



Phase Two Environmental Site Assessment Report

Existing Agricultural Property
King Street
Port Perry, Ontario

Report for Delpark Homes (Port Perry) Inc.

65 Sunray Street, Whitby, Ontario, Canada L1N 8Y3
11148414 | 01 | Report No. 2 | June, 2017



Executive Summary

Based on the results of a Phase One Environmental Site Assessment (ESA), a Phase Two ESA was conducted by GHD Limited for Delpark Homes (Port Perry) Inc. in assessing the environmental concerns of land located along the north side of King Street approximately 60m west of Perryview Drive in Port Perry, Regional Municipality of Durham, Ontario (“the Property”). The Property encompasses an area on the order of 17.4 hectares (43 acres) and is currently used for agricultural purposes (cash crops). The surrounding areas to the north, east and west are municipally serviced for water and sewer. Based on information compiled, the Property was first developed for agricultural use prior to 1927.

The Phase One ESA identified potentially contaminating activities that have resulted in areas of potential environmental concern (APECs) on the Property. The environmental concerns include the historic presence of a former rail line on the Property and the use of fill for rail line construction, as well as for imported fill from adjacent residential subdivisions.

The Phase Two ESA included the exploration of the subsurface by advancing ten (10) boreholes and installing three (3) monitoring wells to sample soil and groundwater. Soil samples were analyzed for pH, metals, petroleum hydrocarbons (PHCs), volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs). One (1) representative groundwater sample was analyzed for pH, metals, PHCs, VOCs and PAHs. Results of the chemical analysis were compared to the Ministry of Environment and Climate Change (MOECC) Table 2 Full Depth Generic Site Condition Standards for Use in a Potable groundwater condition (residential property use) (MOECC, April 15, 2011). The soil and groundwater results meet the MOECC Table 2 Standards for residential property use. It is understood that the Property is being considered for a proposed residential development.

Based on our observations, the information collected, and the present land use, it is our professional opinion that there is a low level of concern from an environmental perspective and the Property is suitable for its proposed residential use. It is GHD’s opinion that no further testing or field investigation is warranted at this time.



Table of Contents

1.	Introduction	1
1.1	Site Description	1
1.2	Property Ownership	1
1.3	Current and Proposed Future Uses	1
1.4	Applicable Site Condition Standard	1
2.	Background Information	2
2.1	Physical Setting	2
2.2	Past Investigations	2
3.	Scope of Investigation	2
3.1	Overview of Site Investigation	2
3.2	Media Investigated	3
3.3	Phase Once Conceptual Site Model	3
3.4	Deviations from Sampling and Analysis Plan	4
3.5	Impediments	4
4.	Investigation Method	4
4.1	General	4
4.2	Drilling	4
4.3	Soil Sampling	5
4.4	Field Screening Measurements	5
4.5	Groundwater: Monitoring Well Installation	5
4.6	Groundwater: Field Measurement of Water Quality	5
4.7	Groundwater: Sampling	5
4.8	Sediment: Sampling	6
4.9	Analytical Testing	6
4.10	Residue Management Procedures	6
4.11	Elevation Surveying	6
4.12	Quality Assurance and Quality Control Measures	6
5.	Review and Evaluation	6
5.1	Geology	7
5.2	Groundwater: Elevations and Flow Direction	7
5.3	Groundwater: Hydraulic Gradient	7
5.4	Fine-Medium Soil Texture	7
5.5	Soil: Field Screening	7
5.6	Soil Quality	7



5.7	Groundwater Quality	10
5.8	Sediment Quality.....	13
5.9	Quality Assurance and Quality Control Results.....	13
5.10	Phase Two Conceptual Site Model.....	13
6.	Conclusions	14
6.1	Signatures	15
7.	References	16
8.	Statement of Limitations	17

Tables

Table 5.1:	Summary of pH in Soil.....	7
Table 5.2:	Summary of PHCs and VOCs in Soil.....	8
Table 5.3:	Summary of PAHs in Soil.....	9
Table 5.4:	Summary of Metals in Soil.....	10
Table 5.5:	Summary of PHCs and VOCs in Groundwater	11
Table 5.6:	Summary of PAHs in Groundwater	12
Table 5.7:	Summary of Metals and pH in Groundwater	13

Enclosures

	<u>Figure No.</u>
Vicinity Plan	1
Property Plan	2
Plot Plan	3
CSM – Study Area	4
CSM – Property	5
Test Hole Plan	6
Phase Two CSM	7

Appendices

Appendix E	Sampling and Analysis Plan
Appendix F	Subsurface Exploration Data
Appendix G	Certificates of Chemical Analysis

*Note: Appendices continue in sequence from the Phase One ESA report dated June, 2017 (Project No. 11148414-01), Report No.1.



1. Introduction

This report presents the results of a Phase Two Environmental Site Assessment (ESA) that was completed by GHD Limited (GHD) for land located along the north side of King Street, approximately 60m west of Perryview Drive in Port Perry, Regional Municipality of Durham, Ontario (“the Property” or “Site”).

1.1 Site Description

The Property encompasses an area on the order of 17.4 hectares (43 acres) in a mainly residential and agricultural area, which is municipally serviced for water and sewer. Based on information compiled, the Property was developed for agricultural purposes prior to 1927.

1.2 Property Ownership

The Property is geographically located on Part Lot 17 and 18, Concession 5 in the geographic Township of Reach. It is currently owned by John Jeffrey since May 1988. No environmental concerns were registered on title for the Property. The Phase One ESA document should be reviewed for additional information with regards to the ownership.

1.3 Current and Proposed Future Uses

The Property supports a barn of unknown age and corresponds to family owned farmland used for cash crops. The proposed future use is residential. A record of site condition is not required.

1.4 Applicable Site Condition Standard

The applicable site condition standard for this Property currently falls under the Ministry of the Environment and Climate Change (MOECC) Table 2 Full Depth Generic Site Condition Standards for Use in a Potable Groundwater Condition for Residential (RPI) property uses (MOECC, April 15, 2011, “Soil, Groundwater and Sediment Standards for use Under Part XV.1 of the *Environmental Protection Act*”). The MOECC Standards provide generic soil and groundwater quality standards for certain chemicals based on combinations of the following site-specific conditions:

- *Property Use Type* – Residential/Parkland/Institutional (RPI) or Industrial/Commercial/ Community (ICC) property uses. The proposed future use is residential. Analytical results will be compared with the RPI property use standards.
- *Restoration of Groundwater Quality* – Potable or non-potable. The area is municipally serviced for water and sewer. The potable groundwater standards will be used.
- *Restoration Depth* – Full depth or stratified depth. For comparative purposes, results will be compared to full depth standards.
- *Soil Texture* – Coarse or medium to fine textured soils. Medium to fine textured soils are defined under Section 42 of Ontario Regulation 153/04 as soil that contain more than 50 percent by mass of particles that are 75 µm or smaller in mean diameter. Coarse textured standards may be used if at least 1/3 of the soil at the property by volume consists of coarse textured soil. The more stringent coarse textured soil standards will be used.



- *Shallow Soil Property* – Based on GHD’s understanding of the stratigraphy, the overburden soils are more than two (2) metres in thickness. As such, the Property is not considered to be a shallow soil property.
- *Water Body* – No water bodies are located on the Property or within 30m. The specific standards relating to the protection of water bodies will not be considered.
- *Environmentally Sensitive Areas* – No environmentally sensitive areas are located within 30m of the Property and specific standards relating to background conditions will not be considered.

2. Background Information

2.1 Physical Setting

The Property is currently a 17.4 hectare agricultural lot. The portion of the lot to the south contains a residential dwelling and has been severed from the Property. It is not included in this ESA. Based on the Phase One ESA, a historic rail line was present on the Property. The Property is surrounded by residential lots to the north, east and west. Lands south of King Street are generally used to support agricultural lands (cash crops) with occasional residential dwellings.

The surrounding topography can be described as gently rolling to generally flat with a gradual slope to the east. Based on topographic relief, it is inferred that surface water and groundwater flow is east towards Lake Scugog wetlands, located 600m to the east. The Property is situated in the physiographic region known as the Peterborough Drumlin Field and Schomberg Clay Plains (Chapman and Putnam, 1984).

2.2 Past Investigations

A letter-report dated November 16, 1999 prepared by Golder Associates Ltd. (Golder) was reviewed. The letter was prepared to describe the fill that was imported to the south-eastern area of the Property during the construction of the adjacent residential subdivision. This report indicates that the fill poses “no issues of potential environmental concern”. No other environmental reports were available for review for the Property.

3. Scope of Investigation

3.1 Overview of Site Investigation

The Phase Two ESA activities have been prepared by a Qualified Person, as defined by the Environmental Protection Act, using Ontario Regulation (O. Reg.) 153/04 (as periodically amended) and generally based upon the document entitled “CSA Z769-00, Phase II Environmental Site Assessment, re-affirmed 2004” for conducting ESAs. A field investigation was conducted under the supervision of GHD to characterize the subsurface conditions including soil and groundwater. The field activities included a total of ten (10) boreholes using a track-mounted drill rig. The boreholes were completed through surficial topsoil into sandy silt or silty sand with varying amounts of gravel, into dense till comprised of silty sand. Bedrock was not encountered. The Phase Two investigation locations are presented on the Test Hole Plan, Figure 6. The following scope of work was conducted.



1. Advanced, sampled and logged ten (10) representative boreholes. Monitoring wells were installed in all three (3) of the boreholes. The boreholes were advanced to a maximum depth of 5.2m. Soil samples were collected at regular intervals and monitored for volatile hydrocarbon vapours using a RKI Instruments Eagle 2 hydrocarbon gas detector.
2. Representative samples of the soil were subjected to chemical analyses to assess soil quality. Soil samples were analyzed for pH, metals, polycyclic aromatic hydrocarbons (PAHs), petroleum hydrocarbons (PHCs) and volatile organic compounds (VOCs).
3. Water level measurements were conducted and one (1) of the representative monitoring wells was developed and sampled to assess groundwater quality. One (1) representative sample of the groundwater was subjected to chemical analyses for pH, metals, PAHs, PHCs and VOCs to assess potential impacts.
4. Analyzed data obtained from the investigation and presented the findings in this report with conclusions and recommendations. The analytical results were compared to the Table 2 Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition (RPI property use standards) (MOECC, April 15, 2011, "Soil, Groundwater and Sediment Standards for use Under Part XV.1 of the *Environmental Protection Act*").

3.2 Media Investigated

Soil and groundwater conditions were investigated with a focus on the areas of potential environmental concern (APECs) outlined in the Phase One ESA. The following potentially contaminating activities (PCAs) were identified resulting in APECs, including:

1. Fill materials of unknown quality (PCA #30). This PCA is identified for construction of the historic rail line as well as for imported fill from an adjacent residential subdivision to the east; and
2. Rail yards, tracks and spurs (PCA #46). This PCA is identified for the presence of the historic rail line on the Property.

The following field investigation activities were completed:

- Advancement of ten (10) boreholes for soil sampling;
- Installation of three (3) monitoring wells;
- Water level measurements conducted at the monitoring wells;
- Development and sampling of one (1) representative monitoring well; and,
- Laboratory analysis of soil and groundwater samples.

The Phase Two investigation locations are presented on the Test Hole Plan, Figure 6.

3.3 Phase Once Conceptual Site Model

A Phase One Conceptual Site Model (CSM) is provided as Figures 4 and 5. The model provides a basic overview, basic geological and hydrogeological information and any other pertinent data that may affect the Phase One ESA. A review of available records and reports indicated that the Property was first developed for agricultural use prior to 1927. Based on the records reviewed and site reconnaissance carried out as part of the Phase One ESA, PCAs were identified resulting in APECs. The Golder letter addressed the APEC related to imported fill material.



The main APEC for the Site was identified from a historic rail line that was present on the Property. The contaminants of potential concern for the APEC include pH, PHCs, VOCs, PAHs and metals. The Property is situated in the physiographic region known as the Peterborough Drumlin Field and Schomberg Clay Plains. Locally, the Property is located within clay plains and is very near the geologic boundary of the sand plains (west of a low-lying drumlin). The inferred groundwater flow direction is expected to be towards Lake Scugog Wetlands.

3.4 Deviations from Sampling and Analysis Plan

A sampling and analysis plan was prepared based upon information from the Phase One ESA. There were no deviations from the sampling and analysis plan. The sampling plan is presented in Appendix E.

3.5 Impediments

There were no impediments for the Phase Two investigation program.

4. Investigation Method

4.1 General

This section of the report describes the field methods utilized during the investigation. The field activities were completed as per MOECC protocols, GHD standard operating procedures and standard industry practices. The Phase Two ESA drilling was completed on June 15, 2017. The investigative tasks that were completed included the following:

- Advancement of boreholes at select locations;
- Completion of field screening measurements;
- Collection of soil samples;
- Installation of monitoring wells in three (3) boreholes;
- Analytical soil testing;
- Residual soil management;
- Development and sampling of one (1) representative well;
- Measurements, field testing and sampling of groundwater;
- Analytical water testing; and,
- Quality assurance and quality control measures.

Prior to the commencement of the subsurface investigation, GHD completed the appropriate public utility notifications.

4.2 Drilling

The subsurface exploration program consisted of ten (10) boreholes drilled by Strong Soil Search using a track mounted drill rig. The boreholes were advanced in the locations illustrated on the Test Hole Plan, Figure 6. The boreholes extended to depths of up to 5.2 m. The borehole logs are presented in Appendix F and provide an overview of the subsurface conditions encountered during drilling. The boreholes were completed through surficial topsoil into sandy silt or silty sand with varying amounts of gravel, into dense till comprised of silty sand. Bedrock was not encountered.



Prior to use, during drilling and between each test hole, the drilling and sampling equipment was decontaminated. The wash procedure for decontamination of equipment was a water detergent wash and potable water rinse.

4.3 Soil Sampling

Based on the sampling plan, field observations, headspace analysis of organic vapour readings, and visual and olfactory evidence of potential contamination, GHD personnel collected soil samples for laboratory analysis directly from the split spoon sampling equipment. Soil samples to be submitted for chemical analysis were placed into clean laboratory prepared sample bottles. Fresh nitrile gloves were worn when collecting the samples. Soil samples selected for chemical analysis were kept in a cooler on ice and delivered to Caduceon Environmental Laboratories (Caduceon) in Richmond Hill, Ontario. The following soil samples were submitted for analysis during the Phase Two ESA program:

- BH-5, SS-2 – pH;
- BH-7, SS-2 – PHCs, VOCs, PAHs, metals; and,
- BH-10, SS-4 – pH.

4.4 Field Screening Measurements

Field screening measurements were completed using a RKI Instruments Eagle 2 portable gas detector. The soil samples obtained during the test hole program were subjected to hydrocarbon vapour testing or “headspace analysis” using the gas detector. Prior to sample collection events, the gas detector was inspected and calibrated according to the manufacturer’s recommendations. The vapour readings shown on the logs in Appendix F were at ambient levels and do not indicate the presence of hydrocarbons or organic compounds.

4.5 Groundwater: Monitoring Well Installation

Monitoring wells were installed in three (3) of the boreholes to measure groundwater levels and provide a means of sampling the groundwater for quality testing to assess potential groundwater impacts with the well screens placed to straddle the water table (where possible). The wells were constructed of 32mm diameter PVC well pipes and 10-slot well screen. The screens are 1.5 m in length, with sand extending above the screen and a bentonite seal to below the surface.

4.6 Groundwater: Field Measurement of Water Quality

Water quality parameters of pH, temperature and conductivity were not measured in the field during development of the monitoring wells. The wells were measured for groundwater level and developed by purging three (3) well volumes of groundwater prior to sampling. No light or dense non-aqueous phase liquids were observed during the well development activities.

4.7 Groundwater: Sampling

After well development, water samples were collected from monitoring well BH-7 on June 16, 2017. The following water samples were submitted for analysis during the Phase Two ESA program:

- BH-7 – pH, PHCs, VOCs, PAHs, metals.



The water samples were kept in a cooler on ice and delivered to Caduceon after collection.

4.8 Sediment: Sampling

Sediment sampling is not applicable.

4.9 Analytical Testing

The analytical testing was completed in accordance with the requirements of Ontario Regulation 153/04 (as amended) and associated MOECC analytical guidance documents. Sampling was completed based upon information available from the Phase One ESA, visual and olfactory observations, field screening and professional judgment.

The analytical testing was completed at Caduceon, an accredited laboratory with the Canadian Association for Laboratory Accreditation (CALA) for the parameters tested during this investigation. Sampling and analysis were completed for pH, PHCs, VOCs, PAHs and metals. Copies of the Certificates of Analysis are provided in Appendix G of this report.

4.10 Residue Management Procedures

Split spoons were cleaned between each sample using laboratory grade detergent and potable water rinse. These wash waters were disposed of by GHD. Clean soil cuttings were placed back into the boreholes. Monitoring well water generated by GHD during the development of the wells was re-infiltrated to the ground.

4.11 Elevation Surveying

An elevation survey was not completed of the test hole locations. If required, topographic elevations can be inferred from an Ontario Base Map or Google Earth.

4.12 Quality Assurance and Quality Control Measures

The Quality Assurance and Quality Control (QAQC) program was implemented during the ESA to ensure quality data was generated. Soil samples were collected with pre-cleaned sampling equipment and placed directly into laboratory supplied dedicated jars. Samples were submitted under chain-of-custody protocol to an analytical laboratory that is accredited with CALA for the parameters tested. From the time of collection to the time of submission to the laboratory, samples were kept cool to maintain sample integrity. The QAQC measures implemented by the laboratory were maintained throughout the investigation and are included in the laboratory's Certificate of Chemical Analysis included in Appendix G. There were no QAQC issues.

5. Review and Evaluation

GHD completed the Phase Two ESA investigation activities to address the APECs defined in the Phase One ESA. This review and evaluation section describes the results of the Phase Two ESA.



5.1 Geology

Reference is made to the borehole logs in Appendix F for details including local soil and geology classification and inferred stratigraphy. The stratigraphy in the areas where boreholes were advanced was comprised of topsoil over sandy silt or silty sand with varying amounts of gravel, over dense silty sand till. Bedrock was not encountered. No deleterious materials were observed during the field investigation. Additional details are provided on the borehole logs.

5.2 Groundwater: Elevations and Flow Direction

The direction of groundwater movement would require long term monitoring that takes into account seasonal variations without influences from specific rain events. In general, shallow groundwater movement is a reflection of the ground surface topography. As such, it is interpreted that the local groundwater flow at the Site would conform to the topography and flow east towards Lake Scugog Wetlands.

5.3 Groundwater: Hydraulic Gradient

An assessment of the groundwater hydraulic gradient was not calculated for this investigation.

5.4 Fine-Medium Soil Texture

The soils will be compared to the more stringent coarse textured MOECC Standards based on the soils encountered at the Property.

5.5 Soil: Field Screening

Field screening of total organic vapours was measured by GHD of each sample using a RKI Instruments (Eagle series: 71-0028RK) hydrocarbon gas detector. No elevated vapours were detected in the samples collected.

5.6 Soil Quality

In total, three (3) representative soil samples were submitted for chemical analyses. Soil samples analyzed were selected based on the APECs identified, visual and olfactory observations and field screening activities. The laboratory certificates of analysis are provided in Appendix G. Two (2) soil samples were submitted for pH analysis. The results of the pH testing are compared against the Ontario Regulation 153 in Table 5.1. The samples meet the MOECC acceptable pH ranges.

Table 5.1: Summary of pH in Soil

Parameter	Sample Identification		MOECC Acceptable Ranges*
	BH-5 SS-2 (0.8 – 1.4 m) June 15, 2017	BH-10, SS-4 (2.3 – 2.9 m) June 15, 2017	
pH (surface soil ≤ 1.5 m)	7.70	--	5 – 9
pH (subsurface soil > 1.5 m)	--	7.94	5 – 11

Note: *pH values are based on Ontario Regulation 153 MOECC acceptable pH ranges.



One (1) soil sample was submitted for analysis of PHCs and VOCs. The results are summarized and compared with the MOECC Table 2 Standards for a residential property use in Table 5.2. The results meet the MOECC Table 2 Standards.

Table 5.2: Summary of PHCs and VOCs in Soil

Parameter	Sample Identification	MOECC Provincial Standards (Table 2)
	BH-7 SS-2 (0.8 – 1.4 m) June 15, 2017	
PHC F1 (C ₆ to C ₁₀)	<10	55
PHC F2 (C ₁₀ to C ₁₆)	7	98
PHC F3 (C ₁₆ to C ₃₄)	20	300
PHC F4 (C ₃₄ to C ₅₀)	<10	2800
Benzene	<0.02	0.21
Ethylbenzene	<0.03	1.1
Toluene	<0.03	2.3
m&p-Xylene	<0.04	NS
o-Xylene	<0.03	NS
Total Xylenes	<0.05	3.1
Acetone	<0.3	16
Bromodichloromethane	<0.02	1.5
Bromoform	<0.02	0.27
Bromomethane	<0.03	0.05
Carbon tetrachloride	<0.02	0.05
Chlorobenzene	<0.03	2.4
Chloroform	<0.03	0.05
Dibromochloromethane	<0.02	2.3
1,2-Dichlorobenzene	<0.02	1.2
1,3-Dichlorobenzene	<0.02	4.8
1,4-Dichlorobenzene	<0.02	0.083
Dichlorodifluoromethane	<0.02	16
1,1-Dichloroethane	<0.03	0.47
1,2-Dichloroethane	<0.03	0.05
1,1-Dichloroethylene	<0.02	0.05
Cis-1,2-Dichloroethylene	<0.02	1.9
Trans-1,2-Dichloroethylene	<0.03	0.084
1,2-Dichloropropane	<0.03	0.05
1,3-Dichloropropene	<0.03	0.05
Ethylene dibromide	<0.02	0.05
Hexane	<0.03	2.8
Methyl ethyl ketone	<0.1	16
Methyl isobutyl ketone	<0.02	1.7
Methyl-t-butyl ether	<0.02	0.75
Methylene chloride	<0.04	0.1
Styrene	<0.03	0.7
1,1,1,2-Tetrachloroethane	<0.02	0.058
1,1,2,2-Tetrachloroethane	<0.02	0.05
Tetrachloroethylene	<0.03	0.28
1,1,1-Trichloroethane	<0.02	0.38
1,1,2-Trichloroethane	<0.02	0.05
Trichloroethylene	<0.03	0.061



Parameter	Sample Identification	MOECC Provincial Standards (Table 2)
	BH-7 SS-2 (0.8 – 1.4 m) June 15, 2017	
Trichlorofluoromethane	<0.02	4
Vinyl chloride	<0.02	0.02

Notes: Analytical results presented as µg/g (parts per million) unless otherwise noted. “<” indicates parameter is below the laboratory reporting limit (i.e. non-detect) MOECC “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act”, April 15, 2011, Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for RPI property use (coarse texture soils).

One (1) soil sample was submitted for analysis of PAHs. The results are summarized and compared with the MOECC Table 2 Standards for a residential property use in Table 5.3. The results meet the MOECC Table 2 Standards.

Table 5.3: Summary of PAHs in Soil

Parameter	Sample Identification	MOECC Provincial Standards (Table 2)
	BH-7 SS-2 (0.8 – 1.4 m) June 15, 2017	
Acenaphthene	<0.05	21
Acenaphthylene	<0.05	0.15
Anthracene	<0.05	0.67
Benzo(a)anthracene	<0.05	0.96
Benzo(a)pyrene	<0.05	0.3
Benzo(b)fluoranthene	<0.05	0.96
Benzo(b+k)fluoranthene	<0.05	0.96
Benzo(g,h,i)perylene	<0.05	9.6
Chrysene	<0.05	9.6
Dibenzo(a,h)anthracene	<0.05	0.1
Fluoranthene	<0.05	9.6
Fluorene	<0.05	62
Indeno(1,2,3,-cd)pyrene	<0.05	0.76
Methylnaphthalene,1-	<0.05	30
Methylnaphthalene,2-	0.05	30
Methylnaphthalene 2-(1-)	0.10	30
Naphthalene	0.06	9.6
Phenanthrene	<0.05	12
Pyrene	<0.05	96

Notes: Analytical results presented as µg/g (parts per million) unless otherwise noted. “<” indicates parameter is below the laboratory reporting limit (i.e. non-detect) MOECC “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act”, April 15, 2011, Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for RPI property use (coarse texture soils).

One (1) soil sample was submitted for analysis of metals. The results are summarized and compared with the MOECC Table 2 Standards for a residential property use in Table 5.4. The results meet the MOECC Table 2 Standards.



Table 5.4: Summary of Metals in Soil

Parameter	Sample Identification	MOECC Provincial Standards (Table 2)
	BH-7 SS-2 (0.8 – 1.4 m) June 15, 2017	
Antimony	0.7	40
Arsenic	2.0	18
Barium	32.7	670
Beryllium	0.37	8
Boron	4.6	120
Boron (HWS)	0.18	2
Cadmium	0.12	1.9
Chromium	11.2	160
Chromium VI	<0.5	8
Cobalt	3.5	80
Copper	16.1	230
Lead	14.4	120
Mercury	0.015	3.9
Molybdenum	0.4	40
Nickel	7.7	270
Selenium	0.3	5.5
Silver	0.02	40
Thallium	0.03	3.3
Uranium	0.49	33
Vanadium	23.3	86
Zinc	60	340

Notes: Analytical results presented as µg/g (parts per million) unless otherwise noted. “<” indicates parameter is below the laboratory reporting limit (i.e. non-detect) MOECC “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act”, April 15, 2011, Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for RPI property use (coarse texture soils).

5.7 Groundwater Quality

On June 16, 2017, groundwater samples were collected from the well installed in borehole BH-7. The groundwater samples were submitted for the analysis of pH, PHCs, VOCs, PAHs and metals. The sample results for PHCs and VOCs are summarized in Table 5.5 and the data is compared with the MOECC Table 2 Full Depth Generic Site Condition Standards for Use in Potable Groundwater Condition for residential property uses. The results meet the MOECC Table 2 Standards.



Table 5.5: Summary of PHCs and VOCs in Groundwater

Parameter	Sample Identification	MOECC Provincial Standards (Table 2)
	BH-7 June 16, 2017	
PHC F1 (C ₆ to C ₁₀)	<20	750
PHC F2 (C ₁₀ to C ₁₆)	<50	150
PHC F3 (C ₁₆ to C ₃₄)	<400	500
PHC F4 (C ₃₄ to C ₅₀)	<400	500
Acetone	<2	2700
Benzene	<0.5	5
Bromodichloromethane	<0.1	16
Bromoform	<0.1	25
Bromomethane	<0.3	0.89
Carbon Tetrachloride	<0.2	0.79
Chlorobenzene	<0.2	30
Chloroform	<0.3	2.4
Dibromochloromethane	<0.1	25
Dichlorobenzene, 1,2-	<0.1	3
Dichlorobenzene, 1,3-	<0.1	59
Dichlorobenzene, 1,4-	<0.2	1
Dichlorodifluoromethane	<1	590
Dichloroethane, 1,1-	<0.1	5
Dichloroethane, 1,2-	<0.1	1.6
Dichloroethylene, 1,1-	<0.1	1.6
Dichloroethene, cis-1,2-	<0.1	1.6
Dichloroethene, trans-1,2-	<0.1	1.6
Dichloropropane, 1,2-	<0.1	5
Dichloropropene, cis-1,3-	<0.1	0.5
Dichloropropene, trans-1,3-	<0.1	0.5
Dichloropropene 1,3-	<0.1	0.5
Ethylbenzene	<0.5	2.4
Ethylene Dibromide	<0.1	0.2
Hexane	<1	51
Methyl Ethyl Ketone	<1	1800
Methyl Isobutyl Ketone	<1	640
Methyl-t-butyl Ether	<1	15
Methylene Chloride	<0.3	50
Styrene	<0.5	5.4
Tetrachloroethane, 1,1,1,2-	<0.1	1.1
Tetrachloroethane, 1,1,2,2-	<0.4	1
Tetrachloroethylene	<0.2	1.6
Toluene	<0.5	24
Trichloroethane, 1,1,1-	<0.1	200
Trichloroethane, 1,1,2-	<0.1	4.7
Trichloroethylene	<0.1	1.6
Trichlorofluoromethane	<0.1	150
Vinyl Chloride	<0.2	0.5
Xylene, m,p-	<0.4	NS
Xylene, o-	<0.1	NS
Xylene, Total	<0.4	300

Notes: All analytical results presented as µg/L (parts per billion) unless otherwise noted. “<” indicates parameter is below the laboratory reporting limit, “—” = Not analysed, NS = no standard. MOECC “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act”, April 15, 2011, Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for all property uses (coarse textured soils).



The sample results for PAHs are summarized in Table 5.6 and the data is compared with the MOECC Table 2 Full Depth Generic Site Condition Standards for Use in Potable Groundwater Condition for residential property uses. The results meet the MOECC Table 2 Standards.

Table 5.6: Summary of PAHs in Groundwater

Parameter	Sample Identification	MOECC Provincial Standards (Table 2)
	BH-7 June 16, 2017	
Acenaphthene	<0.05	4.1
Acenaphthylene	<0.05	1
Anthracene	<0.05	2.4
Benzo(a)anthracene	<0.05	1
Benzo(a)pyrene	<0.01	0.01
Benzo(b)fluoranthene	<0.05	0.1
Benzo(k)fluoranthene	<0.1	0.1
Benzo(g,h,i)perylene	<0.05	0.2
Chrysene	<0.05	0.1
Dibenzo(a,h)anthracene	<0.05	0.2
Fluoranthene	<0.05	0.41
Fluorene	<0.05	120
Indeno(1,2,3,-cd)pyrene	<0.05	0.2
Methylnaphthalene,1-	<0.05	3.2
Methylnaphthalene,2-	<0.05	3.2
Methylnaphthalene 2-(1-)	<0.07	3.2
Naphthalene	<0.05	11
Phenanthrene	<0.05	1
Pyrene	<0.05	4.1

Notes: All analytical results presented as µg/L (parts per billion) unless otherwise noted. “<” indicates parameter is below the laboratory reporting limit, “—” = Not analysed, NS = no standard. MOECC “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act”, April 15, 2011, Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for all property uses (coarse textured soils).

The sample results for metals and pH are summarized in Table 5.7 and the data is compared with the MOECC Table 2 Full Depth Generic Site Condition Standards for Use in Potable Groundwater Condition for residential property uses. The results meet the MOECC Table 2 Standards.



Table 5.7: Summary of Metals and pH in Groundwater

Parameter	Sample Identification	MOECC Provincial Standards (Table 2)
	BH-7 June 16, 2017	
pH	7.56	6.5 – 8.5
Antimony	<0.5	6
Arsenic	<0.70	25
Barium	55.0	1000
Beryllium	<0.1	4
Boron	21	5000
Cadmium	<0.1	2.7
Chromium	2.2	50
Chromium VI	<10	25
Cobalt	<0.2	3.8
Copper	1.4	87
Lead	0.54	10
Mercury	<0.02	0.29
Molybdenum	0.9	70
Nickel	0.8	100
Selenium	1.6	10
Silver	<0.03	1.5
Thallium	<0.1	2
Uranium	0.5	20
Vanadium	<0.4	6.2
Zinc	<5	1100

Notes: All analytical results presented as µg/L (parts per billion) unless otherwise noted. “<” indicates parameter is below the laboratory reporting limit, “—” = Not analysed, NS = no standard. MOECC “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act”, April 15, 2011, Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for all property uses (coarse textured soils).

5.8 Sediment Quality

Sediment quality testing is not applicable.

5.9 Quality Assurance and Quality Control Results

The sampling holding times were met and the samples were properly preserved after collection for the Phase Two ESA. The QAQC measures implemented by the laboratory were maintained throughout the investigation. There were no QAQC issues.

5.10 Phase Two Conceptual Site Model

Based on the investigative work completed, a Phase Two conceptual site model has been prepared and summarized in the narrative below and illustrated on Figure 7 that includes a summary of the chemical analysis results. The Property is an agricultural site with proposed residential use. The lands cover an area of 17.4 ha within an area that is municipally serviced for water. Based on compiled information, the Property was first developed for agricultural use prior to 1927. The surrounding area can be generally described as residential with agricultural use south of King Street.



The Property ground surface is gently rolling to generally flat. The surrounding topography can be described as relatively flat/gently sloping topography to the east. The inferred groundwater flow direction is expected to conform to the topography and flow east towards Lake Scugog Wetlands. The Property is situated in the physiographic region known as the Peterborough Drumlin Field and Schomberg Clay Plains (Chapman and Putnam, 1984). The location relative to topographical features, surrounding roads, and water courses is shown on the Vicinity Plan, Figure 1 and Property Plan, Figure 2. The Plot Plan depicts the Property using a 2016 aerial photograph on Figure 3. APECs related to the PCAs identified in the Phase One ESA are illustrated on the Phase One Conceptual Site Models, Figures 4 and 5 and include potentially contaminating activities that were related to:

- Fill materials of unknown quality (PCA #30) for construction of the historic rail line as well as for imported fill from adjacent residential subdivision to the east; and,
- Rail yards, tracks and spurs (PCA #46) for the presence of the historic rail line on the Property.

The Phase Two ESA consisted of advancing ten (10) boreholes and installation of three (3) monitoring wells. The boreholes were positioned in or down-gradient of the identified APECs. The potential contaminants of concern included pH, PHCs, VOCs, PAHs and metals. The soil and groundwater samples collected and submitted to the laboratory for these parameters met the MOECC Table 2 Residential Standards. It is understood that the Property is being considered for a residential development. Based upon the Phase Two ESA that was conducted, the APECs have been addressed and there is no additional environmental work warranted.

6. Conclusions

The supporting data upon which our conclusions are based have been presented in the previous sections of this report. The environmental assessment represents a "snapshot" in time. Consideration has been given to the known Property history, the physical setting, adjacent land use and current regulatory requirements in developing the terms of reference for this study. GHD cannot guarantee the reliability of information provided by others. However, whenever possible, verification of authenticity was attempted.

Based on our observations, the field investigation program and laboratory results, the following conclusions are presented:

- Soil tested on the Property meets the MOECC Table 2 Standards (residential property use) for the parameters tested including pH, metals, PAHs, PHCs and VOCs; and
- Groundwater tested from the Property meets the MOECC Table 2 Standards (residential property use) for the parameters tested including pH, metals, PAHs, PHCs and VOCs.

Based on our observations, the information collected and the proposed residential land use, it is our professional opinion that there is a low level of concern from an environmental perspective at the Property. The Property is suitable for its proposed future residential use. It is GHD's opinion that no further testing or field investigation is warranted at this time.



6.1 Signatures

The following signatures are provided of GHD staff that prepared and conducted the Phase Two ESA. Mr. Nyle McIlveen, a Qualified Person within the meaning of the Environmental Protection Act and associated Regulation 153/04, has provided his opinion based on the information provided in this report. Following the References section of this report is the Statement of Limitations. These limitations are an integral part of this report. Should questions arise regarding any aspect of our report, please contact our office.

Sincerely,

GHD

David Workman, P.Geo.
Project Manager



Nyle McIlveen, P.Eng.
Senior Engineer



/ew/dw/nm



7. References

Canadian Standards Association (CSA) Z768-01, "Phase I Environmental Site Assessment", reaffirmed 2012.

Chapman and Putnam, 1966. The Physiography of Southern Ontario, 2nd Edition. University of Toronto Press.

Chapman and Putnam, 1984. The Physiography of Southern Ontario, 3rd Edition. Ministry of Natural Resources.

Environmental Protection Act, R.S.O. 1990, and associated regulations.

Golder Associates Ltd., November 16, 1999. Quality of Fill Materials Sourced at Perryview Estates Subdivision (Phase I), Township of Scugog, Ontario.

GHD Limited, June, 2017. Phase One Environmental Site Assessment Report, Existing Agricultural Property, King Street, Port Perry, Ontario.

Ontario Ministry of the Environment, 2011. Ontario Regulation 153/04: Records of Site Condition – Part XV.1 of the Act (Environmental Protection Act 153/04, as amended).



8. Statement of Limitations

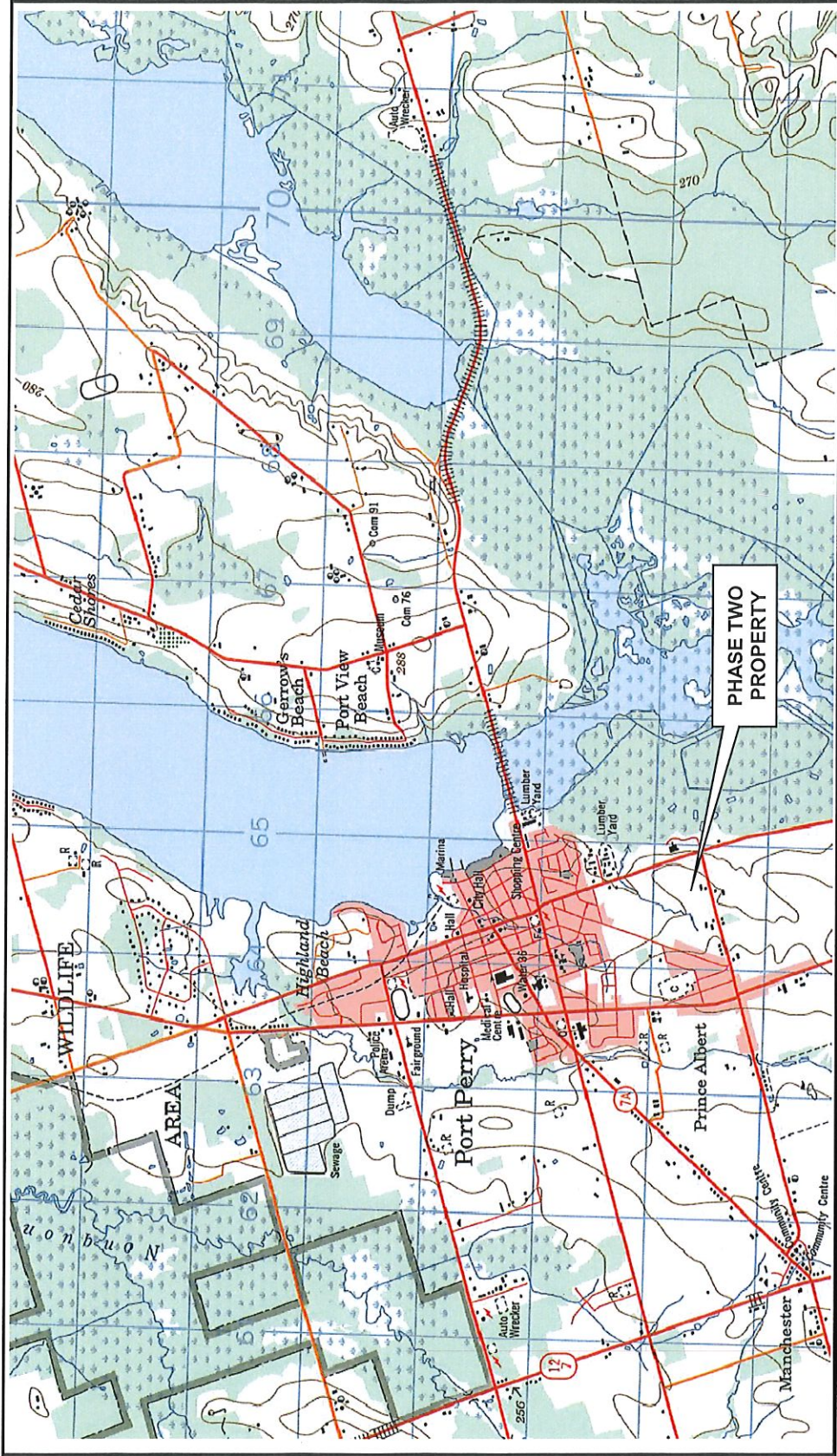
This report is intended solely for Delpark Homes (Port Perry) Inc. in assessing the environmental concerns of lands located along the north side of King Street approximately 60m west of Perryview Drive in Port Perry, Regional Municipality of Durham, Ontario and is prohibited for use by others without GHD's prior written consent. This report is considered GHD's professional work product and shall remain the sole property of GHD. Any unauthorized reuse, redistribution of or reliance on the report shall be at the Client and recipient's sole risk, without liability to GHD. Client shall defend, indemnify and hold GHD harmless from any liability arising from or related to Client's unauthorized distribution of the report. No portion of this report may be used as a separate entity; it is to be read in its entirety and shall include all supporting drawings and appendices.

The conclusions and recommendations made in this report are in accordance with our present understanding of the project, the current site use, surface and subsurface conditions, and are based on available information, a site reconnaissance on the date set out in the report, records review and interviews with appropriate people and the work scope approved by the Client and described in the report and should not be construed as a legal opinion. Therefore, our liability is limited to interpreting accurately the information made available to us and assessing the property information investigated during this Phase Two ESA. The services were performed in a manner consistent with that level of care and skill ordinarily exercised by members of environmental engineering professions currently practicing under similar conditions in the same locality. No other representations, and no warranties or representations of any kind, either expressed or implied, are made. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties.

Soil and groundwater conditions between and beyond the test locations may differ both horizontally and vertically from those encountered at the test locations and conditions may become apparent during future projects which could not be detected or anticipated at the time of our investigation. Should any conditions at the site be encountered which differ from those found at the test locations, we request that we be notified immediately in order to permit a reassessment of our recommendations. If changed conditions are identified, no matter how minor, the recommendations in this report shall be considered invalid until sufficient review and written assessment of said conditions by GHD is completed.

The conclusions in this report are based on available information, documentation and discussions with appropriate people associated with the property. Therefore, our liability is limited to interpreting accurately the information made available to us and assessing the property information at the test hole locations investigated during the Phase Two ESA.

Enclosures



Base map compiled from Energy, Mines and Resources Canada Map 31 D/02 published 1999

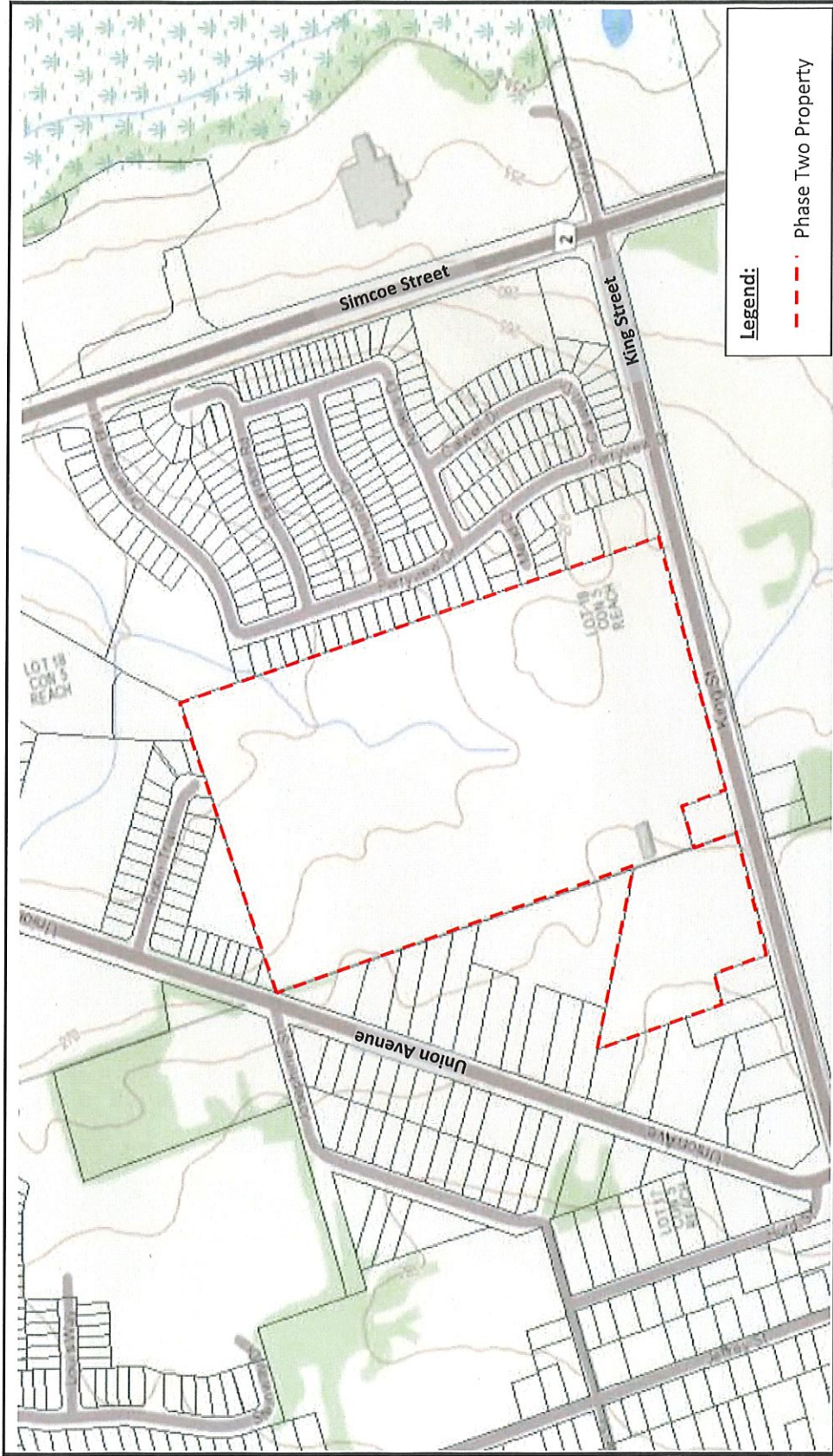
Scale:
1: 50000
Coordinate System:
NAD 1983 UTM Zone 17



Delpark Homes (Port Perry) Inc.
King Street, Port Perry
Phase Two ESA

11148414-01
June, 2017

Vicinity Plan
FIGURE 1



Source: Ministry of Natural Resources and Forestry, online (www.giscopeapp.lrc.gov.on.ca) © Queen's Printer for Ontario, 2016.

Scale:
1: 18000
Coordinate System:
NAD 1983 UTM Zone 17



Delpark Homes (Port Perry) Inc.
King Street, Port Perry
Phase Two ESA

Property Plan

11148414-01
June, 2017

FIGURE 2



Source: Google Earth (2016) © 2016 Google Image published 2016/10/09

Scale:
 Refer to Scale Bar
 Coordinate System:
 NAD 1983 UTM Zone 17






Delpark Homes (Port Perry) Inc.
 King Street, Port Perry
 Phase Two ESA

11148414-01
 June, 2017

Plot Plan
FIGURE 3



Legend:

-  Inferred shallow flow direction
-  Phase One Study Area (250 m from Property)
-  PCA Location

Source: Google Earth (2016) © 2016 Google Image published 2016/07/16

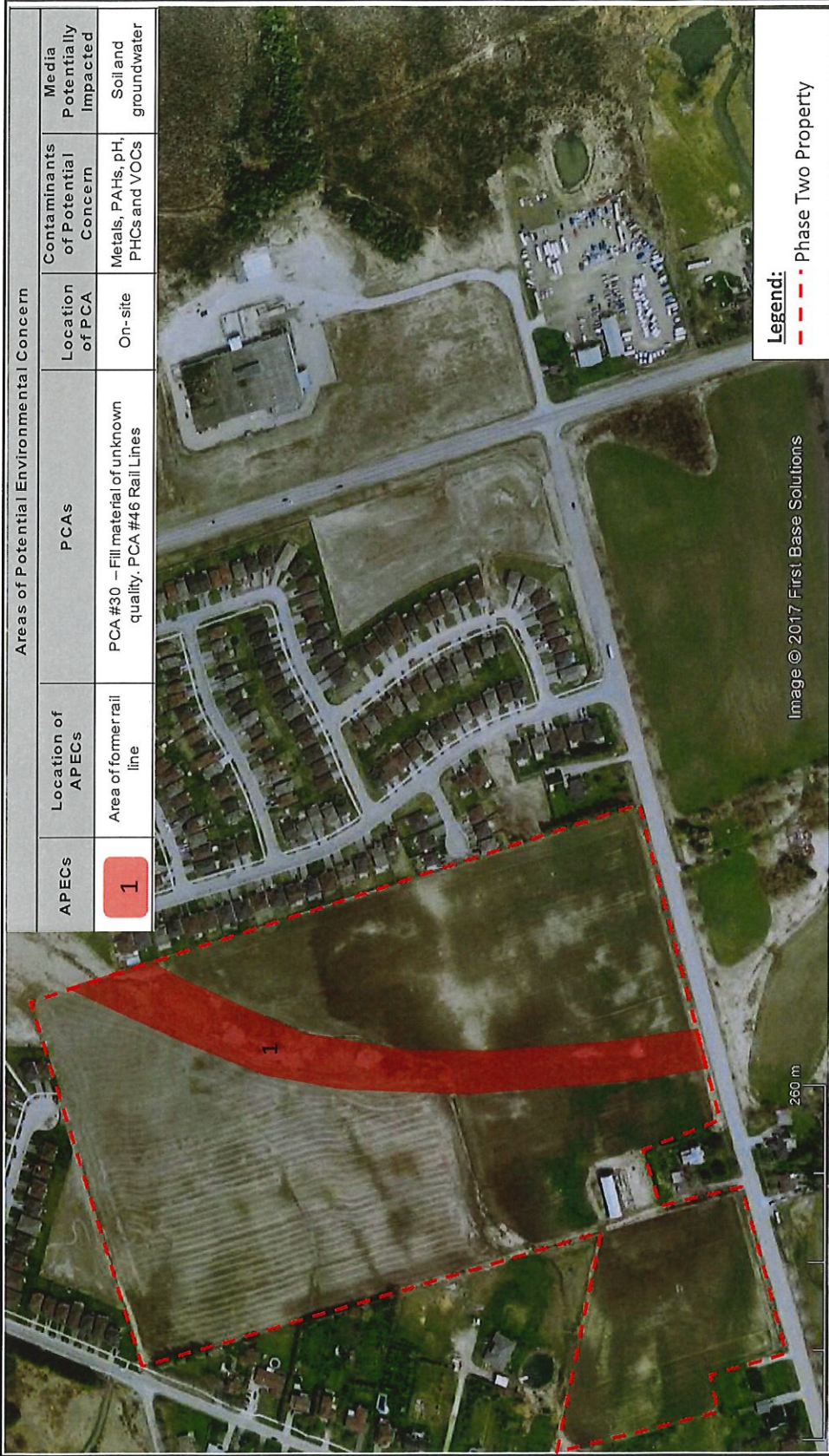
Scale:
 Refer to Scale Bar
 Coordinate System:
 NAD 1983 UTM Zone 17



Delpark Homes (Port Perry) Inc.
 King Street, Port Perry
 Phase Two ESA

11148414-01
 June, 2017

CSM - Study Area **FIGURE 4**



Areas of Potential Environmental Concern					
APECs	Location of APECs	PCAs	Location of PCA	Contaminants of Potential Concern	Media Potentially Impacted
1	Area of former rail line	PCA #30 - Fill material of unknown quality, PCA #46 Rail Lines	On-site	Metals, PAHs, pH, PHCs and VOCs	Soil and groundwater

Image © 2017 First Base Solutions

Legend:
 - - - Phase Two Property

Source: Google Earth (2016) © 2016 Google Image taken 2016/04/08

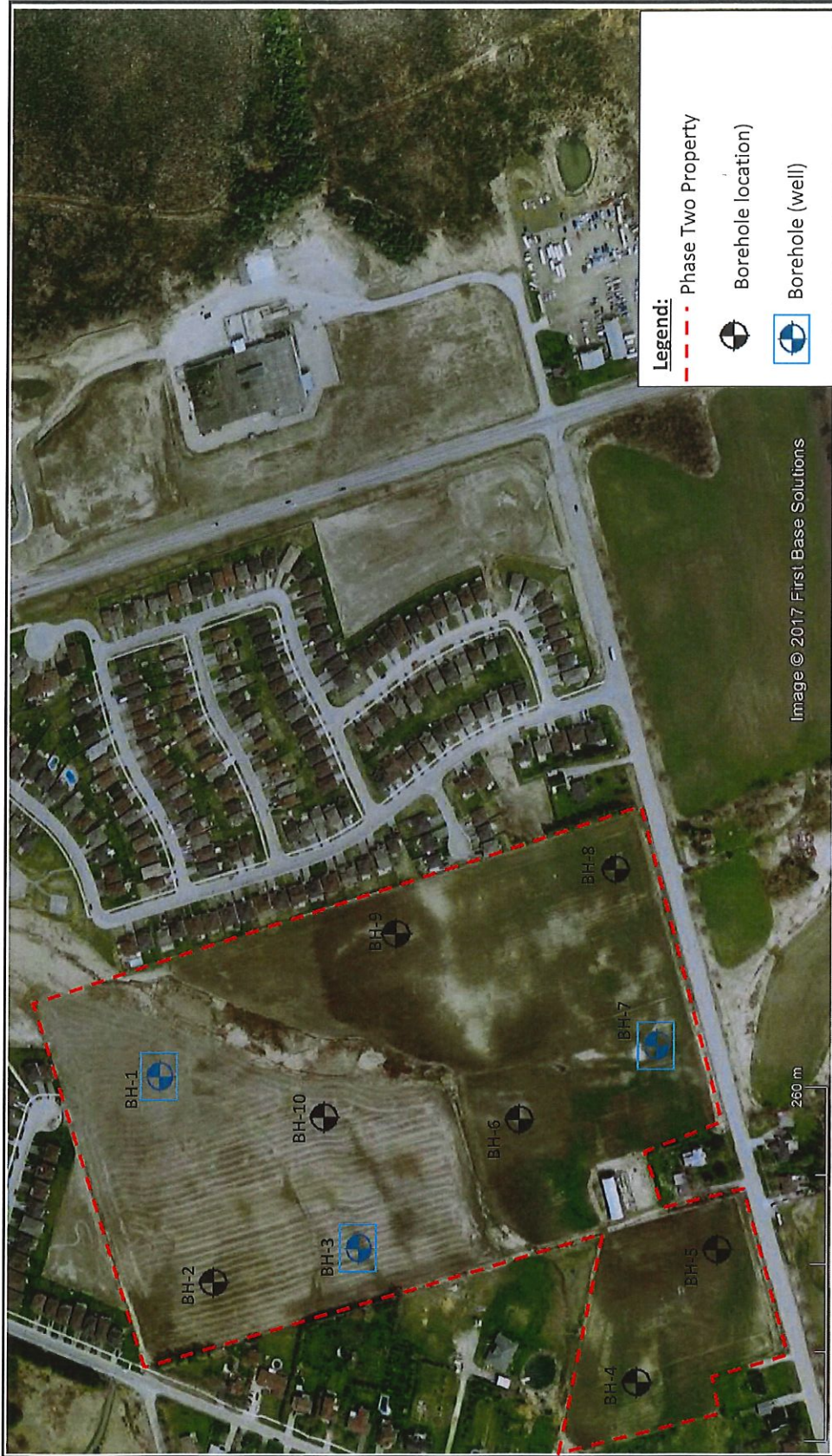
Scale:
 Refer to Scale Bar
 Coordinate System:
 NAD 1983 UTM Zone 17



Delpark Homes (Port Perry) Inc.
 King Street, Port Perry
 Phase Two ESA

11148414-01
 June, 2017

CSM - Property **FIGURE 5**



Source: Google Earth (2016) © 2016 Google Image taken 2016/04/08

Scale:
 Refer to Scale Bar
 Coordinate System:
 NAD 1983 UTM Zone 17



Delpark Homes (Port Perry) Inc.
 King Street, Port Perry
 Phase Two ESA

11148414-01
 June, 2017

Test Hole Plan

FIGURE 6



Areas of Potential Environmental Concern				
APECs	Location of APECs	Potentially Contaminating Activity	Location of PCA	Contaminants of Potential Concern
1	Across the property	PCA #30 - Fill material of unknown quality, PCA #46 Rail Lines	On-site	Metals, PAHs, pH, PHCs and VOCs
				Media Potentially Impacted
				Soil and groundwater
				Test Holes
				BH-7
				Phase Two Conclusion
				Soil and groundwater meet MOECC Table 2 Standards

Image © 2017 First Base Solutions

260 m

- Legend:**
- - - Phase Two Property
 - ⊙ Borehole location
 - ⊕ Borehole (well)

Source: Google Earth (2016) © 2016 Google Image taken 2016/04/08

Scale:
 Refer to Scale Bar
 Coordinate System:
 NAD 1983 UTM Zone 17



Delpark Homes (Port Perry) Inc.
 King Street, Port Perry
 Phase Two ESA

11148414-01
 June, 2017

Phase Two CSM

FIGURE 7

Appendix E

Sampling and Analysis Plan

APPENDIX E: SAMPLING AND ANALYSIS PLAN

PROJECT NO.: 11148414-01
CLIENT: Delpark Homes (Port Perry) Inc.
PROPERTY: King Street, Port Perry, Ontario

APEC	RATIONALE	INVESTIGATION TYPE	SAMPLE IDENTIFICATION	ESTIMATED INVESTIGATION DEPTH	SAMPLE MEDIA	LABORATORY ANALYSIS	PHYSICAL IMPEDIMENTS	SAMPLING GUIDELINES
APEC 1 – Fill materials of unknown quality (PCA #30) and Rail Lines (PCA #46). On-site area of former rail way line.	Confirm soil and groundwater quality in representative area of site that supported a former rail way line.	Borehole and Monitoring Well	BH-7	Borehole depths up to 5m	Soil and Groundwater	<ul style="list-style-type: none"> Metals, VOCs, PHCs, PAHs 	None	Groundwater: Peristaltic pump sampling. No headspace for VOCs. Sample from highest organic vapour reading or at water table.

Notes:

Refer to Test Hole Location Plan for borehole locations. Refer to Proposal and Technical Instructions for details.
 Samples to be submitted to Caduceon Environmental Laboratories. Standard turnaround time to meet project requirements.
 Groundwater monitoring well or piezometer to be developed and purged minimum of 3 times prior to sampling.
 Sample MDLs to meet MOECC Table 2 Standards.

When Fill is encountered, confirm quality of fill (metals testing).

- PHCs and VOCs – select representative soil sample with highest PID reading and/or suspected contamination.
- All soil samples should be collected from at or above water table unless DNAPLs are suspected.
- If impact is encountered, one soil sample should be collected below any “impacted” sample for vertical delineation.

QA/QC

- For RSC, one field duplication for every 10 samples submitted for each media sampled (i.e. soil, GW, sediment).
- One trip blank sample for BTEX/VOCs and PHC F1 for GW samples (must be in each cooler submitted).

Follow GHD collection procedures for soil and groundwater samples including methanol preservative method for soil VOCs and PHC F1 analysis.

Appendix F

Subsurface Exploration Data



BOREHOLE No.: BH-1
ELEVATION: Existing Grade

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Delpark Homes (Port Perry) Inc.

PROJECT: Phase 2 ESA - King Street, Port Perry, Ontario

LOGGED BY: J. Bigioni DATE: 15 June 2017

DRILLING COMPANY: Strong Soil Search Inc. METHOD: Track Mounted CME-55

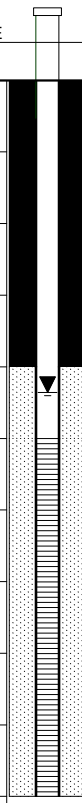
NOTES:

LEGEND

- SS - SPLIT SPOON
- AS - AUGER SAMPLE
- ST - SHELBY TUBE
- CS - CORE SAMPLE
- WATER LEVEL

BOREHOLE LOG ENVIRO 11148414-01, 17-06-21, BOREHOLE LOGS, JB.GPJ GEOLOGIC.GDT 22/6/17

Depth	m Below Existing Grade		Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery %	Moisture Content %	Vapours ppm	Penetration Index N	Shear test (Cu) Sensitivity (S)										Field / Lab	COMMENTS					
	ft	m								10	20	30	40	50	60	70	80	90								
	0.0			GROUND SURFACE						10 20 30 40 50 60 70 80 90																
		0.0		TOPSOIL - (450 mm)																						
1		0.46		SANDY SILT - Brown Sandy Silt, With Gravel, Moist, Loose Compact	SS-1	50	28	0	6	×	○															
2		0.76																								
3		1.0																								
4		1.52		Mottled	SS-2	75	8	0	16	○	×															
5		2.29																								
6																										
7																										
8				SAND - Grey Sand, Trace Silt, Trace Gravel, Moist To Wet, Compact, Seepage Observed At 2.2 m	SS-3	63	17	0	10	×	○															
9																										
10																										
11																										
12																										
13																										
14																										
15		4.57		Occas. Cobble, Very Dense	SS-4	83	18	0	15		×															
16		4.85		END OF BOREHOLE	SS-5	75	17	0	14		×	○														
17																										
18																										



W/L - 1.33 m June 16, 2017

W/L - 1.4 m June 15, 2017

Borehole caved to 2.74 m upon completion

SS-4:
2% Gravel
90% Sand
8% Silt and Clay

50 mm Monitoring well installed to 3.0 m



BOREHOLE No.: BH-2

ELEVATION: Existing Grade

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Delpark Homes (Port Perry) Inc.

PROJECT: Phase 2 ESA - King Street, Port Perry, Ontario

LOGGED BY: J. Bigioni DATE: 15 June 2017

DRILLING COMPANY: Strong Soil Search Inc. METHOD: Track Mounted CME-55

NOTES:

LEGEND

- ☒ SS - SPLIT SPOON
- ▨ AS - AUGER SAMPLE
- ▩ ST - SHELBY TUBE
- ▬ CS - CORE SAMPLE
- ▼ - WATER LEVEL

Depth	m Below Existing Grade		Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Vapours	Penetration Index	Shear test (Cu) Sensitivity (S)		Water content (%)		Atterberg limits (%)		"N" Value (blows / 12 in. -30 cm)	RQD CONE	COMMENTS
	ft	m								w _p	w _L	U _c	U _L	Field	Lab			
	0.0			GROUND SURFACE		%	%	ppm	N	10	20	30	40	50	60	70	80	90
				TOPSOIL - (300 mm)														
1	0.30			SANDY SILT - Brown Sandy Silt, With Gravel, Occas. Organics (Rootlets), Moist, Very Loose Moist To Wet, Loose, Seepage Observed At 0.9 m	SS-1	58	14	0	2	×	○							
2	0.5																	
3	0.76				SS-2	100	17	0	5	×	○							
4	1.0																	
5	1.52			SILTY SAND - Light Brown Grading To Grey Silty Sand, With Gravel, Moist Dense Moist To Wet, Very Dense, Seepage Observed At 3.0 m	SS-3	100	9	0	31		○		×					
6	2.0																	
7	2.5				SS-4	100	8	0	41		○			×				
8	3.0																	
9	3.05				SS-5	100	15	0	75		○						×	
10	3.5																	
11	4.0																	
12	4.5																	
13	5.0				SS-6	100	12	0	50		○						×	
14	5.18																	
15				END OF BOREHOLE														
16																		
17																		
18																		

▼ W/L - 3.05 m
June 15, 2017

Borehole caved to 3.0 m upon completion

BOREHOLE LOG ENVIRO 11148414-01, 17-06-21, BOREHOLE LOGS, JB.GPJ GEOLOGIC.GDT 22/6/17



BOREHOLE No.: BH-3
ELEVATION: Existing Grade

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Delpark Homes (Port Perry) Inc.

LEGEND

PROJECT: Phase 2 ESA - King Street, Port Perry, Ontario

- SS - SPLIT SPOON
- AS - AUGER SAMPLE
- ST - SHELBY TUBE
- CS - CORE SAMPLE
- WATER LEVEL

LOGGED BY: J. Bigioni DATE: 15 June 2017

DRILLING COMPANY: Strong Soil Search Inc. METHOD: Track Mounted CME-55

NOTES:

Depth	m Below Existing Grade		Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Vapours	Penetration Index	Shear test (Cu) Sensitivity (S)		Water content (%)		Atterberg limits (%)		"N" Value (blows / 12 in.-30 cm)	Field	Lab	COMMENTS	
	ft	m								w _p	w _L	U _c	U _L	△	□					
		0.0		GROUND SURFACE		%	%	ppm	N	10	20	30	40	50	60	70	80	90		
				TOPSOIL - (300 mm)																
1		0.30		SANDY SILT - Brown Sandy Silt, With Gravel, Moist, Occas. Organics (Rootlets), Very Loose	SS-1	75	17	0	2	X	○									
2		0.5																		
3		0.76		SILTY SAND - Light Brown Grading To Grey Silty Sand, With Gravel, Moist, Compact	SS-2	100	11	0	22		○	X								
4		1.0																		
5		1.52		Dense																
6		2.0			SS-3	75	9	0	46		○		X							W/L - 1.59 m June 16, 2017
7		2.29		Very Dense																
8		2.5			SS-4	83	7	0	59		○		X							
9		3.0																		
10		3.05		Seepage Observed At 3.0 m																
11		3.5			SS-5	75	6	0	51		○		X							
12		4.0																		
13		4.5																		
14		4.85			SS-6	100	8	0	100+		○							X		W/L - 3.6 m June 15, 2017
15				END OF BOREHOLE																Borehole open upon completion
16																				50 mm Monitoring well installed to 4.57 m
17																				
18																				

BOREHOLE LOG ENVIRO 11148414-01, 17-06-21, BOREHOLE LOGS, JB.GPJ GEOLOGIC.GDT 22/6/17



BOREHOLE No.: BH-4
ELEVATION: Existing Grade

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Delpark Homes (Port Perry) Inc.

PROJECT: Phase 2 ESA - King Street, Port Perry, Ontario

LOGGED BY: J. Bigioni DATE: 15 June 2017

DRILLING COMPANY: Strong Soil Search Inc. METHOD: Track Mounted CME-55

NOTES:

LEGEND

- SS - SPLIT SPOON
- AS - AUGER SAMPLE
- ST - SHELBY TUBE
- CS - CORE SAMPLE
- WATER LEVEL

BOREHOLE LOG ENVIRO 11148414-01, 17-06-21, BOREHOLE LOGS, JB.GPJ GEOLOGIC.GDT 22/6/17

Depth	m Below Existing Grade		Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Vapours	Penetration Index	Shear test (Cu) Sensitivity (S)		Water content (%)		Atterberg limits (%)		"N" Value (blows / 12 in.-30 cm)	RQD CONE	COMMENTS	
	ft	m								Field	Lab	w _p	w _L	Field	Lab				
		0.0		GROUND SURFACE		%	%	ppm	N	10	20	30	40	50	60	70	80	90	
				TOPSOIL - (300 mm)															
1		0.30		SILTY SAND - Brown Silty Sand, Trace Gravel, Occas. Organics (Rootlets), Moist, Loose	SS-1	83	7	0	6	×									
2		0.5																	
3		1.0																	
4					SS-2	75	20	0	6	×	○								
5		1.52		CLAYEY SILT - Brown Clayey Silt, Trace Sand, Moist, Firm	SS-3	50	29	0	5	×		○							
6		2.0																	
7																			
8		2.29		Stiff															
9		2.5																	
10		3.05		Firm	SS-4	83	24	0	11	×	○								
11		3.5																	
12																			
13		4.0																	
14																			
15		4.57		SANDY SILT - Light Brown Sandy Silt, With Gravel, Moist, Compact	SS-5	100	27	0	6	×		○							
16		5.0																	
17		5.18		END OF BOREHOLE	SS-6	75	9	0	22		○	×							
18		5.5																	

▼
 W/L - 3.96 m
 June 15, 2017

 Borehole open upon completion



BOREHOLE No.: BH-6
ELEVATION: Existing Grade

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Delpark Homes (Port Perry) Inc.

PROJECT: Phase 2 ESA - King Street, Port Perry, Ontario

LOGGED BY: J. Bigioni DATE: 15 June 2017

DRILLING COMPANY: Strong Soil Search Inc. METHOD: Track Mounted CME-55

NOTES:

LEGEND

- ☒ SS - SPLIT SPOON
- ▨ AS - AUGER SAMPLE
- ▩ ST - SHELBY TUBE
- ▬ CS - CORE SAMPLE
- ▼ - WATER LEVEL

BOREHOLE LOG ENVIRO 11148414-01, 17-06-21, BOREHOLE LOGS, JB.GPJ GEOLOGIC.GDT 22/6/17

Depth	m Below Existing Grade		Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Vapours	Penetration Index	Shear test (Cu)		Sensitivity (S)		Water content (%)		Atterberg limits (%)		"N" Value (blows / 12 in.-30 cm)	RQD CONE	COMMENTS
	ft	m								w _p	w _L	Field	Lab	Field	Lab					
		0.0		GROUND SURFACE		%	%	ppm	N	10	20	30	40	50	60	70	80	90		
				TOPSOIL - (300 mm)																
1		0.30		SANDY SILT - Brown Sandy Silt, Occas. Organics (Rootlets), Moist, Loose	SS-1	83	22	0	4	×	○									
2		0.5																		
3		0.76		Light Brown With Gravel, Compact																
4		1.0			SS-2	38	17	0	10	×	○									
5		1.52		Grading To Grey, Dense																
6		2.0			SS-3	83	8	0	32	○	×									SS-3: 17% Gravel 35% Sand 48% Silt and Clay
7		2.5																		
8		2.29		Occas. Cobble, Seepage Observed At 3.0 m																
9		2.5			SS-4	88	6	0	100+	○										
10		3.0																		
11		3.5			SS-5	100	8	0	100+	○										
12		4.0																		
13		4.5																		
14		4.5																		
15		4.82			SS-6	90	6	0	100+	○										▼ W/L - 4.42 m June 15, 2017
16		5.0		END OF BOREHOLE																Borehole open upon completion
17		5.5																		
18		5.5																		



BOREHOLE No.: BH-7
ELEVATION: Existing Grade

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Delpark Homes (Port Perry) Inc.

PROJECT: Phase 2 ESA - King Street, Port Perry, Ontario

LOGGED BY: J. Bigioni DATE: 15 June 2017

DRILLING COMPANY: Strong Soil Search Inc. METHOD: Track Mounted CME-55

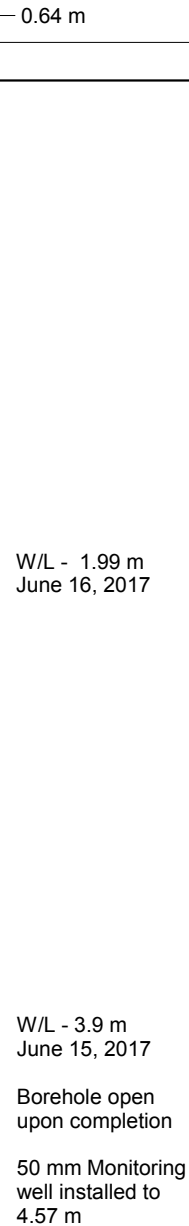
NOTES:

LEGEND

- ☒ SS - SPLIT SPOON
- ▨ AS - AUGER SAMPLE
- ▩ ST - SHELBY TUBE
- ▬ CS - CORE SAMPLE
- ▼ - WATER LEVEL

BOREHOLE LOG ENVIRO 11148414-01, 17-06-21, BOREHOLE LOGS, JB.GPJ GEOLOGIC.GDT 22/6/17

Depth	m Below Existing Grade		Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery %	Moisture Content %	Vapours ppm	Penetration Index N	Shear test (Cu) Sensitivity (S)										Field / Lab	COMMENTS			
	ft	m								w _p	w _L	Atterberg limits (%)	"N" Value (blows / 12 in.-30 cm)	10	20	30	40	50	60			70	80	90
	0.0			GROUND SURFACE						10 20 30 40 50 60 70 80 90														
		0.00		TOPSOIL - (300 mm)																				
1		0.30	▨	FILL - Light Brown Sandy Silt, With Gravel, Occas. Organics (Rootlets), Moist, Loose	SS-1	42	27	0	4	×	○													
2		0.50																						
3		0.76	▨	Brown, Organics (Wood Fragments)																				
4		1.00			SS-2	50	108	0	6	×														
5		1.52	▨	CLAYEY SILT - Brown Clayey Silt, Trace Sand, Moist To Wet, Mottled, Very Soft, Seepage Observed At 1.5 m	SS-3	83	40	0	2	×	○													
6		2.00																						
7		2.29	▨	Moist, Stiff																				
8		2.50			SS-4	83	7	0	13	○	×													
9		2.74	▨	SANDY SILT - Grading Grey Sandy Silt, With Gravel, Occas. Cobble, Moist, Compact Very Dense																				
10		3.05	▨		SS-5	64	5	0	100+	○														
11		3.50																						
12		4.00																						
13		4.50																						
14		4.85	▨	END OF BOREHOLE	SS-6	100	5	0	100+	○														
15		5.00																						
16		5.50																						





BOREHOLE No.: BH-8

ELEVATION: Existing Grade

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Delpark Homes (Port Perry) Inc.

PROJECT: Phase 2 ESA - King Street, Port Perry, Ontario

LOGGED BY: J. Bigioni DATE: 15 June 2017

DRILLING COMPANY: Strong Soil Search Inc. METHOD: Track Mounted CME-55

NOTES:

LEGEND

- SS - SPLIT SPOON
- AS - AUGER SAMPLE
- ST - SHELBY TUBE
- CS - CORE SAMPLE
- WATER LEVEL

BOREHOLE LOG ENVIRO 11148414-01, 17-06-21, BOREHOLE LOGS, JB.GPJ GEOLOGIC.GDT 22/6/17

Depth	m Below Existing Grade		Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Vapours	Penetration Index	Shear test (Cu) Sensitivity (S)										COMMENTS
	ft	m								10	20	30	40	50	60	70	80	90		
		0.0		GROUND SURFACE		%	%	ppm	N	10	20	30	40	50	60	70	80	90		
				TOPSOIL - (300 mm)																
1		0.30		FILL - Brown Sandy Silt, Little Gravel, Occas. Organics (Rootlets), Moist, Loose	SS-1	29	17	0	6	×	○									
2		0.5																		
3		1.0																		
4					SS-2	42	3	0	9	○	×									
5		1.52		SILTY SAND - Light Brown Silty Sand, With Gravel, Moist, Compact	SS-3	63	11	0	26	○	×									
6		2.0																		
7																				
8		2.29		Grading To Grey, Dense, Seepage Observed At 3.3 m	SS-4	83	10	0	40	○		×								
9		2.5																		
10		3.0																		
11		3.5			SS-5	92	14	0	42	○		×								
12																				
13		4.0																		
14																				
15		4.57		Very Dense																
16		4.85		END OF BOREHOLE	SS-6	100	6	0	100+	○								×		
17		5.0																		
18		5.5																		

▼ Borehole caved to 3.9 m upon completion
W/L - 3.96 m
June 15, 2017



BOREHOLE No.: BH-9
ELEVATION: Existing Grade

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Delpark Homes (Port Perry) Inc.

PROJECT: Phase 2 ESA - King Street, Port Perry, Ontario

LOGGED BY: J. Bigioni DATE: 15 June 2017

DRILLING COMPANY: Strong Soil Search Inc. METHOD: Track Mounted CME-55

NOTES:

LEGEND

- ☒ SS - SPLIT SPOON
- ▨ AS - AUGER SAMPLE
- ▧ ST - SHELBY TUBE
- ▩ CS - CORE SAMPLE
- ▼ - WATER LEVEL

BOREHOLE LOG ENVIRO 11148414-01, 17-06-21, BOREHOLE LOGS, JB.GPJ GEOLOGIC.GDT 22/6/17

Depth	m Below Existing Grade		Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Vapours	Penetration Index	Shear test (Cu)		Sensitivity (S)		Water content (%)		Atterberg limits (%)		"N" Value (blows / 12 in.-30 cm)	RQD CONE	COMMENTS	
	ft	m								w _p	w _L	Field	Lab	Field	Lab	Field	Lab				
		0.0		GROUND SURFACE		%	%	ppm	N	10	20	30	40	50	60	70	80	90			
				TOPSOIL - (380 mm)																	
1		0.38		SILTY SAND - Brown Silty Sand, Occas. Organics (Rootlets), Moist, Loose	SS-1	50	15	0	5	×	○										
2		0.76		CLAYEY SILT - Brown Clayey Silt, Trace Sand, Moist, Stiff	SS-2	75	23	0	11	×	○										
5		1.52		Mottled, Firm	SS-3	63	24	0	7	×	○										SS-3: 0% Gravel 1% Sand 99% Silt and Clay 39% between 5-75 µm
9		3.05		Little Gravel, Stiff	SS-4	100	25	0	8	×	○										
11		4.57		SANDY SILT - Grey Sandy Silt, With Gravel, Occas. Cobble, Moist, Very Dense	SS-5	100	22	0	9	×	○										
16		5.18		END OF BOREHOLE	SS-6	63	7	0	70	○								×			▼ W/L - 4.27 m June 15, 2017 Borehole open upon completion



BOREHOLE No.: BH-10
ELEVATION: Existing Grade

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Delpark Homes (Port Perry) Inc.

PROJECT: Phase 2 ESA - King Street, Port Perry, Ontario

LOGGED BY: J. Bigioni DATE: 15 June 2017

DRILLING COMPANY: Strong Soil Search Inc. METHOD: Track Mounted CME-55

NOTES:

LEGEND

- SS - SPLIT SPOON
- AS - AUGER SAMPLE
- ST - SHELBY TUBE
- CS - CORE SAMPLE
- WATER LEVEL

BOREHOLE LOG ENVIRO 11148414-01, 17-06-21, BOREHOLE LOGS, JB.GPJ GEOLOGIC.GDT 22/6/17

Depth	m Below Existing Grade		Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery %	Moisture Content %	Vapours ppm	Penetration Index N	Shear test (Cu) Sensitivity (S)										COMMENTS				
	ft	m								10	20	30	40	50	60	70	80	90						
		0.0		GROUND SURFACE																				
		0.15		TOPSOIL - (150 mm)																				
1		0.15		SILTY SAND - Grey Silty Sand, With Gravel, Occas. Organics (Rootlets), Moist, Very Loose	SS-1	75	22	0	3	×	○													
2		0.5																						
		0.76		Dense																				
3		0.76																						
4		1.0			SS-2	83	9	0	32	○	×													
5		1.5																						
6		2.0			SS-3	83	8	0	37	○	×													
7		2.0																						
		2.29		Occas. Cobble																				
8		2.29																						
9		2.5			SS-4	100	7	0	44	○	×													
10		3.0																						
		3.05		Very Dense, Seepage Observed At 3.0 m																				
11		3.05			SS-5	83	4	0	63	○	×													
12		3.5																						
		3.66																						
		3.9																						
13		4.0																						
14		4.0																						
15		4.5																						
16		5.0			SS-6	75	7	0	51	○	×													
17		5.18		END OF BOREHOLE																				
18		5.5																						

▼ W/L - 3.66 m
 June 15, 2017
 Borehole caved to 3.9 m upon completion



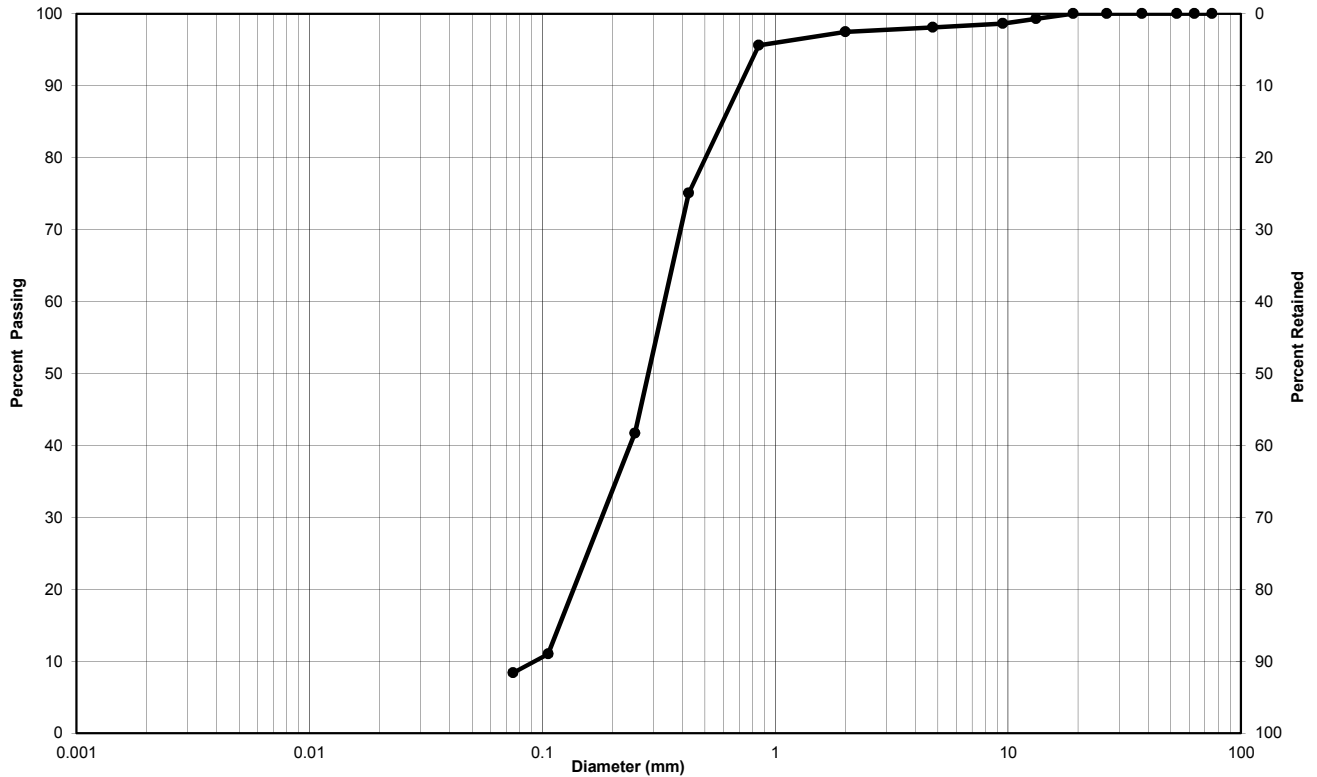
**Particle-Size Analysis of Soils (Geotechnical)
(USCS) (ASTM D422)**

Client: Delpark Homes (Port Perry) Inc. **Lab no.:** SS-D-17-22

Project/Site: King Street, Port Perry **Project no.:** 11148414-01

Borehole no.: BH-1 **Sample no.:** SS-4

Depth: 7.5-9.5' **Enclosure:** F-11



Clay & Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse
Unified Soil Classification System					

Soil Description	Gravel	Sand	Clay & Silt
BH-1 SS-4	2	90	8

Remarks:

Performed by: A. Fawcett **Date:** June 22, 2017

Verified by: *Joe Sullivan* **Date:** June 22, 2017



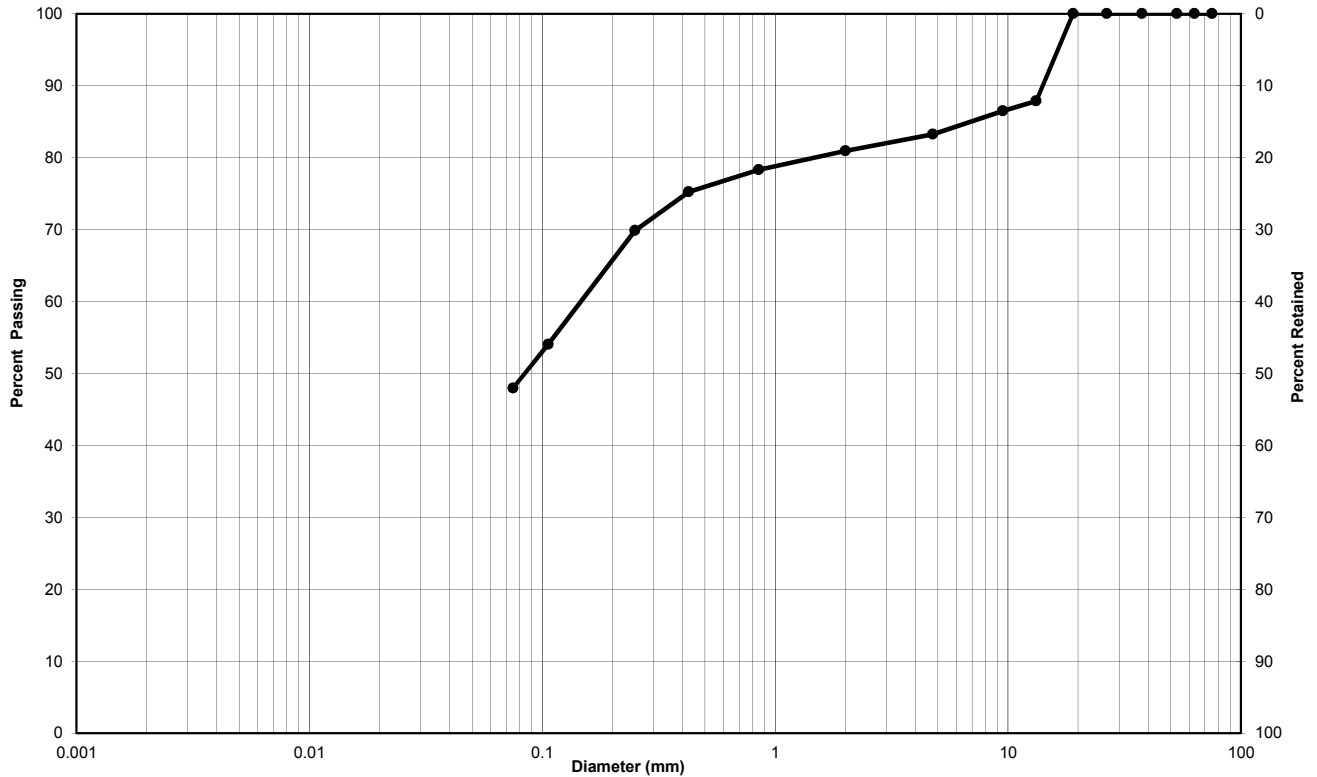
**Particle-Size Analysis of Soils (Geotechnical)
(USCS) (ASTM D422)**

Client: Delpark Homes (Port Perry) Inc. **Lab no.:** SS-D-17-22

Project/Site: King Street, Port Perry **Project no.:** 11148414-01

Borehole no.: BH-6 **Sample no.:** SS-3

Depth: 5-7' **Enclosure:** F-12



Clay & Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse
Unified Soil Classification System					

Soil Description	Gravel	Sand	Clay & Silt
BH-6 SS-3	17	35	48

Remarks:

Performed by: A. Fawcett **Date:** June 22, 2017

Verified by: *Joe Sullivan* **Date:** June 22, 2017



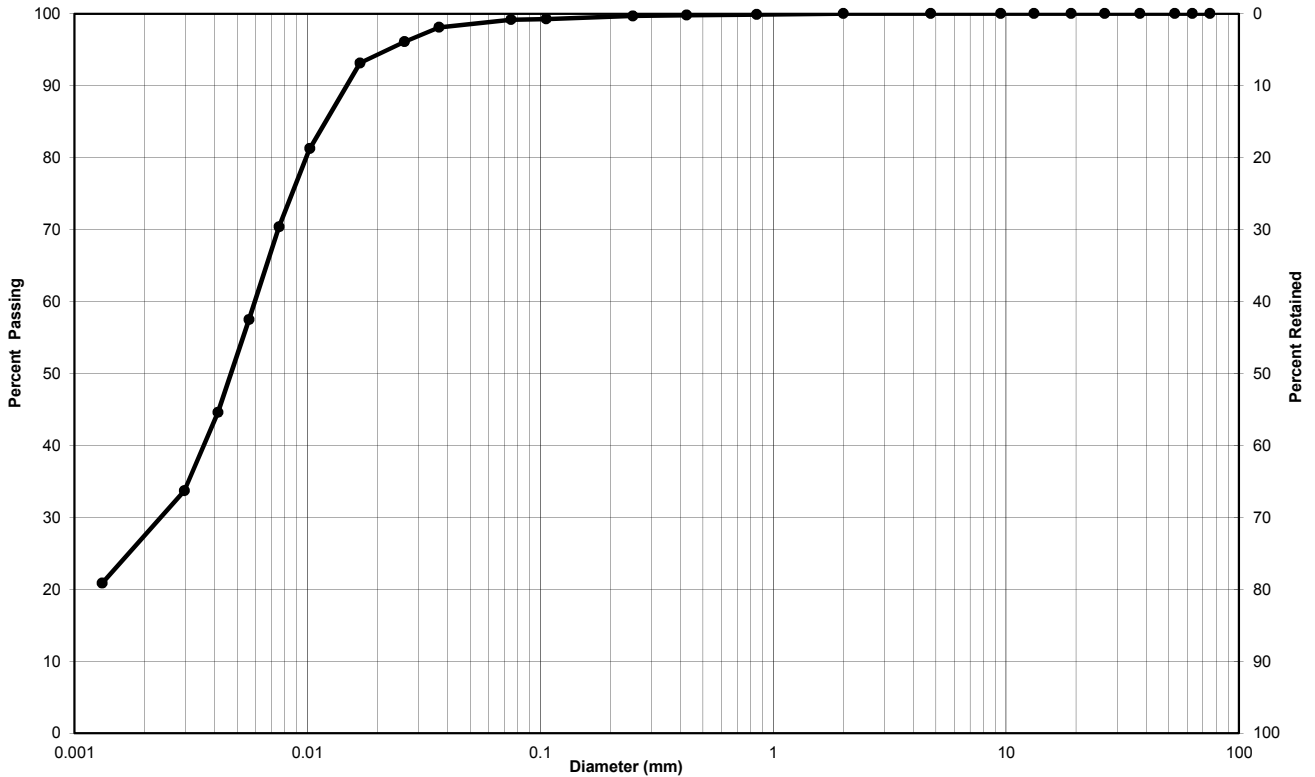
**Particle-Size Analysis of Soils (Geotechnical)
(USCS) (ASTM D422)**

Client: Delpark Homes (Port Perry) Inc. **Lab no.:** SS-D-17-22

Project/Site: King Street, Port Perry **Project no.:** 11148414-01

Borehole no.: BH-9 **Sample no.:** SS-3

Depth: 5-7' **Enclosure:** F-13



Clay & Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse
Unified Soil Classification System					

Soil Description	Gravel	Sand	Clay & Silt
BH-9 SS-3	0	1	99

Remarks:

Performed by: A. Fawcett **Date:** June 22, 2017

Verified by: *Joe Siller* **Date:** June 22, 2017

Appendix G

Certificates of Chemical Analysis

C.O.C.: G32083

REPORT No. B17-16590 (i)

Report To:

GHD Limited
 651 Colby Drive,
 Waterloo Ontario N2V 1G2 Canada

Attention: Joshua Bigioni

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 16-Jun-17

JOB/PROJECT NO.: 1725 King St/11148414-01

DATE REPORTED: 23-Jun-17

P.O. NUMBER: 73507640

SAMPLE MATRIX: Soil

WATERWORKS NO.

Client I.D.	BH-5, SS-2	BH-10, SS-4	BH-7, SS-2	
Sample I.D.	B17-16590-1	B17-16590-2	B17-16590-3	
Date Collected	15-Jun-17	15-Jun-17	15-Jun-17	

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
pH @25°C	pH Units		MOEE 3137	16-Jun-17/R	7.70	7.94		
Antimony	µg/g	0.4	EPA 200.8	19-Jun-17/R			0.7	
Arsenic	µg/g	0.5	EPA 200.8	19-Jun-17/R			2.0	
Barium	µg/g	0.4	EPA 200.8	19-Jun-17/R			32.7	
Beryllium	µg/g	0.05	EPA 200.8	19-Jun-17/R			0.37	
Boron	µg/g	0.5	EPA 200.8	19-Jun-17/R			4.6	
Boron (HWS)	µg/g	0.02	MOE 3470	20-Jun-17/R			0.18	
Cadmium	µg/g	0.03	EPA 200.8	19-Jun-17/R			0.12	
Chromium	µg/g	0.4	EPA 200.8	19-Jun-17/R			11.2	
Chromium (VI)	µg/g	0.5	EPA3060A	19-Jun-17/R			< 0.5	
Cobalt	µg/g	0.2	EPA 200.8	19-Jun-17/R			3.5	
Copper	µg/g	0.4	EPA 200.8	19-Jun-17/R			16.1	
Lead	µg/g	0.1	EPA 200.8	19-Jun-17/R			14.4	
Mercury	µg/g	0.005	EPA7471A	20-Jun-17/R			0.015	
Molybdenum	µg/g	0.1	EPA 200.8	19-Jun-17/R			0.4	
Nickel	µg/g	0.4	EPA 200.8	19-Jun-17/R			7.7	

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

Uncertainty values available upon request



Christine Burke
 Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: G32083

REPORT No. B17-16590 (i)

Report To:

GHD Limited
 651 Colby Drive,
 Waterloo Ontario N2V 1C2 Canada

Attention: Joshua Bigioni

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 16-Jun-17

JOB/PROJECT NO.: 1725 King St/11148414-01

DATE REPORTED: 23-Jun-17

P.O. NUMBER: 73507640

SAMPLE MATRIX: Soil

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method		Date/Site Analyzed		
			Method	Date	Site	Method	Date
Selenium	µg/g	0.1	EPA 200.8	19-Jun-17/R			0.3
Silver	µg/g	0.01	EPA 200.8	19-Jun-17/R			0.02
Thallium	µg/g	0.02	EPA 200.8	19-Jun-17/R			0.03
Uranium	µg/g	0.02	EPA 200.8	19-Jun-17/R			0.49
Vanadium	µg/g	0.8	EPA 200.8	19-Jun-17/R			23.3
Zinc	µg/g	30	EPA 200.8	19-Jun-17/R			60

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)

F2 C10-C16 hydrocarbons in µg/g, (F2-naph if requested)

F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)

F4 C34-C50 hydrocarbons in µg/g

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

Any deviations from the method are noted and reported for any particular sample.

nC6 and nC10 response factor is within 30% of response factor for toluene:

nC10,nC16 and nC34 response factors within 10% of each other:

C50 response factors within 70% of nC10+nC16+nC34 average:

Linearity is within 15%:

All results expressed on a dry weight basis.

Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

Uncertainty values available upon request

Unless otherwise noted all extraction, analysis, QC

requirements and limits for holding time were met.

If analyzed for F4 and F4G they are not to be summed but the

greater of the two numbers are to be used in application to the

CWS PHC

QC will be made available upon request.



Christine Burke

Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from

C.O.C.: G32083

REPORT No. B17-16590 (ii)

Report To:

GHD Limited
 651 Colby Drive,
 Waterloo Ontario N2V 1C2 Canada

Attention: Joshua Bigioni

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 16-Jun-17

JOB/PROJECT NO.: 1725 King St/11148414-01

DATE REPORTED: 23-Jun-17

P.O. NUMBER: 73507640

SAMPLE MATRIX: Soil

WATERWORKS NO.

Client I.D.	BH-7, SS-2			
Sample I.D.	B17-16590-3			
Date Collected	15-Jun-17			

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Acetone	µg/g	0.3	EPA 8260	20-Jun-17/O	< 0.3			
Benzene	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02			
Bromoform	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02			
Bromodichloromethane	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02			
Bromomethane	µg/g	0.03	EPA 8260	20-Jun-17/O	< 0.03			
Carbon Tetrachloride	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02			
Monochlorobenzene (Chlorobenzene)	µg/g	0.03	EPA 8260	20-Jun-17/O	< 0.03			
Chloroform	µg/g	0.03	EPA 8260	20-Jun-17/O	< 0.03			
Dibromochloromethane	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02			
Dibromoethane, 1,2- (Ethylene Dibromide)	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02			
Dichlorobenzene, 1,2-	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02			
Dichlorobenzene, 1,3-	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02			
Dichlorobenzene, 1,4-	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02			
Dichlorodifluoromethane	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02			

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

Uncertainty values available upon request



Christine Burke
 Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: G32083

REPORT No. B17-16590 (ii)

Report To:

GHD Limited
 651 Colby Drive,
 Waterloo Ontario N2V 1C2 Canada

Attention: Joshua Bigioni

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 16-Jun-17

JOB/PROJECT NO.: 1725 King St/11148414-01

DATE REPORTED: 23-Jun-17

P.O. NUMBER: 73507640

SAMPLE MATRIX: Soil

WATERWORKS NO.

Client I.D.	BH-7, SS-2		
Sample I.D.	B17-16590-3		
Date Collected	15-Jun-17		

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Dichloroethane,1,1-	µg/g	0.03	EPA 8260	20-Jun-17/O	< 0.03		
Dichloroethane,1,2-	µg/g	0.03	EPA 8260	20-Jun-17/O	< 0.03		
Dichloroethene, cis-1,2-	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02		
Dichloroethene, 1,1-	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02		
Dichloroethene, trans-1,2-	µg/g	0.03	EPA 8260	20-Jun-17/O	< 0.03		
Dichloropropane,1,2-	µg/g	0.03	EPA 8260	20-Jun-17/O	< 0.03		
Dichloropropene, trans-1,3-	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02		
Dichloropropene, cis-1,3-	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02		
Dichloropropene 1,3-cis+trans	µg/g	0.03	EPA 8260	20-Jun-17/O	< 0.03		
Ethylbenzene	µg/g	0.03	EPA 8260	20-Jun-17/O	< 0.03		
Dichloromethane (Methylene Chloride)	µg/g	0.04	EPA 8260	20-Jun-17/O	< 0.04		
Hexane	µg/g	0.03	EPA 8260	20-Jun-17/O	< 0.03		
Methyl Ethyl Ketone	µg/g	0.1	EPA 8260	20-Jun-17/O	< 0.1		
Methyl Isobutyl Ketone	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02		

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

Uncertainty values available upon request



Christine Burke
 Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: G32083

REPORT No. B17-16590 (ii)

Report To:

GHD Limited
 651 Colby Drive,
 Waterloo Ontario N2V 1C2 Canada

Attention: Joshua Bigioni

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 16-Jun-17

JOB/PROJECT NO.: 1725 King St/11148414-01

DATE REPORTED: 23-Jun-17

P.O. NUMBER: 73507640

SAMPLE MATRIX: Soil

WATERWORKS NO.

Client I.D.	BH-7, SS-2			
Sample I.D.	B17-16590-3			
Date Collected	15-Jun-17			

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Methyl-t-butyl Ether	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02			
Styrene	µg/g	0.03	EPA 8260	20-Jun-17/O	< 0.03			
Tetrachloroethane,1,1,1,2-	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02			
Tetrachloroethane,1,1,2,2-	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02			
Tetrachloroethylene	µg/g	0.03	EPA 8260	20-Jun-17/O	< 0.03			
Toluene	µg/g	0.03	EPA 8260	20-Jun-17/O	< 0.03			
Trichloroethane,1,1,1-	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02			
Trichloroethane,1,1,2-	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02			
Trichloroethylene	µg/g	0.03	EPA 8260	20-Jun-17/O	< 0.03			
Trichlorofluoromethane	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02			
Vinyl Chloride	µg/g	0.02	EPA 8260	20-Jun-17/O	< 0.02			
Xylene, m,p-	µg/g	0.04	EPA 8260	20-Jun-17/O	< 0.04			
Xylene, o-	µg/g	0.03	EPA 8260	20-Jun-17/O	< 0.03			
Xylene, m,p,o-	µg/g	0.05	EPA 8260	20-Jun-17/O	< 0.05			
PHC F1 (C6-C10)	µg/g	10	MOE E3398	20-Jun-17/O	< 10			
PHC F2 (>C10-C16)	µg/g	5	CWS Tier 1	21-Jun-17/K	7			

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

Uncertainty values available upon request



Christine Burke
 Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: G32083

REPORT No. B17-16590 (ii)

Report To:

GHD Limited
 651 Colby Drive,
 Waterloo Ontario N2V 1C2 Canada

Attention: Joshua Bigioni

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 16-Jun-17

JOB/PROJECT NO.: 1725 King St/11148414-01

DATE REPORTED: 23-Jun-17

P.O. NUMBER: 73507640

SAMPLE MATRIX: Soil

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
PHC F3 (>C16-C34)	µg/g	10	CWS Tier 1	21-Jun-17/K	20			
PHC F4 (>C34-C50)	µg/g	10	CWS Tier 1	21-Jun-17/K	< 10			
% moisture	%			22-Jun-17/R	11.1			

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)

F2 C10-C16 hydrocarbons in µg/g, (F2-naph if requested)

F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)

F4 C34-C50 hydrocarbons in µg/g

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

Any deviations from the method are noted and reported for any particular sample.

nC6 and nC10 response factor is within 30% of response factor for toluene:

nC10,nC16 and nC34 response factors within 10% of each other:

C50 response factors within 70% of nC10+nC16+nC34 average:

Linearity is within 15%:

All results expressed on a dry weight basis.

Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

Uncertainty values available upon request

Unless otherwise noted all extraction, analysis, QC

requirements and limits for holding time were met.

If analyzed for F4 and F4G they are not to be summed but the

greater of the two numbers are to be used in application to the

CWS PHC

QC will be made available upon request.



Christine Burke

Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from

C.O.C.: G32083

REPORT No. B17-16590 (iii)

Report To:

GHD Limited
 651 Colby Drive,
 Waterloo Ontario N2V 1C2 Canada

Attention: Joshua Bigioni

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 16-Jun-17

JOB/PROJECT NO.: 1725 King St/11148414-01

DATE REPORTED: 23-Jun-17

P.O. NUMBER: 73507640

SAMPLE MATRIX: Soil

WATERWORKS NO.

Client I.D.	BH-7, SS-2			
Sample I.D.	B17-16590-3			
Date Collected	15-Jun-17			

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Acenaphthene	µg/g	0.05	EPA 8270	21-Jun-17/K	< 0.05			
Acenaphthylene	µg/g	0.05	EPA 8270	21-Jun-17/K	< 0.05			
Anthracene	µg/g	0.05	EPA 8270	21-Jun-17/K	< 0.05			
Benzo(a)anthracene	µg/g	0.05	EPA 8270	21-Jun-17/K	< 0.05			
Benzo(a)pyrene	µg/g	0.05	EPA 8270	21-Jun-17/K	< 0.05			
Benzo(b)fluoranthene	µg/g	0.05	EPA 8270	21-Jun-17/K	< 0.05			
Benzo(b+k)fluoranthene	µg/g	0.05	EPA 8270	21-Jun-17/K	< 0.05			
Benzo(g,h,i)perylene	µg/g	0.05	EPA 8270	21-Jun-17/K	< 0.05			
Benzo(k)fluoranthene	µg/g	0.05	EPA 8270	21-Jun-17/K	< 0.05			
Chrysene	µg/g	0.05	EPA 8270	21-Jun-17/K	< 0.05			
Dibenzo(a,h)anthracene	µg/g	0.05	EPA 8270	21-Jun-17/K	< 0.05			
Fluoranthene	µg/g	0.05	EPA 8270	21-Jun-17/K	< 0.05			
Fluorene	µg/g	0.05	EPA 8270	21-Jun-17/K	< 0.05			
Indeno(1,2,3,-cd)pyrene	µg/g	0.05	EPA 8270	21-Jun-17/K	< 0.05			
Methylnaphthalene,1-	µg/g	0.05	EPA 8270	21-Jun-17/K	< 0.05			
Methylnaphthalene,2-	µg/g	0.05	EPA 8270	21-Jun-17/K	0.05			

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

Uncertainty values available upon request



Christine Burke
 Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: G32083

REPORT No. B17-16590 (iii)

Report To:

GHD Limited
 651 Colby Drive,
 Waterloo Ontario N2V 1C2 Canada

Attention: Joshua Bigioni

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 16-Jun-17

JOB/PROJECT NO.: 1725 King St/11148414-01

DATE REPORTED: 23-Jun-17

P.O. NUMBER: 73507640

SAMPLE MATRIX: Soil

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Methylnaphthalene 2-(1-)	µg/g	0.05	EPA 8270	21-Jun-17/K	0.10			
Naphthalene	µg/g	0.05	EPA 8270	21-Jun-17/K	0.06			
Phenanthrene	µg/g	0.05	EPA 8270	21-Jun-17/K	< 0.05			
Pyrene	µg/g	0.05	EPA 8270	21-Jun-17/K	< 0.05			

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)

F2 C10-C16 hydrocarbons in µg/g, (F2-naph if requested)

F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)

F4 C34-C50 hydrocarbons in µg/g

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

Any deviations from the method are noted and reported for any particular sample.

nC6 and nC10 response factor is within 30% of response factor for toluene:

nC10,nC16 and nC34 response factors within 10% of each other:

C50 response factors within 70% of nC10+nC16+nC34 average:

Linearity is within 15%:

All results expressed on a dry weight basis.

Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

Uncertainty values available upon request

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met.

If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC

QC will be made available upon request.



Christine Burke

Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from

C.O.C.: G32082

REPORT No. B17-16588 (ii)

Report To:

GHD Limited
 651 Colby Drive,
 Waterloo Ontario N2V 1C2 Canada

Attention: Joshua Bigioni

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 16-Jun-17

JOB/PROJECT NO.: 1725 King St/11148414-01

DATE REPORTED: 23-Jun-17

P.O. NUMBER: 73507640

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.	BH - 7		
Sample I.D.	B17-16588-1		
Date Collected	16-Jun-17		

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Acetone	µg/L	2	EPA 8260	21-Jun-17/O	< 2		
Benzene	µg/L	0.5	EPA 8260	21-Jun-17/O	< 0.5		
Bromodichloromethane	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Bromoform	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Bromomethane	µg/L	0.3	EPA 8260	21-Jun-17/O	< 0.3		
Carbon Tetrachloride	µg/L	0.2	EPA 8260	21-Jun-17/O	< 0.2		
Monochlorobenzene (Chlorobenzene)	µg/L	0.2	EPA 8260	21-Jun-17/O	< 0.2		
Chloroform	µg/L	0.3	EPA 8260	21-Jun-17/O	< 0.3		
Dibromochloromethane	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Dibromoethane, 1,2- (Ethylene Dibromide)	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Dichlorobenzene, 1,2-	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Dichlorobenzene, 1,3-	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Dichlorobenzene, 1,4-	µg/L	0.2	EPA 8260	21-Jun-17/O	< 0.2		
Dichlorodifluoromethane	µg/L	1	EPA 8260	21-Jun-17/O	< 1		
Dichloroethane, 1,1-	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Dichloroethane, 1,2-	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Dichloroethene, 1,1-	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Dichloroethene, cis-1,2-	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Dichloroethene, trans-1,2-	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Dichloropropane, 1,2-	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Dichloropropene, cis-1,3-	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Dichloropropene, trans-1,3-	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		



Christine Burke
 Lab Manager

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: G32082

REPORT No. B17-16588 (ii)

Report To:

GHD Limited
 651 Colby Drive,
 Waterloo Ontario N2V 1C2 Canada

Attention: Joshua Bigioni

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 16-Jun-17

JOB/PROJECT NO.: 1725 King St/11148414-01

DATE REPORTED: 23-Jun-17

P.O. NUMBER: 73507640

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.	BH - 7		
Sample I.D.	B17-16588-1		
Date Collected	16-Jun-17		

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Dichloropropene 1,3-cis+trans	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Ethylbenzene	µg/L	0.5	EPA 8260	21-Jun-17/O	< 0.5		
Hexane	µg/L	1	EPA 8260	21-Jun-17/O	< 1		
Dichloromethane (Methylene Chloride)	µg/L	0.3	EPA 8260	21-Jun-17/O	< 0.3		
Methyl Ethyl Ketone	µg/L	1	EPA 8260	21-Jun-17/O	< 1		
Methyl Isobutyl Ketone	µg/L	1	EPA 8260	21-Jun-17/O	< 1		
Methyl-t-butyl Ether	µg/L	1	EPA 8260	21-Jun-17/O	< 1		
Styrene	µg/L	0.5	EPA 8260	21-Jun-17/O	< 0.5		
Tetrachloroethane,1,1,1,2-	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Tetrachloroethane,1,1,2,2-	µg/L	0.4	EPA 8260	21-Jun-17/O	< 0.4		
Tetrachloroethylene	µg/L	0.2	EPA 8260	21-Jun-17/O	< 0.2		
Toluene	µg/L	0.5	EPA 8260	21-Jun-17/O	< 0.5		
Trichloroethane,1,1,1-	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Trichloroethane,1,1,2-	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Trichloroethylene	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Trichlorofluoromethane	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Vinyl Chloride	µg/L	0.2	EPA 8260	21-Jun-17/O	< 0.2		
Xylene, m,p-	µg/L	0.4	EPA 8260	21-Jun-17/O	< 0.4		
Xylene, o-	µg/L	0.1	EPA 8260	21-Jun-17/O	< 0.1		
Xylene, m,p,o-	µg/L	0.4	EPA 8260	21-Jun-17/O	< 0.4		
PHC F1 (C6-C10)	µg/L	20	MOE E3421	21-Jun-17/O	< 20		
PHC F2 (>C10-C16)	µg/L	50	MOE E3421	19-Jun-17/K	< 50		
PHC F3 (>C16-C34)	µg/L	400	MOE E3421	19-Jun-17/K	< 400		



Christine Burke
 Lab Manager

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: G32082

REPORT No. B17-16588 (ii)

Report To:

GHD Limited
 651 Colby Drive,
 Waterloo Ontario N2V 1C2 Canada

Attention: Joshua Bigioni

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9
 Tel: 289-475-5442
 Fax: 289-562-1963

DATE RECEIVED: 16-Jun-17

JOB/PROJECT NO.: 1725 King St/11148414-01

DATE REPORTED: 23-Jun-17

P.O. NUMBER: 73507640

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.	BH - 7			
Sample I.D.	B17-16588-1			
Date Collected	16-Jun-17			

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
PHC F4 (>C34-C50)	µg/L	400	MOE E3421	19-Jun-17/K	< 400		



Christine Burke
 Lab Manager

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: G32082

REPORT No. B17-16588 (iii)

Report To:

GHD Limited
 651 Colby Drive,
 Waterloo Ontario N2V 1C2 Canada

Attention: Joshua Bigioni

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 16-Jun-17

JOB/PROJECT NO.: 1725 King St/11148414-01

DATE REPORTED: 23-Jun-17

P.O. NUMBER: 73507640

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.	BH - 7		
Sample I.D.	B17-16588-1		
Date Collected	16-Jun-17		

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Acenaphthene	µg/L	0.05	EPA 8270	22-Jun-17/K	< 0.05		
Acenaphthylene	µg/L	0.05	EPA 8270	22-Jun-17/K	< 0.05		
Anthracene	µg/L	0.05	EPA 8270	22-Jun-17/K	< 0.05		
Benzo(a)anthracene	µg/L	0.05	EPA 8270	22-Jun-17/K	< 0.05		
Benzo(a)pyrene	µg/L	0.01	EPA 8270	22-Jun-17/K	< 0.01		
Benzo(b)fluoranthene	µg/L	0.05	EPA 8270	22-Jun-17/K	< 0.05		
Benzo(b+k)fluoranthene	µg/L	0.1	EPA 8270	22-Jun-17/K	< 0.1		
Benzo(g,h,i)perylene	µg/L	0.05	EPA 8270	22-Jun-17/K	< 0.05		
Benzo(k)fluoranthene	µg/L	0.05	EPA 8270	22-Jun-17/K	< 0.05		
Chrysene	µg/L	0.05	EPA 8270	22-Jun-17/K	< 0.05		
Dibenzo(a,h)anthracene	µg/L	0.05	EPA 8270	22-Jun-17/K	< 0.05		
Fluoranthene	µg/L	0.05	EPA 8270	22-Jun-17/K	< 0.05		
Fluorene	µg/L	0.05	EPA 8270	22-Jun-17/K	< 0.05		
Indeno(1,2,3,-cd)pyrene	µg/L	0.05	EPA 8270	22-Jun-17/K	< 0.05		
Methylnaphthalene,1-	µg/L	0.05	EPA 8270	22-Jun-17/K	< 0.05		
Methylnaphthalene,2-	µg/L	0.05	EPA 8270	22-Jun-17/K	< 0.05		
Methylnaphthalene 2-(1-)	µg/L	0.07	EPA 8270	22-Jun-17/K	< 0.07		
Naphthalene	µg/L	0.05	EPA 8270	22-Jun-17/K	< 0.05		
Phenanthrene	µg/L	0.05	EPA 8270	22-Jun-17/K	< 0.05		
Pyrene	µg/L	0.05	EPA 8270	22-Jun-17/K	< 0.05		



Christine Burke
 Lab Manager

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: G32082

REPORT No. B17-16588 (i)

Report To:

GHD Limited
 651 Colby Drive,
 Waterloo Ontario N2V 1C2 Canada

Attention: Joshua Bigioni

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 16-Jun-17

JOB/PROJECT NO.: 1725 King St/11148414-01

DATE REPORTED: 23-Jun-17

P.O. NUMBER: 73507640

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.	BH - 7		
Sample I.D.	B17-16588-1		
Date Collected	16-Jun-17		

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
pH @25°C	pH Units		SM 4500	20-Jun-17/R	7.56		
Antimony	µg/L	0.5	EPA 200.8	19-Jun-17/R	< 0.5		
Arsenic	µg/L	0.70	EPA 200.8	19-Jun-17/R	< 0.70		
Barium	µg/L	0.6	EPA 200.8	19-Jun-17/R	55.0		
Beryllium	µg/L	0.1	EPA 200.8	19-Jun-17/R	< 0.1		
Boron	µg/L	2	EPA 200.8	19-Jun-17/R	21		
Cadmium	µg/L	0.1	EPA 200.8	19-Jun-17/R	< 0.1		
Chromium	µg/L	1.1	EPA 200.8	19-Jun-17/R	2.2		
Chromium (VI)	µg/L	10	SM3500CrB	21-Jun-17/R	< 10 ¹		
Cobalt	µg/L	0.2	EPA 200.8	19-Jun-17/R	< 0.2		
Copper	µg/L	0.3	EPA 200.8	19-Jun-17/R	1.4		
Lead	µg/L	0.05	EPA 200.8	19-Jun-17/R	0.54		
Mercury	µg/L	0.02	SM 3112B	20-Jun-17/R	< 0.02		
Molybdenum	µg/L	0.3	EPA 200.8	19-Jun-17/R	0.9		
Nickel	µg/L	0.6	EPA 200.8	19-Jun-17/R	0.8		
Selenium	µg/L	0.5	EPA 200.8	19-Jun-17/R	1.6		
Silver	µg/L	0.03	EPA 200.8	19-Jun-17/R	< 0.03		
Thallium	µg/L	0.1	EPA 200.8	19-Jun-17/R	< 0.1		
Uranium	µg/L	0.3	EPA 200.8	19-Jun-17/R	0.5		
Vanadium	µg/L	0.4	EPA 200.8	19-Jun-17/R	< 0.4		
Zinc	µg/L	5	EPA 200.8	19-Jun-17/R	< 5		

¹ Chromium VI is based on Total Chromium



Christine Burke
 Lab Manager

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill