm)
▲ Full Gas Resp. △ Methane Elim.

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
2390 Stevenage Drive
Ottawa, Ontario

DATUM BM - Top spindle of fire hydrant located just east of subject site. Geodetic elevation = 83.60m.

FILE NO. PE4373

REMARKS

HOLE NO. BH 3

BORINGS BY CME 55 Power Auger **DATE** July 11, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: Volatile Organic Rdg. (ppm) / Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE						0	82.21		
FILL: Crushed stone		AU	1						
0.51						1	81.21		
		SS	2	54	16				
		SS	3	75	15	2	80.21		
Very stiff to stiff, brown **SILTY CLAY**		SS	4	83	8				
						3	79.21		
- grey by 3.0m depth		SS	5	92	4				
						4	78.21		
						5	77.21		
		SS	6	100	3				
						6	76.21		
6.70									
End of Borehole									

Photo Ionization Detector: ○ Lower Explosive Limit % — 20 40 60 80

100 200 300 400 500
RKI Eagle Rdg. (ppm)
▲ Full Gas Resp. △ Methane Elim.

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
2390 Stevenage Drive
Ottawa, Ontario

DATUM BM - Top spindle of fire hydrant located just east of subject site. Geodetic elevation = 83.60m.

FILE NO. PE4373

REMARKS

HOLE NO. BH 4

BORINGS BY CME 55 Power Auger **DATE** July 11, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	82.62
FILL: Crushed stone with silt and sand		AU	1				
0.60							
Very stiff, brown **SILTY CLAY,** trace gravel		SS	2	42	6	1	81.62
1.45							
		SS	3	96	10	2	80.62
		SS	4	92	8		
Very stiff to stiff, brown **SILTY CLAY**		SS	5	96	5	3	79.62
- grey by 3.0m depth						4	78.62
						5	77.62
		SS	6	0	1	6	76.62
6.70							
End of Borehole							
(GWL @ 1.37m - July 31, 2018)							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
2390 Stevenage Drive
Ottawa, Ontario

DATUM BM - Top spindle of fire hydrant located just east of subject site. Geodetic elevation = 83.60m.

FILE NO. PE4373

REMARKS

HOLE NO. BH 5

BORINGS BY CME 55 Power Auger **DATE** July 11, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: Volatile Organic Rdg. (ppm) / Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE									
FILL: Brown silty sand, some gravel 0.18		AU	1			0	82.67		
		SS	2	54	9	1	81.67		
		SS	3	88	9	2	80.67		
Very stiff to stiff, brown **SILTY CLAY**		SS	4	83	6	3	79.67		
- grey by 3.0m depth		SS	5	96	3	4	78.67		
						5	77.67		
		SS	6	100	W	6	76.67		
						7	75.67		
7.47 End of Borehole									

Photo Ionization Detector: ● Volatile Organic Rdg. (ppm); ○ Lower Explosive Limit %

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
2390 Stevenage Drive
Ottawa, Ontario

DATUM BM - Top spindle of fire hydrant located just east of subject site. Geodetic elevation = 83.60m.

FILE NO. PE4373

REMARKS

HOLE NO. BH 6

BORINGS BY CME 55 Power Auger **DATE** July 11, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	82.68
FILL: Crushed stone		AU	1				
0.59							
		SS	2	33	5	1	81.68
		SS	3	54	3	2	80.68
Very stiff to stiff, brown **SILTY CLAY**		SS	4	83	4		
						3	79.68
- grey by 3.0m depth		SS	5	96	2		
						4	78.68
						5	77.68
		SS	6	100	W		
						6	76.68
6.70							
End of Borehole							
(GWL @ 1.41m - July 31, 2018)							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
2390 Stevenage Drive
Ottawa, Ontario

DATUM BM - Top spindle of fire hydrant located just east of subject site. Geodetic elevation = 83.60m.

FILE NO. PE4373

REMARKS

HOLE NO. BH 7

BORINGS BY CME 55 Power Auger **DATE** July 11, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	80.57
TOPSOIL 0.30		AU	1				
		SS	2	17	15	1	79.57
Very stiff to stiff, brown **SILTY CLAY**		SS	3	100	9	2	78.57
		SS	4	100	4		
- grey by 3.0m depth						3	77.57
3.81							
GLACIAL TILL: Grey silty clay, some gravel, cobbles, boulders, trace sand 4.32		SS	5	64	50+	4	76.57
End of Borehole							
Practical refusal to augering at 4.32m depth							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
2390 Stevenage Drive
Ottawa, Ontario

DATUM BM - Top spindle of fire hydrant located just east of subject site. Geodetic elevation = 83.60m.

FILE NO. PE4373

REMARKS

HOLE NO. BH 8

BORINGS BY CME 55 Power Auger **DATE** July 11, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	81.02
TOPSOIL 0.33		AU	1				
		SS	2	100	17	1	80.02
Very stiff to stiff, brown **SILTY CLAY**		SS	3	100	10	2	79.02
		SS	4	100	4		
- firm and grey by 3.0m depth						3	78.02
4.57						4	77.02
GLACIAL TILL: Dense, grey silty sand with gravel, cobbles, boulders, some clay		SS	5	79	42	5	76.02
5.33		SS	6	55	50+		
Inferred weathered **BEDROCK** 5.94							
End of Borehole							
Practical refusal to augering at 5.94m depth							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
2390 Stevenage Drive
Ottawa, Ontario

DATUM BM - Top spindle of fire hydrant located just east of subject site. Geodetic elevation = 83.60m.

FILE NO. PE4373

REMARKS

HOLE NO. BH 9

BORINGS BY CME 55 Power Auger **DATE** July 11, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							
TOPSOIL						0	81.89
0.36		AU	1				
		SS	2	92	17	1	80.89
		SS	3	100	12	2	79.89
Very stiff to stiff, brown **SILTY CLAY**		SS	4	100	5	3	78.89
- grey by 3.8m depth						4	77.89
						5	76.89
5.33							
GLACIAL TILL: Brown silty clay with gravel, cobbles, boulders, some sand		SS	5	59	21		
5.84							
End of Borehole							
Practical refusal to augering at 5.84m depth							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
2390 Stevenage Drive
Ottawa, Ontario

DATUM BM - Top spindle of fire hydrant located just east of subject site. Geodetic elevation = 83.60m.

FILE NO. PE4373

REMARKS

HOLE NO. BH10

BORINGS BY CME 55 Power Auger **DATE** July 11, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: Volatile Organic Rdg. (ppm) / Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE									
TOPSOIL 0.25		AU	1			0	80.26		
		SS	2	83	10	1	79.26		
Very stiff to stiff, brown **SILTY CLAY**		SS	3	100	6	2	78.26		
						3	77.26		
3.35 End of Borehole									

Photo Ionization Detector: ○ Lower Explosive Limit % (20, 40, 60, 80)

RKI Eagle Rdg. (ppm) (100, 200, 300, 400, 500)

▲ Full Gas Resp. △ Methane Elim.

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
2390 Stevenage Drive
Ottawa, Ontario

DATUM BM - Top spindle of fire hydrant located just east of subject site. Geodetic elevation = 83.60m.

FILE NO. PE4373

REMARKS

HOLE NO. BH11

BORINGS BY CME 55 Power Auger **DATE** July 11, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	80.86
TOPSOIL 0.28		AU	1				
		SS	2	83	12	1	79.86
Very stiff to stiff, brown **SILTY CLAY**		SS	3	100	9	2	78.86
- grey by 2.3m depth		SS	4	100	4	3	77.86
3.81							
GLACIAL TILL: Grey silty clay with gravel, cobbles, boulders, trace sand		SS	5	100	50+	4	76.86
4.52							
End of Borehole							
Practical refusal to augering at 4.52m depth							
(GWL @ 2.50m - July 31, 2018)							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
2390 Stevenage Drive
Ottawa, Ontario

DATUM BM - Top spindle of fire hydrant located just east of subject site. Geodetic elevation = 83.60m.

FILE NO. PE4373

REMARKS

HOLE NO. BH12

BORINGS BY CME 55 Power Auger **DATE** July 11, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: ● Volatile Organic Rdg. (ppm) / ○ Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE									
TOPSOIL 0.25		AU	1			0	80.24		
		SS	2		13	1	79.24		
Very stiff to stiff, brown **SILTY CLAY**		SS	3		6	2	78.24		
						3	77.24		
3.35 End of Borehole									

Photo Ionization Detector: ○ Lower Explosive Limit % — 20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Geotechnical Engineering

Environmental Engineering

Hydrogeology

Geological Engineering

Materials Testing

Building Science

Archaeological Services

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Sampling & Analysis Plan

Phase II Environmental Site Assessment
2390 and 2410 Stevenage Drive
Ottawa, Ontario

Prepared For

Sysco Corporation

July 2018

Report: PE4373-SAP

Table of Contents

1.0 SAMPLING PROGRAM

Paterson Group Inc. (Paterson) was commissioned by Sysco Corporation to conduct a Phase II Environmental Site Assessment (ESA) at 2390 and 2410 Stevenage Drive, in the City of Ottawa, Ontario. Based on a Phase I ESA completed by Paterson for the subject property, a subsurface investigation program, consisting of borehole drilling, was developed. A geotechnical investigation was conducted concurrently with the environmental subsurface investigation.

Borehole	Location & Rationale	Proposed Depth & Rationale
BH4	West side of the existing truck mechanic building to assess the potential for soil and groundwater impacts relating to the onsite truck mechanic.	Borehole advanced to approximately 2.5m beneath the suspected water table.
BH6	North side of the existing truck mechanic building to assess the potential for soil and groundwater impacts relating to the onsite truck mechanic.	Borehole advanced to approximately 2.5m beneath the suspected water table.
BH11	South the existing metal fabrication company to assess the potential soil and groundwater impacts relating to the offsite metal fabrication facility.	Borehole advanced to approximately 2.5m beneath the suspected water table.
BH1-3, BH5, BH7-10, and BH12	Provide general coverage of the subject site for geotechnical purposes	Approximately 6m or auger refusal for geotechnical purposes.

At each borehole, split-spoon samples of overburden soils will be obtained at 0.76 m (2'6") intervals until practical refusal to augering. All soil samples will be retained, and samples will be selected for submission following a preliminary screening analysis.

Following borehole drilling, monitoring wells will be installed in selected boreholes (as above) for the measurement of water levels and the collection of groundwater samples. Borehole locations are shown on the Test Hole Location Plan appended to the main report.

2.0 ANALYTICAL TESTING PROGRAM

The analytical testing program for soil at the subject site is based on the following general considerations:

- ❒ At least one sample from each borehole should be submitted, in order to delineate the horizontal extent of contamination across the site.
- ❒ At least one sample from each stratigraphic unit should be submitted, in order to delineate the vertical extent of contamination at the site.
- ❒ In boreholes where there is visual or olfactory evidence of contamination, or where organic vapour meter or photoionization detector readings indicate the presence of contamination, the 'worst-case' sample from each borehole should be submitted for comparison with MOECC site condition standards.
- ❒ In boreholes with evidence of contamination as described above, a sample should be submitted from the stratigraphic unit below the 'worst-case' sample to determine whether the contaminant(s) have migrated downward.
- ❒ Parameters analyzed should be consistent with the Contaminants of Potential Concern identified in the Phase I ESA.

The analytical testing program for groundwater at the subject site is based on the following general considerations:

- ❒ Groundwater monitoring wells should be installed in all boreholes with visual or olfactory evidence of soil contamination, in stratigraphic units where soil contamination was encountered, where those stratigraphic units are at or below the water table (i.e. a water sample can be obtained).
- ❒ Groundwater monitoring well screens should straddle the water table at sites where the contaminants of concern are suspected to be LNAPLs.
- ❒ At least one groundwater monitoring well should be installed in a stratigraphic unit below the suspected contamination, where said stratigraphic unit is water-bearing.
- ❒ Parameters analyzed should be consistent with the Contaminants of Concern identified in the Phase I ESA and with the contaminants identified in the soil samples.

3.0 STANDARD OPERATING PROCEDURES

3.1 Environmental Drilling Procedure

Purpose

The purpose of environmental boreholes is to identify and/or delineate contamination within the soil and/or to install groundwater monitoring wells in order to identify contamination within the groundwater.

Equipment

The following is a list of equipment that is in addition to regular drilling equipment stated in the geotechnical drilling SOP:

- ❒ glass soil sample jars
- ❒ two buckets
- ❒ cleaning brush (toilet brush works well)
- ❒ dish detergent
- ❒ methyl hydrate
- ❒ water (if not available on site - water jugs available in trailer)
- ❒ latex or nitrile gloves (depending on suspected contaminant)
- ❒ RKI Eagle organic vapour meter or MiniRae photoionization detector (depending on contamination suspected)

Determining Borehole Locations

If conditions on site are not as suspected, and planned borehole locations cannot be drilled, **call the office to discuss**. Alternative borehole locations will be determined in conversation with the field technician and supervising engineer.

After drilling is completed a plan with the borehole locations must be provided. Distances and orientations of boreholes with respect to site features (buildings, roadways, etc.) must be provided. Distances should be measured using a measuring tape or wheel rather than paced off. Ground surface elevations at each borehole should be surveyed relative to a fire hydrant located on south side of Lisgar Street (300 Lisgar Street), with geodetic elevation of 72.57m above sea level (asl).

Drilling Procedure

The actual drilling procedure for environmental boreholes is the same as geotechnical boreholes (see SOP for drilling and sampling) with a few exceptions as follows:

- ❒ Continuous split spoon samples (every 0.6 m or 2') or semi-continuous (every 0.76 m or 2'6") are required.
- ❒ Make sure samples are well sealed in plastic bags with no holes prior to screening and are kept cool but unfrozen.
- ❒ If sampling for VOCs, BTEX, or PHCs F1, a soil core from each soil sample which may be analyzed must be taken and placed in the laboratory-provided methanol vial.
- ❒ Note all and any odours or discolouration of samples.
- ❒ Split spoon samplers must be washed between samples.
- ❒ If obvious contamination is encountered, continue sampling until vertical extent of contamination is delineated.
- ❒ As a general rule, environmental boreholes should be deep enough to intercept the groundwater table (unless this is impossible/impractical - call project manager to discuss).
- ❒ If at all possible, soil samples should be submitted to a preliminary screening procedure on site, either using a RKI Eagle, PID, etc. depending on type of suspected contamination.

Spoon Washing Procedure

All sampling equipment (spilt spoons, etc.) must be washed between samples in order to prevent cross contamination of soil samples.

- ❒ Obtain two buckets of water (preferably hot if available)
- ❒ Add a small amount of dish soap to one bucket
- ❒ Scrub spoons with brush in soapy water, inside and out, including tip
- ❒ Rinse in clean water
- ❒ Apply a small amount of methyl hydrate to the inside of the spoon. (A spray bottle or water bottle with a small hole in the cap works well)
- ❒ Allow to dry (takes seconds)
- ❒ Rinse with distilled water, a spray bottle works well.

The methyl hydrate eliminates any soap residue that may be on the spoon, and is especially important when dealing with suspected VOCs.

Screening Procedure

The RKI Eagle is used to screen most soil samples, particularly where petroleum hydrocarbon contamination is suspected. The MiniRae is used when VOCs are suspected, however it also can be useful for detecting petroleum. These tools are for screening purposes only and cannot be used in place of laboratory testing. Vapour results obtained from the RKI Eagle and the PID are relative and must be interpreted.

Screening equipment should be calibrated on an approximately monthly basis, more frequently if heavily used.

- ❒ Samples should be brought to room temperature; this is specifically important in colder weather. Soil must not be frozen.
- ❒ Turn instrument on and allow to come to zero - calibrate if necessary
- ❒ If using RKI Eagle, ensure instrument is in methane elimination mode unless otherwise directed.
- ❒ Ensure measurement units are ppm (parts per million) initially. RKI Eagle will automatically switch to %LEL (lower explosive limit) if higher concentrations are encountered.
- ❒ Break up large lumps of soil in the sample bag, taking care not to puncture bag.
- ❒ Insert probe into soil bag, creating a seal with your hand around the opening.
- ❒ Gently manipulate soil in bag while observing instrument readings.
- ❒ Record the highest value obtained in the first 15 to 25 seconds
- ❒ Make sure to indicate scale (ppm or LEL); also note which instrument was used (RKI Eagle 1 or 2, or MiniRae).
- ❒ Jar samples and refrigerate as per Sampling and Analysis Plan.

3.2 Monitoring Well Installation Procedure

Equipment

- ❒ 5’ x 2” [1.52 m x 50 mm] threaded sections of Schedule 40 PVC slotted well screen (5’ x 1 ¼” [1.52 m x 32 mm] if installing in cored hole in bedrock)
- ❒ 5’ x 2” [1.52 m x 50 mm] threaded sections of Schedule 40 PVC riser pipe (5’ x 1 ¼” [1.52 m x 32 mm] if installing in cored hole in bedrock)
- ❒ Threaded end-cap
- ❒ Slip-cap or J-plug
- ❒ Asphalt cold patch or concrete
- ❒ Silica Sand
- ❒ Bentonite chips (Holeplug)
- ❒ Steel flushmount casing

Procedure

- ❒ Drill borehole to required depth, using drilling and sampling procedures described above.
- ❒ If borehole is deeper than required monitoring well, backfill with bentonite chips to required depth. This should only be done on wells where contamination is not suspected, in order to prevent downward migration of contamination.
- ❒ Only one monitoring well should be installed per borehole.
- ❒ Monitoring wells should not be screened across more than one stratigraphic unit to prevent potential migration of contaminants between units.
- ❒ Where LNAPLs are the suspected contaminants of concern, monitoring wells should be screened straddling the water table in order to capture any free product floating on top of the water table.
- ❒ Thread the end cap onto a section of screen. Thread second section of screen if required. Thread risers onto screen. Lower into borehole to required depth. Ensure slip-cap or J-plug is inserted to prevent backfill materials entering well.
- ❒ As drillers remove augers, backfill borehole annulus with silica sand until the level of sand is approximately 0.3 m above the top of the screen.
- ❒ Backfill with holeplug until at least 0.3 m of holeplug is present above the top of the silica sand.
- ❒ Backfill remainder of borehole with holeplug or with auger cuttings (if contamination is not suspected).
- ❒ Install flushmount casing. Seal space between flushmount and borehole annulus with concrete, cold patch, or holeplug to match surrounding ground surface.

3.3 Monitoring Well Sampling Procedure

Equipment

- ❒ Water level metre or interface probe on hydrocarbon/LNAPL sites
- ❒ Spray bottles containing water and methanol to clean water level tape or interface probe
- ❒ Peristaltic pump
- ❒ Polyethylene tubing for peristaltic pump
- ❒ Flexible tubing for peristaltic pump
- ❒ Latex or nitrile gloves (depending on suspected contaminant)
- ❒ Allen keys and/or 9/16" socket wrench to remove well caps
- ❒ Graduated bucket with volume measurements
- ❒ pH/Temperature/Conductivity combo pen
- ❒ Laboratory-supplied sample bottles

Sampling Procedure

- ❒ Locate well and use socket wrench or Allan key to open metal flush mount protector cap. Remove plastic well cap.
- ❒ Measure water level, with respect to existing ground surface, using water level meter or interface probe. If using interface probe on suspected NAPL site, measure the thickness of free product.
- ❒ Measure total depth of well.
- ❒ Clean water level tape or interface probe using methanol and water. Change gloves between wells.
- ❒ Calculate volume of standing water within well and record.
- ❒ Insert polyethylene tubing into well and attach to peristaltic pump. Turn on peristaltic pump and purge into graduated bucket. Purge at least three well volumes of water from the well. Measure and record field chemistry. Continue to purge, measuring field chemistry after every well volume purged, until appearance or field chemistry stabilizes.
- ❒ Note appearance of purge water, including colour, opacity (clear, cloudy, silty), sheen, presence of LNAPL, and odour. Note any other unusual features (particulate matter, effervescence (bubbling) of dissolved gas, etc.).
- ❒ Fill required sample bottles. If sampling for metals, attach 75-micron filter to discharge tube and filter metals sample. If sampling for VOCs, use low flow rate to ensure continuous stream of non-turbulent flow into sample bottles. Ensure no headspace is present in VOC vials.
- ❒ Replace well cap and flushmount casing cap.

4.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

The QA/QC program for this Phase II ESA is as follows:

- ❒ All non-dedicated sampling equipment (split spoons) will be decontaminated according to the SOPs listed above.
- ❒ All groundwater sampling equipment is dedicated (polyethylene and flexible peristaltic tubing is replaced for each well).
- ❒ Where groundwater samples are to be analyzed for VOCs, one laboratory-provided trip blank will be submitted for analysis with every laboratory submission.
- ❒ Approximately one (1) field duplicate will be submitted for every ten (10) samples submitted for laboratory analysis. A minimum of one (1) field duplicate per project will be submitted. Field duplicates will be submitted for soil and groundwater samples
- ❒ Where combo pens are used to measure field chemistry, they will be calibrated on an approximately monthly basis, according to frequency of use.

5.0 DATA QUALITY OBJECTIVES

The purpose of setting data quality objectives (DQOs) is to ensure that the level of uncertainty in data collected during the Phase II ESA is low enough that decision-making is not affected, and that the overall objectives of the investigation are met.

The quality of data is assessed by comparing field duplicates with original samples. If the relative percent difference (RPD) between the duplicate and the sample is within 20%, the data are considered to be of sufficient quality so as not to affect decision-making. The RPD is calculated as follows:

$$RPD = \left| \frac{x_1 - x_2}{(x_1 + x_2)/2} \right| \times 100\%$$

Where x_1 is the concentration of a given parameter in an original sample and x_2 is the concentration of that same parameter in the field duplicate sample.

For the purpose of calculating the RPD, it is desirable to select field duplicates from samples for which parameters are present in concentrations above laboratory detection limits, i.e. samples which are expected to be contaminated. If parameters are below laboratory detection limits for selected samples or duplicates, the RPD may be calculated using a concentration equal to one half (0.5 x) the laboratory detection limit.

It is also important to consider data quality in the overall context of the project. For example, if the DQOs are not met for a given sample, yet the concentrations of contaminants in both the sample and the duplicate exceed the MOE site remediation standards by a large margin, the decision-making usefulness of the sample may not be considered to be impaired. The proximity of other samples which meet the DQOs must also be considered in developing the Phase II Conceptual Site Model; often there are enough data available to produce a reliable Phase II Conceptual Site Model even if DQOs are not met for certain individual samples.

These considerations are discussed in the body of the report.

6.0 PHYSICAL IMPEDIMENTS TO SAMPLING & ANALYSIS PLAN

Physical impediments to the Sampling and Analysis plan may include:

- ❒ The location of underground utilities
- ❒ Poor recovery of split-spoon soil samples
- ❒ Insufficient groundwater volume for groundwater samples
- ❒ Breakage of sampling containers following sampling or while in transit to the laboratory
- ❒ Elevated detection limits due to matrix interference (generally related to soil colour or presence of organic material)
- ❒ Elevated detection limits due to high concentrations of certain parameters, necessitating dilution of samples in laboratory
- ❒ Drill rig breakdowns
- ❒ Winter conditions
- ❒ Other site-specific impediments

Site-specific impediments to the Sampling and Analysis plan are discussed in the body of the Phase II ESA report.

SYMBOLS AND TERMS

SOIL DESCRIPTION

Behavioural properties, such as structure and strength, take precedence over particle gradation in describing soils. Terminology describing soil structure are as follows:

Desiccated	-	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure.
Varved	-	composed of regular alternating layers of silt and clay.
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or silt and clay.
Well-Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes (see Grain Size Distribution).
Uniformly-Graded	-	Predominantly of one grain size (see Grain Size Distribution).

The standard terminology to describe the strength of cohesionless soils is the relative density, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm.

Relative Density	'N' Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

Consistency	Undrained Shear Strength (kPa)	'N' Value
Very Soft	<12	<2
Soft	12-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their “sensitivity”. The sensitivity is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil.

Terminology used for describing soil strata based upon texture, or the proportion of individual particle sizes present is provided on the Textural Soil Classification Chart at the end of this information package.

ROCK DESCRIPTION

The structural description of the bedrock mass is based on the Rock Quality Designation (RQD).

The RQD classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be a result of closely-spaced discontinuities (resulting from shearing, jointing, faulting, or weathering) in the rock mass and are not counted. RQD is ideally determined from NXL size core. However, it can be used on smaller core sizes, such as BX, if the bulk of the fractures caused by drilling stresses (called “mechanical breaks”) are easily distinguishable from the normal in situ fractures.

RQD %	ROCK QUALITY
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard Penetration Test (SPT))
TW	-	Thin wall tube or Shelby tube
PS	-	Piston sample
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size AXT, BXL, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

GRAIN SIZE DISTRIBUTION

MC%	-	Natural moisture content or water content of sample, %
LL	-	Liquid Limit, % (water content above which soil behaves as a liquid)
PL	-	Plastic limit, % (water content above which soil behaves plastically)
PI	-	Plasticity index, % (difference between LL and PL)
Dxx	-	Grain size which xx% of the soil, by weight, is of finer grain sizes These grain size descriptions are not used below 0.075 mm grain size
D10	-	Grain size at which 10% of the soil is finer (effective grain size)
D60	-	Grain size at which 60% of the soil is finer
Cc	-	Concavity coefficient = $(D30)^2$ / (D10 x D60)
Cu	-	Uniformity coefficient = D60 / D10

Cc and Cu are used to assess the grading of sands and gravels:
Well-graded gravels have: $1 < Cc < 3$ and $Cu > 4$
Well-graded sands have: $1 < Cc < 3$ and $Cu > 6$
Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded.
Cc and Cu are not applicable for the description of soils with more than 10% silt and clay
(more than 10% finer than 0.075 mm or the #200 sieve)

CONSOLIDATION TEST

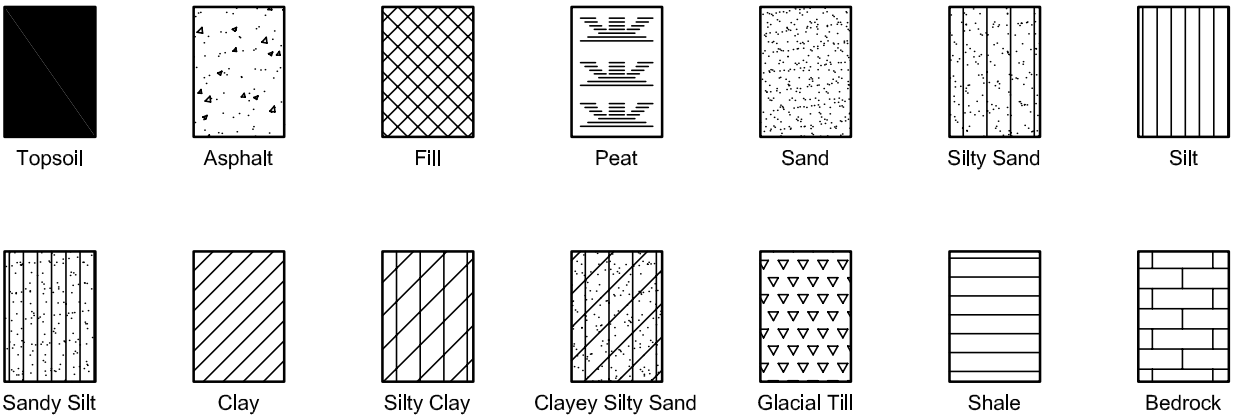
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void Ratio		Initial sample void ratio = volume of voids / volume of solids
Wo	-	Initial water content (at start of consolidation test)

PERMEABILITY TEST

k	-	Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the test.

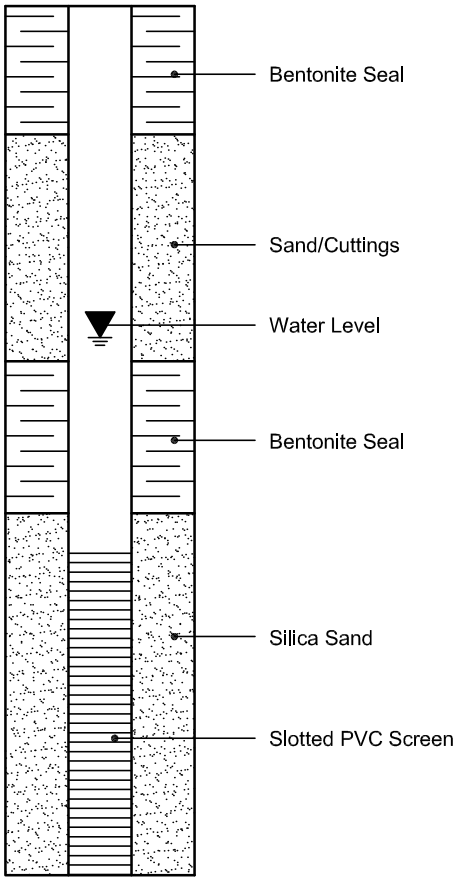
SYMBOLS AND TERMS (continued)

STRATA PLOT

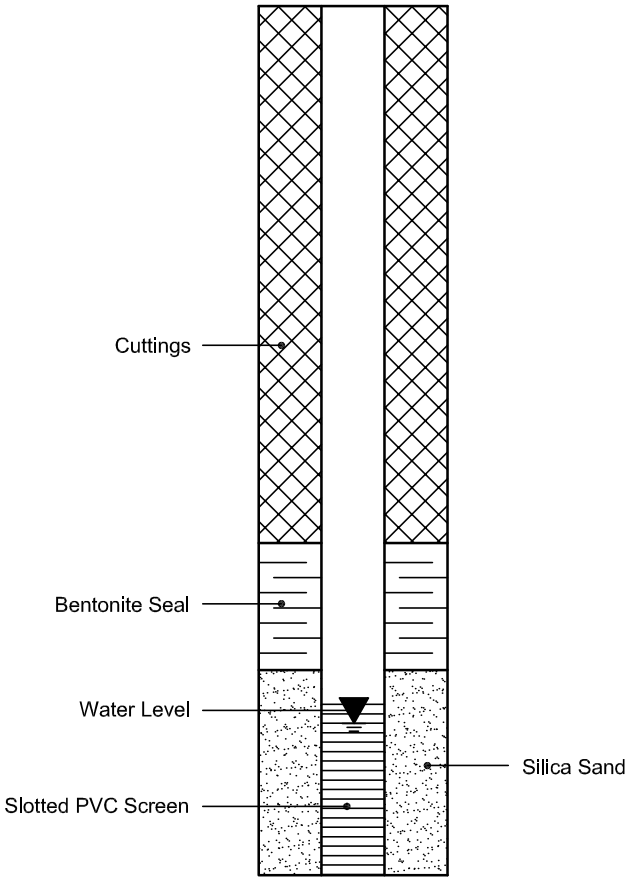


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



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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: 24658
Project: PE4373
Custody: 118693

Report Date: 26-Jul-2018
Order Date: 23-Jul-2018

Order #: 1830150

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

Paracel ID	Client ID
1830150-01	BH4-SS5
1830150-02	BH6-SS5
1830150-03	BH11-SS5

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 24658

Report Date: 26-Jul-2018
Order Date: 23-Jul-2018
Project Description: PE4373

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	25-Jul-18	25-Jul-18
PHC F1	CWS Tier 1 - P&T GC-FID	25-Jul-18	25-Jul-18
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	24-Jul-18	24-Jul-18
Solids, %	Gravimetric, calculation	25-Jul-18	25-Jul-18

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 24658

Report Date: 26-Jul-2018

Order Date: 23-Jul-2018

Project Description: PE4373

	Client ID:	BH4-SS5	BH6-SS5	BH11-SS5	-
	Sample Date:	07/11/2018 09:00	07/11/2018 09:00	07/11/2018 09:00	-
	Sample ID:	1830150-01	1830150-02	1830150-03	-
	MDL/Units	Soil	Soil	Soil	-
Physical Characteristics					
% Solids	0.1 % by Wt.	64.9	67.7	88.7	-
Volatiles					
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Toluene-d8	Surrogate	85.8%	85.7%	78.1%	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	8	-
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	173	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	138	-

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 24658

Report Date: 26-Jul-2018
Order Date: 23-Jul-2018
Project Description: PE4373

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						
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	*2.95*		*ug/g*		*92.2*	*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	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	49	4	ug/g dry	39			22.0	30	
F3 PHCs (C16-C34)	59	8	ug/g dry	38			44.2	30	QR-01
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND				30	
Physical Characteristics									
% Solids	79.4	0.1	% by Wt.	81.1			2.1	25	
Volatiles									
Benzene	ND	0.02	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
m,p-Xylenes	ND	0.05	ug/g dry	ND				50	
o-Xylene	ND	0.05	ug/g dry	ND				50	
Surrogate: Toluene-d8	*3.04*		*ug/g dry*		*83.5*	*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)	195	7	ug/g		97.6	80-120			
F2 PHCs (C10-C16)	152	4	ug/g	39	82.0	60-140			
F3 PHCs (C16-C34)	342	8	ug/g	38	90.2	60-140			
F4 PHCs (C34-C50)	205	6	ug/g	ND	95.9	60-140			
Volatiles									
Benzene	3.68	0.02	ug/g		92.0	60-130			
Ethylbenzene	4.86	0.05	ug/g		122	60-130			
Toluene	4.67	0.05	ug/g		117	60-130			
m,p-Xylenes	10.2	0.05	ug/g		128	60-130			
o-Xylene	4.90	0.05	ug/g		123	60-130			
Surrogate: Toluene-d8	*2.34*		*ug/g*		*73.0*	*50-140*			

Qualifier Notes:

QC Qualifiers :

QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

CCME PHC additional information:

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

Paracel ID: 1830150

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Page 1 of 1

PE4373 permit

Client Name: Paterson	Project Reference: ~~PG4583~~
Contact Name: Mark D'Arcy	Quote #
Address: 154 Colonnade Rd	PO # 24658
Telephone: 613 226 7381	Email Address: mdarcy@patersongroup.ca

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

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

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

Required Analyses

	Paracel Order Number: 1830150 / 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	BH4-SS5	S		3	11 July '18		✓							120 mL + 40 mL HOLD until we contact you.
2	BH6-SS5	S		3	↓		✓							
3	BH11-SS5	S		3	↓		✓							
4														
5														
6														
7														
8	Analyze all samples for PHC/Btex per met on req. TAT. OBSOLETE													
9														
10														

Comments:

Method of Delivery: Paracel

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Relinquished By (Print): PHILIP PRICE	Date/Time: 18/07/18 3:00	Date/Time: JULY 19, 2018 04:35	Date/Time: 24/7/18 8:46
Date/Time: 18 July 2018	Temperature: °C	Temperature: 18.4 °C	pH Verified [ ] By: NA

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Certificate of Analysis

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

Client PO: 24626
Project: PE4373
Custody: 42563

Report Date: 7-Aug-2018
Order Date: 31-Jul-2018

Order #: 1831193

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

Paracel ID	Client ID
1831193-01	BH4-GW1
1831193-02	BH6-GW1
1831193-03	BH11-GW1

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 24626

Report Date: 07-Aug-2018
Order Date: 31-Jul-2018
Project Description: PE4373

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PHC F1	CWS Tier 1 - P&T GC-FID	2-Aug-18	2-Aug-18
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	1-Aug-18	2-Aug-18
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	2-Aug-18	2-Aug-18

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 24626

Report Date: 07-Aug-2018

Order Date: 31-Jul-2018

Project Description: PE4373

	Client ID:	BH4-GW1	BH6-GW1	BH11-GW1	-
	Sample Date:	07/31/2018 09:00	07/31/2018 09:00	07/31/2018 09:00	-
	Sample ID:	1831193-01	1831193-02	1831193-03	-
	MDL/Units	Water	Water	Water	-
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	-
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Ethylene dibromide (dibromoethan	0.2 ug/L	<0.2	<0.2	<0.2	-
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	-
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-

Certificate of Analysis

Client: Paterson Group Consulting Engineers

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Report Date: 07-Aug-2018

Order Date: 31-Jul-2018

Project Description: PE4373

	Client ID:	BH4-GW1	BH6-GW1	BH11-GW1	-
	Sample Date:	07/31/2018 09:00	07/31/2018 09:00	07/31/2018 09:00	-
	Sample ID:	1831193-01	1831193-02	1831193-03	-
	MDL/Units	Water	Water	Water	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	-
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	-
4-Bromofluorobenzene	Surrogate	101%	100%	99.5%	-
Dibromofluoromethane	Surrogate	107%	106%	106%	-
Toluene-d8	Surrogate	105%	109%	102%	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	-

Certificate of Analysis
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Report Date: 07-Aug-2018
Order Date: 31-Jul-2018
Project Description: PE4373

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	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	*88.2*		*ug/L*		*110*	*50-140*			
Surrogate: Dibromofluoromethane	*89.1*		*ug/L*		*111*	*50-140*			
Surrogate: Toluene-d8	*85.2*		*ug/L*		*107*	*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				30	
Volatiles									
Acetone	ND	5.0	ug/L	ND				30	
Benzene	ND	0.5	ug/L	ND				30	
Bromodichloromethane	1.24	0.5	ug/L	1.27			2.4	30	
Bromoform	ND	0.5	ug/L	ND				30	
Bromomethane	ND	0.5	ug/L	ND				30	
Carbon Tetrachloride	ND	0.2	ug/L	ND				30	
Chlorobenzene	ND	0.5	ug/L	ND				30	
Chloroform	3.48	0.5	ug/L	3.50			0.6	30	
Dibromochloromethane	ND	0.5	ug/L	ND				30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND				30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
1,2-Dichloroethane	ND	0.5	ug/L	ND				30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND				30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
1,2-Dichloropropane	ND	0.5	ug/L	ND				30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Ethylene dibromide (dibromoethane	ND	0.2	ug/L	ND				30	
Hexane	ND	1.0	ug/L	ND				30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND				30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND				30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Styrene	ND	0.5	ug/L	ND				30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
Tetrachloroethylene	ND	0.5	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND				30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND				30	
Trichloroethylene	ND	0.5	ug/L	ND				30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: 4-Bromofluorobenzene	*81.0*		*ug/L*		*101*	*50-140*			
Surrogate: Dibromofluoromethane	*85.7*		*ug/L*		*107*	*50-140*			
Surrogate: Toluene-d8	*82.7*		*ug/L*		*103*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	2020	25	ug/L		101	68-117			
F2 PHCs (C10-C16)	1560	100	ug/L		97.8	60-140			
F3 PHCs (C16-C34)	4810	100	ug/L		123	60-140			
F4 PHCs (C34-C50)	3220	100	ug/L		130	60-140			
Volatiles									
Acetone	84.9	5.0	ug/L		84.9	50-140			
Benzene	36.9	0.5	ug/L		92.3	60-130			
Bromodichloromethane	45.0	0.5	ug/L		112	60-130			
Bromoform	51.0	0.5	ug/L		127	60-130			
Bromomethane	31.5	0.5	ug/L		78.6	50-140			
Carbon Tetrachloride	47.1	0.2	ug/L		118	60-130			
Chlorobenzene	38.6	0.5	ug/L		96.4	60-130			
Chloroform	38.8	0.5	ug/L		97.1	60-130			
Dibromochloromethane	49.7	0.5	ug/L		124	60-130			
Dichlorodifluoromethane	31.3	1.0	ug/L		78.3	50-140			
1,2-Dichlorobenzene	37.6	0.5	ug/L		94.1	60-130			
1,3-Dichlorobenzene	39.4	0.5	ug/L		98.5	60-130			
1,4-Dichlorobenzene	37.4	0.5	ug/L		93.5	60-130			
1,1-Dichloroethane	37.2	0.5	ug/L		93.0	60-130			
1,2-Dichloroethane	37.4	0.5	ug/L		93.4	60-130			
1,1-Dichloroethylene	37.2	0.5	ug/L		93.0	60-130			
cis-1,2-Dichloroethylene	37.2	0.5	ug/L		93.1	60-130			
trans-1,2-Dichloroethylene	37.1	0.5	ug/L		92.8	60-130			
1,2-Dichloropropane	36.4	0.5	ug/L		91.1	60-130			
cis-1,3-Dichloropropylene	44.8	0.5	ug/L		112	60-130			
trans-1,3-Dichloropropylene	46.2	0.5	ug/L		116	60-130			
Ethylbenzene	38.0	0.5	ug/L		95.0	60-130			
Ethylene dibromide (dibromoethane	39.0	0.2	ug/L		97.4	60-130			
Hexane	40.2	1.0	ug/L		100	60-130			
Methyl Ethyl Ketone (2-Butanone)	89.8	5.0	ug/L		89.8	50-140			
Methyl Isobutyl Ketone	106	5.0	ug/L		106	50-140			
Methyl tert-butyl ether	89.8	2.0	ug/L		89.8	50-140			
Methylene Chloride	35.6	5.0	ug/L		89.0	60-130			
Styrene	37.5	0.5	ug/L		93.8	60-130			
1,1,1,2-Tetrachloroethane	46.4	0.5	ug/L		116	60-130			
1,1,2,2-Tetrachloroethane	41.2	0.5	ug/L		103	60-130			
Tetrachloroethylene	36.8	0.5	ug/L		91.9	60-130			
Toluene	37.2	0.5	ug/L		93.1	60-130			
1,1,1-Trichloroethane	42.9	0.5	ug/L		107	60-130			
1,1,2-Trichloroethane	36.7	0.5	ug/L		91.8	60-130			
Trichloroethylene	34.8	0.5	ug/L		87.1	60-130			
Trichlorofluoromethane	39.4	1.0	ug/L		98.4	60-130			
Vinyl chloride	38.7	0.5	ug/L		96.7	50-140			
m,p-Xylenes	79.0	0.5	ug/L		98.8	60-130			
o-Xylene	39.9	0.5	ug/L		99.6	60-130			
Surrogate: 4-Bromofluorobenzene	*79.2*		*ug/L*		*99.0*	*50-140*			

Qualifier Notes:

Login Qualifiers :

Received at temperature > 25C
Applies to samples: BH4-GW1, BH6-GW1, BH11-GW1

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

CCME PHC additional information:

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

Paracel ID: 1831193

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Chain of Custody
(Lab Use Only)
№ 42563

Page 1 of 1

Client Name: Paterson Group	Project Reference: PE4373	**Turnaround Time:**
Contact Name: Mark D'Arcy	Quote #	☐ 1 Day ☐ 3 Day
Address: 154 Colonnade Rd S, Ottawa	PO #	☐ 2 Day ☒ Regular
Telephone: 613 226 7381	Email Address:	Date Required:

Criteria: ☒ O. Reg. 153/04 (As Amended) Table 3 ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

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

Required Analyses

Paracel Order Number: 1831193

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	VOCs	PHC + BTEX F1-F4								
1	BH4-GW1	GW		3	Jul 31		X	X								
2	BH6-GW1	↓		↓	↓		X	X								
3	BH11-GW1	↓		↓	↓		X	X								
4																
5																
6																
7																
8																
9																
10																

Comments: will email P.O.

Method of Delivery: walk in

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Mark Mroz	Date/Time:	Date/Time: Aug 1/18 4:17	Date/Time: Aug 1/18 4:17pm
Date/Time: 2018-07-31	Temperature: °C	Temperature: 26.9 °C	pH Verified [ ] By: