SPA 19-44

FINAL

Phase Two Environmental Site Assessment

12300, 12400, 12490 and 12592 Coleraine Drive
Caledon, Ontario

Prepared for:

Triovest Realty Advisors Inc.
40 University Avenue, Suite 1200
Toronto, ON M5J 1T1

Attn: Mr. Randy Gladman
Vice President, Development

December 7, 2017

Pinchin File: 210701.001

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Issued To:	**Triovest Realty Advisors Inc.**
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June 1, 2018

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Association of Professional Engineers of Ontario

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1.0 EXECUTIVE SUMMARY

Pinchin Ltd. (Pinchin) was retained by Triovest Realty Advisors Inc. (Client) to complete a Phase Two Environmental Site Assessment (Phase Two ESA) of the properties located at 12300, 12400, 12490 and 12592 Coleraine Drive in Caledon, Ontario (Site or Phase Two Property). The Phase Two Property is presently undeveloped and consists of access roads, agricultural land and forested areas.

The Phase Two ESA was conducted at the request of the Client to support the filing of a Record of Site Condition (RSC) with the Ontario Ministry of Environment and Climate Change (MOECC) and was completed in accordance with the Province of Ontario's *Ontario Regulation 153/04: Records of Site Condition – Part XV.1 of the Act*, which was last amended by Ontario Regulation 312/17 on July 28, 2017 (O. Reg. 153/04).

The objectives of this Phase Two ESA were to assess the soil quality in relation to three areas of potential environmental concern (APECs) and related potentially contaminating activities (PCAs) and contaminants of potential concern (COPCs) identified in a Phase One ESA completed by Pinchin in accordance with O. Reg. 153/04. The identified APECs, PCAs and COPCs are summarized in the following table:

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #1 (Former AST within basement of residential building at 12300 Coleraine Drive likely containing fuel oil)	Southwest Portion of Phase One Property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs BTEX PAHs	Soil
APEC #2 (Two former ASTs adjacent to former barn at 12300 Coleraine Drive likely containing fuel oil and/or diesel)	Southwest Portion of Phase One Property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs BTEX PAHs	Soil

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Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #3 (Historical and ongoing agricultural operations)	Majority of Phase One Property	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	On-Site	OC Pesticides PCBs	Soil

Notes:

BTEX – benzene, toluene, ethylbenzene and total xylenes
PHCs – petroleum hydrocarbon fractions F1-F4
PAHs – polycyclic aromatic hydrocarbons
OC – organochlorine
PCBs – polychlorinated biphenyls
AST – Aboveground Storage Tank

The Phase Two ESA was completed by Pinchin on November 6, 2017, and included the advancement of 22 boreholes at the Phase Two Property. The boreholes were advanced to depths ranging from approximately 0.3 to 4.57 metres below ground surface (mbgs). Select soil samples collected from each of the borehole locations were submitted for laboratory analyses of petroleum hydrocarbons (PHCs) in the F1 to F4 fraction ranges (F1-F4), benzene, toluene, ethylbenzene and xylenes (collectively referred to as "BTEX"), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and/or organochlorine (OC) pesticides.

Based on Site-specific information, the applicable regulatory standards for the Phase Two Property were determined to be the *"Table 8: Generic Site Condition Standards for Use within 30 m of a Water Body in a Potable Groundwater Condition",* provided in the MOECC document entitled, "*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*" dated April 15, 2011 *(Table 8 Standards)* for medium and fine-textured soils and residential/parkland/institutional/industrial/commercial/community property use.

The laboratory results for the submitted soil samples indicated that all reported concentrations for the parameters analyzed met the corresponding *Table 8 Standards*.

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It is the opinion of the Qualified Person (QP) who supervised the Phase Two ESA that the applicable *Table 8 Standards* for soil at the Phase Two Property have been met as of the Certification Date of December 7, 2017 and that no further subsurface investigation is required in relation to assessing the environmental quality of soil at the Phase Two Property.

This Executive Summary is subject to the same standard limitations as contained in the report and must be read in conjunction with the entire report.

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2.0 INTRODUCTION

A Phase Two ESA is defined as an "assessment of property conducted in accordance with the regulations by or under the supervision of a QP to determine the location and concentration of one or more contaminants in the land or water on, in or under the property". Under O. Reg. 153/04, the purpose of a Phase Two ESA is as follows:

- To determine the location and concentration of contaminants in the land or water on, in or under the Phase Two Property;
- To obtain information about environmental conditions in the land or water on, in or under the Phase Two Property necessary to undertake a Risk Assessment, in accordance with O. Reg. 153/04, with respect to one or more contaminants of concern; and
- To determine if applicable Site Condition Standards and standards specified in a Risk Assessment for contaminants on, in or under the Phase Two Property were met as of the certification date by developing an understanding of the geological and hydrogeological conditions at the Phase Two Property and conducting one or more rounds of field sampling for all contaminants associated with any APEC identified in the Phase Two ESA sampling and analysis plan (SAP) and for any such contaminants identified during subsequent Phase Two ESA activities and analyses of environmental conditions at the Phase Two Property.

This Phase Two ESA was conducted at the request of the Client to support the submittal of an RSC to the MOECC. As such, to support the RSC submission, the Phase Two ESA was conducted in accordance with O. Reg. 153/04.

The overall objectives of this Phase Two ESA were to assess the soil quality in relation to APECs and related COPCs identified in a Phase One ESA completed by Pinchin, the findings of which were summarized in the report entitled "*Phase One Environmental Site Assessment*, *12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario*", completed by Pinchin for HOOPP Realty Inc. by its agent without liability Triovest Realty Advisors Inc., dated October 16, 2017. The property assessed by the Pinchin Phase One ESA is referred to herein as the Phase One Property. The Phase Two ESA was conducted on the whole Phase One Property, at specific APECs identified during the Phase One ESA.

2.1 Site Description

This Phase Two ESA was completed for all of Part of Lots 2 and 3, Concession 5, Geographic Township of Albion, County of Peel, Town of Caledon, Regional Municipality of Peel, located at the municipal addresses of 12300, 12400, 12490 and 12592 Coleraine Drive in Caledon, Ontario. The Phase Two Property is 205.42 acres (83.13 hectares) in size and is bounded by Coleraine Drive and residential buildings followed by various residential, commercial/industrial and agricultural properties to the

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northeast, a property undergoing development to the northwest, and agricultural properties to the southeast and southwest. A Key Map showing the Phase Two Property location is provided on Figure 1 and a detailed plan of the Phase Two Property and surrounding lands is provided on Figure 2 (all figures are provided within Section 9.0).

The Phase Two Property is currently undeveloped and utilized for agricultural purposes.

A summary of the pertinent details of the Phase Two Property is provided in the following table:

Detail	Source/Reference	Information
Legal Description	Legal Survey Drawing provided by Client	Part of Lots 2 and 3, Concession 5, Geographic Township of Albion, County of Peel, Town of Caledon, Regional Municipality of Peel
Municipal Address	Client	12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario, L7E 3A9
Parcel Identification Number (PIN)	Service Ontario Parcel Register	14349-0383 (LT), 14349-0363 (LT), 14349-0378 (LT), 14349-0369 (LT), 14349-0367 (LT), 14349-0349 (LT), 14349-0377 (LT), 14349-0384 (LT)
Current Owner	Service Ontario Parcel Register/Client	Boltcol Holdings North Inc., Boltcol Holdings North LP, Boltcol Holdings South Inc. and Boltcol Holdings South LP
Owner Contact Information	Client	Boltcol Holdings North and Boltcol Holdings South c/o Triovest Realty Advisers Inc. 40 University Avenue, Suite 1200 Toronto, ON, M5J 1T1
Current Occupant	Client	Humberview Farms
Occupant Contact Information	Client	Ms. Heather French humberviewfarms@gmail.com
Client Contact Information	Client	Mr. Randy Gladman Triovest Realty Advisers Inc. 40 University Avenue, Suite 1200 Toronto, ON, M5J 1T1 rgladman@triovest.com

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Detail	Source/Reference	Information
Site Area	Atlas of Canada Toporama	83.13 hectares (205.42 acres)
Current Zoning	Town of Caledon Zoning By-law 2006-50, as amended	A1 – Agricultural MS – Serviced Industrial MP – Prestige Industrial EPA1 – Environmental Policy Area 1 Zone
Centroid UTM Co-ordinate	Atlas of Canada Toporama	602956 Easting
		4855464 Northing
		Zone 17T

A legal survey showing the Phase Two Property is provided in Appendix A (all appendices are provided in Section 10.0).

2.2 Property Ownership

The Phase Two Property is currently owned by Boltcol Holdings North Inc., Boltcol Holdings North LP, Boltcol Holdings South Inc. and Boltcol Holdings South LP. Contact information for the Phase Two Property owner is provided in the preceding section.

Pinchin was retained by Mr. Randy Gladman on behalf of the Client to conduct the Phase Two ESA of the Site. Contact information for Mr. Gladman is provided in the preceding section.

2.3 Current and Proposed Future Uses

The Phase Two Property is presently utilized for agricultural purposes and it is Pinchin's understanding that the Client intends to redevelop the Phase Two Property for commercial/industrial land use. The proposed change of land use does not require that an RSC be filed as per Section 168.3.1 of the Province of Ontario's *Environmental Protection Act*; however, is required by the Regional Municipality of Peel prior to issuance of development permits.

2.4 Applicable Site Condition Standards

The Phase Two Property is an agricultural property located within the Town of Caledon, and the proposed future land use is commercial/institutional. It is Pinchin's understanding that potable water for the Phase Two Property and surrounding area is supplied by privately-owned supply wells.

Bedrock was not encountered at any of the boreholes completed at the Phase Two Property during the Phase Two ESA, which were advanced to a maximum depth of approximately 4.57 mbgs and, as such,

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the Phase Two Property is not a shallow soil property as defined in Section 43.1 of O. Reg. 153/04.

Three tributaries of the West Humber River are located on the Phase Two Property and extend onto properties located northwest, southeast, southwest and northeast of the Phase Two Property

Section 41 of O. Reg. 153/04 states that a property is classified as an “environmentally sensitive area” if the pH of the surface soil (less than 1.5 mbgs) is less than 5 or greater than 9, if the pH of the subsurface soil (greater than 1.5 mbgs) is less than 5 or greater than 11, or if the property is an area of natural significance or is adjacent to or contains land within 30 metres of an area of natural significance. A total of three representative soil samples collected from the boreholes advanced at the Phase Two Property were submitted for pH analysis. The pH analytical results are summarized in Table 1 (all tables are provided in Section 9.0). The pH values measured in the submitted soil samples were within the limits for non-sensitive sites. The Phase Two Property is also not an area of natural significance and it is not adjacent to, nor does it contain land within 30 metres of, an area of natural significance. As such, the Phase Two Property is not an environmentally sensitive area.

As discussed further in Section 6.4, based on the results of grain size analysis completed on representative soil samples collected during the Phase Two ESA and the observed stratigraphy at the borehole locations at the Phase Two Property, it is the QP’s opinion that over two-thirds of the overburden at the Phase Two Property is medium and fine-textured as defined by O. Reg. 153/04.

Based on the above, the appropriate Site Condition Standards for the Phase Two Property are the *Table 8 Standards* for:

- Industrial/commercial/community/residential/parkland/institutional property use.

As such, all analytical results have been compared to these *Table 8 Standards*.

3.0 BACKGROUND INFORMATION

3.1 Physical Setting

The Phase Two Property is located in the east portion of the Town of Caledon at elevations that range between approximately 234 and 239 m above mean sea level (mamsl). The topography of the Phase Two Property consists of rolling hills. The properties surrounding the Phase Two Property are at an equivalent grade with a gradual decrease in elevation towards the southeast. Three tributaries of the West Humber River are located on the Phase Two Property and act as surface water drainage features. Surface water (e.g., storm runoff) is inferred to run overland and drain into these tributaries, or percolate naturally through the soil.

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There are no areas of natural significance located on-Site or within the area assessed by the Pinchin Phase One ESA (the Phase One Study Area). A plan showing the Phase One Study Area is presented on Figure 3. The nearest major water body to the Phase Two Property is the West Humber River, which is located approximately 855 m southwest of the Phase One Property at an elevation of approximately 230 mamsl.

3.2 Past Investigations

3.2.1 Summary of Previous Environmental Investigations by Others

Reports summarizing the following environmental investigations completed by others and pertaining to the Phase Two Property were reviewed as part of the Pinchin Phase One ESA:

- "*Phase I Environmental Site Assessment, Proposed Residential Development, West of Coleraine Drive and North of Mayfield Road, Town of Caledon (Bolton)*" prepared by Soil Engineers Ltd. (SEL) for Solmar Development Corp. on behalf of Nutristock Corp. (Solmar), dated May 13, 2008 (2008 SEL Phase I ESA Report (Central-Northwest Portion of Site));
- "*Phase I Environmental Site Assessment, Proposed Mixed Use Development, Part of Lot 2 Concession 5, 12300 Coleraine Drive, Town of Bolton*" prepared by SEL for Solmar, dated August 20, 2008 (2008 SEL Phase I ESA Report (Southeast Portion of Site)); and
- "*Geotechnical Investigation, Proposed Commercial/Industrial Complex, Coleraine Drive, Bolton, Ontario*" prepared by exp Services Inc. (exp) for Client, dated July 22, 2014 (2014 exp Geotechnical Investigation Report).

A summary of the salient information identified in the above-referenced reports prepared by others is provided below.

2008 SEL Phase I ESA Report (Central-Northwest Portion of Site)

The 2008 SEL Phase I ESA Report (Central-Northwest Portion of Site) presented the findings of a Phase I ESA completed by SEL in general accordance with the CSA document entitled "*Phase I Environmental Site Assessment*" (CSA Document Z768-01), dated November 2001 (reaffirmed 2006) (CSA Phase I ESA Standards) for the central-northwest portion of the Phase One Property. This report consisted of a review of readily available historical records and reasonably ascertainable regulatory information, a Site reconnaissance, an evaluation of information and reporting. Based on Pinchin's review of the 2008 SEL Phase I ESA Report (Central-Northwest Portion of the Site), the following salient information was noted:

- At the time of the Site reconnaissance, the central-northwest and central-southwest portions of the Phase One Property were undeveloped and utilized for agricultural

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purposes. It was noted that chlorinated pesticides "*were more than likely used*" historically on this portion of the Phase One Property;

- The northwest and central-southeast portions of the Phase One Property consisted of "*rural homes*" and agricultural land;
- A tributary traversed the central-northwest portion of the Phase One Property; and
- No aboveground storage tanks (ASTs) or evidence of underground storage tanks (USTs) was observed during the Site reconnaissance.

SEL indicated that "*the chlorinated pesticides will, if they have not already, dissipate with time, assuming they have not been recently reapplied*" and, as such, "*verification analysis for the presence or absence of residual chemicals resulting from long-term use of pesticides is not warranted*".

Based on the above-noted findings, nothing was identified by SEL that would be likely to give rise to potential subsurface impacts at the Phase One Property.

2008 SEL Phase I ESA Report (Southeast Portion of Site)

The 2008 SEL Phase I ESA Report (Southeast Portion of Site) presented the findings of a Phase I ESA completed by SEL in general accordance with the *CSA Phase I ESA Standards* for the southeast portion of the Phase One Property, which holds the municipal address of 12300 Coleraine Drive. This report consisted of a review of readily available historical records and reasonably ascertainable regulatory information, a Site reconnaissance, an evaluation of information and reporting. Based on Pinchin's review of the 2008 SEL Phase I ESA Report (Southeast Portion of the Site), the following salient information was noted:

- At the time of the Site reconnaissance, the southeast portion of the Phase One Property consisted of an agricultural field, one two-storey residential building, an unspecified quantity of sheds and three barns, one of which was noted to have "*collapsed*". The buildings were noted to be located in the vicinity of the southwest boundary of the Phase One Property, and the agricultural field was utilized to farm corn;
- The residential building was constructed in approximately 1890 and, as of 2008, was supplied with hydro services. Potable water was provided to this residential building by a designated supply well, and the house was equipped with a septic system. Vent and fill piping was observed along the northwest elevation of the residential building and was inferred to be associated with a fuel oil AST located within the basement of the residential building. SEL did not conduct a walkthrough of the interior of the residential building as part of their Site reconnaissance and, as such, were unable to confirm the presence of an AST within the residential building;

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- SEL indicated that "*some*" containers of various hazardous materials (e.g., used oil, gasoline jerry cans, paint cans, etc.) were observed within sheds on this portion of the Phase One Property. The quantities and types of hazardous materials stored within the sheds were not indicated by SEL. Given the relatively small quantities of hazardous materials stored on-Site, it is Pinchin's opinion that the observed hazardous material storage is not considered to be large-scale and, as such, is not a PCA that would represent an APEC at the Phase One Property;
- According to an undated property assessment conducted by the Municipal Property Assessment Corporation, five barns were historically located on this portion of the Phase One Property and were constructed between 1930 and 1971. A shed was also noted to be present on-Site and was reportedly constructed in 1987;
- Two metal ASTs were observed on-Site and located along the southeast elevation of a barn that was situated northwest of the residential building. The ASTs were empty and appeared to be approximately 946-L and 1893-L in volume;
- No evidence of USTs was observed during the Site reconnaissance; and
- A creek was located along the southwest boundary of this portion of the Phase One Property and was noted to be considered an Environmentally Sensitive Area. SEL did not provide any additional supporting information.

SEL was unable to indicate whether pesticides had been historically or were currently utilized on-Site, but indicated that "*chlorinated pesticides will, if they have not already, dissipate with time, assuming they have not been recently reapplied*" and, as such, "*verification analysis for the presence or absence of residual chemicals resulting from long-term use of pesticides is not warranted*".

Based on the above-noted findings, nothing was identified by SEL that would be likely to give rise to potential subsurface impacts at the Phase One Property.

2014 exp Geotechnical Investigation Report

The 2014 exp Geotechnical Investigation was conducted to obtain data for geotechnical engineering guidelines at the Phase One Property, to provide recommendations for the design and construction of a proposed development at the Phase One Property, and to evaluate general soil quality at the Phase One Property.

A total of 40 boreholes were advanced at various locations across the Phase One Property to depths ranging between 6.2 and 8.2 mbgs, 10 of which were instrumented with groundwater monitoring wells.

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Subsurface soil at the Phase One Property was noted to generally consist of topsoil underlain by disturbed clayey silt/sandy silt till that extended to depths ranging between 0.4 and 0.8 mbgs, which was then underlain by clayey silt till that extended to the maximum borehole completion depth of 8.2 mbgs. Groundwater within the monitoring wells installed on-Site was measured at depths ranging between 0.0 and 6.1 mbgs.

A total of 15 randomly-selected samples from the boreholes advanced at the Site were submitted for laboratory analyses of metals and inorganics for the assessment of "*general soil quality*". All concentrations of analyzed parameters within the soil samples submitted for laboratory analysis were below the *Table 8 Standards*.

3.2.2 Pinchin Phase One ESA Summary

From August 25, 2017 through December 1, 2017, Pinchin conducted a Phase One ESA in support of the future filing of an RSC for the Phase Two Property. The Phase One ESA consisted of a Site visit, interviews with Site personnel, records review, evaluation of information, and preparation of a written report which was completed under the supervision of a QP. A plan showing the Phase One Study Area is attached as Figure 3.

The Phase One ESA was completed recently (i.e., within one month of the start of the Phase Two ESA) and in accordance with the requirements of O. Reg. 153/04. Therefore, the information provided within the Phase One ESA Report is considered adequate such that it can be relied upon for the purpose of this Phase Two ESA and future filing of an RSC.

Based on information obtained during the Phase One ESA, a total of three APECs and corresponding potentially contaminating activities (PCAs) and COPCs were identified that could potentially affect the environmental condition of the subsurface media on, in or under the Phase Two Property. The COPCs associated with each APEC were determined based on a review of the PCAs and substances associated with the related activities, and on several sources of information, including but not limited to, Pinchin's experience with environmental contamination and hazardous substances, common industry practices for analysis of such contaminants and point sources, literature reviews of COPCs and associated hazardous substances, and evaluations of contaminant mobility and susceptibility for migration in the subsurface.

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The following table presents the APECs and their associated PCAs and COPCs:

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #1 (Former AST within basement of residential building at 12300 Coleraine Drive likely containing fuel oil)	Southwest Portion of Phase One Property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-Site (PCA #1)	PHCs BTEX PAHs	Soil
APEC #2 (Two former ASTs adjacent to former barn at 12300 Coleraine Drive likely containing fuel oil and/or diesel)	Southwest Portion of Phase One Property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-Site (PCA #2)	PHCs BTEX PAHs	Soil
APEC #3 (Historical and ongoing agricultural operations)	Majority of Phase One Property	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	On-Site (PCA #3)	OC Pesticides PCBs	Soil

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Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
NA	Approximately 85 m northeast of the Phase One Property at 12315 Coleraine Drive (DB Schenker)	Item 11 – Commercial Trucking and Container Terminals	Off-Site (PCA #4)	NA	None.
NA	Approximately 190 m north-northwest of the Phase One Property at 12673 Coleraine Drive (Autolinx Express Inc.)	Item 11 – Commercial Trucking and Container Terminals	Off-Site (PCA #5)	NA	None.
NA	Approximately 185 m east of the Phase One Property at 12155 Coleraine Drive (GT Bolton Inc.)	Item 11 – Commercial Trucking and Container Terminals	Off-Site (PCA #6)	NA	None.
NA	Approximately 65 m northeast of the Phase One Property at 12557 Coleraine Drive (Kingspan)	Item 34 – Metal Fabrication	Off-Site (PCA #7)	NA	None.
NA	Immediately west of the Phase One Property	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage	Off-Site (PCA #8)	NA	None.

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Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
		and Large-Scale Applications			
NA	Immediately southwest of the Phase One Property	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Off-Site (PCA #9)	NA	None.
NA	Immediately southeast of the Phase One Property	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Off-Site (PCA #10)	NA	None.
NA	Approximately 90 m east-southeast of the Phase One Property, along the northeast side of Coleraine Drive	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Off-Site (PCA #11)	NA	None.

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Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
NA	Approximately 230 m east-southeast of the Phase One Property, at 8224 Mayfield Road	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Off-Site (PCA #12)	NA	None.
NA	Approximately 25 m northeast of the Phase One Property, along the northeast side of Coleraine Drive	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Off-Site (PCA #13)	NA	None.

Notes:

BTEX – benzene, toluene, ethylbenzene and total xylenes
PHCs – petroleum hydrocarbon fractions F1-F4
PAHs – polycyclic aromatic hydrocarbons
OC – organochlorine
PCBs – polychlorinated biphenyls
NA – not applicable
AST – Aboveground Storage Tank

Plans showing the locations of the identified PCAs and APECs with respect to the Phase Two Property and surrounding properties are attached as Figures 4 and 5.

3.2.3 Use of Previous Analytical Data

The soil data from the 2014 exp Geotechnical Investigation Report did not provide any assessment of the COPCs associated with the APECs identified at the Phase Two Property. As such, no soil quality

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data from this investigation was relied upon in preparing this Phase Two ESA report. No additional previous investigations documented in the above-referenced reports included subsurface investigations at the Site.

4.0 SCOPE OF INVESTIGATION

4.1 Overview of Site Investigation

The scope of work for this Phase Two ESA was prepared to address the APECs identified at the Phase Two Property and consisted of the following:

- Prepared a health and safety plan and arranged for the completion of underground utility locates prior to the commencement of drilling activities;
- Developed a detailed SAP prior to the advancement of the boreholes. The SAP was outlined in the document entitled "*Sampling and Analysis Plan for Phase Two Environmental Site Assessment, 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario*", dated November 3, 2017, which is provided in Appendix B. Based on Pinchin's knowledge of the surrounding properties and known hydrogeological conditions, boreholes were advanced at the Phase Two Property to maximum depths ranging between approximately 0.3 and 4.57 mbgs;
- Retained Strata Drilling Group Inc. (Strata) to advance two boreholes using a Geoprobe 7822DT™ drill rig to investigate the potential presence of soil contaminants associated with APECs #1 and #2 identified in the Phase One ESA;
- Collected discrete soil samples within 20 boreholes advanced throughout the Phase Two Property using a hand auger to investigate the potential presence of soil contaminants associated with APEC #3 identified in the Phase One ESA;
- Collected soil samples at regular intervals within each borehole;
- Field screened soil samples collected from APECs #1 and #2 for petroleum-derived vapours in soil headspace using a combustible gas indicator (CGI) calibrated to hexane, in addition to visual and olfactory considerations;
- Submitted a minimum of one "worst case" soil sample from each borehole for chemical analysis of:
    - PHCs (F1-F4);
    - BTEX;
    - PAHs;
    - PCBs; and/or

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- OC pesticides.

- Submitted three duplicate soil samples for chemical analysis of the above-noted parameters for quality assurance/quality control (QA/QC) purposes;
- Submitted three representative soil samples for the laboratory analysis of grain size and three representative soil samples for the laboratory analysis of pH in order to confirm the appropriate MOECC Site Condition Standards;
- Compared the soil analytical results to the applicable criteria stipulated in the *Table 8 Standards*; and
- Prepared a report (this report) documenting the findings of the Phase Two ESA which meets the reporting requirements listed in *Schedule E* and *Table 1 – Mandatory Requirements for Phase Two Environmental Site Assessment Reports* of O. Reg. 153/04.

4.2 Media Investigated

The scope of work for this Phase Two ESA was prepared to address the APECs and corresponding media at the Phase Two Property as identified through completion of the Phase One ESA.

The medium of concern for the Phase Two ESA was soil, given the direct surficial application of pesticides to the land/crops, and the inferred transportation mechanism of contaminants from fixed ASTs into the subsurface (e.g., surficial spills, etc.). Pinchin did not conduct sediment and/or groundwater sampling as part of this Phase Two ESA, given the ephemeral flow of the tributaries of the West Humber River and transport mechanism of contaminants from the AST having a low potential to impact groundwater, as well as the distance between the historical on-Site ASTs and the tributaries.

For assessing the soil at the Phase Two Property for the presence of COPCs, a total of 22 boreholes were advanced at locations across the Phase Two Property for the purpose of collecting soil samples. A total of 22 soil samples, comprising select “worst case” samples collected from each of the boreholes, were submitted for laboratory analysis of the COPCs.

4.3 Phase One Conceptual Site Model

A conceptual site model (CSM) was created to provide a summary of the findings of the Phase One ESA. The Phase One CSM is summarized in Figures 1 through 5, which illustrate the following features within the Phase One Study Area, where present:

- Existing buildings and structures;
- Water bodies located in whole or in part within the Phase One Study Area;
- Areas of natural significance located in whole or in part within the Phase One Study Area;
- Drinking water wells located at the Phase One Property;

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- Land use of adjacent properties;
- Roads within the Phase One Study Area;
- PCAs within the Phase One Study Area, including the locations of tanks; and
- APECs at the Phase One Property.

The following provides a narrative summary of the Phase One CSM:

- The Phase One Property is an irregularly-shaped parcel of land approximately 205.42 acres (83.13 hectares) in size located on the southwest side of Coleraine Drive, approximately 605 m northwest of Mayfield Road in the Town of Caledon. The Phase One Property consists of undeveloped land, the majority of which is utilized for agricultural purposes. The Phase One Property has been utilized for agricultural purposes since approximately 1840. There is no record of industrial use or of a commercial use (e.g., garage, bulk liquid dispensing facility or dry cleaner) that would require classifying the Phase One Property as an enhanced investigation property;
- Water bodies located within the Phase One Study Area consisted of a three tributaries of the West Humber River, which traverse the Phase One Property and extend northwest, northeast, southeast and southwest of the Phase One Property;
- No areas of natural significance were identified within the Phase One Study Area;
- No drinking water wells were located on the Phase One Property; however, according to the Site Representative and the 2008 SEL Phase I ESA Report (Southeast Portion of Site), potable water was historically provided to the former residential buildings at the Phase One Property by designated potable supply wells. It is unclear if these wells are still present at the Phase One Property. Evidence of these supply wells was not observed during the Site reconnaissance. Additionally, eighteen groundwater monitoring wells (including two clusters of two monitoring wells and one cluster of four monitoring wells) were observed throughout the Phase One Property during the Site reconnaissance. These wells appeared to have been installed as part of the 2104 exp Geotechnical Investigation activities. It is noted that one of the standalone groundwater monitoring wells appeared to have been damaged. Pinchin recommends repairing or decommissioning this monitoring well in accordance with O. Reg. 903/90;
- Coleraine Drive and residential buildings are located immediately northeast of the Phase One Property and followed by various residential, commercial/industrial and agricultural properties. The adjacent property northwest of the Phase One Property is currently undergoing development, and the properties situated immediately southwest and southeast of the Phase One Property consist of agricultural land;

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- A total of thirteen PCAs were identified within the Phase One Study Area, consisting of three PCAs at the Phase One Property and ten PCAs within the Phase One Study Area outside of the Phase One Property. As shown on Figure 4, the off-Site PCAs consist of agricultural land, metal fabrication operations and commercial trucking and shipping operations. Groundwater flow within the Phase One Study Area is interpreted to be to the southwest and soil at the Phase One Property is anticipated to consist of clayey silt. Given the soil type at the Phase One Property, the distances between these properties and the Phase One Property, and the inferred direction of groundwater flow, all off-Site PCAs are not considered to result in APECs at the Phase One Property. All PCAs identified on the Phase One Property represent APECs at the Phase One Property. Figure 5 provides a detailed summary of the APECs and associated PCAs and COPCs;
- Underground utilities at the Phase One Property consist of an underground electrical line within the north corner of the Site, which services the on-Site construction trailer. The Site Representative indicated that the former residential buildings on-Site may have been provided with underground utility services, but was unable to elaborate on which types of utilities and where they entered the Phase One Property. It is unclear whether these utilities remain present at the Phase One Property. Plans were not available to confirm the depths of the underground electrical line but it is estimated to be situated approximately 2 to 3 mbgs;
- The Phase One Property and the surrounding properties located within glacial deposits consisting of silty clay to clayey silt. Bedrock is expected to consist of shale, limestone, dolostone and/or siltstone of the Georgian Bay Formation, Blue Mountain Formation, Billings Formation, Collingwood Member and/or Eastview member. During previous on-Site environmental investigations, the soil stratigraphy was observed to consist of clayey silt till; and
- The Phase One Property consists of gently rolling hills. The area surrounding the Phase One Property slopes gradually downwards towards the southeast. Local groundwater flow is inferred to be to the southwest, based on the topography of the area surrounding the Phase One Property and the location of the tributaries of the West Humber River on the Phase One Property and within the Phase One Study Area.

There were no deviations from the Phase One ESA requirements specified in O. Reg. 153/04 or absence of information that have resulted in uncertainty that would affect the validity of the Phase One CSM.

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4.4 Deviations from Sampling and Analysis Plan

No notable constraints and limitations with respect to the SAP were documented during the field activities, and as such Pinchin has conducted the Phase Two ESA in a manner generally consistent with the SAP provided in Appendix B.

4.5 Impediments

Pinchin had full access to the Phase Two Property throughout the completion of the Phase Two ESA.

5.0 INVESTIGATION METHOD

5.1 General

The Phase Two ESA field work was conducted in accordance with Pinchin's standard operating procedures (SOPs) as provided in the SAP, which have been developed in accordance with the procedures and protocols provided in the MOECC document entitled "*Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario*", dated December 1996, in the Association of Professional Geoscientists of Ontario document entitled *"Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended)"*, dated April 2011, and in O. Reg. 153/04.

No deviations from Pinchin's SOPs occurred during the Phase Two ESA.

5.2 Drilling and Excavating

Pinchin retained Strata to advance two boreholes (BH01 and BH02) at the Phase Two Property on November 6, 2017 to investigate the potential presence of COPCs associated with APECs #1 and #2 identified in the Phase One ESA. These boreholes were drilled to a maximum depth of 4.57 mbgs using a Geoprobe 7822DT™ drill rig.

In addition, Pinchin advanced a total of 20 boreholes (BH03 through BH22) at the Phase Two Property on November 6, 2017 to investigate the potential presence of COPCs associated with the APEC #3 identified in the Phase One ESA. The boreholes were advanced to a maximum depth of 0.3 mbgs using a hand auger.

The locations of the boreholes were selected using the following rationale:

- BH01 – Completed in the location of the former residential building associated with 12300 Coleraine Drive, in order to investigate soil quality in relation to APEC #1;
- BH02 – Completed in the location of the empty ASTs observed adjacent to a former barn at 12300 Coleraine Drive during the 2008 SEL Phase I ESA Report (Southeast Portion of Site), in order to investigate soil quality in relation to APEC #2; and

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- BH03 through BH22 – Completed throughout the Phase Tow Property in an attempt to provide sufficient coverage of the portion of the Phase Two Property utilized for agricultural purposes, in order to investigate soil quality in relation to APEC #3.

The locations of the boreholes are provided on Figure 6. A description of the subsurface stratigraphy encountered during the drilling program is documented in the borehole logs included in Appendix C.

Measures taken to minimize the potential for cross-contamination during the borehole drilling program included:

- The use of dedicated, disposable PVC soil sample liners for soil sample collection during direct-push drilling;
- The use of dedicated, pre-cleaned augers for each borehole location;
- The extraction of soil samples from the interior of the sampling device (where possible), rather than from areas in contact with the sampler walls;
- The cleaning of all non-dedicated drilling and soil sampling equipment (i.e., hand auger) before initial use and between sample and borehole locations; and
- The use of dedicated and disposable nitrile gloves for all soil sample handling.

Soil samples were collected at continuous intervals during direct-push drilling at a general frequency of one soil sample for every 0.76 metres drilled within APECs #1 and #2, and a general frequency of one soil sample for every 0.3 metres augured within APEC #3.

No excavating activities (e.g., test pitting) were completed as part of the Phase Two ESA.

5.3 Soil Sampling

Soil samples were collected in the boreholes advanced within APECs #1 and #2 (i.e., boreholes BH01 and BH02, respectively) at continuous intervals using 3.81 centimetre (cm) inner diameter (ID) direct push soil samplers with dedicated single-use sample liners. Soil samples were also collected from the boreholes advanced within APEC #3 (i.e., boreholes BH03 through BH22) directly from the hand auger at continuous intervals.

Discrete soil samples were collected from the dedicated sample liners and directly from the hand auger by Pinchin personnel. Dedicated and disposable nitrile gloves were worn during the collection of each soil sample. A portion of each sample was placed in a resealable plastic bag for field screening and a portion was containerized in laboratory-supplied glass sampling jars. Following sample collection, the sample jars were placed into dedicated coolers with ice for storage pending transport to Maxxam Analytics Inc. (Maxxam) in Mississauga, Ontario. Formal chain of custody records were maintained between Pinchin and the staff at Maxxam.

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Subsurface soil conditions were logged on-Site by Pinchin personnel at the time of borehole. Based on the soil samples recovered during the borehole drilling program, the soil stratigraphy at the drilling locations generally consists of topsoil underlain by silt, which extended to the maximum borehole completion depth of 4.57 mbgs. In addition, sand was observed within borehole BH01 at a depth of 0 to 3.66 mbgs.

No odours or staining were observed in the soil samples collected during the borehole drilling program.

A detailed description of the subsurface stratigraphy encountered during the borehole drilling program is documented in the borehole logs included in Appendix C.

5.4 Field Screening Measurements

Soil samples from boreholes BH01 and BH02 (i.e., within APECs #1 and #2) were collected at each of the sampling intervals during the drilling activities and analyzed in the field for petroleum-derived vapour concentrations in soil headspace with an RKI Eagle™ CGI operated in methane elimination mode. The soil samples collected for field-screening purposes were placed in resealable plastic bags. The plastic bags were stored in a warm environment for a minimum of five minutes and agitated in order to release organic vapours within the soil pore space prior to analysis with the CGI.

Based on a review of the operator's manual, the RKI Eagle™ CGI has an accuracy/precision of up to +/- 25 ppm, or +/- 5% of the reading (whichever is greater). The CGI was calibrated prior to field use by Pine according to Pine's standard operating procedures. A copy of Pine's calibration record for the CGI is provided in Appendix D.

In general, the soil samples with the highest measured vapour concentrations (i.e., "worst case") from a given borehole were submitted for laboratory analysis. Sample depth and visual and olfactory observations of potential contaminants were also used in conjunction with the vapour concentrations in making the final selection of "worst case" soil samples for laboratory analysis.

5.5 Groundwater Monitoring Well Installation

Groundwater sampling was not completed as part of this Phase Two ESA.

5.6 Sediment Sampling

Sediment sampling was not completed as part of this Phase Two ESA.

5.7 Analytical Testing

All collected soil samples were delivered to Maxxam for analysis. Maxxam is an independent laboratory accredited by the Canadian Association for Laboratory Accreditation. Formal chain of custody records of the sample submissions were maintained between Pinchin and the staff at Maxxam. Maxxam

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conducted the laboratory analysis in accordance with the MOECC document entitled *"Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act"* dated March 9, 2004 and revised on July 1, 2011 (*Analytical Protocol)*.

5.8 Residue Management Procedures

Soil cuttings generated by the borehole drilling program were limited. Given that the laboratory results for the submitted soil samples indicated that all reported concentrations for the parameters analyzed met the corresponding *Table 8 Standards*, and no evidence of NAPL, odours or sheens was observed during sampling activities, the excess soil and equipment cleaning fluids were deposited on the ground surface at the Phase Two Property.

5.9 Elevation Surveying

Given that no groundwater monitoring wells were installed at the Phase Two Property, an elevation survey was not completed as part of this Phase Two ESA.

5.10 Quality Assurance and Quality Control Measures

The QA/QC protocols that were followed during borehole drilling and soil sampling so that representative samples were obtained are described in the following subsections.

5.10.1 Sample Containers, Preservation, Labelling, Handling and Custody of Samples

Soil samples were containerized within laboratory-prepared sample containers in accordance with the *Analytical Protocol*.

The following soil sample containers and preservatives were used:

- PHCs in the F1 fraction range and BTEX: 40 millilitre (mL) glass vials with septum-lids, pre-charged with methanol preservative; and
- PHCs in the F2 to F4 fraction ranges, PAHs, PCBs, OC pesticides, pH and grain size: 120 or 250 mL unpreserved clear glass wide-mouth jars with a Teflon™–lined lid.

Each soil and QA/QC sample was labelled with a unique sample identifier along with the company name, sampling date, Pinchin project number and analysis required.

Each sample was placed in a cooler on ice immediately upon collection and prior to submission to Maxxam for analysis. Formal chain of custody records of the sample submissions were maintained between Pinchin and the staff at Maxxam.

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5.10.2 Equipment Cleaning Procedures

Dedicated, single-use PVC sample liners were used for each soil sample collected within APECs #1 and #2, which precluded the need for drilling equipment cleaning during soil sample collection.

During soil sampling within APEC #3, the stainless-steel hand auger used to collect soil samples was cleaned before initial use and between samples using an Alconox™/potable water mixture followed by a potable water rinse.

5.10.3 Field Quality Control Measures

A total of three field duplicate soil samples were collected by Pinchin during the Phase Two ESA for analysis of one or more of the COPCs. The frequency of field duplicate soil sample analysis complied with the requirement that one field duplicate soil sample is analyzed for every ten regular soil samples submitted for analysis of the COPCs. The soil sample field duplicate pairings and corresponding analytical schedules are summarized as follows:

- Soil sample “BH01-4” and its corresponding field duplicate “DUP-3” were submitted for laboratory analyses of PHCs (F1-F4), BTEX and PAHs;
- Soil sample “BH12-1” and its corresponding field duplicate “DUP-1” were submitted for laboratory analyses of PCBs and OC pesticides; and
- Soil sample “BH21-1” and its corresponding field duplicate “DUP-2” were submitted for laboratory analyses of PCBs and OC pesticides.

The calibration of the RKI Eagle™ CGI used for field screening was checked by the equipment supplier (Pine) prior to use in the field by Pinchin.

As described in Section 5.4, Pine completed the calibration checks in accordance with the equipment manufacturers’ specifications and/or Pine’s SOPs.

5.10.4 QA/QC Sampling Program Deviations

There were no deviations from the QA/QC sampling program outlined in the SAP.

6.0 REVIEW AND EVALUATION

6.1 Geology

Based on the stratigraphic information obtained from the soil samples recovered during the soil sampling activities completed as part of the Phase Two ESA, the soil stratigraphy at the sampling locations generally consists of topsoil underlain by silt that extended to a maximum depth of approximately 4.57 mbgs. The water table was not encountered during this Phase Two ESA.

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The overburden/bedrock interface was not encountered during the drilling activities. Based on geological data published by the Ontario Geological Survey, bedrock is expected to consist of shale, limestone, dolostone and/or siltstone of the Georgian Bay Formation, Blue Mountain Formation, Billings Formation, Collingwood Member and/or Eastview member.

A cross-section summarizing the subsurface geological conditions has been provided as Figure 7.

6.2 Fine-Medium Soil Texture

Three soil samples collected from the boreholes advanced at the Phase Two Property were submitted for 75 micron single-sieve grain size analysis. The soil samples selected for analysis were considered to be representative of the two primary stratigraphic units observed at the borehole locations, which were a topsoil unit and a native silt till unit. As indicated in Table 1, one soil sample (MW02-3) that was representative of the native silt material was classified as medium/fine-textured (6.4% coarse-grained soil) and two representative samples (MW05-1 and MW17-1) that were representative of the topsoil at the Phase Two Property were classified as medium/fine-textured (16.3% and 18.9% coarse-grained soil, respectively).

Based on these grain size analysis results and the observed stratigraphy at the borehole locations at the Phase Two Property, it is the QP's opinion that over two-thirds of the overburden at the Phase Two Property is medium and fine-textured as defined by O. Reg. 153/04. Therefore, the soil at the Phase Two Property was interpreted to be medium and fine-textured for the purpose of determining the MOECC Site Condition Standards applicable to the Phase Two Property.

6.3 Soil Field Screening

Soil vapour headspace concentrations measured in the soil samples collected as part of this Phase Two ESA are presented in the borehole logs. Soil vapour headspace values measured with the CGI in methane elimination mode within each of the soil samples collected from boreholes BH01 and BH02 were all less than 5 ppm by volume (ppm_v).

One most apparent "worst case" soil sample, based on anticipated COPC depth, recovered from each borehole was submitted for laboratory analysis of PHCs (F1-F4), BTEX, PAHs, OC pesticides and/or PCBs.

6.4 Soil Quality

A total of 22 boreholes were advanced at the Phase Two Property at the locations shown on Figure 6 in order to assess for the presence of subsurface impacts resulting from the APECs identified in the Pinchin Phase One ESA. Select soil samples were collected from each of the advanced boreholes and submitted for laboratory analysis of the COPCs. The depth intervals of the soil samples submitted for analysis

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ranged between 0 to 0.3 mbgs and 3.05 to 3.81 mbgs. The soil sample locations, depths and laboratory analyses are summarized in Table 1 and in the borehole logs.

The soil sample analytical results were compared to the *Table 8 Standards* and the following subsections provide a discussion of the findings.

6.4.1 PHCs (F1-F4)

The soil sample analytical results for PHCs (F1-F4), along with the corresponding *Table 8 Standards*, are presented in Table 1. As indicated in Table 1, all reported concentrations of PHCs (F1-F4) in the soil samples submitted for analyses were below the *Table 8 Standards*.

6.4.2 BTEX

The soil sample analytical results for BTEX, along with the corresponding *Table 8 Standards*, are presented in Table 1. As indicated in Table 1, all reported concentrations of BTEX in the soil samples submitted for analyses were below the *Table 8 Standards*.

6.4.3 PAHs

The soil sample analytical results for PAHs, along with the corresponding *Table 8 Standards*, are presented in Table 1. As indicated in Table 1, all reported concentrations of PAHs in the soil samples submitted for analyses were below the *Table 8 Standards*.

6.4.4 OC Pesticides

The soil sample analytical results for OC pesticides, along with the corresponding *Table 8 Standards*, are presented in Table 1. As indicated in Table 1, all reported concentrations of OC pesticides in the soil samples submitted for analyses were below the *Table 8 Standards*.

6.4.5 PCBs

The soil sample analytical results for PCBs, along with the corresponding *Table 8 Standards*, are presented in Table 1. As indicated in Table 1, all reported concentrations of PCBs in the soil samples submitted for analyses were below the *Table 8 Standards*.

6.4.6 General Comments on Soil Quality

The soil sample results show no evidence of chemical or biological transformations of chemical parameters in the subsurface.

6.5 Groundwater Quality

Groundwater sampling was not completed as part of this Phase Two ESA.

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6.6 Sediment Quality

Sediment sampling was not completed as part of this Phase Two ESA.

6.7 Quality Assurance and Quality Control Results

QA/QC comprises technical activities that are used to measure or assess the effect of errors or variability in sampling and analysis. It may also include specification of acceptance criteria for the data and corrective actions to be taken when they are exceeded. QA/QC also includes checks performed to evaluate laboratory analytical quality, checks designed to assess the combined influence of field sampling and laboratory analysis, and checks to specifically evaluate the potential for cross contamination during sampling and sample handling.

The QA/QC samples collected and submitted for analysis by Pinchin during the Phase Two ESA consisted of field duplicate soil samples to assess the suitability of field sampling methods and laboratory performance.

In addition to the above, laboratory quality control activities and sample checks employed by Maxxam included:

- Laboratory duplicates - where two samples obtained from the sample container are analyzed. These are used to evaluate laboratory precision;
- Matrix spike samples - where a known mass of target analyte is added to a matrix sample with known concentrations. These are used to evaluate the influence of the matrix on a method's recovery efficiency;
- Spiked blank samples - where a known amount of target analyte, usually from a second source, is added to a blank matrix sample. These are used to evaluate the accuracy of the analytical method;
- Method blanks - where a clean sample is processed simultaneously with and under the same conditions (i.e., using the same reagents and solvents) as the samples being analyzed. These are used to confirm whether the instrument, reagents and solvents used are contaminant free; and
- Surrogate spike samples - where a known mass of compound not found in nature (e.g., deuterated compounds such as toluene-d8) but that has similar characteristics to the analyzed compounds is added to a sample at a known concentration. These are used to assess the recovery efficiency.

The results of the field QA/QC samples are discussed in the following subsections.

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6.7.1 Soil Duplicate Results

During borehole soil sampling activities, a total of three separate soil duplicate sample pairs were submitted for laboratory analysis. The field duplicate samples were collected by vertically splitting the soil cores/samples into two halves, with one half collected as the regular sample and the other half collected as the field duplicate sample. The sample pairings and corresponding laboratory analyses are as follows:

- Soil sample "BH01-4" and its corresponding field duplicate "DUP-3" were submitted for laboratory analyses of PHCs (F1-F4), BTEX and PAHs;
- Soil sample "BH12-1" and its corresponding field duplicate "DUP-1" were submitted for laboratory analyses of PCBs and OC pesticides; and
- Soil sample "BH21-1" and its corresponding field duplicate "DUP-2" were submitted for laboratory analyses of PCBs and OC pesticides.

The quality of the analytical results was evaluated by calculating relative percent differences (RPDs) for the parameters analyzed for the original and field duplicate samples. The RPD for each parameter was calculated using the following equation:

$$RPD = \frac{(\text{Original Concentration} - \text{Duplicate Concentration}) \times 100}{(\text{Original Concentration} + \text{Duplicate Concentration})/2}$$

An RPD was not calculated unless the parameter concentration in both the original and duplicate sample had detectable concentrations above the corresponding practical quantitation limit for the parameter, which is equal to five times the lowest laboratory reportable detection limit (RDL).

The calculated RPDs for the original and field duplicate soil samples have been compared to performance standards provided in the *Analytical Protocol.* Pinchin notes that although these performance standards only strictly apply to laboratory duplicate samples, they have been considered suitable for comparison to the field duplicate soil sample results as well.

Each of the calculated RPDs met the corresponding performance standards.

Based on Pinchin's review of the calculated RPD values for the submitted soil sample duplicate pairings, the level of observed variance in the reported analytical results is considered acceptable for the purpose of meeting the data quality objectives of this Phase Two ESA.

6.7.2 Deviations from Analytical Protocol

There were no deviations from the holding times, preservation methods, storage requirements and container types specified in the *Analytical Protocol* during the completion of the Phase Two ESA.

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6.7.3 Laboratory Certificates of Analysis

Pinchin has reviewed the laboratory Certificates of Analysis provided by Maxxam for the samples submitted during the Phase Two ESA and confirms the following:

- All laboratory Certificates of Analysis contain a complete record of the sample submission and analysis and meet the requirements of Section 47(3) of O. Reg. 153/04;
- A laboratory Certificate of Analysis has been received for each sample submitted for analysis during the Phase Two ESA;
- All laboratory Certificates of Analysis have been included in full in Appendix H; and
- All of the analytical data reported in the Certificates of Analysis have been summarized, in full, in Table 1.

6.7.4 Laboratory Comments Regarding Sample Analysis

Maxxam routinely conducts internal QA/QC analyses in order to satisfy regulatory QA/QC requirements. The results of the Maxxam QA/QC analyses for the submitted soil samples are summarized in the laboratory Certificates of Analyses provided in Appendix H. Also included in Appendix H are all correspondences between the laboratory and staff at Pinchin.

The following summarizes comments noted by Maxxam noted on the laboratory Certificate of Analysis (Laboratory Certificate B7P0185) for the submitted soil samples that the RDLs for OC pesticides in soil sample BH21-1 were raised by the laboratory as a result of sample dilution due to matrix interferences. Given that the OC pesticide concentrations in this soil sample were below the RDLs and that the RDLs were below the corresponding *Table 8 Standards*, the increased RDLs have no impact on the conclusion that the OC pesticide concentrations in soil sample BH21-1 are below the corresponding *Table 8 Standards*.

The results of the QA/QC analyses were reviewed by the project staff at Maxxam and observed to be within the laboratory's internal requirements. Pinchin has also reviewed the laboratory Certificates of Analysis and has confirmed that the results of the analyses are acceptable for the purpose of meeting the data quality objectives of this Phase Two ESA.

The following general comments apply to the laboratory Certificates of Analysis received from Maxxam as part of this Phase Two ESA:

- The temperatures of the submitted soil samples upon receipt met the sample preservation requirements of the *Analytical Protocol* of 5 ± 3ºC (i.e., between 2 and 8ºC); and
- The custody seal was present and intact on all submissions.

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6.7.5 QA/QC Sample Summary

The overall evaluation of the QA/QC sample results indicates no issues with respect to field collection methods and laboratory performance, and no apparent bias due to ambient conditions at the Phase Two Property and during transportation of the sample containers/samples to and from the analytical laboratory.

As such, it is the QP's opinion that the soil analytical data obtained during the Phase Two ESA are representative of actual Site conditions and are appropriate for meeting the objective of assessing whether the soil at the Phase Two Property meets the applicable MOECC Site Condition Standards.

6.8 Phase Two Conceptual Site Model

The Phase Two Property is located on the southwest side of Coleraine Drive, on the southwest side of Coleraine Drive, approximately 605 metres (m) northwest of Mayfield Road in Caledon, Ontario. The Phase Two Property is bounded by Coleraine Drive and residential buildings followed by various residential, commercial/industrial and agricultural properties to the northeast, a property currently undergoing development to the northwest, and agricultural land to the southwest and southeast. A key map showing the Phase Two Property location is provided as Figure 1.

A Phase One CSM was created during the Pinchin Phase One ESA in order to provide a detailed visualization of the APECs which could occur on, in, under, or affecting the Phase Two Property. The Phase One CSM is summarized in Figures 1 through 7, which illustrate the following features within the Phase One Study Area, where present:

- Existing buildings and structures;
- Water bodies located in whole or in part within the Phase One Study Area;
- Areas of natural significance located in whole or in part within the Phase One Study Area;
- Drinking water wells located at the Phase One Property;
- Land use of adjacent properties;
- Roads within the Phase One Study Area;
- PCAs within the Phase One Study Area, including the locations of tanks; and
- APECs at the Phase One Property.

Multiple groundwater monitoring wells were noted at the Phase One Property during the Phase One ESA. As part of the Phase One ESA, Pinchin reviewed a geotechnical investigation conducted at the Phase Two Property in 2014 by exp Services Inc. (2014 exp Geotechnical Investigation Report) and records of wells on the Phase Two Property within the Water Well Information Systems (WWIS) database. Although the locations of some monitoring wells observed at the Phase Two Property during the Phase One ESA

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appeared to be consistent with the locations of monitoring wells installed as part of the 2014 exp Geotechnical Investigation and with the locations of on-Site monitoring wells detailed in the WWIS database, Pinchin was unable to confirm whether the observed monitoring wells corresponded to the well records within the WWIS database or monitoring well installations conducted as part of the 2014 exp Geotechnical Investigation. The Client indicated that, with the exception of the 2014 exp Geotechnical Investigation, no subsurface investigations have been conducted at the Phase Two Property. As such, it is Pinchin's opinion that it is unlikely that the observed groundwater monitoring wells were installed to investigate PCAs and associated COPCs at the Phase Two Property, and that the presence of the monitoring wells observed on-Site do not represent APECs in relation to the Phase Two Property. The following subsections expand on the Phase One CSM with the information collected during the completion of the Phase Two ESA.

6.8.1 Potentially Contaminating Activities

The Phase One ESA identified a total of three PCAs within the Phase One Study Area that could potentially affect the environmental condition of the subsurface media on, in or under the Phase Two Property. All of these PCAs were located on the Phase Two Property. As noted in the table below, ten additional PCAs were identified within the Phase One Study Area outside of the Phase Two Property, but were not considered to result in APECs at the Phase Two Property. The PCAs and their corresponding APECs at the Phase Two Property are summarized in the following table:

The following table presents the APECs and their associated PCAs and COPCs:

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #1 (Former AST within basement of residential building at 12300 Coleraine Drive likely containing fuel oil)	Southwest Portion of Phase One Property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-Site (PCA #1)	PHCs BTEX PAHs	Soil

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Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #2 (Two former ASTs adjacent to former barn at 12300 Coleraine Drive likely containing fuel oil and/or diesel)	Southwest Portion of Phase One Property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-Site (PCA #2)	PHCs BTEX PAHs	Soil
APEC #3 (Historical and ongoing agricultural operations)	Majority of Phase One Property	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	On-Site (PCA #3)	OC Pesticides PCBs	Soil
NA	Approximately 85 m northeast of the Phase One Property at 12315 Coleraine Drive (DB Schenker)	Item 11 – Commercial Trucking and Container Terminals	Off-Site (PCA #4)	NA	None.
NA	Approximately 190 m north-northwest of the Phase One Property at 12673 Coleraine Drive (Autolinx Express Inc.)	Item 11 – Commercial Trucking and Container Terminals	Off-Site (PCA #5)	NA	None.

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Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
NA	Approximately 185 m east of the Phase One Property at 12155 Coleraine Drive (GT Bolton Inc.)	Item 11 – Commercial Trucking and Container Terminals	Off-Site (PCA #6)	NA	None.
NA	Approximately 65 m northeast of the Phase One Property at 12557 Coleraine Drive (Kingspan)	Item 34 – Metal Fabrication	Off-Site (PCA #7)	NA	None.
NA	Immediately west of the Phase One Property	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Off-Site (PCA #8)	NA	None.
NA	Immediately southwest of the Phase One Property	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Off-Site (PCA #9)	NA	None.

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Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
NA	Immediately southeast of the Phase One Property	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Off-Site (PCA #10)	NA	None.
NA	Approximately 90 m east-southeast of the Phase One Property, along the northeast side of Coleraine Drive	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Off-Site (PCA #11)	NA	None.
NA	Approximately 230 m east-southeast of the Phase One Property, at 8224 Mayfield Road	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Off-Site (PCA #12)	NA	None.

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Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
NA	Approximately 25 m northeast of the Phase One Property, along the northeast side of Coleraine Drive	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Off-Site (PCA #13)	NA	None.

Notes:

BTEX – benzene, toluene, ethylbenzene and total xylenes
PHCs – petroleum hydrocarbon fractions F1-F4
PAHs – polycyclic aromatic hydrocarbons
OC – organochlorine
PCBs – polychlorinated biphenyls
NA – not applicable

Figure 4 shows the locations of PCAs located on-Site and within the Phase One Study Area, and Figure 5 shows the locations of APECs on-Site.

6.8.2 Areas of Potential Environmental Concern

The Phase Two ESA included an assessment of soil quality within each of the APECs. A summary of the findings for each of the APECs is provided below.

APEC #1

During the Site reconnaissance conducted as part of the 2008 SEL Phase I ESA Report (Southeast Portion of Site), vent and fill piping was observed along an exterior wall of a residential building formerly associated with 12300 Coleraine Drive. This piping is inferred to have been associated with an AST that was likely located in the basement of this building, and is inferred to have historically been utilized for fuel oil storage. The historical presence of this AST represented a PCA that required investigation as part of the Phase Two ESA. The subsurface investigation of APEC #1 completed by Pinchin as part of the Phase Two ESA included the advancement of one borehole (BH01). The soil sample submitted from the

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borehole completed within APEC #1 was submitted for laboratory analysis of PHCs (F1-F4), BTEX and PAHs. The concentrations of the parameters tested met the *Table 8 Standards*.

APEC #2

During the Site reconnaissance conducted as part of the 2008 SEL Phase I ESA Report (Southeast Portion of Site), two empty ASTs were observed adjacent to a barn formerly associated with 12300 Coleraine Drive. These ASTs are inferred to have historically held fuel oil and/or diesel. The historical presence of these ASTs represented a PCA that required investigation as part of the Phase Two ESA. The subsurface investigation of APEC #2 completed by Pinchin as part of the Phase Two ESA included the advancement of one borehole (BH02). The soil sample submitted from the borehole completed within APEC #2 was submitted for laboratory analysis of PHCs (F1-F4), BTEX and PAHs. The concentrations of the parameters tested met the *Table 8 Standards*.

APEC #3

Large-scale application of pesticides/herbicides to the Phase Two Property as part of the historical and ongoing agricultural operations carried out on-Site. The application of pesticides/herbicides represented a PCA that required investigation as part of the Phase Two ESA. The subsurface investigation of APEC #3 completed by Pinchin as part of the Phase Two ESA included the advancement of 20 boreholes (BH03 through BH22). The soil samples submitted from the boreholes completed within APEC #2 were submitted for laboratory analysis of OC pesticides and PCBs. The concentrations of the parameters tested met the *Table 8 Standards*.

6.8.3 Subsurface Utilities and Construction Features

No underground utilities or construction features are known or inferred to be present at the Phase Two Property.

6.8.4 Physical Setting

Based on the work completed as part of this Phase Two ESA, the following subsections provide a summary of the physical setting of the Phase Two Property.

Stratigraphy

The observed stratigraphy at the borehole locations completed for the Phase Two ESA generally consisted of topsoil underlain by silt that extended to the maximum borehole completion depth of approximately 4.57 mbgs. Additionally, sand was observed within the borehole advanced within APEC #1 (borehole BH01) and extended from 0 to 3.66 mbgs. The borehole locations are shown on Figure 6. A cross-section summarizing the subsurface geological conditions at the time of the Phase Two ESA (i.e., prior to redevelopment) has been provided as Figure 7.

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Water Bodies and Areas of Natural Significance

Three tributaries of the West Humber River traverse the Phase Two Property, and are extend onto properties located immediately northwest, northeast, southeast and southwest of the Phase Two Property. These tributaries discharge into the West Humber River, which is located approximately 855 m southwest of the Phase Two Property. No additional water bodies are located within the Phase One Study Area. No areas of natural & scientific interest area located within the Phase One Study Area.

Hydrogeological Characteristics

The groundwater flow direction in the unconfined aquifer at the Phase Two Property is inferred to be towards the southwest. Groundwater was not considered to be a media of potential concern and, as such, was not investigated as part of the Phase Two ESA.

Depth to Bedrock and Shallow Soil Property Assessment

Bedrock was not encountered at any of the borehole locations up to the maximum depth drilled of approximately 4.57 mbgs and based on the available water well records, bedrock depth at the Phase Two Property is approximately 11 mbgs. As such, the Phase Two Property is not a shallow soil property, as defined by Section 43.1 of O. Reg. 153/04.

Depth to Water Table

The water table was not encountered within any borehole locations up to the maximum sample collection depth of approximately 4.57 mbgs. However, based on information provided in the 2014 exp Geotechnical Report that was reviewed as part of the Pinchin Phase One ESA, the depth to the water table at the Phase Two Property is expected to be approximately 3.5 mbgs.

Site Sensitivity

The pH values measured in the submitted soil samples were within the limits for non-sensitive sites. The Phase Two Property is also not an area of natural significance and it is not adjacent to, nor does it contain land within 30 metres of, an area of natural significance. As such, the Phase Two Property is not an environmentally sensitive area as defined by Section 41 of O. Reg. 153/04.

Soil Imported to Phase Two Property

No soil was imported to the Phase Two Property during or prior to the completion of the Phase Two ESA.

Proposed Buildings and Other Structures

Pinchin understands that the future use of the Phase Two Property will be for a commercial/industrial development that is still in the planning stages and the configuration of the Phase Two Property, including proposed building locations, has yet to be confirmed.

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6.8.5 Applicable Site Condition Standards

Based on the grain size analysis of representative soil samples collected during the Phase Two ESA and the observed stratigraphy at the borehole locations, Pinchin concluded that over two-thirds of the overburden at the Phase Two Property is medium and fine-textured as defined by O. Reg. 153/04 and Site Condition Standards for coarse-textured soil were not applied.

Based on the information obtained from the Phase One and Two ESAs, the appropriate Site Condition Standards for the Phase Two Property are:

- "Table 8: Full Depth Generic Site Condition Standards for Use within 30 m of a Water Body in a Potable Ground Water Condition", provided in the Ontario Ministry of the Environment and Climate Change (MOECC) document entitled, "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" dated April 15, 2011 (*Table 8 Standards*) for:
  - Medium/fine-textured soils; and
  - Residential/parkland/institutional/industrial/commercial/community property use.

6.8.6 Contaminants Exceeding Applicable Site Condition Standards in Soil

All soil samples collected during the Phase Two ESA met the applicable *Table 8 Standards* for the parameters analyzed.

6.8.7 Meteorological and Climatic Conditions

Minor temporal groundwater table fluctuations are expected to have had a minimal effect on contaminant distribution throughout the Phase Two Property. As such, it is the QP's opinion that meteorological or climatic conditions are unlikely to influence the distribution or migration of the contaminants at the Phase Two Property.

6.8.8 Soil Vapour Intrusion

No volatile parameters were identified at concentrations exceeding the *Table 8 Standards*. As such, soil vapour intrusion into buildings at the Phase Two Property is not considered a concern.

6.8.9 Contaminant Exposure Assessment

Given that all soil samples collected during the Phase Two ESA met the applicable *Table 8 Standards*, Pinchin considered that an evaluation of potential exposure pathways and receptors was unnecessary.

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7.0 CONCLUSIONS

Pinchin completed a Phase Two ESA at the Phase Two Property in accordance with the requirements stipulated in O. Reg. 153/04 for the purpose of filing an RSC. The RSC is required by the Client in relation to the future redevelopment of the Phase Two Property from agricultural to mixed commercial/industrial land use.

The Phase Two ESA completed by Pinchin included the advancement of 22 boreholes at the Phase Two Property.

Based on Site-specific information, the applicable regulatory standards for the Phase Two Property were determined to be the *Table 8 Standards* for residential/parkland/institutional/industrial/commercial/ community land use and medium/fine-textured soils. Soil samples were collected from each of the borehole locations and submitted for laboratory analyses of PHCs (F1-F4), BTEX, PAHs, PCBs and/or OC pesticides.

The laboratory results for the submitted soil samples indicated that all reported concentrations for the parameters analyzed met the corresponding *Table 8 Standards*. The maximum reported soil concentrations for the parameters analyzed are summarized in Tables 6 and 7, respectively.

It is the opinion of the QP who supervised the Phase Two ESA that the applicable *Table 8 Standards* for soil at the Phase Two Property have been met as of the Certification Date of December 7, 2017 and that no further subsurface investigation is required in relation to assessing the environmental quality of soil at the Phase Two Property.

7.1 Signatures

This Phase Two ESA was undertaken under the supervision of Francesco Gagliardi, C.E.T., LET, QP_{ESA} in accordance with the requirements of O. Reg. 153/04 to support the filing of an RSC for the Phase Two Property.

7.2 Terms and Limitations

This Phase Two ESA was performed for Triovest Realty Advisors Inc. (Client) in order to investigate potential environmental impacts at 12300, 12400, 12490 and 12592 Coleraine Drive in Caledon, Ontario (Site). The term recognized environmental condition means the presence or likely presence of any hazardous substance on a property under conditions that indicate an existing release, past release, or a material threat of a release of a hazardous substance into structures on the property or into the ground, groundwater, or surface water of the property. This Phase Two ESA does not quantify the extent of the current and/or recognized environmental condition or the cost of any remediation.

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Conclusions derived are specific to the immediate area of study and cannot be extrapolated extensively away from sample locations. Samples have been analyzed for a limited number of contaminants that are expected to be present at the Site, and the absence of information relating to a specific contaminant does not indicate that it is not present.

No environmental site assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions on a property. Performance of this Phase Two ESA to the standards established by Pinchin is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions on the Site, and recognizes reasonable limits on time and cost.

This Phase Two ESA was performed in general compliance with currently acceptable practices for environmental site investigations, and specific Client requests, as applicable to this Site.

This report was prepared for the exclusive use of the Client, subject to the terms, conditions and limitations contained within the duly authorized proposal for this project. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted.

If additional parties require reliance on this report, written authorization from Pinchin will be required. Pinchin disclaims responsibility of consequential financial effects on transactions or property values, or requirements for follow-up actions and costs. No other warranties are implied or expressed. Furthermore, this report should not be construed as legal advice. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law.

Pinchin makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and these interpretations may change over time.

8.0 REFERENCES

The following documents provided information used in this report:

- "*Phase I Environmental Site Assessment, Proposed Residential Development, West of Coleraine Drive and North of Mayfield Road, Town of Caledon (Bolton)*" prepared by Soil Engineering Ltd. for Solmar Development Corp. on behalf of Nutristock Corp., dated May 13, 2008.

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- "*Phase I Environmental Site Assessment, Proposed Mixed Use Development, Part of Lot 2 Concession 5, 12300 Coleraine Drive, Town of Bolton*" prepared by Soil Engineering Ltd. for Solmar Development Corp. on behalf of Nutristock Corp., dated August 20, 2008.
- "*Geotechnical Investigation, Proposed Commercial/Industrial Complex, Coleraine Drive, Bolton, Ontario*" prepared by exp Services Inc. for Triovest Realty Advisors Inc., dated July 22, 2014.
- Association of Professional Geoscientists of Ontario. Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended). April 2011.
- Ontario Ministry of the Environment. Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario. December 1996.
- Ontario Ministry of the Environment. Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. March 9, 2004 amended July 1, 2011.
- Ontario Ministry of the Environment. Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act. April 15, 2011.
- Pinchin Ltd. Phase One Environmental Site Assessment, 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario. Prepared for HOOPP Realty Inc., October 16, 2017.
- Province of Ontario. Environmental Protection Act, R.S.O 1990, Chapter E.19.
- Province of Ontario. R.R.O. 1990, Regulation 347, General – Waste Management, as amended by Ontario Regulation 234/11.
- Province of Ontario. Ontario Regulation 153/04: Records of Site Condition – Part XV.1 of the Act. Last amended by Ontario Regulation 312/17 on July 28, 2017.
- U.S. Environmental Protection Agency - Region 1. Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells. Revised January 19, 2010.

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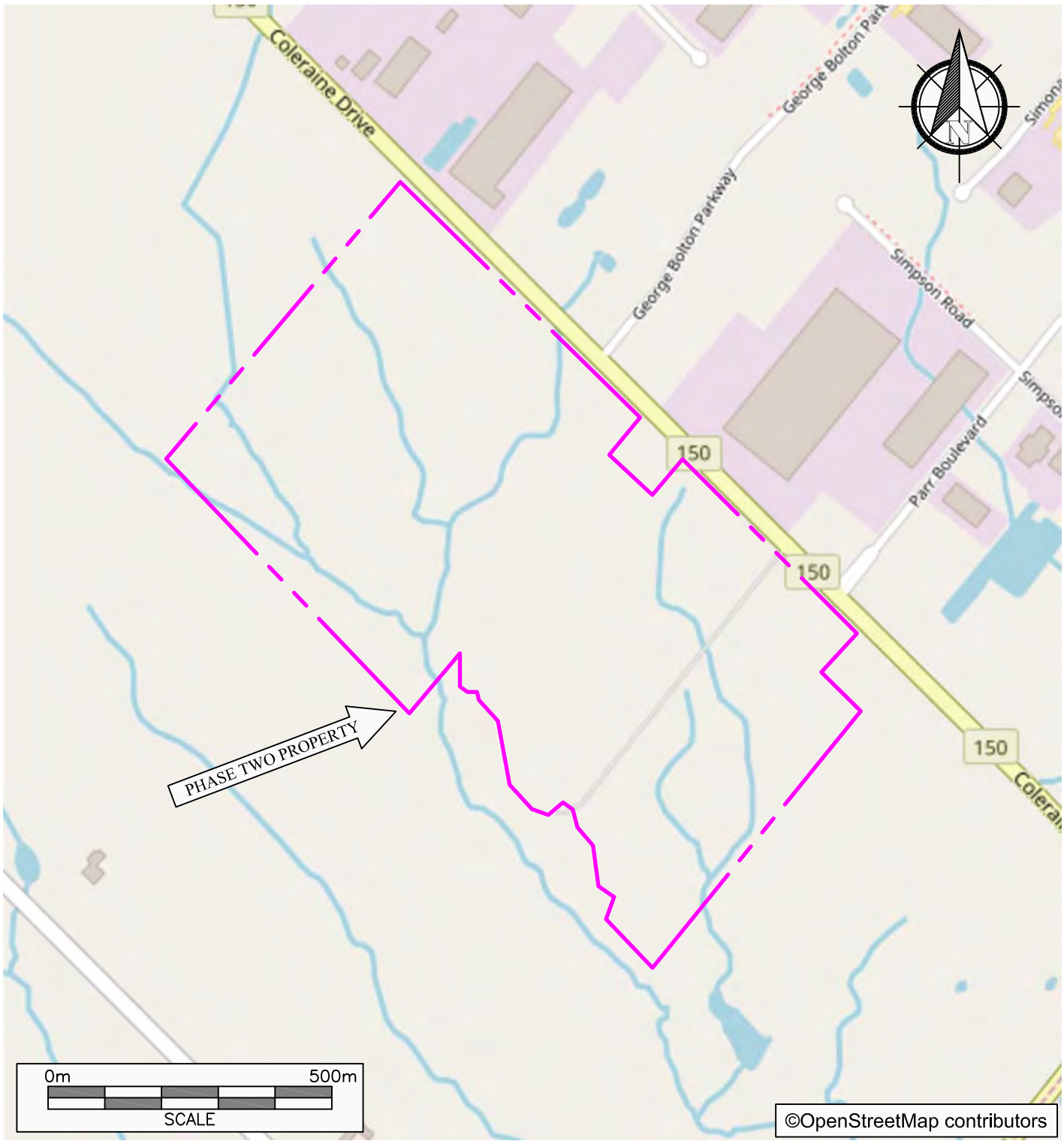
9.0 FIGURES AND TABLES



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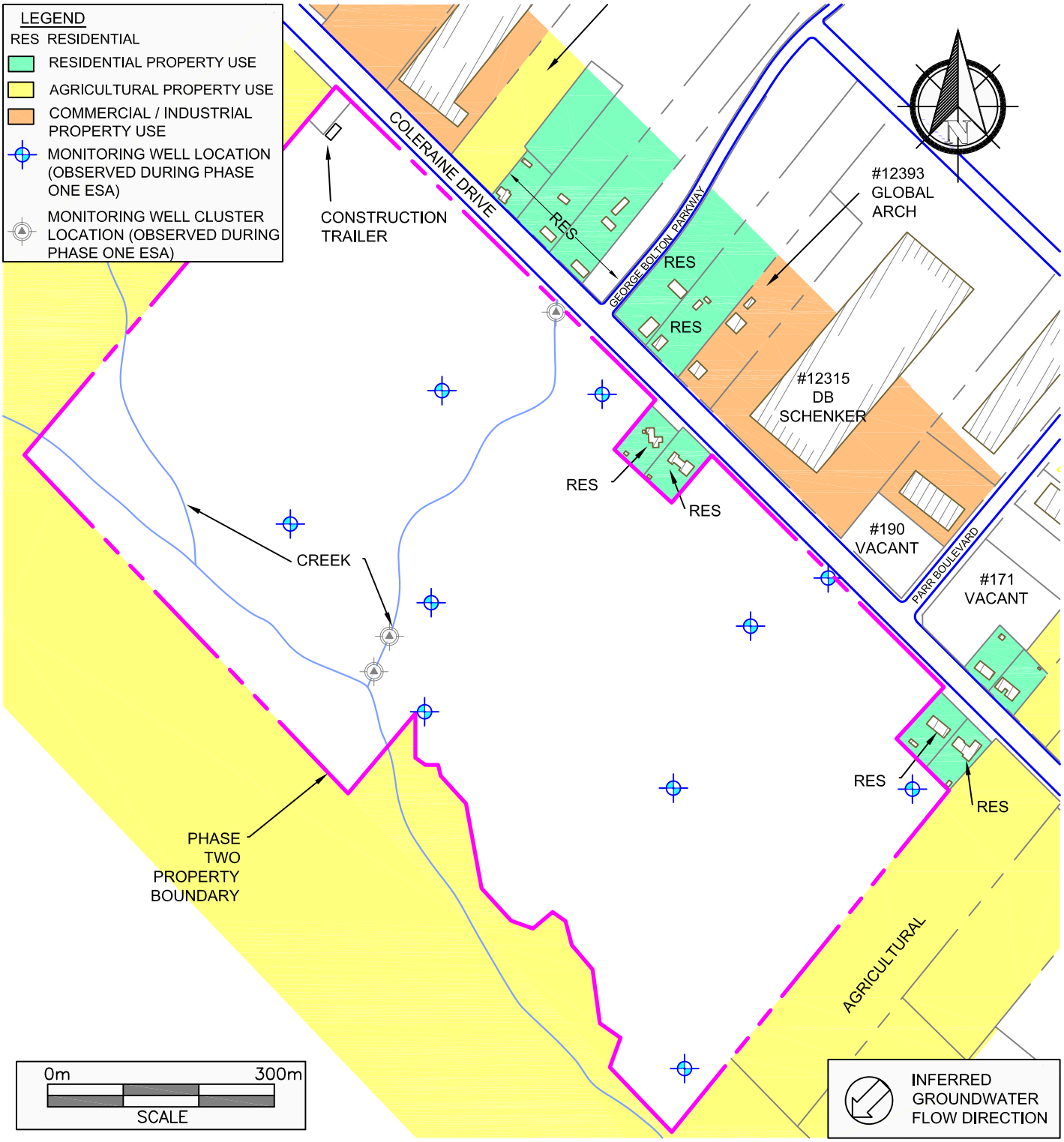
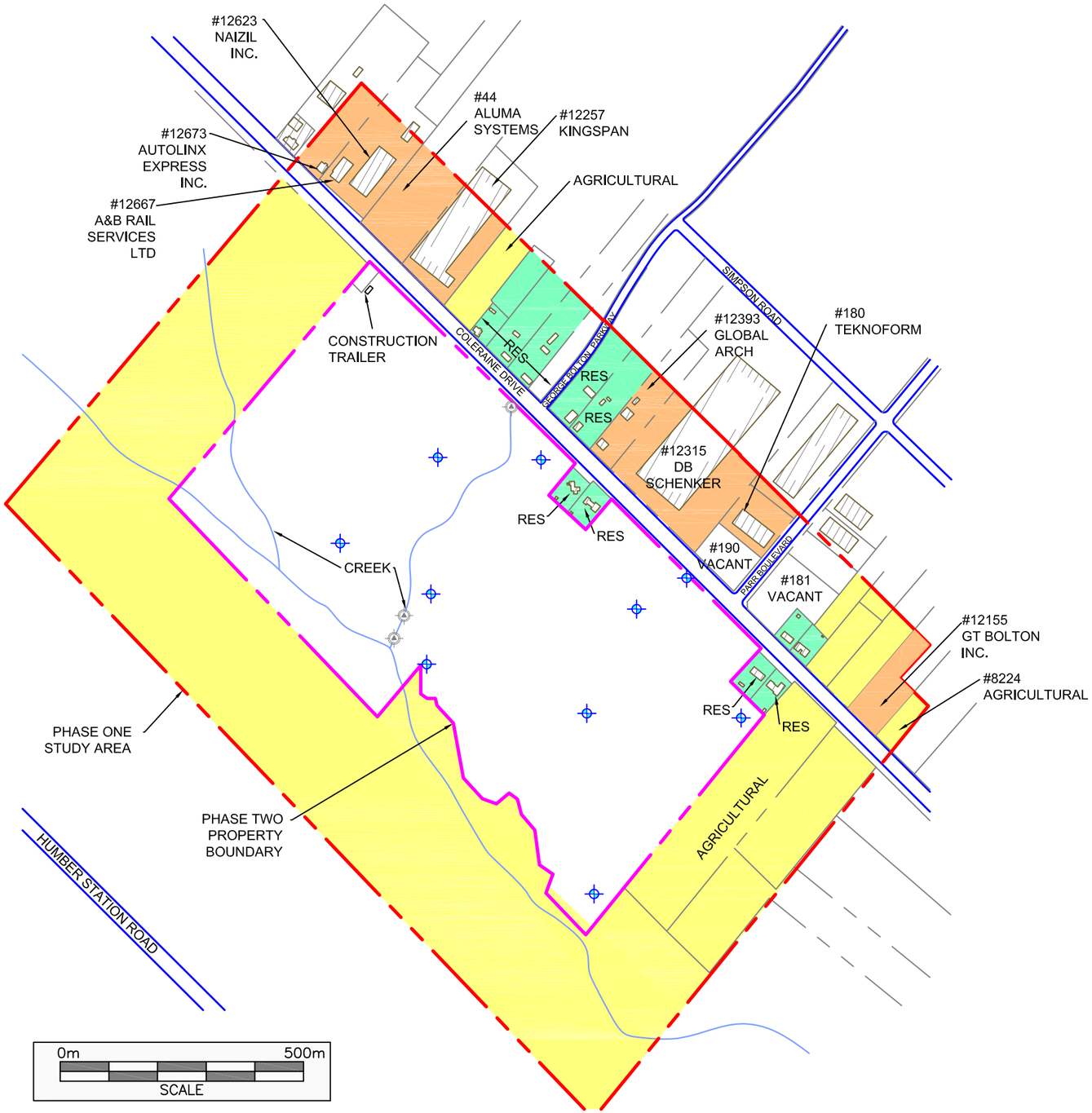
PROJECT NAME: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT			
CLIENT NAME: TRIOVEST REALTY ADVISORS INC.			
PROJECT LOCATION: 12300, 12400, 2490 AND 12592 COLERAINE DRIVE, CALEDON, ONTARIO			
FIGURE NAME: KEY MAP			FIGURE NO.: 1
SCALE: AS SHOWN	PROJECT NO.: 210701.001	DATE: DEC. 2017	



PINCHIN

PROJECT NAME: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT			
CLIENT NAME: TRIOVEST REALTY ADVISORS INC.			
PROJECT LOCATION: 12300, 12400, 2490 AND 12592 COLERAINE DRIVE, CALEDON, ONTARIO			
FIGURE NAME: PHASE TWO PROPERTY			FIGURE NO.: 2
SCALE: AS SHOWN	PROJECT NO.: 210701.001	DATE: DEC. 2017	



N

LEGEND

- RESIDENTIAL PROPERTY USE
- AGRICULTURAL PROPERTY USE
- COMMERCIAL / INDUSTRIAL PROPERTY USE
- RES RESIDENTIAL
- PHASE ONE STUDY AREA BOUNDARY
- MONITORING WELL LOCATION (OBSERVED DURING PHASE ONE ESA)
- MONITORING WELL CLUSTER LOCATION (OBSERVED DURING PHASE ONE ESA)

PINCHIN

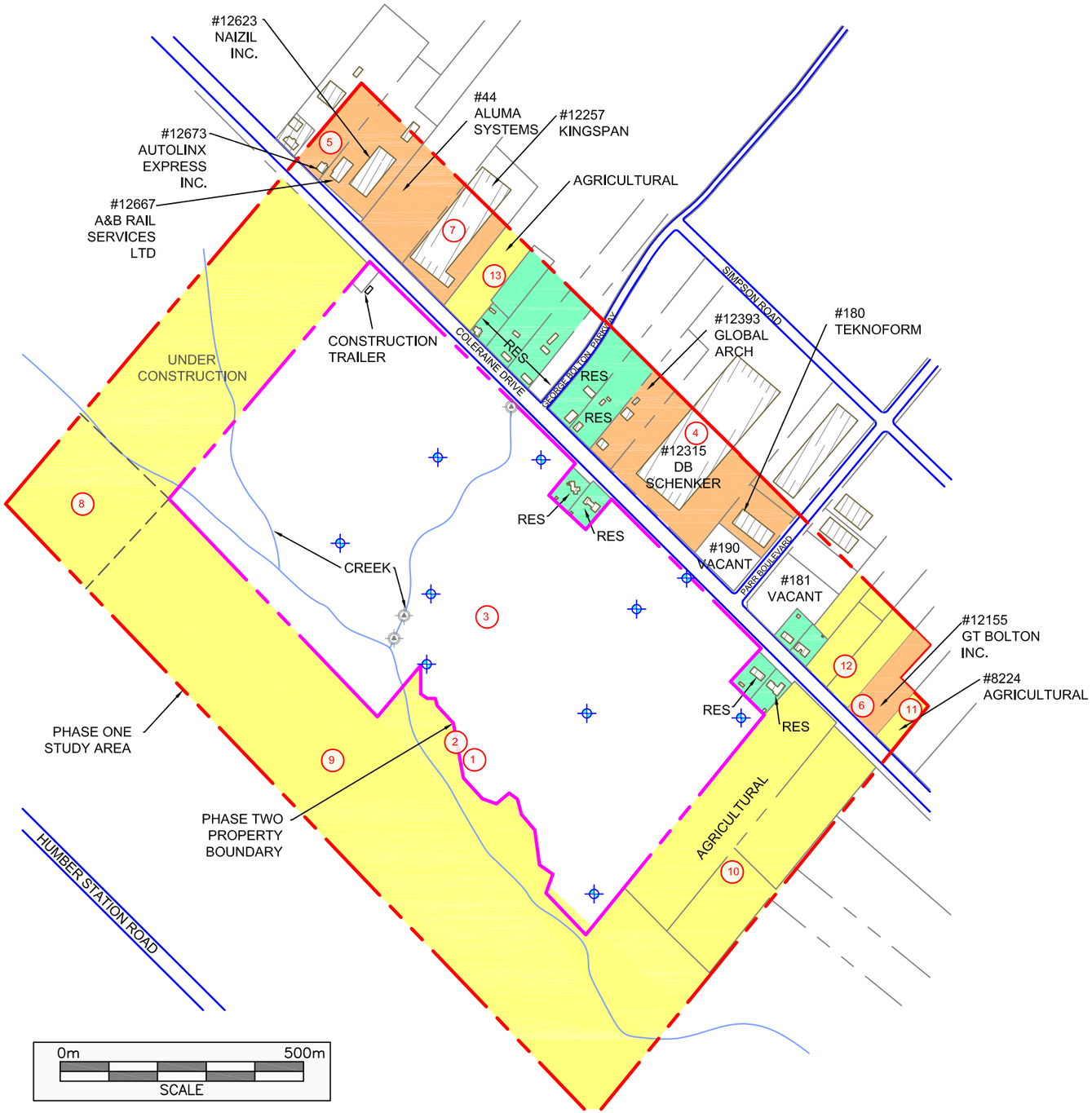
PROJECT NAME
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

CLIENT NAME
TRIOVEST REALTY ADVISORS INC.

PROJECT LOCATION
12300, 12400, 2490 AND 12592 COLERAINE DRIVE, CALEDON, ONTARIO

FIGURE NAME
PHASE ONE STUDY AREA

SCALE	PROJECT NO.
AS SHOWN	210701.001
DATE	FIGURE NO.
DEC. 2017	3



N

LEGEND

- RESIDENTIAL PROPERTY USE
- AGRICULTURAL PROPERTY USE
- COMMERCIAL / INDUSTRIAL PROPERTY USE
- RES RESIDENTIAL
- PHASE ONE STUDY AREA BOUNDARY
- MONITORING WELL LOCATION (OBSERVED DURING PHASE ONE ESA)
- MONITORING WELL CLUSTER LOCATION (OBSERVED DURING PHASE ONE ESA)
- (#) PCA LOCATION

PINCHIN

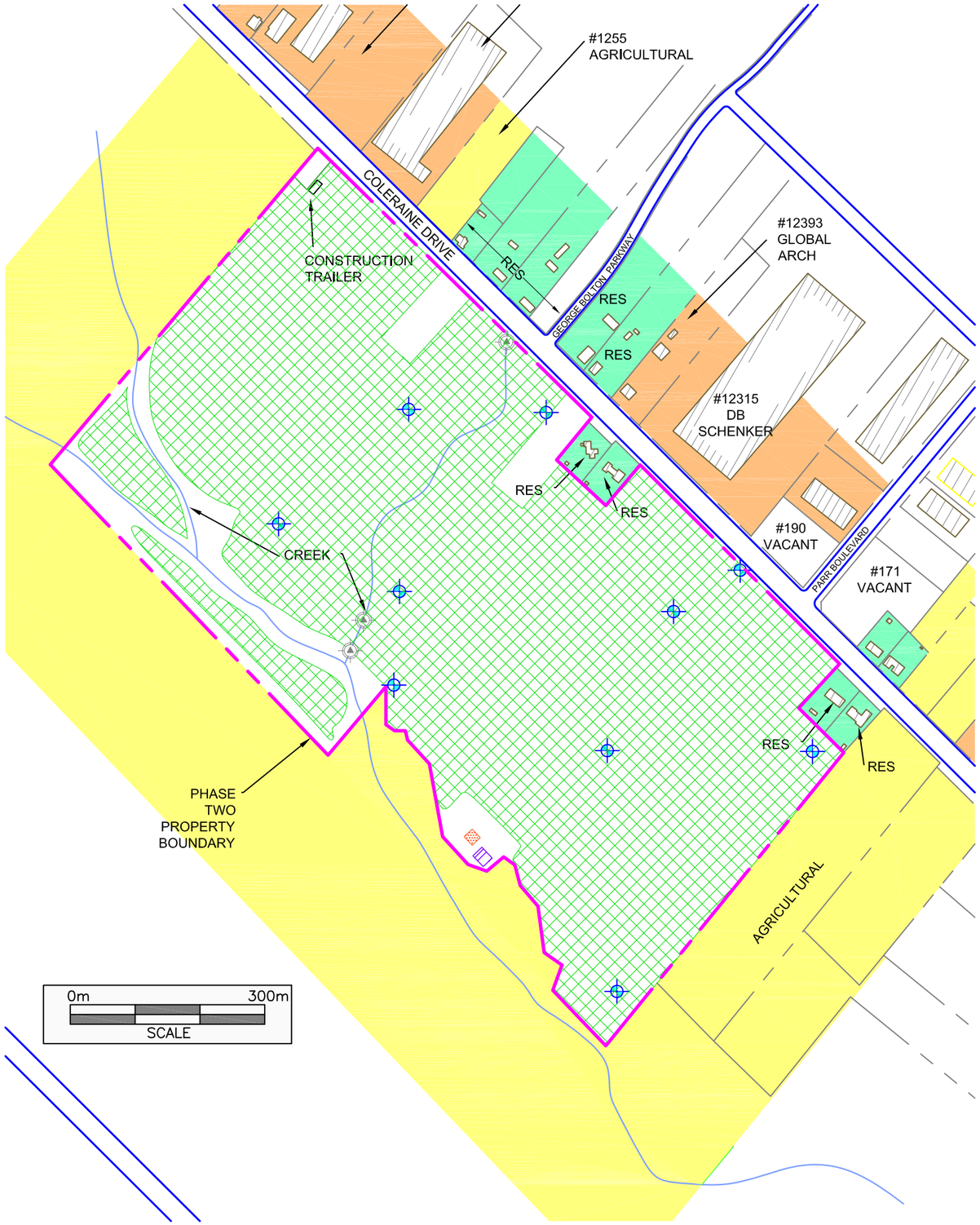
PROJECT NAME
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

CLIENT NAME
TRIOVEST REALTY ADVISORS INC.

PROJECT LOCATION
12300, 12400, 2490 AND 12592 COLERAINE DRIVE, CALEDON, ONTARIO

FIGURE NAME
POTENTIALLY CONTAMINATING ACTIVITIES

SCALE	PROJECT NO.
AS SHOWN	210701.001
DATE	FIGURE NO.
DEC. 2017	4



Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #1 (Former AST within basement of residential building at 12300 Coleraine Drive likely containing fuel oil)	Southwest Portion of Phase One Property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs BTEX PAHs	Soil
APEC #2 (Two former ASTs adjacent to former barn at 12300 Coleraine Drive likely containing fuel oil and/or diesel)	Southwest Portion of Phase One Property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs BTEX PAHs	Soil
APEC #3 (Historical and ongoing agricultural operations)	Majority of Phase One Property	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	On-Site	OC Pesticides PCBs	Soil

INFERRED GROUNDWATER FLOW DIRECTION

N

LEGEND

- RESIDENTIAL PROPERTY USE
- AGRICULTURAL PROPERTY USE
- COMMERCIAL / INDUSTRIAL PROPERTY USE
- RES RESIDENTIAL
- PHASE ONE STUDY AREA BOUNDARY
- MONITORING WELL LOCATION (OBSERVED DURING PHASE ONE ESA)
- MONITORING WELL CLUSTER LOCATION (OBSERVED DURING PHASE ONE ESA)
- APEC 1
- APEC 2
- APEC 3

PINCHIN

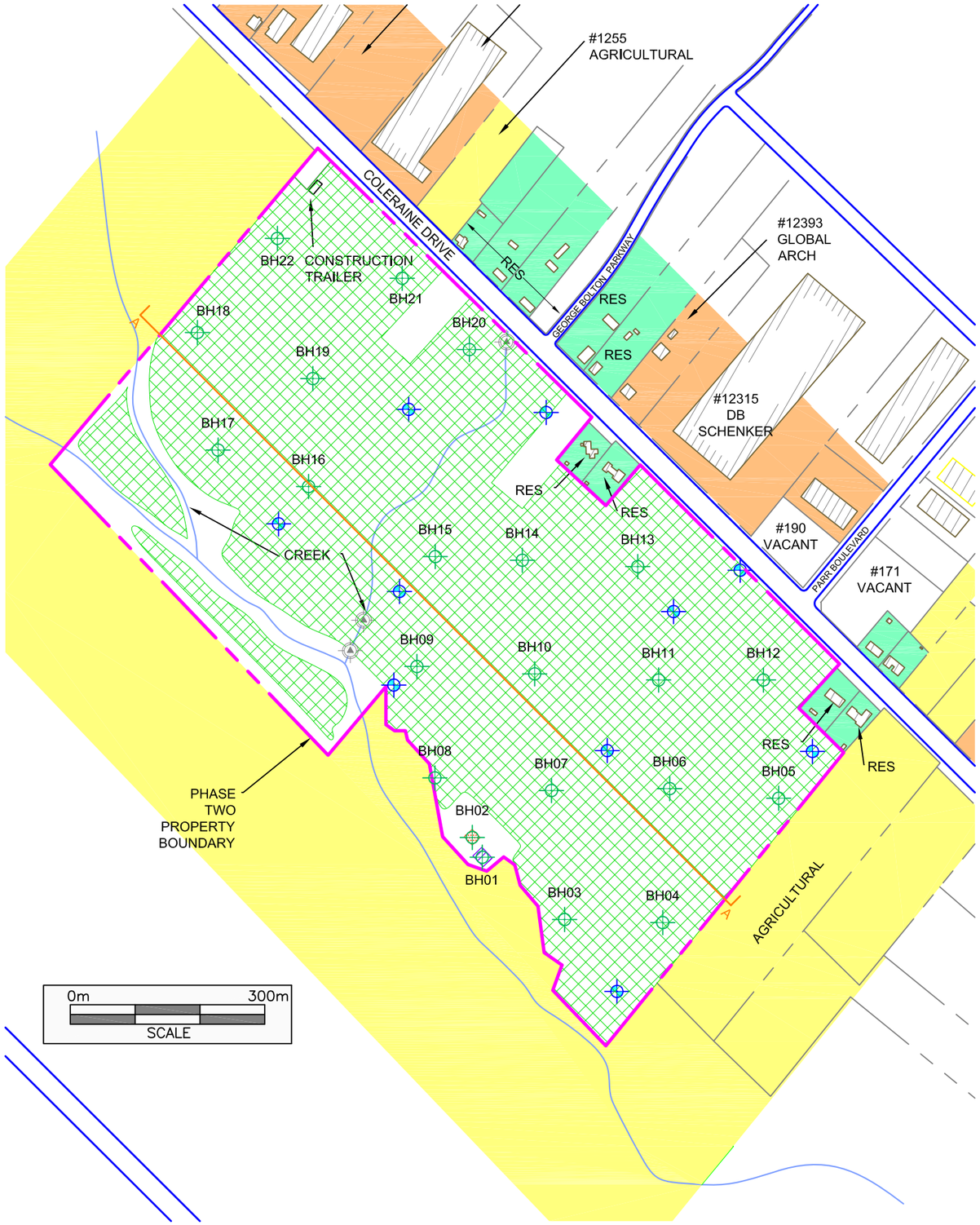
PROJECT NAME
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

CLIENT NAME
TRIOVEST REALTY ADVISORS INC.

PROJECT LOCATION
12300, 12400, 2490 AND 12592 COLERAINE DRIVE, CALEDON, ONTARIO

FIGURE NAME
AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

SCALE	PROJECT NO.
AS SHOWN	210701.001
DATE	FIGURE NO.
DEC. 2017	5



Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #1 (Former AST within basement of residential building at 12300 Coleraine Drive likely containing fuel oil)	Southwest Portion of Phase One Property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs BTEX PAHs	Soil
APEC #2 (Two former ASTs adjacent to former barn at 12300 Coleraine Drive likely containing fuel oil and/or diesel)	Southwest Portion of Phase One Property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs BTEX PAHs	Soil
APEC #3 (Historical and ongoing agricultural operations)	Majority of Phase One Property	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	On-Site	OC Pesticides PCBs	Soil

INFERRED GROUNDWATER FLOW DIRECTION

LEGEND

- RESIDENTIAL PROPERTY USE
- AGRICULTURAL PROPERTY USE
- COMMERCIAL / INDUSTRIAL PROPERTY USE
- RES RESIDENTIAL
- PHASE ONE STUDY AREA BOUNDARY
- MONITORING WELL LOCATION (OBSERVED DURING PHASE ONE ESA)
- MONITORING WELL CLUSTER LOCATION (OBSERVED DURING PHASE ONE ESA)
- APEC 1
- APEC 2
- APEC 3
- BOREHOLE LOCATION
- A A' CROSS SECTION LOCATION

PINCHIN

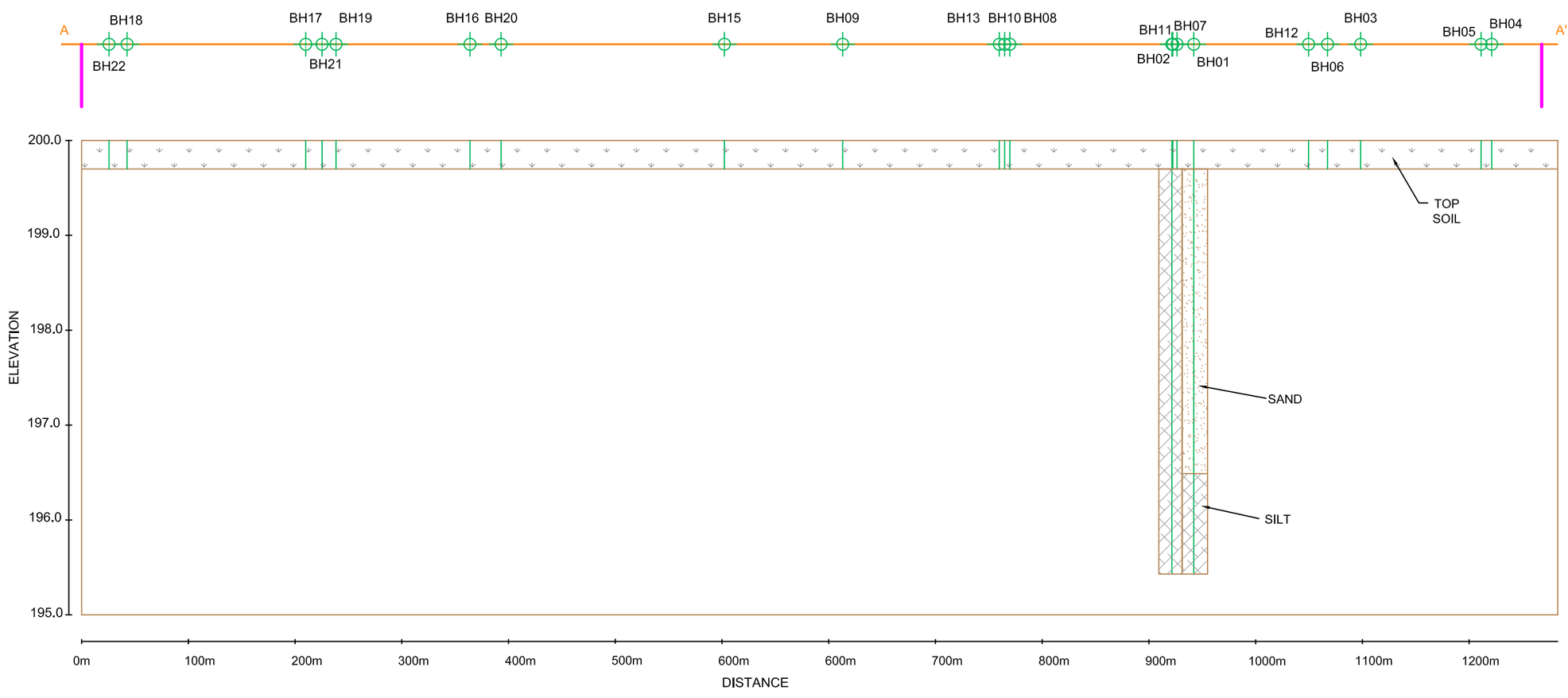
PROJECT NAME
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

CLIENT NAME
TRIOVEST REALTY ADVISORS INC.

PROJECT LOCATION
12300, 12400, 2490 AND 12592 COLERAINE DRIVE, CALEDON, ONTARIO

FIGURE NAME
BOREHOLE AND CROSS-SECTION LOCATION PLAN

SCALE	PROJECT NO.
AS SHOWN	210701.001
DATE	FIGURE NO.
DEC. 2017	6



LEGEND

- BOREHOLE
- SILT
- SAND
- TOP SOIL
- APPROXIMATE SITE BOUNDARY

PINCHIN

PROJECT NAME
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

CLIENT NAME
TRIOVEST REALTY ADVISORS INC.

PROJECT LOCATION
12300, 12400, 2490 AND 12592 COLERAINE DRIVE, CALEDON, ONTARIO

FIGURE NAME
CROSS SECTION A-A'

SCALE	PROJECT NO.
AS SHOWN	210701.001
DATE	FIGURE NO.
DEC. 2017	7

TABLE 1
SOIL ANALYTICAL RESULTS
Triovest Realty Advisors Inc.
12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Sample Designation	*BH01-4*	*DUP-3*	*BH02-1*	*BH02-3*	*BH02-4*	*BH03-1*	*BH04-1*	*BH05-1*	***MOECC Table 8 Standards****
Sample Collection Date (dd/mm/yyyy)	*06/11/2017*	*06/11/2017*	*06/11/2017*	*06/11/2017*	*06/11/2017*	*06/11/2017*	*06/11/2017*	*06/11/2017*	
Sample Depth (mbgs)	*3.05 to 3.81*	*3.05 to 3.81*	*0 to 0.76*	*1.52 to 2.29*	*2.29 to 3.05*	*0 to 0.3*	*0 to 0.3*	*0 to 0.3*	
Sample Location	*BH01*	*BH01*	*BH02*	*BH02*	*BH02*	*BH03*	*BH04*	*BH05*	
Laboratory Certificate of Analysis No.	*B7P0185*	*B7P0185*	*B7P0185*	*B7P0185*	*B7P0185*	*B7P0185*	*B7P0185*	*B7P0185*	
Date(s) of Analysis (dd/mm/yyyy)	*10/11/2017*	*10/11/2017*	*10/11/2017*	*17/11/2017*	*10/11/2017*	*13/11/2017*	*13/11/2017*	*13/11/2017*	
	11/11/2017	*11/11/2017*	*11/11/2017*	-	-	*14/11/2017*	*14/11/2017*	*14/11/2017*	
	13/11/2017	*13/11/2017*	*13/11/2017*	-	-	-	-	*17/11/2017*	
	14/11/2017	*14/11/2017*	*14/11/2017*	-	-	-	-	-	
Miscellaneous Parameters									
pH (pH Units)	-	-	7.80	-	7.83	-	-	-	NV
Sieve #200 <0.075 mm (%)	-	-	-	93.6	-	-	-	83.7	NV
Sieve #200 >0.075 mm (%)	-	-	-	6.4	-	-	-	16.3	NV
Soil Texture	-	-	-	Medium/Fine	-	-	-	Medium/Fine	NV
Petroleum Hydrocarbons (PHCs)									
PHCs F1 (C_6 - C_{10})	<10	<10	<10	-	-	-	-	-	25
PHCs F2 (>C_{10} - C_{16})	<10	<10	<10	-	-	-	-	-	10
PHCs F3 (>C_{16} - C_{34})	<50	<50	<50	-	-	-	-	-	240
PHCs F4 (>C_{34} - C_{50})	<50	<50	<50	-	-	-	-	-	120
Benzene, Toluene, Ethylbenzene and Xylenes									
Benzene	<0.020	<0.020	<0.020	-	-	-	-	-	0.02
Toluene	<0.020	<0.020	<0.020	-	-	-	-	-	0.2
Ethylbenzene	<0.020	<0.020	<0.020	-	-	-	-	-	0.05
Xylenes	<0.040	<0.040	<0.040	-	-	-	-	-	0.05
Polycyclic Aromatic Hydrocarbons									
Acenaphthene	<0.0050	<0.0050	<0.0050	-	-	-	-	-	0.072
Acenaphthylene	<0.0050	<0.0050	<0.0050	-	-	-	-	-	0.093
Anthracene	<0.0050	<0.0050	<0.0050	-	-	-	-	-	0.22
Benzo(a)anthracene	<0.0050	<0.0050	<0.0050	-	-	-	-	-	0.36
Benzo(a)pyrene	<0.0050	<0.0050	<0.0050	-	-	-	-	-	0.3
Benzo(b)fluoranthene	<0.0050	<0.0050	<0.0050	-	-	-	-	-	0.47
Benzo(ghi)perylene	<0.0050	<0.0050	<0.0050	-	-	-	-	-	0.68
Benzo(k)fluoranthene	<0.0050	<0.0050	<0.0050	-	-	-	-	-	0.48
Chrysene	<0.0050	<0.0050	<0.0050	-	-	-	-	-	0.16
Dibenzo(a,h)anthracene	<0.0050	<0.0050	<0.0050	-	-	-	-	-	0.18
Fluoranthene	<0.0050	<0.0050	<0.0050	-	-	-	-	-	0.69
Fluorene	<0.0050	<0.0050	<0.0050	-	-	-	-	-	0.19
Indeno(1,2,3-cd)pyrene	<0.0050	<0.0050	<0.0050	-	-	-	-	-	0.23
Methylnaphthalene 2-(1-)	<0.0071	<0.0071	<0.0071	-	-	-	-	-	0.59
Naphthalene	<0.0050	<0.0050	<0.0050	-	-	-	-	-	0.09
Phenanthrene	<0.0050	<0.0050	<0.0050	-	-	-	-	-	0.69
Pyrene	<0.0050	<0.0050	<0.0050	-	-	-	-	-	1
Styrene	<0.0050	<0.0050	<0.0050	-	-	-	-	-	0.05
Organochlorine Pesticides									
Aldrin	-	-	-	-	-	<0.0020	<0.0020	<0.0020	0.05
Chlordane (Total)	-	-	-	-	-	<0.0020	<0.0020	<0.0020	0.05
o,p-DDD + p,p-DDD	-	-	-	-	-	<0.0020	<0.0020	<0.0020	0.05
o,p-DDE + p,p-DDE	-	-	-	-	-	<0.0020	<0.0020	<0.0020	0.05
o,p-DDT + p,p-DDT	-	-	-	-	-	<0.0020	<0.0020	<0.0020	1.4
Dieldrin	-	-	-	-	-	<0.0020	<0.0020	<0.0020	0.05
Endosulfan (Total)	-	-	-	-	-	<0.0020	<0.0020	<0.0020	0.04
Endrin	-	-	-	-	-	<0.0020	<0.0020	<0.0020	0.04
Heptachlor	-	-	-	-	-	<0.0020	<0.0020	<0.0020	0.05
Heptachlor Epoxide	-	-	-	-	-	<0.0020	<0.0020	<0.0020	0.05
Hexachlorobenzene	-	-	-	-	-	<0.0020	<0.0020	<0.0020	0.02
Hexachlorobutadiene	-	-	-	-	-	<0.0020	<0.0020	<0.0020	0.01
Hexachloroethane	-	-	-	-	-	<0.0020	<0.0020	<0.0020	0.01
Methyloxychlor	-	-	-	-	-	<0.0050	<0.0050	<0.0050	0.05
Polychlorinated Biphenyls									
Total Polychlorinated Biphenyls	-	-	-	-	-	<0.040	<0.020	<0.040	0.3

Notes:

MOECC Table 8 Standards* — Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 8 Standards, All Soil Textures, Potable Groundwater Condition within 30 m of a Water Body, for Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use.

BOLD	Exceeds Site Condition Standard
BOLD	Reportable Detection Limit Exceeds Site Condition Standard
Units	All Units In Micrograms Per Gram, Unless Otherwise Noted
(##)	Bracketed Values Indicate Laboratory Duplicate Results
mbgs	Metres Below Ground Surface
NV	No Value

TABLE 1
SOIL ANALYTICAL RESULTS
Triovest Realty Advisors Inc.
12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Sample Designation	*BH06-1*	*BH07-1*	*BH08-1*	*BH09-1*	*BH10-1*	*BH11-1*	*BH12-1*	*DUP-1*	***MOECC Table 8 Standards****
Sample Collection Date (dd/mm/yyyy)	*06/11/2017*	*06/11/2017*	*06/11/2017*	*06/11/2017*	*06/11/2017*	*06/11/2017*	*06/11/2017*	*06/11/2017*	
Sample Depth (mbgs)	*0 to 0.3*	*0 to 0.3*	*0 to 0.3*	*0 to 0.3*	*0 to 0.3*	*0 to 0.3*	*0 to 0.3*	*0 to 0.3*	
Sample Location	*BH06*	*BH07*	*BH08*	*BH09*	*BH10*	*BH11*	*BH12*	*BH12*	
Laboratory Certificate of Analysis No.	*B7P0185*	*B7P0185*	*B7P0185*	*B7P0185*	*B7P0185*	*B7P0185*	*B7P0185*	*B7P0185*	
Date(s) of Analysis (dd/mm/yyyy)	*13/11/2017*	*13/11/2017*	*13/11/2017*	*13/11/2017*	*13/11/2017*	*13/11/2017*	*13/11/2017*	*13/11/2017*	
	14/11/2017	*14/11/2017*	*14/11/2017*	*14/11/2017*	*14/11/2017*	*14/11/2017*	*14/11/2017*	*14/11/2017*	
	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	
Miscellaneous Parameters									
pH (pH Units)	-	-	-	-	-	-	-	-	NV
Sieve #200 <0.075 mm (%)	-	-	-	-	-	-	-	-	NV
Sieve #200 >0.075 mm (%)	-	-	-	-	-	-	-	-	NV
Soil Texture	-	-	-	-	-	-	-	-	NV
Petroleum Hydrocarbons (PHCs)									
PHCs F1 (C_6 - C_{10})	-	-	-	-	-	-	-	-	25
PHCs F2 (>C_{10} - C_{16})	-	-	-	-	-	-	-	-	10
PHCs F3 (>C_{16} - C_{34})	-	-	-	-	-	-	-	-	240
PHCs F4 (>C_{34} - C_{50})	-	-	-	-	-	-	-	-	120
Benzene, Toluene, Ethylbenzene and Xylenes									
Benzene	-	-	-	-	-	-	-	-	0.02
Toluene	-	-	-	-	-	-	-	-	0.2
Ethylbenzene	-	-	-	-	-	-	-	-	0.05
Xylenes	-	-	-	-	-	-	-	-	0.05
Polycyclic Aromatic Hydrocarbons									
Acenaphthene	-	-	-	-	-	-	-	-	0.072
Acenaphthylene	-	-	-	-	-	-	-	-	0.093
Anthracene	-	-	-	-	-	-	-	-	0.22
Benzo(a)anthracene	-	-	-	-	-	-	-	-	0.36
Benzo(a)pyrene	-	-	-	-	-	-	-	-	0.3
Benzo(b)fluoranthene	-	-	-	-	-	-	-	-	0.47
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	0.68
Benzo(k)fluoranthene	-	-	-	-	-	-	-	-	0.48
Chrysene	-	-	-	-	-	-	-	-	0.16
Dibenzo(a,h)anthracene	-	-	-	-	-	-	-	-	0.18
Fluoranthene	-	-	-	-	-	-	-	-	0.69
Fluorene	-	-	-	-	-	-	-	-	0.19
Indeno(1,2,3-cd)pyrene	-	-	-	-	-	-	-	-	0.23
Methylnaphthalene 2-(1-)	-	-	-	-	-	-	-	-	0.59
Naphthalene	-	-	-	-	-	-	-	-	0.09
Phenanthrene	-	-	-	-	-	-	-	-	0.69
Pyrene	-	-	-	-	-	-	-	-	1
Styrene	-	-	-	-	-	-	-	-	0.05
Organochlorine Pesticides									
Aldrin	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.05
Chlordane (Total)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.05
o,p-DDD + p,p-DDD	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.05
o,p-DDE + p,p-DDE	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.05
o,p-DDT + p,p-DDT	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	1.4
Dieldrin	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.05
Endosulfan (Total)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.04
Endrin	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.04
Heptachlor	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.05
Heptachlor Epoxide	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.05
Hexachlorobenzene	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.02
Hexachlorobutadiene	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.01
Hexachloroethane	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.01
Methyloxychlor	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.05
Polychlorinated Biphenyls									
Total Polychlorinated Biphenyls	<0.020	<0.020	<0.040	<0.020	<0.020	<0.020	<0.020	<0.015	0.3

Notes:

MOECC Table 8 Standards* — Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 8 Standards, All Soil Textures, Potable Groundwater Condition within 30 m of a Water Body, for Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use.

BOLD	Exceeds Site Condition Standard
BOLD	Reportable Detection Limit Exceeds Site Condition Standard
Units	All Units In Micrograms Per Gram, Unless Otherwise Noted
(##)	Bracketed Values Indicate Laboratory Duplicate Results
mbgs	Metres Below Ground Surface

TABLE 1
SOIL ANALYTICAL RESULTS
Triovest Realty Advisors Inc.
12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Sample Designation	*BH13-1*	*BH14-1*	*BH15-1*	*BH16-1*	*BH17-1*	*BH18-1*	*BH19-1*	*BH20-1*	***MOECC Table 8 Standards****
Sample Collection Date (dd/mm/yyyy)	*06/11/2017*	*06/11/2017*	*06/11/2017*	*06/11/2017*	*06/11/2017*	*06/11/2017*	*06/11/2017*	*06/11/2017*	
Sample Depth (mbgs)	*0 to 0.3*	*0 to 0.3*	*0 to 0.3*	*0 to 0.3*	*0 to 0.3*	*0 to 0.3*	*0 to 0.3*	*0 to 0.3*	
Sample Location	*BH13*	*BH14*	*BH15*	*BH16*	*BH17*	*BH18*	*BH19*	*BH20*	
Laboratory Certificate of Analysis No.	*B7P0185*	*B7P0185*	*B7P0185*	*B7P0185*	*B7P0185*	*B7P0185*	*B7P0185*	*B7P0185*	
Date(s) of Analysis (dd/mm/yyyy)	*13/11/2017*	*13/11/2017*	*13/11/2017*	*13/11/2017*	*13/11/2017*	*13/11/2017*	*13/11/2017*	*13/11/2017*	
	14/11/2017	*14/11/2017*	*14/11/2017*	*14/11/2017*	*14/11/2017*	*14/11/2017*	*14/11/2017*	*14/11/2017*	
	-	-	-	-	*17/11/2017*	-	-	-	
	-	-	-	-	-	-	-	-	
Miscellaneous Parameters									
pH (pH Units)	-	-	-	-	-	-	6.64	-	NV
Sieve #200 <0.075 mm (%)	-	-	-	-	81.1	-	-	-	NV
Sieve #200 >0.075 mm (%)	-	-	-	-	18.9	-	-	-	NV
Soil Texture	-	-	-	-	Medium/Fine	-	-	-	NV
Petroleum Hydrocarbons (PHCs)									
PHCs F1 (C_6 - C_{10})	-	-	-	-	-	-	-	-	25
PHCs F2 (>C_{10} - C_{16})	-	-	-	-	-	-	-	-	10
PHCs F3 (>C_{16} - C_{34})	-	-	-	-	-	-	-	-	240
PHCs F4 (>C_{34} - C_{50})	-	-	-	-	-	-	-	-	120
Benzene, Toluene, Ethylbenzene and Xylenes									
Benzene	-	-	-	-	-	-	-	-	0.02
Toluene	-	-	-	-	-	-	-	-	0.2
Ethylbenzene	-	-	-	-	-	-	-	-	0.05
Xylenes	-	-	-	-	-	-	-	-	0.05
Polycyclic Aromatic Hydrocarbons									
Acenaphthene	-	-	-	-	-	-	-	-	0.072
Acenaphthylene	-	-	-	-	-	-	-	-	0.093
Anthracene	-	-	-	-	-	-	-	-	0.22
Benzo(a)anthracene	-	-	-	-	-	-	-	-	0.36
Benzo(a)pyrene	-	-	-	-	-	-	-	-	0.3
Benzo(b)fluoranthene	-	-	-	-	-	-	-	-	0.47
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	0.68
Benzo(k)fluoranthene	-	-	-	-	-	-	-	-	0.48
Chrysene	-	-	-	-	-	-	-	-	0.16
Dibenzo(a,h)anthracene	-	-	-	-	-	-	-	-	0.18
Fluoranthene	-	-	-	-	-	-	-	-	0.69
Fluorene	-	-	-	-	-	-	-	-	0.19
Indeno(1,2,3-cd)pyrene	-	-	-	-	-	-	-	-	0.23
Methylnaphthalene 2-(1-)	-	-	-	-	-	-	-	-	0.59
Naphthalene	-	-	-	-	-	-	-	-	0.09
Phenanthrene	-	-	-	-	-	-	-	-	0.69
Pyrene	-	-	-	-	-	-	-	-	1
Styrene	-	-	-	-	-	-	-	-	0.05
Organochlorine Pesticides									
Aldrin	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020 (<0.0020)	<0.0020	<0.0020	0.05
Chlordane (Total)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.05
o,p-DDD + p,p-DDD	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.05
o,p-DDE + p,p-DDE	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.05
o,p-DDT + p,p-DDT	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	1.4
Dieldrin	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020 (<0.0020)	<0.0020	<0.0020	0.05
Endosulfan (Total)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.04
Endrin	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020 (<0.0020)	<0.0020	<0.0020	0.04
Heptachlor	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020 (<0.0020)	<0.0020	<0.0020	0.05
Heptachlor Epoxide	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020 (<0.0020)	<0.0020	<0.0020	0.05
Hexachlorobenzene	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020 (<0.0020)	<0.0020	<0.0020	0.02
Hexachlorobutadiene	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020 (<0.0020)	<0.0020	<0.0020	0.01
Hexachloroethane	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020 (<0.0020)	<0.0020	<0.0020	0.01
Methyloxychlor	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0020 (<0.0020)	<0.0050	<0.0050	0.05
Polychlorinated Biphenyls									
Total Polychlorinated Biphenyls	<0.020	<0.020	<0.020	<0.020	<0.020	<0.015	<0.015	<0.015	0.3

Notes:

MOECC Table 8 Standards* — Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 8 Standards, All Soil Textures, Potable Groundwater Condition within 30 m of a Water Body, for Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use.

BOLD	Exceeds Site Condition Standard
BOLD	Reportable Detection Limit Exceeds Site Condition Standard
Units	All Units In Micrograms Per Gram, Unless Otherwise Noted
(##)	Bracketed Values Indicate Laboratory Duplicate Results
mbgs	Metres Below Ground Surface
NV	No Value

TABLE 1
SOIL ANALYTICAL RESULTS
Triovest Realty Advisors Inc.
12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Sample Designation	*BH21-1*	*DUP-2*	*BH22-1*	***MOECC Table 8 Standards****
Sample Collection Date (dd/mm/yyyy)	*06/11/2017*	*06/11/2017*	*06/11/2017*	
Sample Depth (mbgs)	*0 to 0.3*	*0 to 0.3*	*0 to 0.3*	
Sample Location	*BH21*	*BH21*	*BH22*	
Laboratory Certificate of Analysis No.	*B7P0185*	*B7P0185*	*B7P0185*	
Date(s) of Analysis (dd/mm/yyyy)	*13/11/2017*	*13/11/2017*	*13/11/2017*	
	14/11/2017	*14/11/2017*	*14/11/2017*	
	-	-	-	
	-	-	-	
Miscellaneous Parameters				
pH (pH Units)	-	-	-	NV
Sieve #200 <0.075 mm (%)	-	-	-	NV
Sieve #200 >0.075 mm (%)	-	-	-	NV
Soil Texture	-	-	-	NV
Petroleum Hydrocarbons (PHCs)				
PHCs F1 (C_6 - C_{10})	-	-	-	25
PHCs F2 (>C_{10} - C_{16})	-	-	-	10
PHCs F3 (>C_{16} - C_{34})	-	-	-	240
PHCs F4 (>C_{34} - C_{50})	-	-	-	120
Benzene, Toluene, Ethylbenzene and Xylenes (BTEX)				
Benzene	-	-	-	0.02
Toluene	-	-	-	0.2
Ethylbenzene	-	-	-	0.05
Xylenes	-	-	-	0.05
Polycyclic Aromatic Hydrocarbons				
Acenaphthene	-	-	-	0.072
Acenaphthylene	-	-	-	0.093
Anthracene	-	-	-	0.22
Benzo(a)anthracene	-	-	-	0.36
Benzo(a)pyrene	-	-	-	0.3
Benzo(b)fluoranthene	-	-	-	0.47
Benzo(ghi)perylene	-	-	-	0.68
Benzo(k)fluoranthene	-	-	-	0.48
Chrysene	-	-	-	0.16
Dibenzo(a,h)anthracene	-	-	-	0.18
Fluoranthene	-	-	-	0.69
Fluorene	-	-	-	0.19
Indeno(1,2,3-cd)pyrene	-	-	-	0.23
Methylnaphthalene 2-(1-)	-	-	-	0.59
Naphthalene	-	-	-	0.09
Phenanthrene	-	-	-	0.69
Pyrene	-	-	-	1
Styrene	-	-	-	0.05
Organochlorine Pesticides				
Aldrin	<0.0020	<0.0020	<0.0020	0.05
Chlordane (Total)	<0.0020	<0.0020	<0.0020	0.05
o,p-DDD + p,p-DDD	<0.0020	<0.0020	<0.0020	0.05
o,p-DDE + p,p-DDE	<0.0020	<0.0020	<0.0020	0.05
o,p-DDT + p,p-DDT	<0.0020	<0.0020	<0.0020	1.4
Dieldrin	<0.0020	<0.0020	<0.0020	0.05
Endosulfan (Total)	<0.0020	<0.0020	<0.0020	0.04
Endrin	<0.0020	<0.0020	<0.0020	0.04
Heptachlor	<0.0020	<0.0020	<0.0020	0.05
Heptachlor Epoxide	<0.0020	<0.0020	<0.0020	0.05
Hexachlorobenzene	<0.0020	<0.0020	<0.0020	0.02
Hexachlorobutadiene	<0.0020	<0.0020	<0.0020	0.01
Hexachloroethane	<0.0020	<0.0020	<0.0020	0.01
Methyloxychlor	<0.0050	<0.0050	<0.0050	0.05
Polychlorinated Biphenyls				
Total Polychlorinated Biphenyls	<0.020	<0.015	<0.015	0.3

Notes:

MOECC Table 8 Standards*	Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 8 Standards, All Soil Textures, Potable Groundwater Condition within 30 m of a Water Body, for Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use.
BOLD	Exceeds Site Condition Standard
BOLD	Reportable Detection Limit Exceeds Site Condition Standard
Units	All Units In Micrograms Per Gram, Unless Otherwise Noted
(##)	Bracketed Values Indicate Laboratory Duplicate Results
mbgs	Metres Below Ground Surface

TABLE 2
MAXIMUM CONCENTRATIONS IN SOIL
Triovest Realty Advisors Inc.
12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Parameter	*Maximum Concentration*	*Sample Designation*	*Sample Location*	*Sample Depth (mbgs)*
Petroleum Hydrocarbons (PHCs)				
PHCs F1 (C_6 - C_{10})	<10	All Submitted Samples		
PHCs F2 (>C_{10} - C_{16})	<10	All Submitted Samples		
PHCs F3 (>C_{16} - C_{34})	<50	All Submitted Samples		
PHCs F4 (>C_{34} - C_{50})	<50	All Submitted Samples		
Benzene, Toluene, Ethylbenzene and Xylenes				
Benzene	<0.020	All Submitted Samples		
Toluene	<0.020	All Submitted Samples		
Ethylbenzene	<0.020	All Submitted Samples		
Xylenes	<0.040	All Submitted Samples		
Polycyclic Aromatic Hydrocarbons				
Acenaphthene	<0.0050	All Submitted Samples		
Acenaphthylene	<0.0050	All Submitted Samples		
Anthracene	<0.0050	All Submitted Samples		
Benzo(a)anthracene	<0.0050	All Submitted Samples		
Benzo(a)pyrene	<0.0050	All Submitted Samples		
Benzo(b)fluoranthene	<0.0050	All Submitted Samples		
Benzo(ghi)perylene	<0.0050	All Submitted Samples		
Benzo(k)fluoranthene	<0.0050	All Submitted Samples		
Chrysene	<0.0050	All Submitted Samples		
Dibenzo(a,h)anthracene	<0.0050	All Submitted Samples		
Fluoranthene	<0.0050	All Submitted Samples		
Fluorene	<0.0050	All Submitted Samples		
Indeno(1,2,3-cd)pyrene	<0.0050	All Submitted Samples		
Methylnaphthalene 2-(1-)	<0.0071	All Submitted Samples		
Naphthalene	<0.0050	All Submitted Samples		
Phenanthrene	<0.0050	All Submitted Samples		
Pyrene	<0.0050	All Submitted Samples		
Styrene	<0.0050	All Submitted Samples		
Organochlorine Pesticides				
Aldrin	<0.0020	All Submitted Samples		
Chlordane (Total)	<0.0020	All Submitted Samples		
o,p-DDD + p,p-DDD	<0.0020	All Submitted Samples		
o,p-DDE + p,p-DDE	<0.0020	All Submitted Samples		
o,p-DDT + p,p-DDT	<0.0020	All Submitted Samples		
Dieldrin	<0.0020	All Submitted Samples		
Endosulfan (Total)	<0.0020	All Submitted Samples		
Endrin	<0.0020	All Submitted Samples		
Heptachlor	<0.0020	All Submitted Samples		
Heptachlor Epoxide	<0.0020	All Submitted Samples		
Hexachlorobenzene	<0.0020	All Submitted Samples		
Hexachlorobutadiene	<0.0020	All Submitted Samples		
Hexachloroethane	<0.0020	All Submitted Samples		
Methyloxychlor	<0.0050	All Submitted Samples		
Polychlorinated Biphenyls				
Total Polychlorinated Biphenyls	<0.040	BH03-1, BH05-1 and BH08-1	BH03, BH05 and BH08	0 to 0.3

Notes:

Units	All Units In Micrograms Per Gram, Unless Otherwise Noted
mbgs	Metres Below Ground Surface

10.0 APPENDICES

APPENDIX A

Legal Survey

METRIC

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

OVERSIZE 1 OF 1 SHEETS

PLAN OF TOPOGRAPHICAL SURVEY OF

PART OF LOTS 2 AND 3 CONCESSION 5

(GEOGRAPHIC TOWNSHIP OF ALBION, COUNTY OF PEEL)

TOWN OF CALEDON

REGIONAL MUNICIPALITY OF PEEL

SCALE 1 : 500

10m 0 10 20 30m

NOTES

BEARINGS SHOWN HEREON ARE UTM GRID, ZONE 17, NAD83(CSRS) (2010) AND ARE DERIVED FROM THE OBSERVED REFERENCE POINTS OCP1 AND OCP2 BY REAL TIME NETWORK AND STATIC OBSERVATIONS.

DISTANCES SHOWN ON THIS PLAN ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99969786.

CONTROL MONUMENTS SHOWN HAVE BEEN TIED TO THIS SURVEY TO THE URBAN ACCURACY PER SEC. 14(2) OF ONTARIO REGULATION 216/10.

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

LEGEND

BENCH MARK

ELEVATIONS ARE DERIVED FROM BENCH MARK No. 10519980009 OBTAINED FROM THE MINISTRY OF NATURAL RESOURCES COSINE INTERNET SITE HAVING AN ELEVATION OF 217.968 METRES.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 17th DAY OF JUNE, 2014.

JUNE 19, 2014.
DATE:

J. NANFARA
ONTARIO LAND SURVEYOR

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
1892298

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR In accordance with Regulation 1026, Section 29(3).

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nanfara & ng surveyors inc
PROFESSIONAL LAND SURVEYORS
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CHECKED BY:	DRAWN BY:	REV. DATE:	W.O.	REV.
JN	MRD	2014/06/19	20140576T1	A

APPENDIX B

Sampling and Analysis Plan

DRAFT

Sampling and Analysis Plan for Phase Two Environmental Site Assessment

12300, 12400, 12490 and 19592 Coleraine Drive
Caledon, Ontario

Prepared for:

Triovest Realty Advisors Inc.
40 University Avenue, Suite 1200
Toronto, ON M5J 1T1

Attn: Mr. Randy Gladman
Vice President, Development

December 7, 2017

Pinchin File: 210701.001

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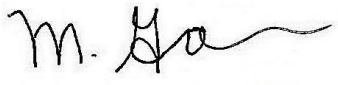
Issued To:	**Triovest Realty Advisors Inc.**
Contact:	**Mr. Randy Gladman** **Vice President, Development**
Issued On:	**December 7, 2017**
Pinchin File:	**210701.001**
Issuing Office:	**6 - 875 Main Street West, Suite 200,** **Hamilton ON L8S 4P9**
Primary Pinchin Contact:	**Melissa Gallagher, P.Eng.**



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1.0 INTRODUCTION

Pinchin Ltd. (Pinchin) has prepared this Sampling and Analysis Plan (SAP) for the Phase Two Environmental Site Assessment (ESA) to be performed at the property located at 12300, 12400, 12490 and 19592 Coleraine Drive in Caledon, Ontario (Site or Phase Two Property). The Phase Two Property is presently undeveloped and consists of access roads, agricultural land and forested areas. A Key Map showing the Phase Two Property location is provided on Figure 1 (all figures are located in Appendix I).

The Phase Two ESA will be conducted at the request of Triovest Realty Advisors Inc. (Client) to support the filing of a Record of Site Condition (RSC) with the Ontario Ministry of the Environment and Climate Change (MOECC, formerly the Ontario Ministry of the Environment) and will be completed in accordance with the Province of Ontario's *Ontario Regulation 153/04: Records of Site Condition – Part XV.1 of the Act*, which was last amended by Ontario Regulation 333/13 on July 28, 2017 (O. Reg. 153/04).

This SAP provides the scope of work and procedures for completing the field investigation for the Phase Two ESA. The Phase Two ESA will be performed in accordance with the scope of work, and terms and conditions described in the proposal entitled *"Proposal for Phase Two Environmental Site Assessment and Record of Site Condition Filing, 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario"*, prepared for Client, dated October 13, 2017.

2.0 AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

The objectives of the Phase Two ESA will be to assess soil quality at the Phase Two Property in relation to three areas of potential environmental concern (APECs) and related potentially contaminating activities (PCAs) and contaminants of potential concern (COPCs) identified in a Phase One ESA completed by Pinchin in accordance with O. Reg. 153/04, the findings of which are provided in the draft report entitled "*Phase One Environmental Site Assessment, 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario",* prepared for Client. The APECs and corresponding PCAs and COPCs are summarized on Figure 2 and in the following table:

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #1 (Former AST Within Basement of	Southwest Portion of Phase One Property	Item 28 – Gasoline and Associated Products	On-Site	PHCs BTEX PAHs	Soil

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Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
Residential Building at 12300 Coleraine Drive Likely Containing Fuel Oil)		Storage in Fixed Tanks			
APEC #2 (Two Former ASTs Adjacent to Former Barn at 12300 Coleraine Drive Likely Containing Fuel Oil and/or Diesel)	Southwest Portion of Phase One Property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs BTEX PAHs	Soil
APEC #3 (Historical and Ongoing Agricultural Operations)	Majority of Phase One Property	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	On-Site	OC Pesticides PCBs	Soil

Notes:

BTEX – benzene, toluene, ethylbenzene and total xylenes
PHCs – petroleum hydrocarbon fractions F1-F4
PAHs – polycyclic aromatic hydrocarbons
OC – organochlorine
PCBs – polychlorinated biphenyls

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3.0 SCOPE OF WORK

The information obtained from the Phase One ESA, in particular the Phase One Conceptual Site Model, was used to determine the environmental media requiring investigation during the Phase Two ESA (i.e., soil and groundwater), the locations and depths for sample collection, and the parameters to be analyzed for the samples submitted from each APEC. The Phase Two ESA scope of work will include the advancement of twenty-two boreholes. The proposed borehole locations are provided on Figure 3.

Table 1 in Appendix II provides a detailed summary of the proposed Phase Two ESA scope of work, including:

- Boreholes to be completed within each APEC and the COPCs to be analyzed for samples collected in each APEC;
- Media to be sampled at each sampling location, the sampling system (see Section 7.0), the soil sampling depth intervals and the sampling frequency; and
- Number of samples per borehole to be collected and submitted for laboratory analysis.

Note that the soil sampling depth intervals (i.e., borehole depths) and sampling frequency are based on Pinchin's current knowledge of subsurface conditions and may be revised based on the actual subsurface conditions encountered.

Additional scope of work items include the following:

- Submission of two surface soil samples (0 to 1.5 mbgs) and one subsurface soil sample (deeper than 1.5 mbgs) for pH analysis; and
- Submission of three soil samples for grain size analysis.

4.0 DATA QUALITY OBJECTIVES

The data quality objectives (DQOs) for the Phase Two ESA will be to obtain unbiased analytical data that are representative of actual soil and groundwater conditions at the Phase Two Property. This will be accomplished by implementing a quality assurance/quality control (QA/QC) program, as described in Section 5.0, and by completing the field work in accordance with Pinchin's standard operating procedures (SOPs), as described in Section 6.0. Pinchin's SOPs are based in part on the MOECC's *"Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario"*, dated December 1996 and the Association of Professional Geoscientists of Ontario document entitled *"Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended)"*, dated April 2011.

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The DQOs are intended to minimize uncertainty in the analytical data set such that the data are considered reliable enough to not affect the conclusions and recommendations of the Phase Two ESA and to meet the overall objective of the Phase Two ESA, which is to assess the environmental quality of the Phase Two Property in relation to the identified APECs.

5.0 QUALITY ASSURANCE/QUALITY CONTROL PROGRAM

5.1 Non-Dedicated Sampling and Monitoring Equipment Cleaning

Based on the proposed scope of work, a non-dedicated hand auger will be used for soil sampling during completion of the Phase Two ESA. The hand auger will be cleaned prior to initial use and between samples or sampling locations, as appropriate, following the equipment cleaning procedures described in SOP-EDR009. Any non-dedicated sampling or monitoring equipment not listed above that is used during the Phase Two ESA will also be cleaned in accordance with SOP-EDR009.

5.2 Trip Blanks

Groundwater sampling is not being undertaken during the Phase Two ESA and as such, submission and analysis of trip blanks is not required.

5.3 Field Duplicate Samples

Field duplicate soil and groundwater samples will be collected for laboratory analysis in accordance with SOP-EDR025 at a frequency of one sample for every ten samples submitted for laboratory analysis, with a minimum of one sample per media sampled per COPC.

5.4 Calibration Checks on Field Instruments

5.4.1 Field Screening Instruments

The combustible gas indicator (CGI) used for the field screening of soil samples will be calibrated in accordance with the procedures described in SOP-EDR003. Calibration checks will also be made at the frequency specified in SOP-EDR003.

Records of the calibration and calibration checks of the CGI, including any calibration sheets provided by the equipment supplier, will be kept for inclusion in the Phase Two ESA report.

5.4.2 Water Quality Measurement Instruments

The Phase Two ESA scope of work will not include groundwater sampling and the calibration of water quality measurement instruments is not required.

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6.0 STANDARD OPERATING PROCEDURES

The proposed field investigation for the Phase Two ESA will require the following SOPs to be followed:

- Borehole drilling (SOP-EDR006);
- Soil sampling (SOP-EDR013 and SOP-EDR019);
- Field screening (SOP-EDR003); and
- QA/QC sampling (SOP-EDR025).
- Non-dedicated field equipment decontamination (SOP-EDR009).

The above-referenced SOPs are provided in Appendix III. Each SOP includes a section describing the specific requirements for Phase Two ESAs completed to support the filing of an RSC in accordance with O. Reg. 153/04.

Any deviations from the SOPs will be summarized in the Phase Two ESA report.

7.0 SAMPLING SYSTEM

The borehole locations in all APECs will be selected following a judgemental sampling system. Boreholes and monitoring wells will be placed at locations where the potential for COPCs to be present is considered the highest (i.e., “worst case”), as per the following:

- A borehole will be completed in the approximate location of the former house associated with 12300 Coleraine Drive that, according to the Phase I ESA completed at this portion of the Phase Two Property in 2008 by Soil Engineers Ltd. (2008 Phase I ESA), historically contained an aboveground storage tank (AST). This AST is inferred to have historically contained fuel oil (APEC #1);
- A borehole will be advanced in the approximate location of the empty ASTs observed adjacent to a barn associated with 12300 Coleraine Drive during the 2008 Phase I ESA, which are inferred to have previously contained diesel or fuel oil (APEC #2); and
- Twenty boreholes will be completed throughout the portion of the Phase Two Property that is currently and has historically been utilized for agricultural purposes (APEC #3).

In addition, the field screening results for soil samples collected from each borehole will be used to select “worst case” samples for laboratory analysis.

The sampling system that will be used for each APEC is summarized in Table 1.

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8.0 PHYSICAL IMPEDIMENTS

Pinchin does not anticipate any physical impediments that will limit access to the Phase Two Property during completion of the Phase Two ESA.

9.0 TERMS AND LIMITATIONS

This Sampling and Analysis Plan (SAP) has been prepared to summarize the general scope of work and field procedures to be followed for the Phase Two ESA that will be performed for Triovest Realty Advisors Inc. (Client) in order to investigate potential environmental impacts at 12300, 12400, 12490 and 12592 Coleraine Drive in Caledon, Ontario (Site). The term recognized environmental condition means the presence or likely presence of any hazardous substance on a property under conditions that indicate an existing release, past release, or a material threat of a release of a hazardous substance into structures on the property or into the ground, groundwater, or surface water of the property. The Phase Two ESA will not quantify the extent of the current and/or recognized environmental condition or the cost of any remediation.

Conclusions derived from the Phase Two ESA will be specific to the immediate area of study and cannot be extrapolated extensively away from sample locations. Samples will be analyzed for a limited number of contaminants that are expected to be present at the Site, and the absence of information relating to a specific contaminant does not indicate that it is not present.

No environmental site assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions on a property. Performance of the Phase Two ESA to the standards established by Pinchin is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions on the Site, and recognizes reasonable limits on time and cost.

The Phase Two ESA will be performed in general compliance with currently acceptable practices for environmental site investigations, and specific Client requests, as applicable to this Site.

This SAP was prepared for the exclusive use of the Client, subject to the terms, conditions and limitations contained within the duly authorized proposal for this project. Any use which a third party makes of this SAP, or any reliance on or decisions to be made based on it, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted.

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If additional parties require reliance on this SAP, written authorization from Pinchin will be required. Pinchin disclaims responsibility of consequential financial effects on transactions or property values, or requirements for follow-up actions and costs. No other warranties are implied or expressed. Furthermore, this SAP should not be construed as legal advice. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law.

Pinchin makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this SAP, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and these interpretations may change over time.

J:\210000s\0210701.000 Triovest,12300Coleraine,EDR,PhaseOne\0210701.001 Triovest,12300Coleraine,EDR,PhaseTwo\Deliverables\Appendix B - SAP\210701.001 SAP, Triovest, 12300 Coleraine Dr, Caledon, ON.docx

Template: RSC Sampling and Analysis Plan, EDR, July 12, 2017

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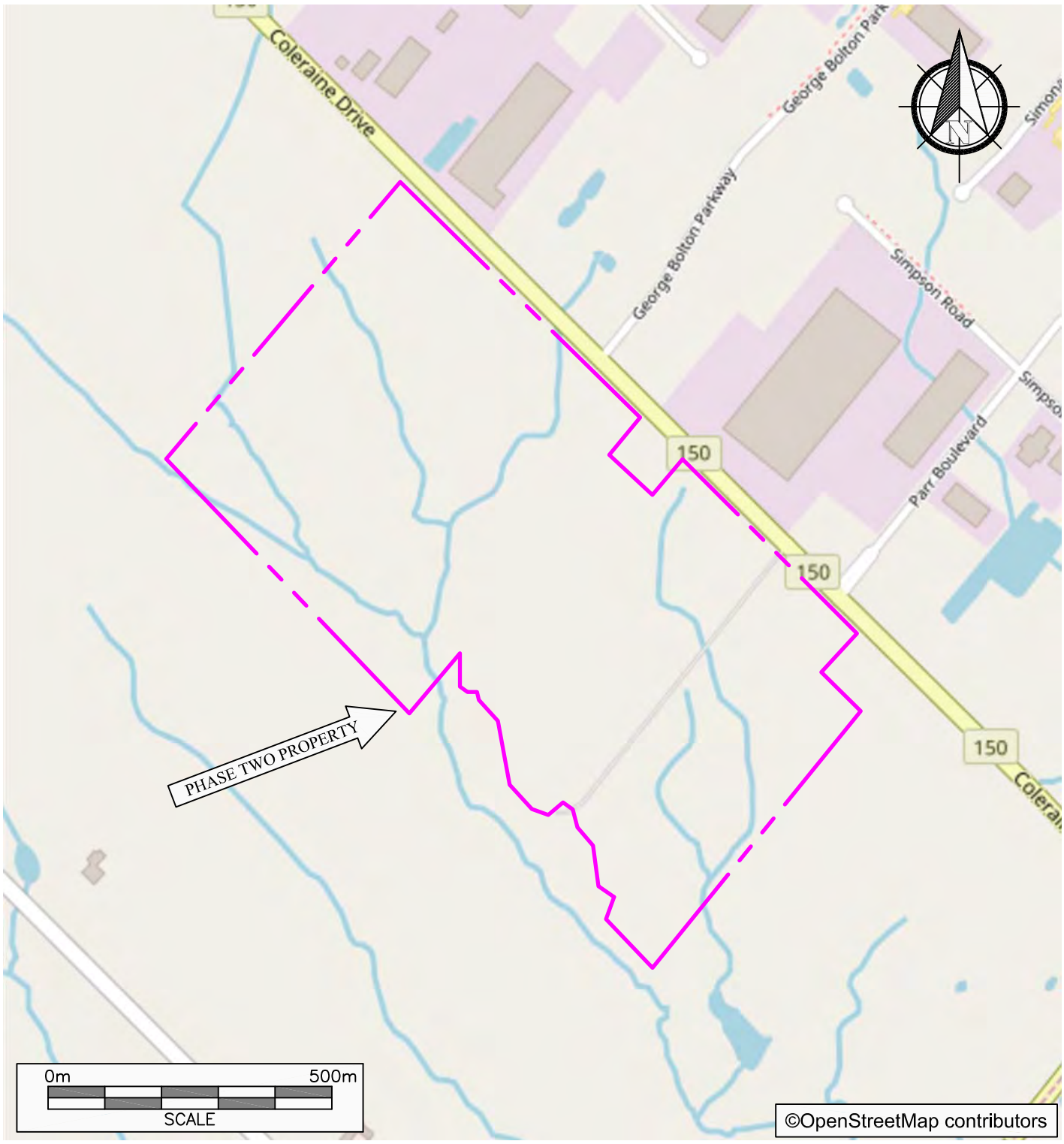
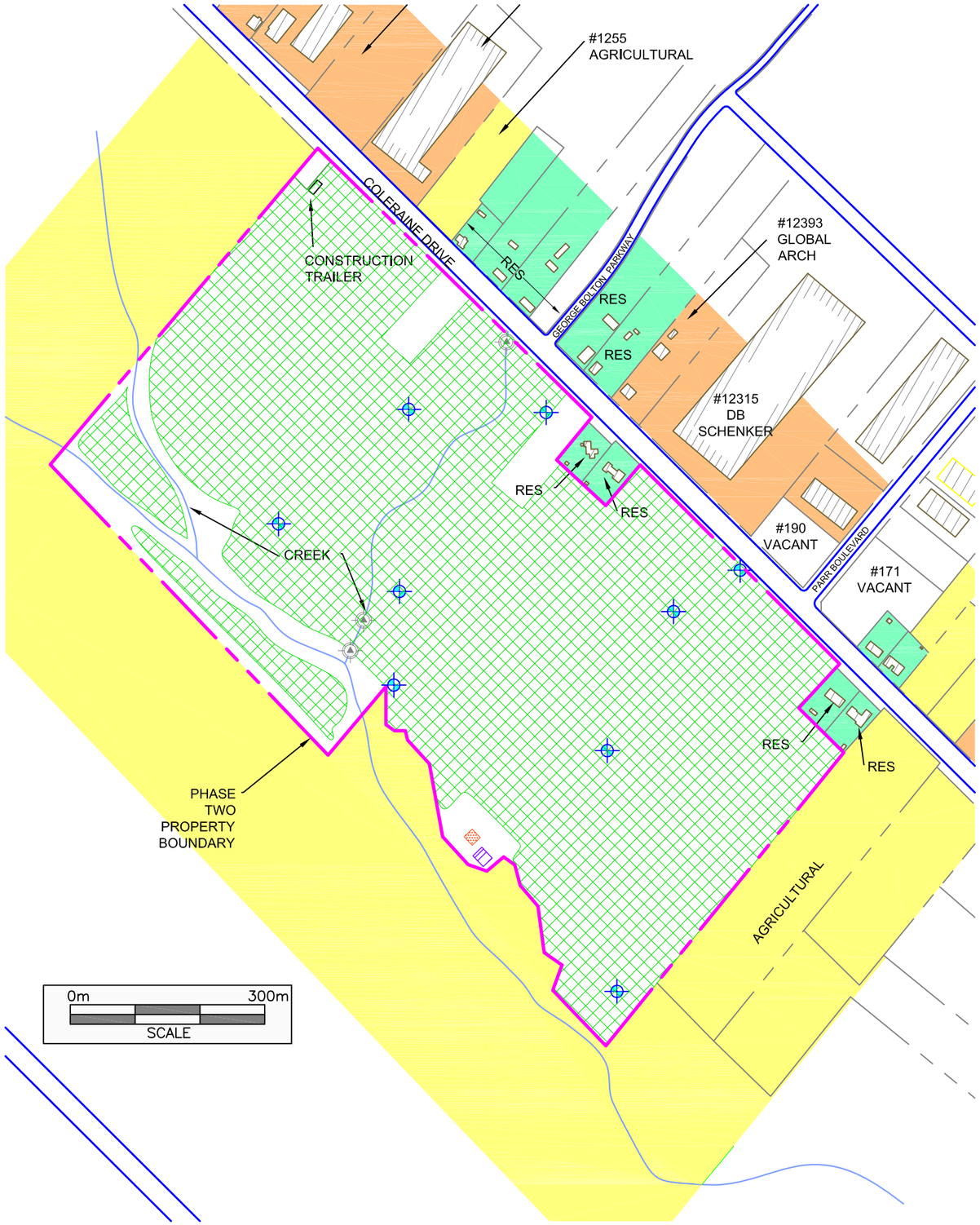
APPENDIX I
Figures



PINCHIN

PROJECT NAME	SAMPLING AND ANALYSIS PLAN		
CLIENT NAME	TRIOVEST REALTY ADVISORS INC.		
PROJECT LOCATION	12300, 12400, 2490 AND 12592 COLERAINE DRIVE, CALEDON, ONTARIO		
FIGURE NAME	KEY MAP		FIGURE NO. 1
SCALE: AS SHOWN	PROJECT NO.: 210701.001	DATE: NOV. 2017	



Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase Two Property	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #1 (Former AST Within Basement of Residential Building at 12300 Coleraine Drive Likely Containing Fuel Oil)	Southwest Portion of Phase Two Property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs BTEX PAHs	Soil
APEC #2 (Two Former ASTs Adjacent to Former Barn at 12300 Coleraine Drive Likely Containing Fuel Oil and/or Diesel)	Southwest Portion of Phase Two Property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs BTEX PAHs	Soil
APEC #3 (Historical and Ongoing Agricultural Operations)	Majority of Phase Two Property	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	On-Site	OC Pesticides PCBs	Soil

INFERRED GROUNDWATER FLOW DIRECTION

LEGEND

- RESIDENTIAL PROPERTY USE
- AGRICULTURAL PROPERTY USE
- COMMERCIAL / INDUSTRIAL PROPERTY USE
- RES RESIDENTIAL
- PHASE ONE STUDY AREA BOUNDARY
- MONITORING WELL LOCATION
- MONITORING WELL CLUSTER LOCATION
- APEC 1
- APEC 2
- APEC 3

PINCHIN

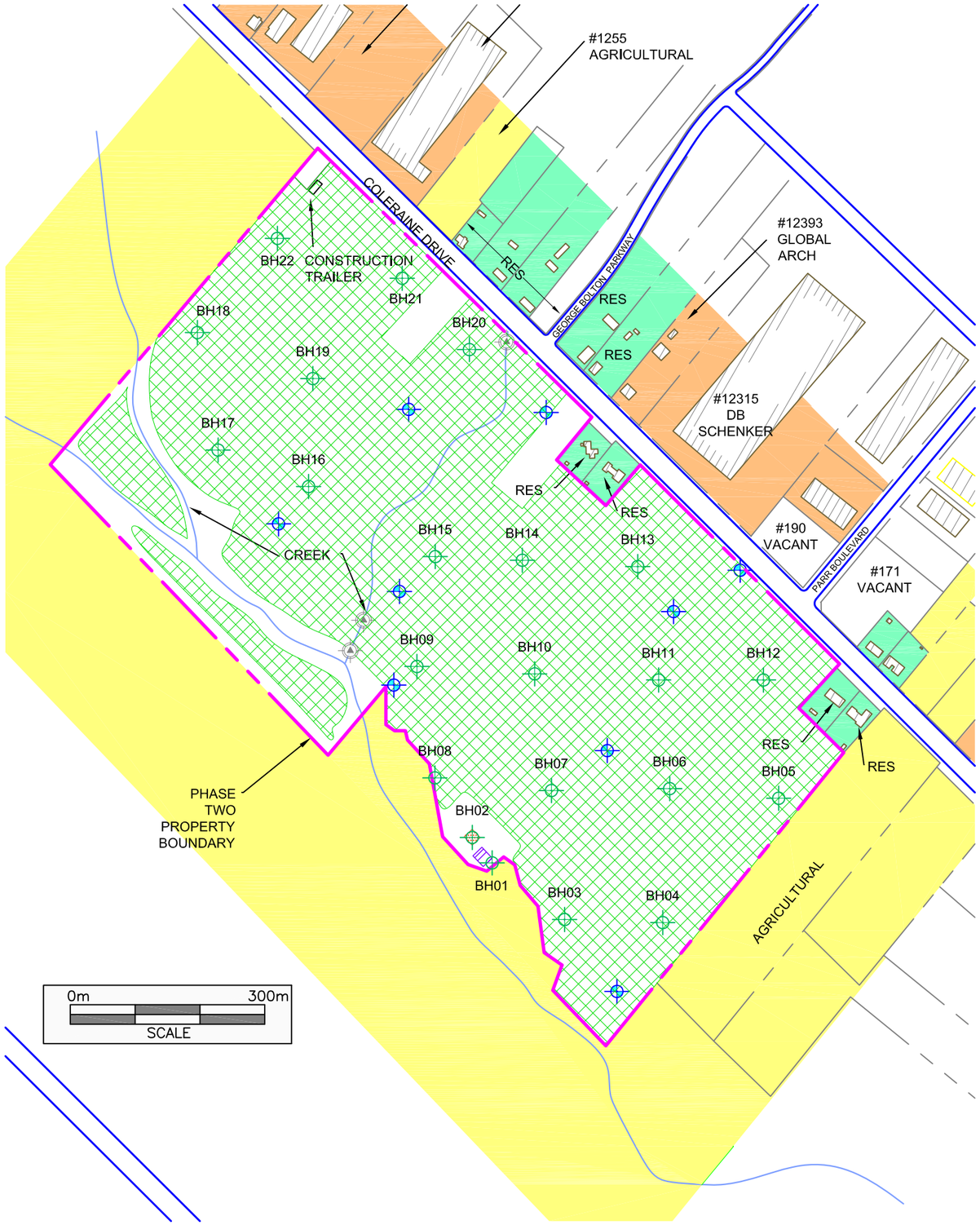
PROJECT NAME
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

CLIENT NAME
TRIOVEST REALTY ADVISORS INC.

PROJECT LOCATION
12300, 12400, 2490 AND 12592 COLERAINE DRIVE, CALEDON, ONTARIO

FIGURE NAME
AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

SCALE	PROJECT NO.
AS SHOWN	210701.001
DATE	FIGURE NO.
NOV. 2017	2



Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase Two Property	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #1 (Former AST Within Basement of Residential Building at 12300 Coleraine Drive Likely Containing Fuel Oil)	Southwest Portion of Phase Two Property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs BTEX PAHs	Soil
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INFERRED GROUNDWATER FLOW DIRECTION

LEGEND

- RESIDENTIAL PROPERTY USE
- AGRICULTURAL PROPERTY USE
- COMMERCIAL / INDUSTRIAL PROPERTY USE
- RES RESIDENTIAL
- PHASE ONE STUDY AREA BOUNDARY
- MONITORING WELL LOCATION
- MONITORING WELL CLUSTER LOCATION
- APEC 1
- APEC 2
- APEC 3
- BOREHOLE LOCATION

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PROJECT NAME
SAMPLING AND ANALYSIS PLAN

CLIENT NAME
TRIOVEST REALTY ADVISORS INC.

PROJECT LOCATION
12300, 12400, 2490 AND 12592
COLERAINE DRIVE, CALEDON, ONTARIO

FIGURE NAME
BOREHOLE AND
CROSS-SECTION
LOCATION

SCALE	PROJECT NO.
AS SHOWN	210701.001
DATE	FIGURE NO.
NOV. 2017	3

APPENDIX II
Tables

TABLE 1
PHASE TWO ESA SCOPE OF WORK SUMMARY
Triovest Realty Advisors Inc.
12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

APEC #	Sampling Location	Media Sampled	COPCs					Number of Samples Submitted for Analysis	Soil Sampling Depth Interval (mbgs)	Sampling Frequency	Sampling System	Rationale/Notes
			PHCs	BTEX	PAHs	PCBs	OC Pesticides					
1	BH01	Soil	●	●	●			1	0 to 4.57	Continous/Soil cores every 1.5 m	Judgemental	Assess soil quality in relation to vent and fill pipes observed during a Phase I ESA completed in 2008 (2008 Phase I ESA) along an exterior elevation of a residential building formerly located on the portion of the Phase Two Property holding the municipal address of 12300 Coleraine Drive. These vent and fill pipes are inferred to have been associated with a fuel oil AST within the basement of this building. (PCA #1)
2	BH02	Soil	●	●	●			1	0 to 4.57	Continous/Soil cores every 1.5 m	Judgemental	Assess soil quality in relation to empty ASTs observed during the 2008 Phase I ESA adjacent to a barn formerly located on the portion of the Phase Two Property holding the municipal address of 12300 Coleraine Drive. These ASTs are inferred to have been historically utilized for fuel oil or diesel storage. (PCA #2)
3	BH03	Soil				●	●	1	0 to 0.3	Continous/Soil cores every 1.5 m	Judgemental	Assess soil quality in relation to the historical and ongoing agricultural activities on the Phase Two Property. (PCA #3)
	BH04	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	
	BH05	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	
	BH06	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	
	BH07	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	
	BH08	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	
	BH09	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	
	BH10	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	
	BH11	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	
	BH12	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	
	BH13	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	
	BH14	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	
	BH15	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	
	BH16	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	
	BH17	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	
	BH18	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	
	BH19	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	
	BH20	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	
	BH21	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	
	BH22	Soil				●	●	1	0 to 0.3	Continous/Soil samples every 0.3 m	Judgemental	

Notes:

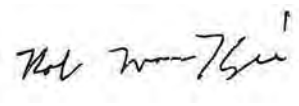
PHCs	Petroleum Hydrocarbons (Fraction 1	APEC	Area of Potential Environmental Concern
BTEX	Benzene, Toluene, Ethylbenzene ar	COPCs	Contaminants of Potential Concern
PAHs	Polycyclic Aromatic Hydrocarbons	m	metre
PCBs	Polychlorinated Biphenyls	mbgs	metres below ground surface
OC	Organochlorine	PCA	Potentially Contaminating Activity

Pinchin File: 90000

APPENDIX III

Pinchin Standard Operating Procedures

SOP – EDR003 – REV004 – FIELD SCREENING OF SOIL SAMPLES

Title:	Field Screening of Soil Samples
Practice:	EDR
First Effective Date:	June 16, 2009
Version:	004
Version Date:	April 28, 2017
Author:	Robert MacKenzie
Authorized by:	Robert MacKenzie
Signature:	

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1.0 VERSION HISTORY

Version	Date	Summary of Changes	Author
Original	June 16, 2009	N/A	MEM
001	November 26, 2010	Update approval signature	FG
002	September 25, 2013	Revised SOP to reflect current practices/Added section on O.Reg. 153/04 compliance	RLM
003	April 29, 2016	Updated Section 4.0/Modified time between readings to 1 hour	RLM
004	April 28, 2017	Removed reference to Pinchin West/In Section 5.2, clarified that soil vapour measurements do not need to be made within one hour of sampling during winter conditions	RLM

2.0 SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) presents the quantitative and qualitative methods to be used by Pinchin field personnel for field screening soil samples for potential impacts during field investigations.

The quantitative part of field screening consists of the measurement of vapour concentrations in soil sample headspace in order to assess the potential for volatile constituents to be present in the soil. The soil vapour readings obtained from these measurements are then used to assist in selecting potential "worst case" soil samples for submission to the laboratory for analysis. There are no regulatory standards for comparison with soil headspace vapour readings and we are using the general principle that the sample with the highest soil headspace vapour concentration from a group of samples is often the most likely to be impacted by volatile constituents.

The qualitative part of field screening includes assessing the soil for visual or olfactory indicators of potential contamination and is used in conjunction with the soil headspace vapour readings to select "worst case" soil samples to be submitted for laboratory analysis.

Note that soil vapour measurements have limited value when selecting "worst case" soil samples for laboratory analysis of non-volatile parameters such as metals. Visual observations of the presence of staining and debris (e.g., brick fragments and other building materials, coal ash, etc.), along with sample depth and likely migration pathways are to be factored into selecting the samples. The sample with the highest soil headspace vapour reading is not automatically selected under these circumstances.

Soil samples collected for soil vapour measurement must not be submitted for laboratory analysis except for analysis of non-volatile parameters (i.e., metals and inorganics) or grain size analysis.

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This SOP also applies to the field screening of sediment samples but for simplicity, only soil samples are referred to below.

3.0 OVERVIEW

Not applicable.

4.0 DISTRIBUTION

This is an on-line document. Paper copies are valid only on the day they are printed. Refer to the author if you are in any doubt about the accuracy of this document.

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- Distributed to senior staff at Le Groupe Gesfor Poirier and Pinchin LeBlanc for distribution as appropriate.

5.0 PROCEDURE

5.1 Equipment and Supplies

- Resealable plastic bags (e.g., Ziploc®);

  (Note that small capacity bags (e.g., 500 millilitre capacity) are preferred over larger sized bags. When conducting headspace screening of a set of soil samples, the size of bag used should be consistent throughout in order to maintain the same approximate headspace volume in each bag);
- Combustible gas indicator (CGI) capable of operating in methane-elimination and/or photo-ionization detector (PID);

  (The Project Manager will be responsible for selecting the appropriate instrument(s) for each project. CGIs (e.g., RKI Eagle or Gastechtor) are acceptable for screening of petroleum hydrocarbons (PHCs) and related compounds, whereas PIDs (e.g., MiniRAE) are acceptable for screening for volatile organic compounds (VOCs), including chlorinated solvents, but can also be used when screening for PHCs. For many projects, it will be appropriate to employ both a CGI and a PID); and
- Calibration equipment (e.g., calibration gas, regulators, tubing, calibration bags, etc. as provided by the equipment supplier).

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5.2 Soil Headspace Vapour Measurement Procedure

The procedure for conducting soil headspace vapour measurements for soil sample headspace is as follows:

1. Unless pre-calibrated by the equipment supplier, calibrate the CGI/PID as per the instrument manufacturer's instructions before commencing soil vapour measurements. Record the date and time of calibration, and type and concentration of the calibration gas used in the field logbook or field forms;
2. Label the plastic bag with the sample number;
3. Create a split soil sample by splitting the sample core vertically (i.e., along the longitudinal axis) with one half used for soil headspace vapour measurement and the other half used to fill sample jars for laboratory analysis of volatile parameters (e.g., VOCs and PHCs (F1 fraction)). In other words, the depth interval of the soil subjected to soil headspace vapour measurements should be the same as the depth interval from which samples for volatile parameters are collected. This procedure doesn't apply to grab samples but is to be completed when soil cores are obtained, such as sampling with dual tube samplers, split-spoon samplers and hand augers. For grab samples, soil used for laboratory analysis and soil headspace vapour measurements should be collected from proximal locations;
4. Place the soil into the plastic bag until the bag is approximately one-quarter full as soon as possible after the sampling device is retrieved/opened;
5. Seal the bag and break apart the soil by manually kneading the soil in the sealed bag;
6. Allow the soil sample to equilibrate at ambient temperature for a minimum of 5 minutes but no longer than one hour before taking a soil headspace vapour measurement. The exception to this is that during winter conditions, the soil samples should be placed in a heated environment (e.g., building interior) to warm up for a minimum of 15 minutes before taking soil vapour measurements. In this case, the soil vapour measurements do not need to be completed within one hour of sample collection;
7. Do not store the bagged soil samples in direct sunlight prior to taking soil headspace vapour measurements;
8. When conducting soil headspace vapour measurements with a CGI, make sure it is switched to methane elimination mode;
9. When completing soil headspace vapour measurements of a soil sample using both a PID and CGI, the vapour measurement using the PID should be made first;

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10. Immediately before taking a soil headspace vapour measurement, gently agitate the bag and then create a small opening in the top of the bag. Insert the tip of the CGI/PID into the headspace of the bag and quickly reseal the bag around the tip to minimize leakage. If there is any water inside the bag, ensure that the tip does not contact the water;
11. Record the maximum vapour concentration measured within the first 10 seconds after inserting the tip of the CGI/PID into the bag. Note any anomalies that occur during the taking of the measurement (e.g., if the readings displayed by the instrument progressively increase and do not reach an obvious peak);
12. Remove the tip of the CGI/PID from the bag and reseal the bag immediately in case additional soil headspace vapour measurements are needed. If the soil headspace vapour is measured for a sample using a PID and an additional measurement with a CGI is required, wait a minimum of five minutes after the bag is resealed before taking the measurement with the CGI;
13. Before completing the next soil headspace vapour measurement, allow the CGI/PID to reach “zero” or “baseline”. If the CGI/PID does not return to “zero” or “baseline” it should be recalibrated before further soil headspace vapour measurements are made;
14. At the discretion of the Project Manager, a calibration check of the CGI/PID should be completed at least once per day or at a frequency of once per 100 soil headspace vapour measurements (for projects where numerous soil headspace vapour measurements are made on a daily basis such as a large remediation project); and
15. A calibration check is made by measuring the concentration of a sample of the calibration gas with the CGI/PID without making any adjustments to the instrument beforehand and comparing the measured concentration with the known concentration. The comparison of the measured concentration versus the actual concentration of the calibration gas indicates how much the instrument’s calibration may have been altered during soil headspace vapour measurements, which is known as “instrument drift”. Should the calibration check show instrument drift of more than 10%, the CGI/PID needs to be recalibrated before completing further soil headspace vapour measurements. Record all pertinent information for the calibration check (e.g., date and time, initial measured concentration, calibration gas type and concentration) in the field logbook or field forms.

5.3 Visual Screening

Visual screening consists of examining the soil sample for potential indicators of contamination as per the following:

1. Visually examine the soil sample, including breaking apart a portion of the sample;

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2. Note any indications of a mottled appearance, dark discolouration or staining, free-phase product or unusual colour;
3. Note any indications of non-soil constituents, such as brick, asphalt, wood or concrete fragments, coal fragments, coal ash, etc.; and
4. Record the findings of the visual screening in the field logbook or field forms. If there is no visual evidence of impacts this should be noted.

5.4 Olfactory Screening

Record in the field logbook or field forms the presence of any odours noted during sample collection and visual screening. Field staff are not expected to directly smell soil samples to assess the presence/absence of odours.

If it is possible to identify the likely type of odour (e.g., PHC-like, solvent-like, etc.) then this information should be recorded along with a comment on the severity of the odour (e.g., slight, strong, etc.). If the odour cannot be readily identified, it should be described in the field notes as “unidentified odour”.

If no odours are observed, this information should also be recorded in the field logbook or field forms.

5.5 Additional Considerations for Ontario Regulation 153/04 Phase Two ESA Compliance

When completing a Phase Two Environmental Assessment (ESA) in accordance with Ontario Regulation 153/04, the following additional procedures must be undertaken:

- Calibration of the CGI/PID must be completed at the beginning of each field day and calibration checks must be made either at the end of each field day or after every 100 soil vapour readings (whichever occurs first); and
- Thorough records of the CGI/PID calibration and calibration checks must be kept, including any calibration sheets provided by the equipment supplier. The Quality Assurance/Quality Control section of the Phase Two ESA report requires a discussion of field screening instrument calibration, and equipment calibration records must be appended to the Phase Two ESA report.

6.0 TRAINING

The Practice Leader is responsible for identifying the training needs of EDR staff and ensuring that staff are trained and competent before undertaking work assignments.

All trained personnel are responsible for identifying coaching or re-training needs (if they are uncomfortable with work assignments that have been assigned).

The careful application of *Health & Safety Training* by each employee is an integral part of all activities and is assumed as part of this SOP.

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7.0 MAINTENANCE OF SOP

1 Year.

8.0 REFERENCES

Association of Professional Geoscientists of Ontario, *Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended),* April 2011.

Ontario Ministry of the Environment, *Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario*, December 1996.

9.0 APPENDICES

None.

I:\2017 SOP Updates\SOP - EDR003 - REV004 - Field Screening of Soil Samples.docx

Template: Master SOP Template – February 2014

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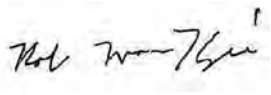
SOP – EDR006 – REV003 – BOREHOLE DRILLING

Title:	Borehole Drilling
Practice:	EDR
First Effective Date:	November 25, 2010
Version:	003
Version Date:	April 28, 2017
Author:	Francesco Gagliardi and Robert MacKenzie
Authorized by:	Robert MacKenzie
Signature:	

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1.0 VERSION HISTORY

Version	Date	Summary of Changes	Author
Original	November 25, 2010	N/A	FG
001	November 22, 2013	Streamlined text to reflect most common current practices/Removed sections covered by other SOPs	RM
002	April 29, 2016	Updated Section 4.0	RM
003	April 28, 2017	Removed reference to Pinchin West	RM

2.0 SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) presents a description of the methods employed for the completion of boreholes and the collection of subsurface soil samples.

Boreholes are typically completed to determine geologic conditions for hydrogeological evaluation, to allow the installation of monitoring wells, and to allow for the collection of subsurface soil samples for laboratory analysis.

Several methods are available for the collection of shallow subsurface soil samples using hand-held equipment (e.g., hand augers, post-hole augers). However, the use of a drill rig, equipped with direct-push tooling, solid-stem augers and/or hollow-stem augers, is the most common method used by Pinchin to advance boreholes and will be the focus of this SOP.

A detailed discussion of all the various drilling rigs and drilling methods (e.g., direct push, augering, sonic drilling, air/water/mud rotary drilling, etc.) is beyond the scope of this SOP. The Project Manager will be responsible for determining the appropriate drill rig and drilling method for the site investigation.

The majority of the site investigations completed by Pinchin involve relatively straightforward drilling within the overburden within a one aquifer system. In some situations, such as when multiple aquifers are spanned by a borehole, when drilling into bedrock or when there are known impacts in the shallow subsurface, drilling using telescoped casing methods may be appropriate. Telescoped casing and bedrock drilling methods are beyond the scope of this SOP. In these situations, the Project Manager, in consultation with the drilling contractor, will be required to confirm the drilling requirements and procedures.

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3.0 OVERVIEW

Not applicable.

4.0 DISTRIBUTION

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- Distributed to senior staff at Le Groupe Gesfor Poirier and Pinchin LeBlanc for distribution as appropriate.

5.0 PROCEDURE

5.1 General

The overall borehole drilling program is to be managed in accordance with SOP-EDR005. In particular, utility locates must be completed in accordance with SOP-EDR021 before any drilling activities commence.

All non-dedicated drilling and sample collection equipment must be decontaminated in accordance with SOP-EDR009.

5.2 Prior Planning and Preparation

The planning requirements for borehole drilling programs are covered in detail in SOP-EDR005.

As noted above, the type of drilling rig and drilling method will be determined by the Project Manager when scoping out the site investigation. In some cases, a switch in drilling rig and/or drilling method may be required depending on site conditions. For example, if competent bedrock is encountered in the subsurface at a depth above the water table, bedrock coring would be required to advance the borehole deep enough to install a monitoring well.

5.3 Borehole Drilling Procedures

Once the final location for a proposed boring has been selected and utility clearances are complete, one last visual check of the immediate area should be performed before drilling proceeds. This last visual check should confirm the locations of any adjacent utilities (subsurface or overhead) and verification of adequate clearance.

In some instances, in particular where there is uncertainty regarding the location of buried utilities or the borehole is being completed near a buried utility, the use of a hydro-excavating (hydro-vac) unit will be

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required to advance the borehole to a depth below the bottom of the utility. The hydro-vac uses a combination of high-pressure water and high-suction vacuum (in the form of a vacuum truck) to excavate soil. This is also known as “daylighting”. The need to use a hydro-vac will be determined by the Project Manager.

If it is necessary to relocate any proposed borehole due to terrain, utilities, access, etc., the Project Manager must be notified and an alternate location will be selected.

5.4 Borehole Nomenclature

If a borehole is advanced strictly for the purpose of soil sampling and no monitoring well is installed, the borehole should be identified as “BHxx”. If a monitoring well is installed in a borehole, the borehole should be identified as “MWxx”.

To avoid confusion, for site investigations involving both boreholes and monitoring wells, the numerical identifiers are to be sequential (e.g., there should not be a BH01 and MW01 for the same project).

When completing supplemental drilling programs, the borehole number should start at either the next sequential number after the last borehole number used in the first stage, or label them as ‘100 series’, ‘200 series’, etc. as appropriate (e.g., BH101, MW102, etc. for the first series of additional boreholes).

It is also acceptable to add the 2 digit year either before or after the borehole or monitoring well name (e.g., 17-MW101 or MW101-17).

5.5 Borehole Advancement

Each borehole will be advanced incrementally to permit intermittent or continuous sampling as specified by the Project Manager. Typically, the sampling frequency is one sample for every 2.5 or 5 feet (0.75 or 1.5 metres) the borehole is advanced. At the discretion of the Project Manager, soil samples may be collected at a lower frequency in homogeneous soil or at a higher frequency if changes in stratigraphy or other visual observations warrant it.

5.6 Direct-Push Drilling

This method is most commonly used at Pinchin to obtain representative samples of the subsurface soil material at a site. Direct-push drilling is achieved by driving a steel sampler into the subsurface at 1.5 metre intervals until the desired depth is achieved. The samplers are advanced by the drilling rig by means of a hydraulic hammer. For each soil sample run, a dedicated PVC sample liner is placed within the steel sampler which collects the soil as the sampler is advanced. After each sample run, a new sampler is assembled and it is advanced deeper down the open borehole.

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There are generally two methods of direct-push drilling which are used:

- Dual-tube sampling; and
- Macro-core sampling.

A dual-tube sampler consists of an 8.25 centimetre (cm) inner diameter steel tooling (outer tube), equipped with a steel cutting-shoe affixed to the advancing end. A smaller diameter steel tooling, consisting of a 5.75 cm inner diameter (inner tube), fits within the outer tube and contains a PVC sample liner within. These two tubes form the completed dual-tube sampler. The completed dual-tube sampler has a length of 1.5 metres.

A macro-core sampler consists of the smaller inner tube (mentioned above) used independently. The macro-core sampler measures approximately 1.5 metres in length.

The difference in drilling methods used is typically determined by soil conditions. Where soil conditions consist of tight or dense soil types (e.g., silts or clays), the macro-core sampling method may be used as this method provides less resistance to advancing the sampler. In soil types that are less resistive (e.g., loose sands), the dual-tube sampler may be used.

5.7 Auger Drilling (Split-Spoon)

The auger drilling method for borehole advancement and sampling involves using an auger drill rig to advance the borehole to the desired sampling depth and sampling with a split-spoon sampler. Borehole advancement with hollow stem augers is the preferred drilling method when sampling with split-spoon samplers as it minimizes the potential from sloughed material to reach the bottom of a borehole and possibly cross-contaminate samples when the split-spoon is driven beyond the bottom of the borehole. Solid stem augers can be used when drilling at sites with cohesive soils (e.g., silty clay), provided that the borehole remains open after the augers are removed from the ground prior to driving the split-spoon sampler.

The split-spoon sampler consists of an 18- or 24-inch (0.45 or 0.60 metres) long, 2-inch (5.1 cm) outside diameter tube, which comes apart lengthwise into two halves.

Once the borehole is advanced to the target depth, the sampler is driven continuously for either 18 or 24 inches (0.45 or 0.60 metres) by a 140-pound (63.5 kilogram) hammer. The hammer may be lifted and dropped by either the cathead and rope method, or by using an automatic or semi-automatic drop system.

The number of blows applied in each 6-inch (0.15 metre) increment is counted until one of the following occurs:

- A total of 50 blows have been applied during any one of the 6-inch (0.15 metre) increments described above;

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- A total of 100 blows have been applied;
- There is no advancement of the sampler during the application of ten successive blows of the hammer (i.e., the spoon is "bouncing" on a cobble or bedrock); or
- The sampler has advanced the complete 18 or 24 inches (0.45 or 0.60 metre) without the limiting blow counts occurring as described above.

On the field form, record the number of blows required to drive each 6-inch (0.15 metre) increment of penetration. The first 6 inches is considered to be a seating drive.

The sum of the number of blows required for the second and third 6 inches (0.15 metres) of penetration is termed the "standard penetration resistance" or the "N-value". This information is typically provided on the borehole logs included in our site investigation reports.

The drill rods are then removed from the borehole and the split-spoon sampler unthreaded from the drill rods.

Caution must be used when drilling with augers below the groundwater table, particularly in sandy or silty soils. These soils tend to heave or "blow back" up the borehole due to the difference in hydraulic pressure between the inside of the borehole and the undisturbed formation soil. If blowback occurs, the drilling contractor will introduce water or drilling mud into the borehole or inside of the hollow-stem augers (if used) to equalize the hydraulic pressure and permit drilling deeper to proceed.

Heaving conditions and the use of water or drilling mud must be noted on the field logs, including the approximate volume of water or drilling mud used.

5.8 Auger Drilling (Direct Sampling)

In some jurisdictions (e.g., BC, Manitoba) it may be acceptable to collect soil samples directly from auger flights when using solid stem augers.

When sampling directly from auger flights, care must be exercised not to collect soils that were in direct contact with the auger or that were smeared along the edge of the borehole.

5.9 Borehole Advancement In Bedrock

It is sometimes possible to advance augers through weathered bedrock but borehole advancement through competent bedrock requires alternate drilling procedures. Bedrock drilling can be accomplished by advancing core barrels or tri-cone bits using air rotary or water rotary drilling methods. A description of the various bedrock drilling procedures is beyond the scope of this SOP.

The bedrock drilling method selected will depend in part on the type of bedrock, the borehole depth required, whether bedrock core logging is required, whether telescoped casing is required, etc. The Project Manager, in consultation with the drilling contractor, will determine the best method for advancing boreholes in competent bedrock.

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5.10 Borehole Soil Sample Logging and Collection

The following describes the methods for logging and collection of samples from a split-spoon or direct-push sampler but can be adapted for sample collection from augers:

1. After the driller opens the split-spoon sampler or PVC liner, measure the length of the soil core retained in the sampler in inches or centimetres. Be sure to be consistent in the use of metric or imperial units, and that the units used are clearly noted in the field notes. The percentage of soil retained versus the length of the sampler is known as "sample recovery" and this information is presented on the borehole logs within our Phase II ESA reports;
2. Dedicated, disposable nitrile gloves are to be worn during soil logging and sampling;
3. When using a dual-tube or macro-core sampler with direct-push drilling, there is usually sufficient sample recovery to permit the collection of two soil samples from each sample run. In this case, if the sample recovery is greater than 2.5 feet (0.75 metres), divide the recovered soil into two depth intervals and log/collect a sample from each interval. Split-spoon samplers typically are not long enough nor provide enough sample to divide a sample run into two. However, if a recovered sample contains distinct stratigraphic units (e.g., fill material and native material, obviously impacted soil and non-impacted soil), the distinct units are to be sampled separately. It is especially important that potentially impacted soil (e.g., fill material, obviously impacted soil) is not mixed with potentially unimpacted soil (e.g., native soil, soil without obvious impacts) to form one sample;
4. Discard the top several centimetres in each core as this material is the most likely to have sloughed off the borehole wall and may not be representative of the soil from the intended depth interval;
5. To minimize the potential for cross-contamination, scrape the exterior of the soil core with a clean, stainless-steel putty knife, trowel or similar device to remove any smeared soil. Note that is not practical and can be skipped if the soil is non-cohesive (e.g., loose sand);
6. Split the soil core longitudinally along the length of the sampler and to the extent practical, collect the soil samples for laboratory analysis from the centre of the core (i.e., soil that has not contacted the sampler walls). When sampling directly from augers, soils in direct contact with the auger or soils retained on the augers that may have been in contact with the edge of the borehole should not be collected;
7. Collect soil samples for potential volatile parameter analysis and field screening (in that order) as soon as possible after the core is opened. The length of time between opening the sampler and sample collection for these parameters should not exceed 2 minutes. It

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is important to follow this as it minimizes the potential for volatile constituents in the soil to be lost. See SOP-EDR003 for additional details regarding the collection of soil samples for field screening;

8. Drillers are not to open the split-spoon sampler or PVC liner until instructed to do so. If drilling and sample retrieval is occurring at a rate faster than Pinchin staff are able to sample and log the soil cores, the drillers are to be instructed to slow down or stop until further notice. This will prevent a back log of soil cores from accumulating and minimize the exposure of the soil cores to ambient conditions. This is particularly important when sampling for VOCs;
9. Collect soil samples for the remaining parameters to be analyzed;
10. Soil samples are to be labelled and handled in accordance with SOP-EDR013;
11. Record the parameters sampled for, the type(s) and number of sample containers, and the time and date of sample collection in the field notes;
12. Determine the soil texture in accordance with SOP-EDR019 and record this information in the field notes;
13. Soil samples collected for soil headspace vapour measurement must not be submitted for laboratory analysis except for analysis of non-volatile parameters (i.e., metals and inorganics) or grain size analysis;
14. Immediately following collection, place each sample container in a cooler containing ice bags or ice packs; and
15. After the maximum borehole drilling depth is reached, measure the borehole depth with a weighted measuring tape and record the total depth in the field notes if the borehole diameter is large enough to permit measurement.

5.11 Borehole Backfilling.

Following completion of each borehole in which a well is not installed, it must be properly backfilled with bentonite and/or bentonite grout by the drilling contractor. The drilling contractor is to be consulted to confirm the proper borehole abandonment procedures required by the local regulations (e.g., Ontario Regulation 903 (as amended) for Ontario sites).

Drill cuttings are not be used to backfill boreholes.

Record the borehole backfilling method and materials used in the field notes.

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5.12 Borehole Location Documentation

For each borehole, complete the following to document its location:

1. Photograph the completed borehole location. Close up photographs of the borehole are to be taken as well as more distant photographs that show the location of site landmarks relative to the borehole so that the photograph can be used to locate the borehole in the future; and
2. Using a measuring tape or measuring wheel, measure the distance between the borehole and a nearby landmark (e.g., corner of the nearest building) and provide a borehole location sketch in the field notes. Measurements are to be made at right angles relative to the orientation of the landmark or to a fixed axis (e.g., relative to true north). If required by the Project Manager, measure the UTM coordinates of the borehole with a hand-held GPS device.

5.13 Field Notes

The field notes must document all drilling equipment used, sample depths and measurements collected during the borehole drilling activities. The field notes must be legible and concise such that the entire borehole drilling and soil sampling event can be reconstructed later for future reference. The field notes are to be recorded on the field forms or in a field book.

5.14 Additional Considerations for O. Reg. 153/04 Phase Two ESA Compliance

None. Following this SOP will be sufficient to comply with the Ontario Regulation 153/04 requirements for Phase Two Environmental Site Assessments.

6.0 TRAINING

The Practice Leader is responsible for identifying the training needs of EDR staff and ensuring that staff are trained and competent before undertaking work assignments.

All trained personnel are responsible for identifying coaching or re-training needs (if they are uncomfortable with work assignments that have been assigned).

The careful application of Health & Safety Training by each employee is an integral part of all activities and is assumed as part of this SOP.

7.0 MAINTENANCE OF SOP

1 Year.

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8.0 REFERENCES

Canadian Standards Association, *Phase II Environmental Site Assessment, CSA Standard Z769-00 (R2008)*, dated 2000 and reaffirmed in 2008.

Association of Professional Geoscientists of Ontario, *Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended)*, April 2011.

9.0 APPENDICES

None.

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Template: Master SOP Template – February 2014

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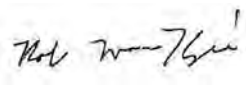
SOP – EDR009 – REV004 – FIELD DECONTAMINATION OF NON-DEDICATED MONITORING AND SAMPLING EQUIPMENT

Title:	Field Decontamination of Non-Dedicated Monitoring and Sampling Equipment
Practice:	EDR
First Effective Date:	August 03, 2009
Version:	004
Version Date:	April 28, 2017
Author:	Robert MacKenzie
Authorized by:	Robert MacKenzie
Signature:	

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1.0 VERSION HISTORY

Version	Date	Summary of Changes	Author
Original	August 02, 2009	N/A	MEM
001	November 26, 2010	Updated Approval Signature/Added reference to Ontario Regulation 511/09	FG
002	September 20, 2013	Revised majority of text to reflect current practices/Focused on equipment cleaning and removed reference to personnel decontamination/Added section on O. Reg. 153/04 requirements/Revised reference list	RLM
003	April 29, 2016	Updated Section 4.0/Removed methanol as optional cleaning reagent	RLM
004	April 28, 2017	Removed reference to Pinchin West/In Section 5.2.2, modified requirements for cleaning water level tapes and interface probes/In Section 5.2.3, modified requirements for cleaning electrical or retrieval cables for pumps	RLM

2.0 SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) presents the general requirements for field decontamination of non-dedicated equipment used for monitoring of environmental media and the collection of environmental samples (i.e., equipment that is re-used between monitoring and sampling locations). Note that the procedures described in this SOP also apply to pumps used for well development.

3.0 OVERVIEW

The main purpose of non-dedicated monitoring and sampling equipment decontamination is to minimize the potential for cross-contamination during monitoring/sampling activities completed for site investigations. Cross-contamination can occur when equipment used to monitor/sample contaminated soil, groundwater or sediment is reused at another monitoring/sampling location without cleaning. This can result in the transfer of contaminants from a “dirty” monitoring/sampling location to a “clean” monitoring/sampling location, causing possible positive bias of subsequent samples. Positive sample bias can result in reported analytical results that are not representative of actual site conditions and, if significant cross-contamination occurs, can result in reported exceedances of the applicable regulatory standards for samples that would have met the standards had cross-contamination not occurred.

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Site investigations completed by Pinchin typically use the following non-dedicated monitoring/sampling equipment:

- Manually operated equipment (e.g., water level tapes/interface probes using during groundwater monitoring and sampling, knifes/spatulas used for soil sampling, hand augers);
- Pumps for groundwater monitoring well development, purging and/or sampling (e.g., bladder pumps, submersible pumps); and
- Downhole drilling/sampling equipment (e.g., split-spoon samplers, augers).

The above list is not all inclusive and other non-dedicated monitoring/sampling equipment may be employed during a site investigation that requires decontamination. For example, it may be appropriate to decontaminate the bucket of a backhoe used for test pitting between test pit locations. The Project Manager will be responsible for identifying the additional monitoring/sampling equipment that requires decontamination and instructing field staff regarding the procedure to be followed for cleaning this equipment.

When conducting field monitoring and sampling work in the field, it is not always possible to judge whether a monitoring/sampling location is uncontaminated. Because of this, it is important that all non-dedicated monitoring/sampling equipment be properly cleaned before initial use and between uses to minimize the potential for cross-contamination to occur.

4.0 DISTRIBUTION

This is an on-line document. Paper copies are valid only on the day they are printed. Refer to the author if you are in any doubt about the accuracy of this document.

This SOP will be distributed to all Pinchin staff and others as follows:

- Posted to the SOP section of the Environmental Due Diligence and Remediation (EDR) Practice Line on the Pinchin Orchard; and
- Distributed to senior staff at Le Groupe Gesfor Poirier and Pinchin LeBlanc for distribution as appropriate.

5.0 PROCEDURE

5.1 Equipment and Supplies

The following is a list of equipment needed to perform the decontamination of non-dedicated monitoring and sampling equipment in accordance with this SOP:

- Personal Protective Equipment (PPE);
- Potable tap water;

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- Distilled water (store bought);
- Volatile organic compound (VOC)-free deionized distilled water (supplied by the analytical laboratory);
- Laboratory grade, phosphate-free soap;
- Wash buckets (minimum of three);
- Scrub brushes;
- Paper towels; and
- Buckets or drums with resealable lids for containing liquids generated by equipment cleaning.

Other equipment required to clean drilling equipment (e.g., steam cleaner, power washer, tub for containing wash water, etc.) is typically provided by the drilling subcontractor. The Project Manager is responsible for ensuring that the drilling subcontractor brings the required cleaning equipment to the project site. Prior to mobilization, the Project Manager should also assess the availability of a potable water supply for drilling equipment cleaning at the project site. When no accessible potable water supply is available at a project site, the drilling subcontractor will need to bring a potable water supply to the site in the drill rig water supply tank or separate support vehicle, or arrange to have a third-party supplier deliver potable water to the site.

5.2 Procedure

5.2.1 General Procedures and Considerations

The following general procedures and considerations apply to all decontamination of non-dedicated monitoring/sampling equipment activities:

- Personnel will dress in suitable PPE to reduce personal exposure during equipment decontamination activities;
- In addition to cleaning between monitoring/sampling locations, all non-dedicated monitoring/sampling equipment must be cleaned before initial use. Field staff should not assume that the equipment was properly cleaned by the last person to use it;
- Prior to starting a drilling program, the downhole drilling equipment (e.g., augers) must be inspected and any “dirty” equipment must not be used in the drilling program or it must be cleaned prior to use; and
- All liquids and solids generated by the cleaning of non-dedicated monitoring/sampling equipment are to be containerized and managed in accordance with the procedures outlined in SOP-EDR020 – Investigation Derived Wastes.

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5.2.2 Decontamination of Manually Operated Monitoring/Sampling Equipment

The procedure for decontaminating manually operated monitoring/sampling equipment is as follows:

- Wash the equipment in a bucket filled with a mixture of phosphate-free soap/potable water, while using a brush to remove any obvious contamination and/or adhered soil;
- Rinse the equipment thoroughly in a bucket filled with potable water;
- Rinse the equipment thoroughly using a spray bottle filled with distilled water, capturing the rinsate in a bucket; and
- Allow the equipment to air dry. If there is insufficient time to allow the equipment to air dry before reusing, or the equipment cleaning is occurring during winter conditions, the equipment should be dried after the final rinse with a clean paper towel.

At the discretion of the Project Manager, it may be acceptable to use spray bottles, rather than buckets, for lightly contaminated equipment or if no obvious contaminants are present.

Should soil or obvious contaminants remain on the equipment after cleaning, the above procedure must be repeated until the soil or contaminants have been removed. The equipment should not be reused if repeated cleanings do not remove the soil or contaminants.

The above equipment cleaning procedure applies to, but is not limited to, the following non-dedicated monitoring/sampling equipment:

- Knives/spatulas used for soil sampling;
- Hand augers;
- Water level tapes and interface probes (both the end probe and portion of the tape that entered the well);
- The exterior of submersible pumps and interior/exterior of bladder pumps (including the portion of the electrical or retrieval cables that contact groundwater in a well); and
- Various pieces of drilling equipment, including split-spoon samplers, hollow stem auger centre plugs, continuous sampling tubes, and the reusable portions of dual-tube samplers.

At the discretion of the Project Manager, the distilled water used for the final equipment rinse will be VOC-free deionized distilled water supplied by the analytical laboratory. For example, the use of VOC-free distilled water would be appropriate for a project where trace VOCs are being investigated and it is important to minimize the potential for cross-contamination and positive bias of VOC sample results.

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For tapes associated with water level tapes and interface probes, if they were submerged in a monitoring well water free of non-aqueous phase liquids or obvious contamination, the tape can be cleaned at the discretion of the Project Manager by pulling the tape through a towel dampened with phosphate-free soap/potable water as the tape is retrieved. The end probe should then be cleaned as described above.

5.2.3 Decontamination of Groundwater Sampling Pumps

The exterior of each bladder or submersible pump that is used for well development, well purging and/or groundwater sampling, and the portion of any electrical or retrieval cables that entered the well, are to be cleaned following the procedure described above for decontaminating manually operated monitoring/sampling equipment.

Submersible pumps are not designed to be disassembled in the field and cleaning of the interior of this type of pump requires flushing of cleaning solutions through the pump. After cleaning the exterior of the pump, the minimum decontamination requirement for a submersible pump is the flushing of a phosphate-free soap/potable water mixture contained in a bucket through the pump (i.e., pumping the mixture through the pump and capturing the pump outflow in the same bucket or a separate bucket), followed by flushing distilled water contained in a separate bucket through the pump and capturing the pump outflow in the same bucket or separate bucket. Note that store bought distilled water is acceptable for this purpose.

At the discretion of the Project Manager and depending on the requirements of the project, the final step in the process is a final flush with laboratory-supplied VOC-free distilled water.

The following summarizes the flushing sequence for decontaminating the interior of a submersible pump:

- Soap/water mixture*;
- Distilled water (store bought)*; and
- Distilled water (laboratory supplied VOC-free distilled water - to be confirmed by the Project Manager).

* Minimum requirement.

Bladder pumps are designed for disassembly in the field to facilitate the replacement of the bladders. The internal parts of a bladder pump are to be cleaned in accordance with the procedure described above for decontaminating manually operated monitoring/sampling equipment. Whenever possible, bladders are to be disposed of between well locations. However, if it is necessary to reuse a bladder, it must be cleaned in accordance with the procedure for cleaning manually operated monitoring/sampling equipment. It should be noted that bladders are difficult to clean and the decontamination procedure needs to be thorough.

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Flushing of a bladder pump with distilled water after cleaning and reassembly is not required unless specified by the Project Manager.

5.2.4 Decontamination of Downhole Drilling Equipment

Hollow stem and solid stem augers used for borehole advancement are to be decontaminated by the drilling contractor using the following procedure:

- Wherever possible, all augers used for borehole drilling should be cleaned before initial use and between borehole locations by steam cleaning or power washing with potable water. However, the minimum requirements for auger cleaning are as follows:
  - Use a brush or shovel to remove excess soil from all used augers; and
  - Any augers that may come into contact with groundwater are to be decontaminated by steam cleaning or power washing with potable water. An auger must not be used for the balance of the drilling program if obvious contaminants or residual soil remain on the auger following decontamination, unless subsequent cleaning efforts remove these materials.

As noted previously, downhole drilling equipment used for soil sample retrieval (e.g., split-spoon samplers, continuous sampling tubes and the reusable portions of dual-tube samplers used with direct push rigs) and the hollow stem auger centre plug are to be decontaminated following the procedure outlined above for cleaning manually operated monitoring/sampling equipment.

5.3 Decontamination Records

Field personnel will be responsible for documenting the decontamination of non-dedicated monitoring/sampling equipment and drilling equipment in their field log book or field forms. The documentation should include the type of equipment cleaned and the frequency of cleaning, the methods and reagents used for equipment cleaning, and how fluids generated by the equipment cleaning were stored.

5.4 Additional Considerations for Ontario Regulation 153/04 Phase Two ESA Compliance

When completing a Phase Two Environmental Assessment (ESA) in accordance with Ontario Regulation 153/04, the following additional procedures must be undertaken:

- All augers must have excess soil removed by a brush or shovel and be steam cleaned or power washed before initial use and between borehole locations regardless of whether they contact the groundwater or not (i.e., the minimum requirements listed above for auger cleaning are not sufficient); and

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- Thorough records of the frequency and cleaning materials used for the decontamination of non-dedicated monitoring/sampling equipment and downhole drilling must be kept. The Quality Assurance/Quality Control section of the Phase Two ESA report requires a summary of what steps were taken to minimize the potential for cross-contamination during the Phase Two ESA. The handling and disposal of fluids generated by equipment decontamination must also be well documented in the field for inclusion in the Phase Two ESA report.

6.0 TRAINING

The Practice Leader is responsible for identifying the training needs of EDR staff and ensuring that staff are trained and competent before undertaking work assignments.

All trained personnel are responsible for identifying coaching or re-training needs (if they are uncomfortable with work assignments that have been assigned).

The careful application of *Health & Safety Training* by each employee is an integral part of all activities and is assumed as part of this SOP.

7.0 MAINTENANCE OF SOP

1 Year.

8.0 REFERENCES

Association of Professional Geoscientists of Ontario, *Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended),* April 2011.

9.0 APPENDICES

None.

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Template: Master SOP Template – February 2014

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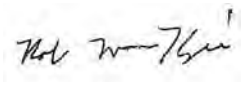
SOP – EDR013 – REV004 – SAMPLING HANDLING DOCUMENTATION

Title:	Sampling Handling Documentation
Practice:	EDR
First Effective Date:	August 03, 2009
Version:	004
Version Date:	April 28, 2017
Author:	Mark McCormack and Robert MacKenzie
Authorized by:	Robert MacKenzie
Signature:	

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1.0 VERSION HISTORY

Version	Date	Summary of Changes	Author
Original	August 03, 2009	N/A	MEM
001	November 26, 2010	Updated Approval Signature/Added reference to Ontario Regulation 511/09	FG
002	September 12, 2013	Updated text/Added tables from MOE lab protocol/Streamlined reference section/Added O. Reg. 153/04 compliance section	RLM
003	April 29, 2016	Updated Section 4.0/Aligned document retention with PEP	RLM
004	April 28, 2017	Removed reference to Pinchin West	RLM

2.0 SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) presents the general requirements for sample handling and documentation practices.

3.0 OVERVIEW

Not applicable.

4.0 DISTRIBUTION

This is an on-line document. Paper copies are valid only on the day they are printed. Refer to the author if you are in any doubt about the accuracy of this document.

This SOP will be distributed to all Pinchin staff and others as follows:

- Posted to the SOP section of the Environmental Due Diligence and Remediation (EDR) Practice Line on the Pinchin Orchard; and
- Distributed to senior staff at Le Groupe Gesfor Poirier and Pinchin LeBlanc for distribution as appropriate.

5.0 PROCEDURE

5.1 Equipment Required

- Laboratory-supplied sample containers;
- Field log book or field forms; and
- Laboratory-supplied Chain-of-Custody forms.

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5.2 Procedures

5.2.1 Sample Labelling

Sample labels are to be filled out in the field at the time of sampling as completely as possible by field personnel. All sample labels shall be filled out using waterproof ink. At a minimum, each label shall contain the following information:

- Sample identifier, consisting of sample location (borehole number, monitoring well number, surface sample location, etc.) and sample number (if appropriate). For example, the second soil sample collected during borehole advancement at borehole BH3 would be labelled "BH3-2";
- Pinchin project number;
- Date and time of sample collection;
- Company name (i.e., Pinchin); and
- Type of analysis.

5.2.2 Sample Containers, Preservation and Holding Times

The sample containers, sample preservation and holding times for projects in Ontario are to be those specified in Table A (for soil and sediment) and Table B (groundwater) from the Ontario Ministry of the Environment Climate Change (MOECC, formerly the Ontario Ministry of the Environment) document entitled *"Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act",* dated March 9, 2004, amended as of July 1, 2011. These tables are attached and form part of this SOP.

With reference to the attached Tables A and B, field personnel must use the sample containers appropriate for the parameters being sampled for, undertake any required field preservation or filtration and observe the sample holding times.

Each province has its own preservation and holding time regulations or guidance, which are generally similar. It is the Project Manager's responsibility to ensure that field staff are aware of, and can meet, the requirements in the province they are working in.

5.2.3 Sample Documentation

The following sections describe documentation required in the field notes and on the Chain-of-Custody forms.

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Field Notes

Documentation of observations and data from the field will provide information on sample collection and also provide a permanent record of field activities. The observations and data will be recorded using a pen with permanent ink in the field log book or on field forms.

The information in the field book or field forms will, at a minimum, include the following:

- Site name;
- Name of field personnel;
- Sample location (borehole number, monitoring well number, surface sample location, etc.);
- Sample number;
- Date and time of sample collection;
- Sample containers used;
- Description of sample;
- Matrix sampled;
- Sample depth (if applicable);
- Method of field preservation (if applicable);
- Whether filtration was completed for water samples;
- Analysis requested;
- Field observations;
- Results of any field measurements (e.g., field screening measurements, depth to water, etc.); and
- Volumes purged (if applicable).

In addition to the above, other pertinent information is to be recorded in the field log book or field forms depending on the type of sampling being completed (e.g., field parameter measurements and pumping rates for low flow sampling) as required by the SOP for the particular sampling activity.

Sufficient information should be recorded to allow the sampling event to be reconstructed without relying on the sampler's memory.

All field notes are to be scanned and saved to the project folder on the server immediately upon returning from the field.

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Sample Chain-of-Custody

Sample Chain-of-Custody maintains the traceability of the samples from the time they are collected until the analytical data are issued by the laboratory. Initial information concerning collection of the samples will be recorded in the field log book or field forms as described above. Information on the custody, transfer, handling and shipping of samples will be recorded on a Chain-of-Custody for each sample submission.

All signed Chain-of-Custody forms will be photocopied or duplicate copies retained prior to sample shipment. A Chain-of-Custody should be laboratory specific and will typically be supplied by the laboratory with the sample containers requested for the project. The sampler will be responsible for fully filling out the Chain-of-Custody for each sample submission.

The Chain-of-Custody will be signed by the sampler when the sampler relinquishes the samples to anyone else (i.e., courier or laboratory). Until samples are picked up by the courier or delivered to the laboratory, they must be stored in a secure area. The following information needs to be provided on the Chain-of-Custody at a minimum:

- Company name;
- Name, address, phone number, fax number and e-mail address of the main contact for the submission (typically the Project Manager);
- Project information (project number, site address, quotation number, rush turnaround number, etc.);
- Regulatory standards or criteria applicable to the samples (including whether the samples are for regulated drinking water or whether the samples are for a Record of Site Condition);
- Sample identifiers;
- Date and time of sample collection;
- Matrix (e.g., soil, groundwater, sediment, etc.);
- Field preservation information (e.g., whether groundwater samples for metals analysis were field filtered);
- Analyses required;
- Number of sample containers per sample;
- Analytical turnaround required (i.e., standard or rush turnaround);
- Sampler's name and signature;
- Date and time that custody of the samples was transferred;

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- Name and signature of person accepting custody of the samples from Pinchin, and date and time of custody transfer; and
- Method of shipment (if applicable).

The person responsible for delivery of the samples to the laboratory or transfer to a courier will sign the Chain-of-Custody, retain a duplicate copy or photocopy of the Chain-of-Custody so it can be scanned and saved to the project file, document the method of shipment, and send the original copy of the Chain-of Custody with the samples.

5.3 Additional Considerations for Ontario Regulation. 153/04 Phase Two ESA Compliance

Custody seals must be placed on all coolers containing samples prior to transfer to a courier or delivery to the laboratory. The laboratory will comment on the presence/absence of custody seals in the Certificate-of-Analysis for each submission and this information must be discussed in the Quality Assurance/Quality Control section of the Phase Two Environmental Site Assessment report.

6.0 TRAINING

The Practice Leader is responsible for identifying the training needs of EDR staff and ensuring that staff are trained and competent before undertaking work assignments.

All trained personnel are responsible for identifying coaching or re-training needs (if they are uncomfortable with work assignments that have been assigned).

The careful application of *Health & Safety Training* by each employee is an integral part of all activities and is assumed as part of this SOP.

7.0 MAINTENANCE OF SOP

1 Year.

8.0 REFERENCES

Ontario Ministry of the Environment and Climate Change, *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act*, March 9, 2004, as amended as of July 1, 2011.

9.0 APPENDICES

Appendix I Tables A and B From Ontario MOECC Laboratory Protocol

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APPENDIX I

Tables A and B From Ontario MOECC Laboratory Protocol

TABLE A: SOIL AND SEDIMENT Sample Handling and Storage Requirements

SOIL Inorganic Parameters	**Container**[1]	**Field Preservation**	**Storage Temp.**[2]	**Preserved Holding Time**[3]	**Unpreserved Holding Time**[3]
Chloride, electrical conductivity	glass, HDPE or PET	none	5 ± 3 °C		30 days as received (without lab drying); indefinite when dried at the lab
Cyanide (CN^-)	glass wide-mouth jar, Teflon™ lined lid	protect from light	5 ± 3 °C		14 days
Fraction organic carbon (FOC)	glass jar, Teflon™ lined lid	none	5 ± 3 °C		28 days as received(without lab drying); indefinite storage time when dried
Hexavalent chromium	glass, HDPE	none	5 ± 3 °C		30 days as received
Metals (includes hydride-forming metals, SAR, HWS boron, calcium, magnesium, sodium)	glass, HDPE	none	5 ± 3 °C		180 days as received (without lab drying); indefinite when dried at the lab
Mercury, methyl mercury	glass, HDPE or PET	none	5 ± 3 °C		28 days
pH	glass, HDPE or PET	none	5 ± 3 °C		30 days as received
SOIL Organic Parameters	**Container** [1,5,6,7,20]	**Field Preservation**	**Storage Temp.**[2]	**Preserved Holding Time**[3]	**Unpreserved Holding Time**[3]
BTEX[8], PHCs (F1)[8], THMs, VOCs[7] **NB: SEE FOOTNOTE #20**	40–60 mL glass vial (charged with methanol preservative, pre-weighed)[6] AND glass jar (for moisture content) [hermetic samplers are an acceptable alternative[5, 18]]	methanol (aqueous $NaHSO_4$ is an acceptable alternative for bromomethane)[6, 7, 18,20]	5 ± 3 °C	14 days	hermetic samples: stabilize with methanol preservative within 48 hours of sampling[18]
1,4-Dioxane[9, 15]	when processed as a VOC sample: same as per VOCs above; when processed as an extractable: same as per ABNs below; (consult laboratory)[9,15,18]		5 ± 3 °C	14 days	when processed as a VOC sample: same as per VOCs above; when processed as an extractable: same as per ABNs below; (consult laboratory)[18]
PHCs (F2–F4)	glass wide-mouth jar, Teflon™ lined lid	none	5 ± 3 °C		14 days
ABNs, CPs, OCs, PAHs	glass wide-mouth jar, Teflon™ lined lid	none	5 ± 3 °C		60 days
Dioxins and furans, PCBs	glass wide-mouth jar Teflon™ lined lid	none	5 ± 3 °C		indefinite storage time

HDPE = high density polyethylene; PET = polyethylene terephthalate; HWS = hot water soluble boron; THM = trihalomethanes; VOC = volatile organic compounds; BTEX = benzene, toluene, ethylbenzene, xylenes; PHCs = petroleum hydrocarbons; CPs = chlorophenols; PCBs = polychlorinated biphenyls; OCs = organochlorine pesticides

[1–20]footnotes immediately follow Table B

TABLE B: GROUND WATER Sample Handling and Storage Requirement

GROUND WATER Inorganic Parameters	**Container[10]**	**Field Preservation**	**Storage Temperature[2]**	**Preserved Holding Time[3]**	**Unpreserved Holding Time[3]**
Chloride, electrical conductivity, pH	HDPE or glass	none	5 ± 3 °C		28 days
Cyanide (CN^-)	HDPE or glass	NaOH to a pH > 12	5 ± 3 °C	14 days	must be field preserved
Hexavalent chromium	HDPE or glass	field filter followed by buffer solution to a pH 9.3–9.7 [17]	5 ± 3 °C	28 days[17]	24 hours[17]
Metals (includes hydride-forming metals, calcium, magnesium, sodium)	HDPE or Teflon™ [10]	field filter followed by HNO_3 to pH < 2[11]	room temperature when preserved	60 days	must be field preserved
Mercury	glass or Teflon™ [10]	field filter followed by HCl to pH < 2[11]	room temperature when preserved	28 days	must be field preserved
Methyl mercury	glass or Teflon™	DO NOT FILTER HCl or H_2SO_4 to pH <2[12]	5 ± 3 °C	28 days	DO NOT FILTER must be field preserved[12]
GROUND WATER Organic Parameters[10, 13, 14]	**Container[10, 13, 14]**	**Field Preservation**	**Storage Temperature[2]**	**Preserved Holding Time[3]**	**Unpreserved Holding Time[3]**
BTEX, PHCs (F1),THMs, VOCs;	40–60 mL glass vials (minimum of 2)[14] (no headspace)	$NaHSO_4$ or HCl to a pH < 2[16]	5 ± 3 °C	14 days	7 days
1,4-Dioxane[9, 15]	when processed as a VOC sample: same as per VOCs above; when processed as an extractable: same as per ABNs below; (consult laboratory)[9, 15]		5 ± 3 °C	14 days	14 days
PHCs (F2–F4)	1L amber glass bottle, Teflon™ lined lid	$NaHSO_4$ or HCl to a pH < 2[16]	5 ± 3 °C	40 days	7 days
ABNs, CP, OCs, PAHs[19], PCBs	1L amber glass bottle, Teflon™ lined lid	none	5 ± 3 °C		14 days
Dioxins and furans	1L amber glass bottle, Teflon™ lined lid	None	5 ± 3 °C		indefinite storage time

HDPE = high density polyethylene;THM = trihalomethanes; VOC = volatile organic compounds; BTEX = benzene, toluene, ethylbenzene, xylenes; PHCs = petroleum hydrocarbons; CPs = chlorophenols; PCBs = polychlorinated biphenyls; OCs = organochlorine pesticides

1 One soil container is generally sufficient for inorganic analysis and another for extractable organics. A separate container is required for BTEX, THM, VOC and PHC (F1) moisture analysis.

2 Storage temperature refers to storage at the laboratory. Samples should be cooled and transported as soon as possible after collection.

3 Holding time refers to the time delay between time of sample collection and time stabilization/analysis is initiated. For samples stabilized with methanol, the hold time for the recovered methanol extract is up to 40 days.

[4] PET can not be used for samples requiring antimony analysis.

[5] As an alternative, the USEPA has investigated hermetic sample devices that take and seal a single core sample. The sample is submitted as is to the laboratory where it is extruded into an extracting solvent. Samples must be received at the laboratory within 48 hours of sampling. (Note that replicate samples are necessary for bisulphate and methanol extraction for all samples plus laboratory duplicates and spikes.) Consult the laboratory for the number of samples required.

[6] The USEPA has approved field preservation. Pre-weighed vials containing known weights of methanol preservative (or aqueous sodium bisulphate if used for bromomethane) are sent to the field. Sample cores (approximately 5 g) are extruded directly into the vial. The vials are sealed, and submitted directly to the laboratory. In practice, this technique requires great care to prevent losses of methanol due to leaking vials or through splashing. Consult the laboratory for the number of containers required.

[7] Methanol-preserved samples may elevate the detection limit for bromomethane (VOC); a separate bisulphate-preserved sample or hermetically sealed sample may be submitted at the time of sampling if bromomethane is a chemical of concern – contact the laboratory to determine if a separate sample should be collected.

[8] For BTEX and PHC (F1) pre-charging the soil sampling container with methanol preservative is an accepted deviation from the CCME method.

[9] 1,4-Dioxane may be analyzed with the ABNs or VOCs; sample container requirements used for ABNs or VOCs are both acceptable. If 1,4-dioxane is to be analyzed with ABNs, follow the ABN sample container requirements; similarly if it is to be analyzed with VOCs, follow VOC sample container requirements. Consult the laboratory for the container type and the total number required (see also footnote #15).

[10] Samples containing visual sediment at the time of analysis should be documented and noted on the Certificate of Analysis or written report as results may be biased high due to the inclusion of sediment in the extraction.

[11] Field filter with 0.45µm immediately prior to adding preservative or filling pre-charged container.

[12] Sample directly into a HCl or H_2SO_4 preserved container, or add acid to an unfiltered sample immediately after sample collection in the field.

[13] Aqueous organic samples should be protected from light. If amber bottles are not available, glass should be wrapped in foil.

[14] Separate containers are required for each organic water analysis. Consult the laboratory for required volumes. Chloride and electrical conductivity can be taken from the same container.

[15] For 1,4-dioxane in soil and sediment, no preservative is required if processed as an ABN, however. Methanol is an acceptable alternative if processed as a VOC. For 1,4-dioxane in groundwater, no preservative is required, however, $NaHSO_4$ or HCl are acceptable alternatives.

[16] Preserved to reduce biodegradation, however effervescence/degassing may occur in some ground water samples. In this case, rinse preservative out three times with sample and submit to the laboratory as unpreserved.

[17] To achieve the 28-day holding time, use the ammonium sulfate buffer solution [i.e., $(NH_4)_2SO_4/NH_4OH$] or $(NH_4)_2SO_4/NH_4OH/NaOH + NaOH$] as specified in EPA Method 218.6 (revision 3.3, 1994) or Standard Methods 3500-Cr Chromium (2009).Using only NaOH without the ammonium sulfate buffer to adjust the pH would require analysis within 24 hours of sampling.

[18] Alternatively, to achieve a longer hold time, hermetic samples may be frozen within 48 hours of sampling as per ASTM method D6418 – 09; however, storage stability must be validated by the laboratory with no more than 10% losses.

[19] For benzo(a)pyrene in ground water samples filtration prior to analysis on a duplicate sample is permitted.

[20] For VOC, BTEX, F1 PHCs, 1,4 dioxane soil samples collected before July 1, 2011, the following sampling and handling requirements are also permitted.

SOIL Organic Parameters	Container	Preservative	Storage Temperature	Preserved Holding Time	Unpreserved Holding Time
VOC, BTEX, F1 PHCs, 1,4-dioxane*	glass jar, Teflon lined lid, no headspace, separate container required Hermetic samplers are an acceptable alternative	none field preservation with aqueous sodium bisulphate and methanol is an acceptable alternative	5 ± 3C	See notations 1-3 below	Stabilize by extraction or freezing within 48 hrs of receipt at the laboratory (7days from sampling). Frozen or field preserved samples must be extracted within 14 days of sampling.

*Special care must be used when sampling for VOC, BTEX and F1 in soil and sediment. Studies have shown that substantial losses can occur through volatilization and bacterial degradation. There are several allowable options for field collection of samples. Each is discussed below. Consult SW846, Method 5035A for additional detail. The laboratory is required to stabilize the sample on the day of receipt, either by extraction or freezing.

1. Collection in soil containers: To minimize volatilization losses, minimize sample handling and mixing during the process of filling the sample container. The bottle should be filled with headspace and voids minimized. Care is required to ensure that no soil remains on the threads of the jar, preventing a tight seal and allowing volatilization losses. To minimize losses through bacterial degradation, commence cooling of the samples immediately and transport the samples to the lab as soon as possible, ideally on the day of sampling. Samples must be received at the laboratory within 48 hours of sampling. Freezing can be used to extend the hold time to 14 days, however the practice is difficult to implement in the field and can cause sample breakage.
2. As an alternative, the USEPA has investigated hermetic sample devices that take and seal a single core sample. The sampler is submitted as is to the laboratory where it is extruded into the extracting solvent. Samples must be received at the laboratory within 48 hours of sampling. This technique minimizes volatilization losses and is worth consideration for critical sites. (Note that replicate samplers are necessary for bisulphate and methanol extraction for all samples plus lab duplicates and spikes). Consult the laboratory for the number of samplers required.
3 The USEPA has also approved field preservation. Pre-weighed vials containing known weights of methanol and aqueous sodium bisulphate preservative are sent to the field. Sample cores (≈5 g) are extruded directly into the vial. The vials are sealed, and submitted directly to the laboratory. In practice, this technique requires great care to implement successfully. Losses due to leaking vials, through splashing and effervescence (aqueous bisulphate) can easily occur and make the sample unusable. Consult the laboratory for the number of containers required.

SOP – EDR019 – REV003 – SOIL SAMPLE LOGGING

Title:	Soil Sample Logging
Practice:	EDR
First Effective Date:	August 03, 2013
Version:	003
Version Date:	April 28, 2017
Author:	Francesco Gagliardi and Robert MacKenzie
Authorized by:	Robert MacKenzie
Signature:	

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1.0 VERSION HISTORY

Version	Date	Summary of Changes	Author
Original	November 26, 2010	N/A	FG
001	October 31, 2013	Streamlined SOP to focus only on soil sample logging/Added O. Reg. 153/04 compliance section	RLM
002	April 29, 2016	Updated Section 4.0	RLM
003	April 28, 2017	Removed reference to Pinchin West	RLM

2.0 SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) presents the methods used to describe the physical characteristics of soil samples collected during site investigations.

The methods and equipment used for retrieving soil samples are provided in other SOPs (e.g., SOP-EDR007 – Borehole Drilling) and will not be repeated herein.

3.0 OVERVIEW

Not applicable.

4.0 DISTRIBUTION

This is an on-line document. Paper copies are valid only on the day they are printed. Refer to the author if you are in any doubt about the accuracy of this document.

This SOP will be distributed to all Pinchin staff and others as follows:

- Posted to the SOP section of the Environmental Due Diligence and Remediation (EDR) Practice Line on the Pinchin Orchard; and
- Distributed to senior staff at Le Groupe Gesfor Poirier and Pinchin LeBlanc for distribution as appropriate.

5.0 PROCEDURE

5.1 General Procedures

For each soil sample collected during a site investigation, the following information is to be recorded in the field log book or field forms in the order presented below:

- Depth;
- Primary soil texture;

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- Colour;
- Minor constituents*;
- Noticeable odours;
- Noticeable staining;
- Noticeable free-phase product/sheen*; and
- Moisture content.

*These constituents only need to be noted if they are actually present in the sample.

5.1.1 Primary Soil Texture

The primary soil texture should be determined using the attached flow chart as a guide to help classify the soil.

5.1.2 Colour

Describe the primary colour of the soil sample (e.g., brown, grey, black, green, white, yellow, red). The relative lightness or darkness of the primary colour can be described using the adjectives “light” or “dark” as appropriate. Soil that exhibits different shades or tints is to be described by using two colours (e.g., brown-grey). If the soil sample contains spots of a different colour, this is to be described as “mottling” (e.g., grey with green mottling).

5.1.3 Minor Constituents

Note the presence of minor constituents in the soil that are “natural” materials (e.g., gravel, cobbles, sand, oxidation, etc.) or “man-made” materials (e.g., asphalt, brick, concrete, coal or glass fragments, coal ash, etc.). Gravel comprises particles between 5 millimetres (mm) and 75 mm in diameter. Cobbles comprise particles greater than 75 mm in diameter.

When the percentage of the minor constituents in the soil is between approximately 0 and 10%, the adjective used to describe the relative amount of the minor constituent is “trace” (e.g., silty sand with trace brick fragments).

When the percentage of minor constituents of soil is between approximately 10 and 30%, the adjective used to describe the relative amount of the minor constituent is “some” (e.g., silty sand with some concrete fragments).

When the percentage of the “natural” minor soil constituents is between approximately 30 and 50%, the minor soil type is described by adding a ‘y’ or ‘ey’ to the soil type (e.g., silty, sandy, clayey) but note that these descriptors are covered by the soil texture analysis.

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When the percentage of the "man-made" minor soil constituents is between approximately 30 and 50%, describe the soil as per the normal procedure and add "with" the minor constituent type(s) (e.g., silty sand with coal ash and brick fragments).

5.1.4 Noticeable Odours

Field staff are not expected to directly smell soil samples to assess the presence/absence of odours.

If it is possible to identify the likely type of odour then this information should be recorded along with a comment on the severity of the odour (e.g., slight, strong, etc.). Identification of specific chemical compounds, such as petroleum hydrocarbons (PHCs) or solvents is acceptable; however, this identification should be referenced as "xxxx-like" (e.g., PHC-like, solvent-like, etc.). This principal also applies when describing staining and free-phase product.

If the odour cannot be readily identified, it should be described in the field notes as "unidentified odour". If no noticeable odours are observed, this needs to be recorded in the field notes as "no odour".

5.1.5 Noticeable Staining

Describe the colour and possible source of the staining (e.g., black PHC-like staining).

If no noticeable staining is observed, this needs to be recorded in the field notes as "no staining".

5.1.6 Noticeable Free-Phase Product/Sheen

Describe the colour, odour, possible composition and relative viscosity (if sufficient product is present to assess) of the product (e.g., dark brown, viscous, motor oil-like product). Identification of the composition of the product is acceptable but needs to be described as PHC-like, motor oil-like. Alternatively, the product can be described as "resembling" a substance (e.g., "resembling motor oil").

The presence of any observed iridescent sheen is to be recorded in the field notes. Note that the presence of an iridescent sheen by itself in the soil does not constitute the presence of free-phase product but may be an indicator that free-phase product is present within the vicinity of the borehole.

5.1.7 Moisture Content

Describe the moisture content of the soil sample using one of the following three terms:

- Dry – no visible evidence of water and the soil is dry to the touch;
- Moist – visible evidence of water but the soil is relatively dry to the touch. Do not use the term "damp" to describe this type of soil; and
- Wet – visible evidence of water and the soil is wet to the touch. Free water is evident when sandy soil is squeezed. Do not use the term "saturated" to describe this type of soil.

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5.1.8 Recording Soil Sample Descriptions in Field Notes

Recording the information in the field notes consistently in the above order will make it easier to prepare the borehole logs for the site investigation report.

Example soil sample descriptions are as follows:

- Sand, grey, trace gravel, PHC-like odours, free-phase PHC-like product, wet;
- Silty sand, brownish-grey, some gravel, trace asphalt and brick fragments, no odours or staining, moist; and
- Silty clay, brown, trace gravel, no odours or staining, moist to wet at 2.4 mbgs.

5.2 General Considerations

Where any physical properties change within a soil sample, the depth at which this transition takes place needs to be recorded. For example, for a soil sample collected from 1.8 to 2.4 metres below ground surface (mbgs), if the upper 0.3 metres has no odours but PHC-like odours are present below this depth then the field notes need to state “no odours from 1.8 to 2.1 mbgs, PHC-like odours from 2.1 to 2.4 mbgs”.

Some soil samples will contain a thin seam of a different soil type, such as a sand seam within a silty clay. The depth interval of any such seam is to be recorded in the field notes, and the material comprising the seam should be described separately using the logging procedure outlined above.

Avoid the use of geotechnical terms (e.g., stiff, dense, high plasticity, etc.) when logging soil samples. EDR staff are not trained or expected to assess soil conditions from a geotechnical perspective. If any geotechnical terms are inadvertently included in the field notes, they must not be included in the borehole logs provided in our report.

5.3 Additional Considerations for Ontario Regulation 153/04 Phase Two ESA Compliance

None. Following this SOP will be sufficient to comply with the Ontario Regulation 153/04 requirements for Phase Two ESAs with respect to field logging. Risk assessments completed in accordance with Ontario Regulation 153/04 will typically require soil samples to be submitted to a laboratory for full soil texture analysis, but this is beyond the scope of field logging.

6.0 TRAINING

The Practice Leader is responsible for identifying the training needs of EDR staff and ensuring that staff is trained and competent before undertaking work assignments.

All trained personnel are responsible for identifying coaching or re-training needs (if they are uncomfortable with work assignments that have been assigned).

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The careful application of *Health & Safety Training* by each employee is an integral part of all activities and is assumed as part of this SOP.

7.0 MAINTENANCE OF SOP

1 Year.

8.0 REFERENCES

American Society for Testing and Materials, *ASTM D2487-11 - Standard Practice for Classification of Soils for Engineering Purposes (United Soil Classification System)*, 2011.

Association of Professional Geoscientists of Ontario, *Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended)*, April 2011.

9.0 APPENDICES

Appendix 1 Soil Texture by Feel Chart

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Template: Master SOP Template – February 2014

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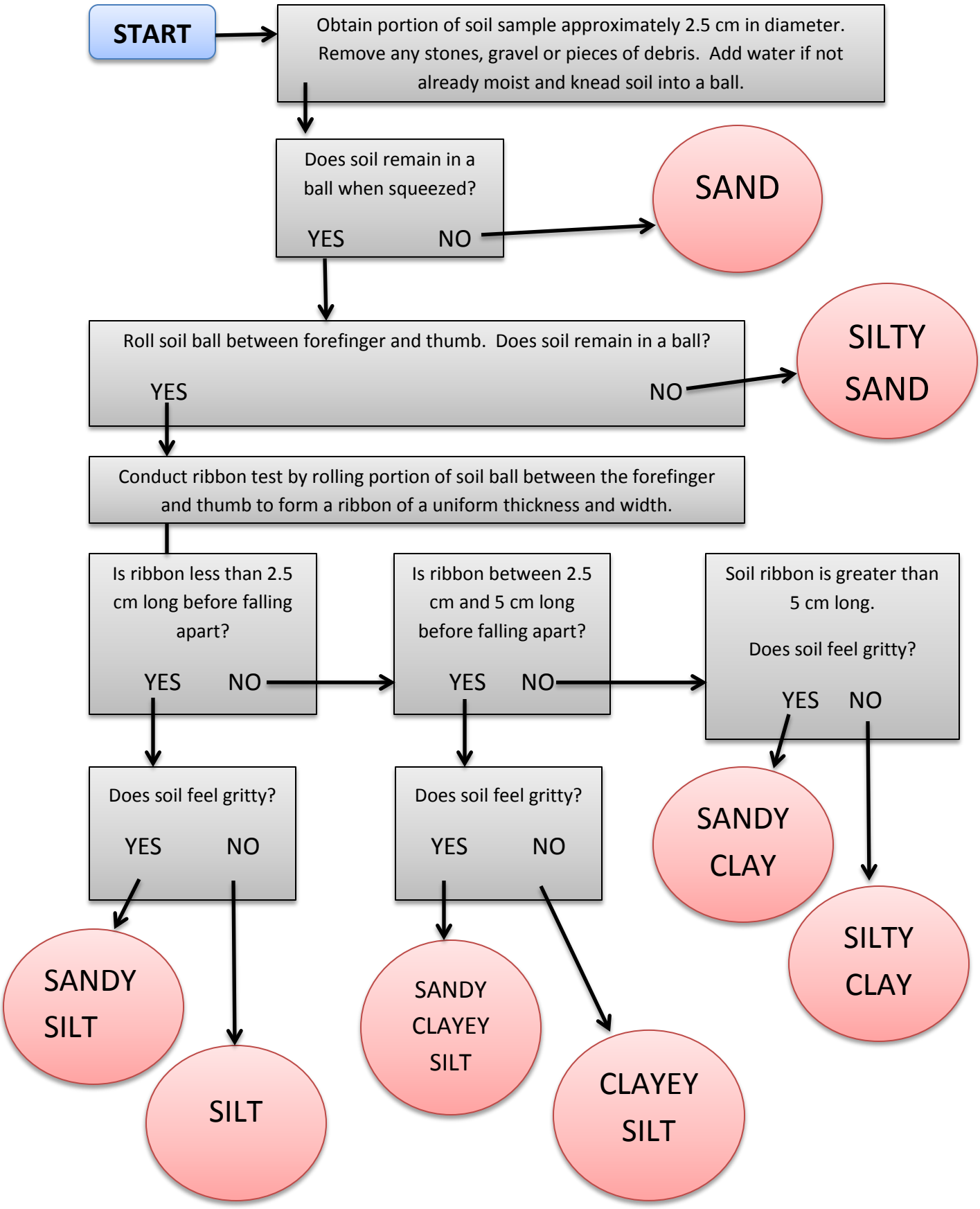
APPENDIX I

Soil Texture by Feel Chart

Key to Soil Texture by Feel



SOP – EDR025 – REV003 – QA/QC SAMPLING

Title:	QA/QC Sampling
Practice:	EDR
First Effective Date:	January 17, 2014
Version:	003
Version Date:	April 28, 2017
Author:	Robert MacKenzie
Authorized by:	Robert MacKenzie
Signature:	

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1.0 VERSION HISTORY

Version	Date	Summary of Changes	Author
Original	January 17, 2014	N/A	RLM
001	June 26, 2014	Amended blind duplicate sampling requirements	RLM
002	April 29, 2016	Updated Section 4.0/Amended O.Reg. 153/04 trip blank requirements	RLM
003	April 28, 2017	Removed reference to Pinchin West	RLM

2.0 SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) describes the standard procedures for collecting soil, water and sediment samples for quality assurance/quality control (QA/QC) purposes.

A QA/QC program is essentially a management system that ensures that quality standards are met within a stated level of confidence. The QC component of the program comprises daily activities in the field and laboratory that are used to control the quality of both the samples collected and the sample analytical data. The QA component of the program is made up of measures used to determine whether the QC activities are effective.

When completing a site investigation, one of our primary goals is to obtain analytical data that are representative of actual soil, water and/or sediment conditions at the site. The completion of a QA/QC program, consisting of the collection and analysis of various QA/QC samples, provides information for use in evaluating the accuracy of the analytical data used to assess the environmental quality of the site.

The type and number of samples comprising the QA/QC program will be determined by the Project Manager on a site-by-site basis, but will typically include at a minimum a trip blank when collecting water samples for volatile parameter analysis and duplicate soil, sediment and/or groundwater samples. Other types of QA/QC samples may be collected (e.g., equipment or field blanks) to meet project-specific requirements at the discretion of the Project Manager.

The QA/QC sampling requirements and procedures for indoor air, soil vapour and sorbent tube samples are described in SOP-EDR012, SOP-EDR018 and SOP-EDR027, respectively.

3.0 OVERVIEW

The types of samples collected for the QA/QC program during site investigations may include the following:

- Trip blanks;
- Field blanks;

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- Equipment blanks; and
- Field duplicates.

Trip blanks are used to assess whether ambient air conditions may have resulted in positive bias of water samples collected for volatile parameter analysis during transportation of the sample containers to and from a project site. Note that the term “positive bias” means that reported sample concentrations are greater than actual in situ sample concentrations due to some form of “cross-contamination”.

Field blanks are collected to assess whether ambient air conditions may have resulted in positive bias of samples collected at a project site for volatile parameter analysis at the time of sampling.

Equipment blanks are collected to assess the efficiency of non-dedicated monitoring/sampling equipment cleaning procedures.

Duplicate samples are collected to assess whether field sampling and laboratory analytical methods are suitable and reproducible.

The analytical results of the QA/QC samples are reviewed by the Project Manager to assess whether any data quality issues are evident which may affect the interpretation of the soil, water and/or sediment sample analytical data.

4.0 DISTRIBUTION

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- Distributed to senior staff at Le Groupe Gesfor Poirier and Pinchin LeBlanc for distribution as appropriate.

5.0 PROCEDURE

5.1 Equipment and Supplies

The equipment/supplies required for QA/QC sample collection are the same as that used for regular investigative sampling, except for the following:

- Volatile organic compound (VOC)-free distilled water supplied by the analytical laboratory for use in the collection of field blanks and/or equipment blanks;
- Additional sample jars supplied by the analytical laboratory for the collection of field blanks, equipment blanks and field duplicates; and

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- Trip blanks supplied by the analytical laboratory.

5.2 QA/QC Sampling Procedures

5.2.1 General Procedures for QA/QC Blank Sampling

The analytical laboratory that will be completing the analysis of the regular investigative samples and QA/QC samples for a project must supply the water used to collect field blanks and equipment blanks. Water provided by another analytical laboratory or store-bought distilled water must not be used.

5.2.2 Trip Blanks

A trip blank is a set of VOC sample vials filled by the analytical laboratory with VOC-free distilled water and shipped with the sample containers. A trip blank is to be stored with the sample containers provided by the analytical laboratory during travel to the project site, while on the project site, and during travel from the project site back to the analytical laboratory. The sample containers comprising a trip blank are not to be opened in the field.

For some projects, submissions of volatile parameter samples to the analytical laboratory over several days will be required. In this case, a trip blank sample should accompany each submission to the laboratory. If this situation is anticipated, the Project Manager must request that the analytical laboratory provide sufficient trip blanks so that a trip blank can accompany the submission of each set of samples to the laboratory.

Trip blanks are to be analyzed for the same volatile parameters (i.e., VOCs and/or petroleum hydrocarbons (PHCs) (F1 fraction)) as the regular investigative samples. For example, if the groundwater sampling program includes analysis of VOCs and PHCs (F1-F4 fractions), then the trip blank(s) require analysis of VOCs and PHCs (F1 fraction). If the groundwater sampling program only includes VOC analysis, then the trip blank(s) require analysis of VOCs only.

Unless specified by the Project Manager, trip blanks are not required for soil and sediment sampling, or for water sampling involving only non-volatile parameters. At the discretion of the Project Manager and to meet project-specific requirements, trip blanks for non-volatile parameters can be prepared and analyzed using the same principals as for volatile parameter trip blanks.

5.2.3 Field Blanks

A field blank is a set of VOC sample vials filled during a sampling event at a project site with VOC-free distilled water supplied by the analytical laboratory and submitted for analysis of volatile parameters (i.e., VOCs and/or PHCs (F1 fraction)).

Field blanks are to be collected at a sample location considered “worst case” with respect to ambient air conditions (e.g., adjacent to and downwind of the pump island of an active retail fuel outlet, inside an active on-the-premises dry cleaner, etc.). At project sites where there is

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no obvious “worst case” ambient air location, the field blank can be collected at a sampling location picked randomly. The field blank collection location and rationale for selecting it must be documented in the field notes.

If a groundwater sampling event at a project site occurs over more than one day, a field blank is to be collected for each day of sampling.

Some project sites may have an isolated area where the ambient air conditions are significantly poorer than the remainder of the site and a field blank collected from this area may not be representative of conditions elsewhere on the site. In this case, at the discretion of the Project Manager, the collection of two field blanks may be appropriate, with one field blank collected from the poor ambient air area and one field blank collected from a location outside of this area.

Unless specified by the Project Manager, field blanks are not required for soil and sediment sampling, or for water sampling involving only non-volatile parameters. At the discretion of the Project Manager and to meet project-specific requirements, field blanks for non-volatile parameters can be collected and analyzed using the same principals as for volatile parameter field blanks.

5.2.4 Equipment Blanks

An equipment blank is collected by pouring VOC-free distilled water supplied by the analytical laboratory either over or through non-dedicated sampling/monitoring equipment that has been cleaned following sampling/monitoring using the procedures outlined in SOP-EDR009. The resulting rinsate is then captured in sample containers appropriate for the intended analysis. Note that the surface over which the distilled water is poured must be the surface from which samples are collected from or that is in contact with the medium being monitored. For example, if an equipment blank is being collected from a split-spoon sampler, the distilled water must be poured through the interior of the sampler, and not the exterior of the sampler.

The Project Manager will be responsible for determining the sampling/monitoring equipment from which equipment blanks will be obtained, the number of equipment blanks and the parameters to be analyzed. Regarding the latter, the parameters analyzed for equipment blanks are typically the parameters of concern for a given project site.

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5.2.5 Evaluation of Blank Sample Results

The Project Manager will evaluate the results of the blank sample analysis to assess whether these results show that bias may have been introduced to investigative samples collected during the field sampling activities. Judgement by the Project Manager will be required to assess whether the blank sample results have any effect on the interpretation of the investigative sample results. This is assessed on a case-by-case basis, but the following general principals can be applied:

- If all soil, groundwater and/or sediment samples collected for a site investigation meet the applicable environmental standards/criteria, the presence of detectable or elevated parameter concentrations in the blanks has no effect on the interpretation of the investigative sample results;
- If parameters have detectable or elevated concentrations in the blank samples but none of these parameters are present in the regular investigative samples at concentrations exceeding the applicable environmental standards/criteria, the blank sample results have no effect on the interpretation of the investigative sample results;
- If parameters have detectable or elevated parameter concentrations in the blank samples and one or more of these parameters are present in the regular investigative samples at concentrations exceeding the applicable environmental standards/criteria, then positive bias of the regular investigative samples may have occurred. The Project Manager will need to assess a number of variables, including the relative parameter concentrations in the blank and regular investigative samples, to determine whether the regular investigative sample data is considered representative and usable for assessing the environmental quality of the site. If the regular investigative sample data is questionable, then resampling may be required; and
- If the regular investigative samples have exceedances of the applicable environmental standards/criteria and the blank samples have non-detectable parameter concentrations, the blank sample results have no effect on the interpretation of the investigative sample results.

5.2.6 General Procedures for QA/QC Duplicate Sampling

Whenever possible, duplicate samples are to be collected from “worst case” sample locations. The reason for this is that Relative Percent Differences (RPDs) are calculated using the analytical results of the duplicate and regular investigative samples to evaluate the suitability and reproducibility of field sampling and laboratory analytical methods. However, RPDs for a given parameter can only be calculated if there are detectable concentrations in both samples, and “worst case” sample locations are the most likely to have detectable levels of parameters of concern. The calculation and evaluation of RPDs is discussed at the end of this section.

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When filling sample containers, the order of collection is regular investigative sample first and duplicate sample second.

5.2.7 Field Duplicate Samples – Soil/Sediment

Soils/sediments are frequently heterogeneous because they are typically deposited in horizontal layers over time, causing both small scale and large scale grain size variations that can often result in significant variations in contaminant concentrations between layers. Because of this, it is important that duplicate soil/sediment samples be collected from the same vertical depths as the regular investigative samples in sample cores or at discrete sampling locations (e.g., grab samples).

When collecting a duplicate soil/sediment sample from a sampling device that provides a soil core (e.g., dual-tube sampler, split-spoon sampler), the soil core is to be split in half vertically (i.e., longitudinally). A portion of one half of the core is used for the regular investigative sample and a portion of the other half of the core is used for the duplicate sample. The portion of each core placed in sample jars for analysis must be obtained from the same depth interval within the cores.

When collecting a duplicate soil/sediment sample from a grab sample (e.g., excavation floor or sidewall), the field duplicate sample must be collected as close as possible to the regular investigative sample location at the sample depth and within the same soil layer.

There are no special procedures for collecting field duplicates of composite soil/sediment samples given that the soil/sediment is homogenized during the composite sample collection procedure.

A field duplicate soil/sediment sample must be collected at the same time as the regular investigative sample. Retroactively splitting a soil/sediment sample to obtain a field duplicate sample is not permitted.

5.2.8 Field Duplicate Samples – Surface Water/Potable Water/Groundwater

There are no special procedures for collecting surface water/potable water/groundwater field duplicate samples with the following exceptions:

- When collecting a duplicate water sample for metals analysis and field filtering is required, a new filter is to be used to collect the duplicate sample unless the groundwater has a low sediment content; and
- When collecting a duplicate surface water sample, the sample containers for the same parameter(s) should be immersed in the surface water body at the same location and at the same time whenever possible.

5.2.9 Duplicate Sample Labelling

The duplicate sample should have the term “DUP” in the sample identifier to distinguish it as a duplicate sample.

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5.2.10 Evaluation of Duplicate Sample Results

Duplicate sample results are evaluated by calculating RPDs using the following equation:

$$RPD = \frac{\text{Absolute Value (Original Concentration – Duplicate Concentration)}}{\text{(Original Concentration + Duplicate Concentration)/2}} \times 100\%$$

RPDs are not calculated unless the parameter concentrations in both the regular investigative sample and duplicate sample are detectable concentrations above the corresponding practical quantitation limit (PQL) for the parameter, which is equal to five times the lowest laboratory reportable detection limit (RDL).

For example, if the RDL for a parameter is 0.1 parts per million (ppm), and the concentration in the regular investigative sample is 0.4 ppm and the concentration in the duplicate sample is 0.6 ppm, the RPD cannot be calculated because the concentration in the regular investigative sample (0.4 ppm) is less than the PQL of 0.5 ppm (5 times the RDL of 0.1 ppm).

Also, if the regular investigative sample concentration is 2 ppm and the duplicate sample concentration is <1 ppm, then the RPD cannot be calculated regardless of the PQL since detectable concentrations were not reported for both samples.

Calculated RPDs for the regular investigative and field duplicate samples are compared to established performance standards to evaluate the suitability and reproducibility of field sampling and laboratory analytical methods. In Ontario, the Ontario Ministry of the Environment and Climate Change (formerly the Ontario Ministry of the Environment) provides duplicate sample performance standards in the document *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act,* dated March 9, 2004, amended as of July 1, 2011. Although these performance standards only strictly apply to laboratory duplicate samples, they are considered suitable for comparison to field duplicate samples. Other provinces provide their own similar guidance.

When calculated RPDs exceed the performance standards, the Project Manager will evaluate whether these results have any effect on the interpretation of the investigative sample results. This is judged on a case-by-case basis, but in many situations RPD values above the performance standards can be attributed to small scale heterogeneity inherent in soil samples or variations in the quantity of sediment in groundwater or surface water samples, and are not indicative of poor field sampling or laboratory procedures. The results of internal laboratory QA/QC sampling may provide additional information as to the precision of the data. Furthermore, if all soil, water and/or sediment samples collected for a site investigation meet the applicable environmental standards/criteria, the apparent lack of precision shown by elevated RPD values should not affect the interpretation of the investigative sample results.

Sometimes a regular investigative sample will meet the applicable environmental standards/criteria and its corresponding duplicate sample will fail the applicable environmental standards/criteria (or vice versa).

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In Ontario, it is permitted to average the parameter concentrations of two samples provided they are collected at the same time and from the same sample location and depth. The resulting average parameter concentrations are then compared with the applicable standards to determine whether the sample meets or fails the standards. This approach is not acceptable in all jurisdictions. In situations where averaging is not acceptable to the regulatory agency, the "worst case" sample result is to be used in assessing the environmental condition of the project site.

5.3 Fieldwork Records

The field notes must include the following information with respect to QA/QC samples:

- The date and time of sampling for all blank/duplicate samples;
- The sample location for field blanks and the rationale for selecting the field blank locations;
- The type of equipment from which a rinsate was collected for equipment blanks and the parameters to be analyzed; and
- The corresponding regular investigative sample location/sample interval for duplicate samples and the parameters to be analyzed.

5.4 Additional Considerations for Ontario Regulation 153/04 Phase Two ESA Compliance

When completing a Phase Two ESA in accordance with Ontario Regulation 153/04, the QA/QC sampling program must consist of the following as a minimum:

- At least one field duplicate soil, sediment or groundwater sample must be collected for every ten samples submitted for analysis. The frequency is one duplicate sample for one to 10 regular investigative samples, two duplicate samples for 11 to 20 samples, etc. for all parameters analyzed. For example, even if only one groundwater sample is collected for PAHs analysis, a duplicate of this sample must be collected.

When sampling for VOCs, one trip blank sample must be submitted to the laboratory for VOCs analysis for each submission to the laboratory. In other words, if a groundwater sampling program lasts three days and samples are submitted to the laboratory at the end of each day, there must be a total of three trip blanks submitted with the samples (i.e., one per day of sampling). Note that analysis of trip blank samples for other volatile parameters (e.g., PHCs (F1 Fraction)) is not mandatory but can be completed at the discretion of the Qualified Person.

6.0 TRAINING

The Practice Leader is responsible for identifying the training needs of EDR staff and ensuring that staff are trained and competent before undertaking work assignments.

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All trained personnel are responsible for identifying coaching or re-training needs (if they are uncomfortable with work assignments that have been assigned).

The careful application of *Health & Safety Training* by each employee is an integral part of all activities and is assumed as part of this SOP.

7.0 MAINTENANCE OF SOP

1 Year.

8.0 REFERENCES

Association of Professional Geoscientists of Ontario, *Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended),* April 2011.

Ontario Ministry of the Environment and Climate Change, *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act*, March 9, 2004, as amended as of July 1, 2011.

Water, Air and Climate Change Branch, Ministry of Water, Land and Air Protection, Province of British Columbia, *British Columbia Field Sampling Manual*, 2003.

9.0 APPENDICES

None.

I:\2017 SOP Updates\SOP - EDR025 - REV003 - QA QC Sampling.docx

Template: Master SOP Template – February 2014

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APPENDIX C
Borehole Logs

Log of Borehole: BH01

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (RKI)	Laboratory Analysis
0 / 0		Ground Surface	0.00	No Monitoring Well Installed					
0–12 / 0–3.66		***Sand*** Moist, grey-brown, some silt, trace gravel.			1	50	BH01-1	<5	
					2	70	BH01-2	<5	
							BH01-3	<5	
					3	100	BH01-4	<5	PHCs, BTEX, PAHs
12–15 / 3.66–4.57		***Silt*** Damp, grey, trace sand.	4.57		4	100	BH01-5	<5	
15 / 4.57		End of Borehole							

Soil vapour concentration measured using an RKI Eagle combustible gas indicator (RKI).

Contractor: Strata Drilling Group

Drilling Method: Direct Push

Well Casing Size: NA

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Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH02

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE

SAMPLE

Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (RKI)	Laboratory Analysis
0 / 0		Ground Surface	0.00						
0–3 / 0–1		***Topsoil*** Moist, dark brown. ***Silt*** Damp, brown, some sand, trace gravel.		No Monitoring Well Installed	1	70	BH02-1	<5	PHCs, BTEX, PAHs, pH
							BH02-2	<5	
3–6 / 1–2		Grey below 1.22 mbgs.			2	100	BH02-3	<5	Grain Size
6–9 / 2–3					3	80	BH02-4	<5	pH
9–12 / 3–4		Trace sand and no gravel below 3.35 mbgs.			4	90	BH02-5	<5	
12–15 / 4–5			4.57		5	100	BH02-6	<5	
15 / 5		End of Borehole							
19 / 6		Soil vapour concentration measured using an RKI Eagle combustible gas indicator (RKI).							

Contractor: Strata Drilling Group

Drilling Method: Direct Push

Well Casing Size: NA

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Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH03

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00						
		Topsoil Moist, dark brown.		No Monitoring Well Installed	1	100	BH03-1	NM	OC Pesticides, PCBs
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

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Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH04

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00	No Monitoring Well Installed					
		Topsoil Moist, dark brown.			1	100	BH04-1	NM	OC Pesticides, PCBs
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

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Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH05

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00						
		Topsoil Moist, dark brown.		No Monitoring Well Installed	1	100	BH05-1	NM	OC Pesticides, PCBs, Grain Size
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

Pinchin Ltd.

6-875 Main Street West, Suite 200

Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH06

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00	No Monitoring Well Installed					
		Topsoil Moist, dark brown.			1	100	BH06-1	NM	OC Pesticides, PCBs
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

Pinchin Ltd.

6-875 Main Street West, Suite 200

Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH07

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00						
		Topsoil Moist, dark brown.		No Monitoring Well Installed	1	100	BH07-1	NM	OC Pesticides, PCBs
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

Pinchin Ltd.

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Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH08

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00						
		Topsoil Moist, dark brown.		No Monitoring Well Installed	1	100	BH08-1	NM	OC Pesticides, PCBs
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

Pinchin Ltd.

6-875 Main Street West, Suite 200

Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH09

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00						
		Topsoil Moist, dark brown.		No Monitoring Well Installed	1	100	BH09-1	NM	OC Pesticides, PCBs
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

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Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH10

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00						
		Topsoil Moist, dark brown.		No Monitoring Well Installed	1	100	BH10-1	NM	OC Pesticides, PCBs
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

Pinchin Ltd.

6-875 Main Street West, Suite 200

Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH11

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00						
		Topsoil Moist, dark brown.		No Monitoring Well Installed	1	100	BH11-1	NM	OC Pesticides, PCBs
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

Pinchin Ltd.

6-875 Main Street West, Suite 200

Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH12

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00						
		Topsoil Moist, dark brown.		No Monitoring Well Installed	1	100	BH12-1	NM	OC Pesticides, PCBs
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

Pinchin Ltd.

6-875 Main Street West, Suite 200

Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH13

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00						
		Topsoil Moist, dark brown.		No Monitoring Well Installed	1	100	BH13-1	NM	OC Pesticides, PCBs
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

Pinchin Ltd.

6-875 Main Street West, Suite 200

Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH14

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00						
		Topsoil Moist, dark brown.		No Monitoring Well Installed	1	100	BH14-1	NM	OC Pesticides, PCBs
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

Pinchin Ltd.

6-875 Main Street West, Suite 200

Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH15

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00						
		Topsoil Moist, dark brown.		No Monitoring Well Installed	1	100	BH15-1	NM	OC Pesticides, PCBs
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

Pinchin Ltd.

6-875 Main Street West, Suite 200

Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH16

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00						
		Topsoil Moist, dark brown.		No Monitoring Well Installed	1	100	BH16-1	NM	OC Pesticides, PCBs
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

Pinchin Ltd.

6-875 Main Street West, Suite 200

Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH17

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00						
		Topsoil Moist, dark brown.		No Monitoring Well Installed	1	100	BH17-1	NM	OC Pesticides, PCBs, Grain Size
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

Pinchin Ltd.

6-875 Main Street West, Suite 200

Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH18

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00						
		Silty Sand Moist, brown, trace gravel.		No Monitoring Well Installed	1	100	BH18-1	NM	OC Pesticides, PCBs
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

Pinchin Ltd.

6-875 Main Street West, Suite 200

Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH19

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00						
		Topsoil Moist, dark brown.		No Monitoring Well Installed	1	100	BH19-1	NM	OC Pesticides, PCBs, pH
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

Pinchin Ltd.

6-875 Main Street West, Suite 200

Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH20

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00						
		Topsoil Moist, dark brown.		No Monitoring Well Installed	1	100	BH20-1	NM	OC Pesticides, PCBs
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

Pinchin Ltd.

6-875 Main Street West, Suite 200

Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH21

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
0 / 0		Ground Surface	0.00						
		Topsoil Moist, dark brown.		No Monitoring Well Installed	1	100	BH21-1	NM	OC Pesticides, PCBs
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

Pinchin Ltd.

6-875 Main Street West, Suite 200

Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH22

Project #: 210701.001 **Logged By:** JL

Project: Phase Two Environmental Site Assessment

Client: Triovest Realty Advisors Inc.

Location: 12300, 12400, 12490 and 12592 Coleraine Drive, Caledon, Ontario

Drill Date: November 6, 2017 **Project Manager:** MG

SUBSURFACE PROFILE					SAMPLE				
Depth	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration (ppmv) (PID)	Laboratory Analysis
ft / m		Ground Surface	0.00						
0 / 0		***Silty Sand*** Moist, brown, trace gravel.		No Monitoring Well Installed	1	100	BH22-1	NM	OC Pesticides, PCBs
1			0.30						
		End of Borehole							
2									

Contractor: NA

Drilling Method: Hand Auger

Well Casing Size: NA

Pinchin Ltd.

6-875 Main Street West, Suite 200

Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NA

Sheet: 1 of 1

APPENDIX D

Field Instrument Calibration Records

INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

6380 Tomken Road, Unit 1 & 2
Mississauga, ONTARIO L5T1Y4
Toll-free: (866) 688-0388

Pine Environmental Services, Inc.

Instrument ID 19828
Description RKI Eagle 2 with I/R HC Sensor
Calibrated 11/2/2017 5:09:51PM

Manufacturer RKI
Model Number Eagle 2 (I.R. SENSOR)
Serial Number/ Lot Number E2B932
Location Ontario
Department

State Certified
Status Pass
Temp °C 22
Humidity % 38

Calibration Specifications

Group # 1
Group Name Hexane
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
0 / 0	%LEL	0	%LEL	0	0	0.00%	Pass
15 / 15	%LEL	15	%LEL	15	15	0.00%	Pass

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

Test Standard ID	Description	Manufacturer	Model Number	Serial Number / Lot Number	Last Cal Date/ Opened Date	Next Cal Date / Expiration Date
ON HEX 15%LEL HBH-262-0.165--2	ON HEX 15%LEL LOT HBH-262-0.165-2	Spec Air	32465	HBH-262-0.165-2		7/7/2021

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Kevin Johnson

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

APPENDIX E

Laboratory Certificates of Analysis

Your Project #: 210701.001
Site Location: PHASE II/12300 COLERAINE DR, CALEDON

Attention:Melissa Gallagher

Pinchin Ltd
Unit 6
875 Main St W
Hamilton, ON
L8S 4R9

Your C.O.C. #: 635506-04-01, 635506-02-01, 635506-01-01

Report Date: 2017/11/20
Report #: R4868960
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7P0185
Received: 2017/11/07, 16:56

Sample Matrix: Soil
Samples Received: 27

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum	3	N/A	2017/11/14	CAM SOP-00301	EPA 8270D m
Petroleum Hydro. CCME F1 & BTEX in Soil (1)	3	N/A	2017/11/11	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Soil (2)	3	2017/11/10	2017/11/13	CAM SOP-00316	CCME CWS m
Moisture	2	N/A	2017/11/09	CAM SOP-00445	Carter 2nd ed 51.2 m
Moisture	23	N/A	2017/11/10	CAM SOP-00445	Carter 2nd ed 51.2 m
OC Pesticides (Selected) & PCB (3)	15	2017/11/13	2017/11/15	CAM SOP-00307	SW846 8081, 8082
OC Pesticides (Selected) & PCB (3)	7	2017/11/14	2017/11/15	CAM SOP-00307	SW846 8081, 8082
OC Pesticides Summed Parameters	22	N/A	2017/11/11	CAM SOP-00307	EPA 8081/8082 m
PAH Compounds in Soil by GC/MS (SIM)	3	2017/11/10	2017/11/11	CAM SOP-00318	EPA 8270D m
pH CaCl2 EXTRACT	3	2017/11/10	2017/11/10	CAM SOP-00413	EPA 9045 D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Your Project #: 210701.001
Site Location: PHASE II/12300 COLERAINE DR, CALEDON

Attention:Melissa Gallagher

Pinchin Ltd
Unit 6
875 Main St W
Hamilton, ON
L8S 4R9

Your C.O.C. #: 635506-04-01, 635506-02-01, 635506-01-01

Report Date: 2017/11/20
Report #: R4868960
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7P0185
Received: 2017/11/07, 16:56

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.
(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.
(3) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Antonella Brasil, Senior Project Manager
Email: ABrasil@maxxam.ca
Phone# (905)817-5817

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Maxxam Job #: B7P0185
Report Date: 2017/11/20

Pinchin Ltd
Client Project #: 210701.001
Site Location: PHASE II/12300 COLERAINE DR, CALEDON
Sampler Initials: JL

RESULTS OF ANALYSES OF SOIL

Maxxam ID		FMU629		FMU630			FMU632	FMU635	
Sampling Date		2017/11/06 09:30		2017/11/06 10:00			2017/11/06 10:10	2017/11/06 01:15	
COC Number		635506-04-01		635506-04-01			635506-04-01	635506-04-01	
	UNITS	BH01-4	QC Batch	BH02-1	RDL	QC Batch	BH02-4	BH19-1	QC Batch
Inorganics									
Moisture	%	11	5258193	13	1.0	5258193			
Available (CaCl2) pH	pH			7.80		5258022	7.83	6.64	5258022

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FMU636	FMU637	FMU638	FMU639	FMU640		
Sampling Date		2017/11/06 10:35	2017/11/06 10:45	2017/11/06 10:55	2017/11/06 11:05	2017/11/06 11:15		
COC Number		635506-02-01	635506-02-01	635506-02-01	635506-02-01	635506-02-01		
	UNITS	BH03-1	BH04-1	BH05-1	BH06-1	BH07-1	RDL	QC Batch
Inorganics								
Moisture	%	20	20	23	23	29	1.0	5259484

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FMU641		FMU642	FMU643	FMU643	FMU644		
Sampling Date		2017/11/06 11:25		2017/11/06 11:35	2017/11/06 11:45	2017/11/06 11:45	2017/11/06 11:55		
COC Number		635506-02-01		635506-02-01	635506-02-01	635506-02-01	635506-02-01		
	UNITS	BH08-1	QC Batch	BH09-1	BH10-1	BH10-1 Lab-Dup	BH11-1	RDL	QC Batch
Inorganics									
Moisture	%	21	5259547	21	22	21	32	1.0	5259484

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam ID		FMU645		FMU646	FMU647	FMU648	FMU649		
Sampling Date		2017/11/06 12:05		2017/11/06 12:15	2017/11/06 12:25	2017/11/06 12:35	2017/11/06 12:45		
COC Number		635506-02-01		635506-01-01	635506-01-01	635506-01-01	635506-01-01		
	UNITS	BH12-1	QC Batch	BH13-1	BH14-1	BH15-1	BH16-1	RDL	QC Batch
Inorganics									
Moisture	%	24	5259547	20	21	23	23	1.0	5259484

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7P0185
Report Date: 2017/11/20

Pinchin Ltd
Client Project #: 210701.001
Site Location: PHASE II/12300 COLERAINE DR, CALEDON
Sampler Initials: JL

RESULTS OF ANALYSES OF SOIL

Maxxam ID		FMU650	FMU651	FMU652	FMU653	FMU654	FMU655		
Sampling Date		2017/11/06 12:55	2017/11/06 01:05	2017/11/06 01:15	2017/11/06 01:25	2017/11/06 01:35	2017/11/06 01:45		
COC Number		635506-01-01	635506-01-01	635506-01-01	635506-01-01	635506-01-01	635506-01-01		
	UNITS	BH17-1	BH18-1	BH19-1	BH20-1	BH21-1	BH22-1	RDL	QC Batch
Inorganics									
Moisture	%	21	15	21	20	22	13	1.0	5259484

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FMU656	FMU657		FMU658		
Sampling Date		2017/11/06	2017/11/06		2017/11/06		
COC Number		635506-02-01	635506-02-01		635506-02-01		
	UNITS	DUP-1	DUP-2	QC Batch	DUP-3	RDL	QC Batch
Inorganics							
Moisture	%	24	22	5259484	12	1.0	5259315

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7P0185
Report Date: 2017/11/20

Pinchin Ltd
Client Project #: 210701.001
Site Location: PHASE II/12300 COLERAINE DR, CALEDON
Sampler Initials: JL

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FMU629	FMU630	FMU658		
Sampling Date		2017/11/06 09:30	2017/11/06 10:00	2017/11/06		
COC Number		635506-04-01	635506-04-01	635506-02-01		
	UNITS	BH01-4	BH02-1	DUP-3	RDL	QC Batch
Calculated Parameters						
Methylnaphthalene, 2-(1-)	ug/g	<0.0071	<0.0071	<0.0071	0.0071	5254430
Polyaromatic Hydrocarbons						
Acenaphthene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	5259320
Acenaphthylene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	5259320
Anthracene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	5259320
Benzo(a)anthracene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	5259320
Benzo(a)pyrene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	5259320
Benzo(b/j)fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	5259320
Benzo(g,h,i)perylene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	5259320
Benzo(k)fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	5259320
Chrysene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	5259320
Dibenz(a,h)anthracene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	5259320
Fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	5259320
Fluorene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	5259320
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	5259320
1-Methylnaphthalene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	5259320
2-Methylnaphthalene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	5259320
Naphthalene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	5259320
Phenanthrene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	5259320
Pyrene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	5259320
Surrogate Recovery (%)						
D10-Anthracene	%	93	98	97		5259320
D14-Terphenyl (FS)	%	88	110	93		5259320
D8-Acenaphthylene	%	88	87	90		5259320

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7P0185
Report Date: 2017/11/20

Pinchin Ltd
Client Project #: 210701.001
Site Location: PHASE II/12300 COLERAINE DR, CALEDON
Sampler Initials: JL

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FMU629	FMU630	FMU658		
Sampling Date		2017/11/06 09:30	2017/11/06 10:00	2017/11/06		
COC Number		635506-04-01	635506-04-01	635506-02-01		
	UNITS	BH01-4	BH02-1	DUP-3	RDL	QC Batch
BTEX & F1 Hydrocarbons						
Benzene	ug/g	<0.020	<0.020	<0.020	0.020	5261496
Toluene	ug/g	<0.020	<0.020	<0.020	0.020	5261496
Ethylbenzene	ug/g	<0.020	<0.020	<0.020	0.020	5261496
o-Xylene	ug/g	<0.020	<0.020	<0.020	0.020	5261496
p+m-Xylene	ug/g	<0.040	<0.040	<0.040	0.040	5261496
Total Xylenes	ug/g	<0.040	<0.040	<0.040	0.040	5261496
F1 (C6-C10)	ug/g	<10	<10	<10	10	5261496
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	10	5261496
F2-F4 Hydrocarbons						
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	10	5259318
F3 (C16-C34 Hydrocarbons)	ug/g	<50	<50	<50	50	5259318
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	<50	50	5259318
Reached Baseline at C50	ug/g	Yes	Yes	Yes		5259318
Surrogate Recovery (%)						
1,4-Difluorobenzene	%	101	101	101		5261496
4-Bromofluorobenzene	%	101	101	100		5261496
D10-Ethylbenzene	%	110	117	102		5261496
D4-1,2-Dichloroethane	%	98	98	97		5261496
o-Terphenyl	%	89	93	92		5259318

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7P0185
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Pinchin Ltd
Client Project #: 210701.001
Site Location: PHASE II/12300 COLERAINE DR, CALEDON
Sampler Initials: JL

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		FMU636		FMU637		FMU638		FMU639		
Sampling Date		2017/11/06 10:35		2017/11/06 10:45		2017/11/06 10:55		2017/11/06 11:05		
COC Number		635506-02-01		635506-02-01		635506-02-01		635506-02-01		
	UNITS	BH03-1	RDL	BH04-1	RDL	BH05-1	RDL	BH06-1	RDL	QC Batch
Calculated Parameters										
Chlordane (Total)	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5254741
o,p-DDD + p,p-DDD	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5254741
o,p-DDE + p,p-DDE	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5254741
o,p-DDT + p,p-DDT	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5254741
Total Endosulfan	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5254741
Total PCB	ug/g	<0.040	0.040	<0.020	0.020	<0.040	0.040	<0.020	0.020	5254741
Pesticides & Herbicides										
Aldrin	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
a-Chlordane	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
g-Chlordane	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
o,p-DDD	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
p,p-DDD	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
o,p-DDE	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
p,p-DDE	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
o,p-DDT	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
p,p-DDT	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
Dieldrin	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
Lindane	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
Endosulfan I (alpha)	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
Endosulfan II (beta)	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
Endrin	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
Heptachlor	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
Heptachlor epoxide	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
Hexachlorobenzene	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
Hexachlorobutadiene	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
Hexachloroethane	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	5262536
Methoxychlor	ug/g	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	5262536
Aroclor 1242	ug/g	<0.040	0.040	<0.020	0.020	<0.040	0.040	<0.020	0.020	5262536
Aroclor 1248	ug/g	<0.040	0.040	<0.020	0.020	<0.040	0.040	<0.020	0.020	5262536
Aroclor 1254	ug/g	<0.040	0.040	<0.020	0.020	<0.040	0.040	<0.020	0.020	5262536
Aroclor 1260	ug/g	<0.040	0.040	<0.020	0.020	<0.040	0.040	<0.020	0.020	5262536
Surrogate Recovery (%)										
2,4,5,6-Tetrachloro-m-xylene	%	75		87		83		85		5262536

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7P0185
Report Date: 2017/11/20

Pinchin Ltd
Client Project #: 210701.001
Site Location: PHASE II/12300 COLERAINE DR, CALEDON
Sampler Initials: JL

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		FMU636		FMU637		FMU638		FMU639		
Sampling Date		2017/11/06 10:35		2017/11/06 10:45		2017/11/06 10:55		2017/11/06 11:05		
COC Number		635506-02-01		635506-02-01		635506-02-01		635506-02-01		
	UNITS	BH03-1	RDL	BH04-1	RDL	BH05-1	RDL	BH06-1	RDL	QC Batch
Decachlorobiphenyl	%	125		102		81		90		5262536

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7P0185
Report Date: 2017/11/20

Pinchin Ltd
Client Project #: 210701.001
Site Location: PHASE II/12300 COLERAINE DR, CALEDON
Sampler Initials: JL

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		FMU640		FMU641		FMU642	FMU643	FMU644		
Sampling Date		2017/11/06 11:15		2017/11/06 11:25		2017/11/06 11:35	2017/11/06 11:45	2017/11/06 11:55		
COC Number		635506-02-01		635506-02-01		635506-02-01	635506-02-01	635506-02-01		
	UNITS	BH07-1	RDL	BH08-1	RDL	BH09-1	BH10-1	BH11-1	RDL	QC Batch
Calculated Parameters										
Chlordane (Total)	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5254741
o,p-DDD + p,p-DDD	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5254741
o,p-DDE + p,p-DDE	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5254741
o,p-DDT + p,p-DDT	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5254741
Total Endosulfan	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5254741
Total PCB	ug/g	<0.020	0.020	<0.040	0.040	<0.020	<0.020	<0.020	0.020	5254741
Pesticides & Herbicides										
Aldrin	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
a-Chlordane	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
g-Chlordane	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
o,p-DDD	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
p,p-DDD	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
o,p-DDE	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
p,p-DDE	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
o,p-DDT	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
p,p-DDT	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Dieldrin	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Lindane	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Endosulfan I (alpha)	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Endosulfan II (beta)	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Endrin	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Heptachlor	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Heptachlor epoxide	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Hexachlorobenzene	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Hexachlorobutadiene	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Hexachloroethane	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Methoxychlor	ug/g	<0.0050	0.0050	<0.0050	0.0050	<0.0050	<0.0050	<0.0050	0.0050	5262536
Aroclor 1242	ug/g	<0.020	0.020	<0.040	0.040	<0.020	<0.020	<0.020	0.020	5262536
Aroclor 1248	ug/g	<0.020	0.020	<0.040	0.040	<0.020	<0.020	<0.020	0.020	5262536
Aroclor 1254	ug/g	<0.020	0.020	<0.040	0.040	<0.020	<0.020	<0.020	0.020	5262536
Aroclor 1260	ug/g	<0.020	0.020	<0.040	0.040	<0.020	<0.020	<0.020	0.020	5262536
Surrogate Recovery (%)										
2,4,5,6-Tetrachloro-m-xylene	%	73		85		76	79	74		5262536

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B7P0185
Report Date: 2017/11/20

Pinchin Ltd
Client Project #: 210701.001
Site Location: PHASE II/12300 COLERAINE DR, CALEDON
Sampler Initials: JL

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		FMU640		FMU641		FMU642	FMU643	FMU644		
Sampling Date		2017/11/06 11:15		2017/11/06 11:25		2017/11/06 11:35	2017/11/06 11:45	2017/11/06 11:55		
COC Number		635506-02-01		635506-02-01		635506-02-01	635506-02-01	635506-02-01		
	UNITS	**BH07-1**	**RDL**	**BH08-1**	**RDL**	**BH09-1**	**BH10-1**	**BH11-1**	**RDL**	**QC Batch**
Decachlorobiphenyl	%	89		96		82	93	108		5262536

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7P0185
Report Date: 2017/11/20

Pinchin Ltd
Client Project #: 210701.001
Site Location: PHASE II/12300 COLERAINE DR, CALEDON
Sampler Initials: JL

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		FMU645	FMU646	FMU647	FMU648	FMU649	FMU650		
Sampling Date		2017/11/06 12:05	2017/11/06 12:15	2017/11/06 12:25	2017/11/06 12:35	2017/11/06 12:45	2017/11/06 12:55		
COC Number		635506-02-01	635506-01-01	635506-01-01	635506-01-01	635506-01-01	635506-01-01		
	UNITS	BH12-1	BH13-1	BH14-1	BH15-1	BH16-1	BH17-1	RDL	QC Batch
Calculated Parameters									
Chlordane (Total)	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5254741
o,p-DDD + p,p-DDD	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5254741
o,p-DDE + p,p-DDE	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5254741
o,p-DDT + p,p-DDT	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5254741
Total Endosulfan	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5254741
Total PCB	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	5254741
Pesticides & Herbicides									
Aldrin	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
a-Chlordane	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
g-Chlordane	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
o,p-DDD	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
p,p-DDD	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
o,p-DDE	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
p,p-DDE	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
o,p-DDT	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
p,p-DDT	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Dieldrin	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Lindane	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Endosulfan I (alpha)	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Endosulfan II (beta)	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Endrin	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Heptachlor	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Heptachlor epoxide	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Hexachlorobenzene	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Hexachlorobutadiene	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Hexachloroethane	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	5262536
Methoxychlor	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	5262536
Aroclor 1242	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	5262536
Aroclor 1248	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	5262536
Aroclor 1254	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	5262536
Aroclor 1260	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	5262536
Surrogate Recovery (%)									
2,4,5,6-Tetrachloro-m-xylene	%	75	81	79	84	82	88		5262536

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7P0185
Report Date: 2017/11/20

Pinchin Ltd
Client Project #: 210701.001
Site Location: PHASE II/12300 COLERAINE DR, CALEDON
Sampler Initials: JL

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		FMU645	FMU646	FMU647	FMU648	FMU649	FMU650		
Sampling Date		2017/11/06 12:05	2017/11/06 12:15	2017/11/06 12:25	2017/11/06 12:35	2017/11/06 12:45	2017/11/06 12:55		
COC Number		635506-02-01	635506-01-01	635506-01-01	635506-01-01	635506-01-01	635506-01-01		
	UNITS	BH12-1	BH13-1	BH14-1	BH15-1	BH16-1	BH17-1	RDL	QC Batch
Decachlorobiphenyl	%	102	97	95	108	108	107		5262536

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7P0185
Report Date: 2017/11/20

Pinchin Ltd
Client Project #: 210701.001
Site Location: PHASE II/12300 COLERAINE DR, CALEDON
Sampler Initials: JL

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		FMU651			FMU651			FMU652		
Sampling Date		2017/11/06 01:05			2017/11/06 01:05			2017/11/06 01:15		
COC Number		635506-01-01			635506-01-01			635506-01-01		
	UNITS	BH18-1	RDL	QC Batch	BH18-1 Lab-Dup	RDL	QC Batch	BH19-1	RDL	QC Batch
Calculated Parameters										
Chlordane (Total)	ug/g	<0.0020	0.0020	5254741				<0.0020	0.0020	5254741
o,p-DDD + p,p-DDD	ug/g	<0.0020	0.0020	5254741				<0.0020	0.0020	5254741
o,p-DDE + p,p-DDE	ug/g	<0.0020	0.0020	5254741				<0.0020	0.0020	5254741
o,p-DDT + p,p-DDT	ug/g	<0.0020	0.0020	5254741				<0.0020	0.0020	5254741
Total Endosulfan	ug/g	<0.0020	0.0020	5254741				<0.0020	0.0020	5254741
Total PCB	ug/g	<0.015	0.015	5254741				<0.015	0.015	5254741
Pesticides & Herbicides										
Aldrin	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
a-Chlordane	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
g-Chlordane	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
o,p-DDD	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
p,p-DDD	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
o,p-DDE	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
p,p-DDE	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
o,p-DDT	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
p,p-DDT	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
Dieldrin	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
Lindane	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
Endosulfan I (alpha)	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
Endosulfan II (beta)	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
Endrin	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
Heptachlor	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
Heptachlor epoxide	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
Hexachlorobenzene	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
Hexachlorobutadiene	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
Hexachloroethane	ug/g	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673	<0.0020	0.0020	5264673
Methoxychlor	ug/g	<0.0050	0.0050	5264673	<0.0050	0.0050	5264673	<0.0050	0.0050	5264673
Aroclor 1242	ug/g	<0.015	0.015	5264673	<0.015	0.015	5264673	<0.015	0.015	5264673
Aroclor 1248	ug/g	<0.015	0.015	5264673	<0.015	0.015	5264673	<0.015	0.015	5264673
Aroclor 1254	ug/g	<0.015	0.015	5264673	<0.015	0.015	5264673	<0.015	0.015	5264673
Aroclor 1260	ug/g	<0.015	0.015	5264673	<0.015	0.015	5264673	<0.015	0.015	5264673

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Job #: B7P0185
Report Date: 2017/11/20

Pinchin Ltd
Client Project #: 210701.001
Site Location: PHASE II/12300 COLERAINE DR, CALEDON
Sampler Initials: JL

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		FMU651			FMU651			FMU652		
Sampling Date		2017/11/06 01:05			2017/11/06 01:05			2017/11/06 01:15		
COC Number		635506-01-01			635506-01-01			635506-01-01		
	UNITS	BH18-1	RDL	QC Batch	BH18-1 Lab-Dup	RDL	QC Batch	BH19-1	RDL	QC Batch
Surrogate Recovery (%)										
2,4,5,6-Tetrachloro-m-xylene	%	89		5264673	98		5264673	76		5264673
Decachlorobiphenyl	%	105		5264673	130		5264673	92		5264673

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B7P0185
Report Date: 2017/11/20

Pinchin Ltd
Client Project #: 210701.001
Site Location: PHASE II/12300 COLERAINE DR, CALEDON
Sampler Initials: JL

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		FMU653		FMU654		FMU655	FMU656	FMU657		
Sampling Date		2017/11/06 01:25		2017/11/06 01:35		2017/11/06 01:45	2017/11/06	2017/11/06		
COC Number		635506-01-01		635506-01-01		635506-01-01	635506-02-01	635506-02-01		
	UNITS	BH20-1	RDL	BH21-1	RDL	BH22-1	DUP-1	DUP-2	RDL	QC Batch
Calculated Parameters										
Chlordane (Total)	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5254741
o,p-DDD + p,p-DDD	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5254741
o,p-DDE + p,p-DDE	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5254741
o,p-DDT + p,p-DDT	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5254741
Total Endosulfan	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5254741
Total PCB	ug/g	<0.015	0.015	<0.020	0.020	<0.015	<0.015	<0.015	0.015	5254741
Pesticides & Herbicides										
Aldrin	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
a-Chlordane	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
g-Chlordane	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
o,p-DDD	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
p,p-DDD	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
o,p-DDE	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
p,p-DDE	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
o,p-DDT	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
p,p-DDT	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
Dieldrin	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
Lindane	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
Endosulfan I (alpha)	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
Endosulfan II (beta)	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
Endrin	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
Heptachlor	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
Heptachlor epoxide	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
Hexachlorobenzene	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
Hexachlorobutadiene	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
Hexachloroethane	ug/g	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	5264673
Methoxychlor	ug/g	<0.0050	0.0050	<0.0050	0.0050	<0.0050	<0.0050	<0.0050	0.0050	5264673
Aroclor 1242	ug/g	<0.015	0.015	<0.015	0.015	<0.015	<0.015	<0.015	0.015	5264673
Aroclor 1248	ug/g	<0.015	0.015	<0.015	0.015	<0.015	<0.015	<0.015	0.015	5264673
Aroclor 1254	ug/g	<0.015	0.015	<0.015	0.015	<0.015	<0.015	<0.015	0.015	5264673
Aroclor 1260	ug/g	<0.015	0.015	<0.020	0.020	<0.015	<0.015	<0.015	0.015	5264673
Surrogate Recovery (%)										
2,4,5,6-Tetrachloro-m-xylene	%	89		84		85	78	64		5264673

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7P0185
Report Date: 2017/11/20

Pinchin Ltd
Client Project #: 210701.001
Site Location: PHASE II/12300 COLERAINE DR, CALEDON
Sampler Initials: JL

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		FMU653		FMU654		FMU655	FMU656	FMU657		
Sampling Date		2017/11/06 01:25		2017/11/06 01:35		2017/11/06 01:45	2017/11/06	2017/11/06		
COC Number		635506-01-01		635506-01-01		635506-01-01	635506-02-01	635506-02-01		
	UNITS	**BH20-1**	**RDL**	**BH21-1**	**RDL**	**BH22-1**	**DUP-1**	**DUP-2**	**RDL**	**QC Batch**
Decachlorobiphenyl	%	106		103		110	105	109		5264673

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	8.7°C

Custody Seal Present/Intact

OC Pesticide Analysis: Detection limits were raised due to matrix interferences.

Sample FMU654 [BH21-1] : OC Pestiide Analysis: Detection limits were raised due to matrix interferences.

Results relate only to the items tested.

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Maxxam Job #: B7P0185
Report Date: 2017/11/20

Pinchin Ltd
Client Project #: 210701.001
Site Location: PHASE II/12300 COLERAINE DR, CALEDON
Sampler Initials: JL

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5258022	TA1	Spiked Blank	Available (CaCl2) pH	2017/11/10		100	%	97 - 103
5258022	TA1	RPD	Available (CaCl2) pH	2017/11/10	0.093		%	N/A
5258193	GG2	RPD	Moisture	2017/11/09	3.2		%	20
5259315	AUP	RPD	Moisture	2017/11/10	8.1		%	20
5259318	KLI	Matrix Spike	o-Terphenyl	2017/11/13		90	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/11/13		85	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2017/11/13		90	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2017/11/13		93	%	50 - 130
5259318	KLI	Spiked Blank	o-Terphenyl	2017/11/13		88	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/11/13		83	%	80 - 120
			F3 (C16-C34 Hydrocarbons)	2017/11/13		88	%	80 - 120
			F4 (C34-C50 Hydrocarbons)	2017/11/13		89	%	80 - 120
5259318	KLI	Method Blank	o-Terphenyl	2017/11/13		92	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/11/13	<10		ug/g	
			F3 (C16-C34 Hydrocarbons)	2017/11/13	<50		ug/g	
			F4 (C34-C50 Hydrocarbons)	2017/11/13	<50		ug/g	
5259318	KLI	RPD	F2 (C10-C16 Hydrocarbons)	2017/11/13	NC		%	30
			F3 (C16-C34 Hydrocarbons)	2017/11/13	6.1		%	30
			F4 (C34-C50 Hydrocarbons)	2017/11/13	NC		%	30
5259320	RAJ	Matrix Spike	D10-Anthracene	2017/11/11		88	%	50 - 130
			D14-Terphenyl (FS)	2017/11/11		80	%	50 - 130
			D8-Acenaphthylene	2017/11/11		86	%	50 - 130
			Acenaphthene	2017/11/11		88	%	50 - 130
			Acenaphthylene	2017/11/11		82	%	50 - 130
			Anthracene	2017/11/11		76	%	50 - 130
			Benzo(a)anthracene	2017/11/11		83	%	50 - 130
			Benzo(a)pyrene	2017/11/11		85	%	50 - 130
			Benzo(b/j)fluoranthene	2017/11/11		74	%	50 - 130
			Benzo(g,h,i)perylene	2017/11/11		87	%	50 - 130
			Benzo(k)fluoranthene	2017/11/11		75	%	50 - 130
			Chrysene	2017/11/11		88	%	50 - 130
			Dibenz(a,h)anthracene	2017/11/11		81	%	50 - 130
			Fluoranthene	2017/11/11		67	%	50 - 130
			Fluorene	2017/11/11		86	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2017/11/11		79	%	50 - 130
			1-Methylnaphthalene	2017/11/11		80	%	50 - 130
			2-Methylnaphthalene	2017/11/11		75	%	50 - 130
			Naphthalene	2017/11/11		75	%	50 - 130
			Phenanthrene	2017/11/11		85	%	50 - 130
			Pyrene	2017/11/11		69	%	50 - 130
5259320	RAJ	Spiked Blank	D10-Anthracene	2017/11/11		97	%	50 - 130
			D14-Terphenyl (FS)	2017/11/11		102	%	50 - 130
			D8-Acenaphthylene	2017/11/11		88	%	50 - 130
			Acenaphthene	2017/11/11		87	%	50 - 130
			Acenaphthylene	2017/11/11		82	%	50 - 130
			Anthracene	2017/11/11		83	%	50 - 130
			Benzo(a)anthracene	2017/11/11		80	%	50 - 130
			Benzo(a)pyrene	2017/11/11		87	%	50 - 130
			Benzo(b/j)fluoranthene	2017/11/11		84	%	50 - 130
			Benzo(g,h,i)perylene	2017/11/11		90	%	50 - 130
			Benzo(k)fluoranthene	2017/11/11		82	%	50 - 130
			Chrysene	2017/11/11		85	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dibenz(a,h)anthracene	2017/11/11		87	%	50 - 130
			Fluoranthene	2017/11/11		85	%	50 - 130
			Fluorene	2017/11/11		86	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2017/11/11		87	%	50 - 130
			1-Methylnaphthalene	2017/11/11		81	%	50 - 130
			2-Methylnaphthalene	2017/11/11		72	%	50 - 130
			Naphthalene	2017/11/11		82	%	50 - 130
			Phenanthrene	2017/11/11		84	%	50 - 130
			Pyrene	2017/11/11		87	%	50 - 130
5259320	RAJ	Method Blank	D10-Anthracene	2017/11/11		95	%	50 - 130
			D14-Terphenyl (FS)	2017/11/11		81	%	50 - 130
			D8-Acenaphthylene	2017/11/11		87	%	50 - 130
			Acenaphthene	2017/11/11	<0.0050		ug/g	
			Acenaphthylene	2017/11/11	<0.0050		ug/g	
			Anthracene	2017/11/11	<0.0050		ug/g	
			Benzo(a)anthracene	2017/11/11	<0.0050		ug/g	
			Benzo(a)pyrene	2017/11/11	<0.0050		ug/g	
			Benzo(b/j)fluoranthene	2017/11/11	<0.0050		ug/g	
			Benzo(g,h,i)perylene	2017/11/11	<0.0050		ug/g	
			Benzo(k)fluoranthene	2017/11/11	<0.0050		ug/g	
			Chrysene	2017/11/11	<0.0050		ug/g	
			Dibenz(a,h)anthracene	2017/11/11	<0.0050		ug/g	
			Fluoranthene	2017/11/11	<0.0050		ug/g	
			Fluorene	2017/11/11	<0.0050		ug/g	
			Indeno(1,2,3-cd)pyrene	2017/11/11	<0.0050		ug/g	
			1-Methylnaphthalene	2017/11/11	<0.0050		ug/g	
			2-Methylnaphthalene	2017/11/11	<0.0050		ug/g	
			Naphthalene	2017/11/11	<0.0050		ug/g	
			Phenanthrene	2017/11/11	<0.0050		ug/g	
			Pyrene	2017/11/11	<0.0050		ug/g	
5259320	RAJ	RPD	Acenaphthene	2017/11/11	NC		%	40
			Acenaphthylene	2017/11/11	NC		%	40
			Anthracene	2017/11/11	NC		%	40
			Benzo(a)anthracene	2017/11/11	NC		%	40
			Benzo(a)pyrene	2017/11/11	NC		%	40
			Benzo(b/j)fluoranthene	2017/11/11	NC		%	40
			Benzo(g,h,i)perylene	2017/11/11	NC		%	40
			Benzo(k)fluoranthene	2017/11/11	NC		%	40
			Chrysene	2017/11/11	NC		%	40
			Dibenz(a,h)anthracene	2017/11/11	NC		%	40
			Fluoranthene	2017/11/11	NC		%	40
			Fluorene	2017/11/11	NC		%	40
			Indeno(1,2,3-cd)pyrene	2017/11/11	NC		%	40
			1-Methylnaphthalene	2017/11/11	NC		%	40
			2-Methylnaphthalene	2017/11/11	NC		%	40
			Naphthalene	2017/11/11	NC		%	40
			Phenanthrene	2017/11/11	NC		%	40
			Pyrene	2017/11/11	NC		%	40
5259484	CYN	RPD [FMU643-01]	Moisture	2017/11/10	3.3		%	20
5259547	CYN	RPD	Moisture	2017/11/10	5.5		%	20
5261496	ABD	Matrix Spike	1,4-Difluorobenzene	2017/11/11		101	%	60 - 140
			4-Bromofluorobenzene	2017/11/11		101	%	60 - 140

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			D10-Ethylbenzene	2017/11/11		116	%	60 - 140
			D4-1,2-Dichloroethane	2017/11/11		99	%	60 - 140
			Benzene	2017/11/11		90	%	60 - 140
			Toluene	2017/11/11		82	%	60 - 140
			Ethylbenzene	2017/11/11		89	%	60 - 140
			o-Xylene	2017/11/11		91	%	60 - 140
			p+m-Xylene	2017/11/11		89	%	60 - 140
			F1 (C6-C10)	2017/11/11		93	%	60 - 140
5261496	ABD	Spiked Blank	1,4-Difluorobenzene	2017/11/11		102	%	60 - 140
			4-Bromofluorobenzene	2017/11/11		100	%	60 - 140
			D10-Ethylbenzene	2017/11/11		99	%	60 - 140
			D4-1,2-Dichloroethane	2017/11/11		100	%	60 - 140
			Benzene	2017/11/11		105	%	60 - 140
			Toluene	2017/11/11		97	%	60 - 140
			Ethylbenzene	2017/11/11		103	%	60 - 140
			o-Xylene	2017/11/11		105	%	60 - 140
			p+m-Xylene	2017/11/11		103	%	60 - 140
			F1 (C6-C10)	2017/11/11		111	%	80 - 120
5261496	ABD	Method Blank	1,4-Difluorobenzene	2017/11/11		102	%	60 - 140
			4-Bromofluorobenzene	2017/11/11		101	%	60 - 140
			D10-Ethylbenzene	2017/11/11		98	%	60 - 140
			D4-1,2-Dichloroethane	2017/11/11		100	%	60 - 140
			Benzene	2017/11/11	<0.020		ug/g	
			Toluene	2017/11/11	<0.020		ug/g	
			Ethylbenzene	2017/11/11	<0.020		ug/g	
			o-Xylene	2017/11/11	<0.020		ug/g	
			p+m-Xylene	2017/11/11	<0.040		ug/g	
			Total Xylenes	2017/11/11	<0.040		ug/g	
			F1 (C6-C10)	2017/11/11	<10		ug/g	
			F1 (C6-C10) - BTEX	2017/11/11	<10		ug/g	
5261496	ABD	RPD	Benzene	2017/11/11	NC		%	50
			Toluene	2017/11/11	NC		%	50
			Ethylbenzene	2017/11/11	NC		%	50
			o-Xylene	2017/11/11	NC		%	50
			p+m-Xylene	2017/11/11	NC		%	50
			Total Xylenes	2017/11/11	NC		%	50
			F1 (C6-C10)	2017/11/11	NC		%	30
			F1 (C6-C10) - BTEX	2017/11/11	NC		%	30
5262536	MAK	Matrix Spike	2,4,5,6-Tetrachloro-m-xylene	2017/11/14		88	%	50 - 130
			Decachlorobiphenyl	2017/11/14		118	%	50 - 130
			Aldrin	2017/11/14		95	%	50 - 130
			a-Chlordane	2017/11/14		113	%	50 - 130
			g-Chlordane	2017/11/14		110	%	50 - 130
			o,p-DDD	2017/11/14		128	%	50 - 130
			p,p-DDD	2017/11/14		117	%	50 - 130
			o,p-DDE	2017/11/14		98	%	50 - 130
			p,p-DDE	2017/11/14		109	%	50 - 130
			o,p-DDT	2017/11/14		98	%	50 - 130
			p,p-DDT	2017/11/14		105	%	50 - 130
			Dieldrin	2017/11/14		128	%	50 - 130
			Lindane	2017/11/14		85	%	50 - 130
			Endosulfan I (alpha)	2017/11/14		132 (1)	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Endosulfan II (beta)	2017/11/14		119	%	50 - 130
			Endrin	2017/11/14		116	%	50 - 130
			Heptachlor	2017/11/14		93	%	50 - 130
			Heptachlor epoxide	2017/11/14		105	%	50 - 130
			Hexachlorobenzene	2017/11/14		93	%	50 - 130
			Hexachlorobutadiene	2017/11/14		68	%	50 - 130
			Hexachloroethane	2017/11/14		53	%	50 - 130
			Methoxychlor	2017/11/14		117	%	50 - 130
5262536	MAK	Spiked Blank	2,4,5,6-Tetrachloro-m-xylene	2017/11/14		93	%	50 - 130
			Decachlorobiphenyl	2017/11/14		119	%	50 - 130
			Aldrin	2017/11/14		92	%	50 - 130
			a-Chlordane	2017/11/14		106	%	50 - 130
			g-Chlordane	2017/11/14		101	%	50 - 130
			o,p-DDD	2017/11/14		115	%	50 - 130
			p,p-DDD	2017/11/14		111	%	50 - 130
			o,p-DDE	2017/11/14		92	%	50 - 130
			p,p-DDE	2017/11/14		108	%	50 - 130
			o,p-DDT	2017/11/14		88	%	50 - 130
			p,p-DDT	2017/11/14		86	%	50 - 130
			Dieldrin	2017/11/14		125	%	50 - 130
			Lindane	2017/11/14		77	%	50 - 130
			Endosulfan I (alpha)	2017/11/14		128	%	50 - 130
			Endosulfan II (beta)	2017/11/14		112	%	50 - 130
			Endrin	2017/11/14		98	%	50 - 130
			Heptachlor	2017/11/14		88	%	50 - 130
			Heptachlor epoxide	2017/11/14		100	%	50 - 130
			Hexachlorobenzene	2017/11/14		92	%	50 - 130
			Hexachlorobutadiene	2017/11/14		103	%	50 - 130
			Hexachloroethane	2017/11/14		76	%	50 - 130
			Methoxychlor	2017/11/14		99	%	50 - 130
5262536	MAK	RPD	Aroclor 1242	2017/11/14	NC		%	40
			Aldrin	2017/11/14	NC		%	40
			a-Chlordane	2017/11/14	NC		%	40
			g-Chlordane	2017/11/14	NC		%	40
			o,p-DDD	2017/11/14	NC		%	40
			p,p-DDD	2017/11/14	NC		%	40
			o,p-DDE	2017/11/14	NC		%	40
			p,p-DDE	2017/11/14	NC		%	40
			o,p-DDT	2017/11/14	NC		%	40
			p,p-DDT	2017/11/14	NC		%	40
			Dieldrin	2017/11/14	NC		%	40
			Lindane	2017/11/14	NC		%	40
			Endosulfan I (alpha)	2017/11/14	NC		%	40
			Endosulfan II (beta)	2017/11/14	NC		%	40
			Endrin	2017/11/14	NC		%	40
			Heptachlor	2017/11/14	NC		%	40
			Heptachlor epoxide	2017/11/14	NC		%	40
			Hexachlorobenzene	2017/11/14	NC		%	40
			Hexachlorobutadiene	2017/11/14	NC		%	40
			Hexachloroethane	2017/11/14	NC		%	40
			Methoxychlor	2017/11/14	NC		%	40
			Aroclor 1242	2017/11/14	NC		%	40

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Aroclor 1248	2017/11/14	NC		%	40
			Aroclor 1254	2017/11/14	NC		%	40
			Aroclor 1260	2017/11/14	NC		%	40
5262536	MAK	Method Blank	2,4,5,6-Tetrachloro-m-xylene	2017/11/14		82	%	50 - 130
			Decachlorobiphenyl	2017/11/14		123	%	50 - 130
			Aldrin	2017/11/14	<0.0020		ug/g	
			a-Chlordane	2017/11/14	<0.0020		ug/g	
			g-Chlordane	2017/11/14	<0.0020		ug/g	
			o,p-DDD	2017/11/14	<0.0020		ug/g	
			p,p-DDD	2017/11/14	<0.0020		ug/g	
			o,p-DDE	2017/11/14	<0.0020		ug/g	
			p,p-DDE	2017/11/14	<0.0020		ug/g	
			o,p-DDT	2017/11/14	<0.0020		ug/g	
			p,p-DDT	2017/11/14	<0.0020		ug/g	
			Dieldrin	2017/11/14	<0.0020		ug/g	
			Lindane	2017/11/14	<0.0020		ug/g	
			Endosulfan I (alpha)	2017/11/14	<0.0020		ug/g	
			Endosulfan II (beta)	2017/11/14	<0.0020		ug/g	
			Endrin	2017/11/14	<0.0020		ug/g	
			Heptachlor	2017/11/14	<0.0020		ug/g	
			Heptachlor epoxide	2017/11/14	<0.0020		ug/g	
			Hexachlorobenzene	2017/11/14	<0.0020		ug/g	
			Hexachlorobutadiene	2017/11/14	<0.0020		ug/g	
			Hexachloroethane	2017/11/14	<0.0020		ug/g	
			Methoxychlor	2017/11/14	<0.0050		ug/g	
			Aroclor 1242	2017/11/14	<0.015		ug/g	
			Aroclor 1248	2017/11/14	<0.015		ug/g	
			Aroclor 1254	2017/11/14	<0.015		ug/g	
			Aroclor 1260	2017/11/14	<0.015		ug/g	
5264673	LPG	Matrix Spike [FMU651-01]	2,4,5,6-Tetrachloro-m-xylene	2017/11/15		90	%	50 - 130
			Decachlorobiphenyl	2017/11/15		108	%	50 - 130
			Aldrin	2017/11/15		88	%	50 - 130
			a-Chlordane	2017/11/15		96	%	50 - 130
			g-Chlordane	2017/11/15		92	%	50 - 130
			o,p-DDD	2017/11/15		110	%	50 - 130
			p,p-DDD	2017/11/15		103	%	50 - 130
			o,p-DDE	2017/11/15		86	%	50 - 130
			p,p-DDE	2017/11/15		97	%	50 - 130
			o,p-DDT	2017/11/15		89	%	50 - 130
			p,p-DDT	2017/11/15		87	%	50 - 130
			Dieldrin	2017/11/15		119	%	50 - 130
			Lindane	2017/11/15		71	%	50 - 130
			Endosulfan I (alpha)	2017/11/15		112	%	50 - 130
			Endosulfan II (beta)	2017/11/15		100	%	50 - 130
			Endrin	2017/11/15		90	%	50 - 130
			Heptachlor	2017/11/15		88	%	50 - 130
			Heptachlor epoxide	2017/11/15		88	%	50 - 130
			Hexachlorobenzene	2017/11/15		89	%	50 - 130
			Hexachlorobutadiene	2017/11/15		78	%	50 - 130
			Hexachloroethane	2017/11/15		51	%	50 - 130
			Methoxychlor	2017/11/15		134 (1)	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5264673	LPG	Spiked Blank	2,4,5,6-Tetrachloro-m-xylene	2017/11/15		86	%	50 - 130
			Decachlorobiphenyl	2017/11/15		110	%	50 - 130
			Aldrin	2017/11/15		85	%	50 - 130
			a-Chlordane	2017/11/15		94	%	50 - 130
			g-Chlordane	2017/11/15		89	%	50 - 130
			o,p-DDD	2017/11/15		106	%	50 - 130
			p,p-DDD	2017/11/15		103	%	50 - 130
			o,p-DDE	2017/11/15		82	%	50 - 130
			p,p-DDE	2017/11/15		96	%	50 - 130
			o,p-DDT	2017/11/15		84	%	50 - 130
			p,p-DDT	2017/11/15		85	%	50 - 130
			Dieldrin	2017/11/15		108	%	50 - 130
			Lindane	2017/11/15		70	%	50 - 130
			Endosulfan I (alpha)	2017/11/15		114	%	50 - 130
			Endosulfan II (beta)	2017/11/15		101	%	50 - 130
			Endrin	2017/11/15		91	%	50 - 130
			Heptachlor	2017/11/15		85	%	50 - 130
			Heptachlor epoxide	2017/11/15		89	%	50 - 130
			Hexachlorobenzene	2017/11/15		89	%	50 - 130
			Hexachlorobutadiene	2017/11/15		98	%	50 - 130
			Hexachloroethane	2017/11/15		72	%	50 - 130
			Methoxychlor	2017/11/15		113	%	50 - 130
5264673	LPG	RPD	Aroclor 1242	2017/11/15	NC		%	40
5264673	LPG	Method Blank	2,4,5,6-Tetrachloro-m-xylene	2017/11/15		90	%	50 - 130
			Decachlorobiphenyl	2017/11/15		107	%	50 - 130
			Aldrin	2017/11/15	<0.0020		ug/g	
			a-Chlordane	2017/11/15	<0.0020		ug/g	
			g-Chlordane	2017/11/15	<0.0020		ug/g	
			o,p-DDD	2017/11/15	<0.0020		ug/g	
			p,p-DDD	2017/11/15	<0.0020		ug/g	
			o,p-DDE	2017/11/15	<0.0020		ug/g	
			p,p-DDE	2017/11/15	<0.0020		ug/g	
			o,p-DDT	2017/11/15	<0.0020		ug/g	
			p,p-DDT	2017/11/15	<0.0020		ug/g	
			Dieldrin	2017/11/15	<0.0020		ug/g	
			Lindane	2017/11/15	<0.0020		ug/g	
			Endosulfan I (alpha)	2017/11/15	<0.0020		ug/g	
			Endosulfan II (beta)	2017/11/15	<0.0020		ug/g	
			Endrin	2017/11/15	<0.0020		ug/g	
			Heptachlor	2017/11/15	<0.0020		ug/g	
			Heptachlor epoxide	2017/11/15	<0.0020		ug/g	
			Hexachlorobenzene	2017/11/15	<0.0020		ug/g	
			Hexachlorobutadiene	2017/11/15	<0.0020		ug/g	
			Hexachloroethane	2017/11/15	<0.0020		ug/g	
			Methoxychlor	2017/11/15	<0.0050		ug/g	
			Aroclor 1242	2017/11/15	<0.015		ug/g	
			Aroclor 1248	2017/11/15	<0.015		ug/g	
			Aroclor 1254	2017/11/15	<0.015		ug/g	
			Aroclor 1260	2017/11/15	<0.015		ug/g	
5264673	LPG	RPD [FMU651-01]	Aldrin	2017/11/15	NC		%	40
			a-Chlordane	2017/11/15	NC		%	40
			g-Chlordane	2017/11/15	NC		%	40

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			o,p-DDD	2017/11/15	NC		%	40
			p,p-DDD	2017/11/15	NC		%	40
			o,p-DDE	2017/11/15	NC		%	40
			p,p-DDE	2017/11/15	NC		%	40
			o,p-DDT	2017/11/15	NC		%	40
			p,p-DDT	2017/11/15	NC		%	40
			Dieldrin	2017/11/15	NC		%	40
			Lindane	2017/11/15	NC		%	40
			Endosulfan I (alpha)	2017/11/15	NC		%	40
			Endosulfan II (beta)	2017/11/15	NC		%	40
			Endrin	2017/11/15	NC		%	40
			Heptachlor	2017/11/15	NC		%	40
			Heptachlor epoxide	2017/11/15	NC		%	40
			Hexachlorobenzene	2017/11/15	NC		%	40
			Hexachlorobutadiene	2017/11/15	NC		%	40
			Hexachloroethane	2017/11/15	NC		%	40
			Methoxychlor	2017/11/15	NC		%	40
			Aroclor 1242	2017/11/15	NC		%	40
			Aroclor 1248	2017/11/15	NC		%	40
			Aroclor 1254	2017/11/15	NC		%	40
			Aroclor 1260	2017/11/15	NC		%	40

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) The recovery was above the upper control limit. This may represent a high bias in some results for this specific analyte. For results that were not detected (ND), this potential bias has no impact.

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Maxxam Job #: B7P0185
Report Date: 2017/11/20

Pinchin Ltd
Client Project #: 210701.001
Site Location: PHASE II/12300 COLERAINE DR, CALEDON
Sampler Initials: JL

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere, Scientific Service Specialist

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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CHAIN OF CUSTODY RECORD

Page 1 of 4

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#47523 Pinchin Ltd	Company Name:		Quotation #:	A70927	Maxxam Job #:	Bottle Order #: 635506
Attention:	Accounts Payable	Attention:	Melissa Gallagher	P.O. #:			
Address:	Unit 6 875 Main St W Hamilton ON L8S 4R9	Address:		Project:	210701.001		
				Project Name:	Phase II	COC #:	Project Manager:
Tel:	(905) 577-6206 x Fax: (905) 577-6207 x	Tel:	(905) 577-6206 x1721 Fax:	Site #:	12300 Coleraine Dr, Etobicoke	C#635506-04-01	Antonella Brasil
Email:	ap@pinchin.com	Email:	mgallagher@pinchin.com	Sampled By:	Jason Caplette		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☒ Ind/Comm ☒ Coarse ☐ Table 3 ☐ Agri/Other ☒ For RSC ☒ Table 2	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ☐ PWQO ☐ Other	

Include Criteria on Certificate of Analysis (Y/N)? _____

ANALYSIS REQUESTED (PLEASE BE SPECIFIC):

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number: _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle) Metals / Hg / Cr VI	BTEX VOCs in Water & F1-F4 (For RSC)	PAHs (Soil)	OC Pesticides (Soil)	PCBs (Soil)	pH	Grain size				# of Bottles	* Comments
1		BH01-4	2017/11/06	9:30	SOIL		X	X								3	
2		BH02-1		10:00	SOIL		X	X								3	
3		BH02-1		10:10	SOIL						X					1	
4		BH02-3		10:10	SOIL							X				1	
5		BH02-4		10:10	SOIL						X					1	
6		BH05-1		10:55	SOIL							X				1	
7		BH17-1		12:55	SOIL							X				1	
8		BH19-1		1:15	SOIL						X					1	
9					SOIL												
10					SOIL												

07-Nov-17 16:56
Antonella Brasil
B7P0185
GK1 ENV-727

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Jason Caplette	2017/11/07	11:40		2017/10/07 2017/11/07	16:56	

Laboratory Use Only				
Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
		Present	✓	
		Intact		

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* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

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CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#47523 Pinchin Ltd	Company Name:		Quotation #:	A70927	Maxxam Job #:	Bottle Order #:
Attention:	Accounts Payable	Attention:	Melissa Gallagher	P.O. #:			635506
Address:	Unit 6 875 Main St W Hamilton ON L8S 4R9	Address:		Project:	210701.001	COC #:	Project Manager:
Tel:	(905) 577-6206 x Fax (905) 577-6207 x	Tel:	(905) 577-6206 x1721 Fax	Project Name:	Phase II	C#635506-02-01	Antonella Brasil
Email:	ap@pinchin.com	Email:	mgallagher@pinchin.com	Site #:	12300 Coleraine Dr, Caledon		
				Sampled By:	Jason Laplante		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☒ Ind/Comm ☒ Coarse ☐ Table 3 ☐ Agri/Other ☒ For RSC ☒ Table 8	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ☐ PWQO ☐ Other	

Include Criteria on Certificate of Analysis (Y/N)? ____

ANALYSIS REQUESTED (PLEASE BE SPECIFIC):

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	VOCs by HS + F1-F4 (For RSC)	PAHs (Soil)	OC Pesticides (Soil)	PCBs (Soil)	# of Bottles	Comments
1		BH03-1	2017/11/06	10:35	SOIL				X	X	1	
2		BH04-1		10:45	SOIL				X	X	1	
3		BH05-1		10:55	SOIL				X	X	1	
4		BH06-1		11:05	SOIL				X	X	1	
5		BH07-1		11:15	SOIL				X	X	1	
6		BH08-1		11:25	SOIL				X	X	1	
7		BH09-1		11:35	SOIL				X	X	1	
8		BH10-1		11:45	SOIL				X	X	1	
9		BH11-1		11:55	SOIL				X	X	1	
10		BH12-1		12:05	SOIL				X	X	1	

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ____ Time Required: ____ ☐
Rush Confirmation Number: ____ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Jason Laplante	2017/11/07	11:40	MAPLETT J	2017/11/07	16:56	

Laboratory Use Only					
Time Sensitive	Temperature (°C) on Rece:	Custody Seal	Yes	No
		Present	✓	
		Intact	✓	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

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CHAIN OF CUSTODY RECORD

Page 3 of 4

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name	#47523 Pinchin Ltd	Company Name		Quotation #	A70927	Maxxam Job #:	Bottle Order #: 635506
Attention	Accounts Payable	Attention	Melissa Gallagher	P.O. #			
Address	Unit 6 875 Main St W Hamilton ON L8S 4R9	Address		Project	210701.001		
				Project Name	Phase II	COC #:	Project Manager:
Tel	(905) 577-6206 x Fax (905) 577-6207 x	Tel	(905) 577-6206 x1721 Fax	Site #	12300 Coleraine Dr. Caledon	C#635506-01-01	Antonella Brasil
Email	ap@pinchin.com	Email	mgallagher@pinchin.com	Sampled By	Jason Laplante		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☒ Ind/Comm ☒ Coarse ☐ Table 3 ☐ Agri/Other ☒ For RSC ☒ Table 3	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ☐ PWQO ☐ Other	

Include Criteria on Certificate of Analysis (Y/N)? _____

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	VOCs by HS & F1-F4 (For RSC)	PAHs (Soil)	OC Pesticides (Soil)	PCBs (Soil)	# of Bottles	Comments
1		BH13-1	2017/11/06	12:15	SOIL				X	X	1	
2		BH14-1		12:25	SOIL				X	X	1	
3		BH15-1		12:35	SOIL				X	X	1	
4		BH16-1		12:45	SOIL				X	X	1	
5		BH17-1		12:55	SOIL				X	X	1	
6		BH18-1		1:05	SOIL				X	X	1	
7		BH19-1		1:15	SOIL				X	X	1	
8		BH20-1		1:25	SOIL				X	X	1	
9		BH21-1		1:35	SOIL				X	X	1	
10		BH22-1		1:45	SOIL				X	X	1	

Turnaround Time (TAT) Required
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number: _____ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Jason Laplante	2017/11/07	11:40	KUAKEFESLA	2017/11/07	16:56	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Rece	Custody Seal Present	Yes ✓	No
		Intact	✓	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

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SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

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CHAIN OF CUSTODY RECORD

Page 4 of 4

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#47523 Pinchin Ltd	Company Name:		Quotation #:	A70927	Maxxam Job #:	Bottle Order #: 635506
Attention:	Accounts Payable	Attention:	Melissa Gallagher	P.O. #:			
Address:	Unit 6 875 Main St W Hamilton ON L8S 4R9	Address:		Project:	210701.001		
				Project Name:	Phase II	COC #:	Project Manager:
Tel:	(905) 577-6206 x Fax (905) 577-6207 x	Tel:	(905) 577-6206 x1721 Fax	Site #:	12300 Coleraine Dr., Caledon	C#635506-03-01	Antonella Brasil
Email:	ap@pinchin.com	Email:	mgallagher@pinchin.com	Sampled By:	Jason Laplante		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☒ Ind/Comm ☒ Coarse ☐ Table 3 ☐ Agri/Other ☒ For RSC ☒ Table 8	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ☐ PWQO ☐ Other	

Include Criteria on Certificate of Analysis (Y/N)? ____

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ____ Time Required: ____ ☐
Rush Confirmation Number: ____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	ANALYSIS REQUESTED (PLEASE BE SPECIFIC): BTEX VOCs, PHCs F1-F4 (For RSC)	PAHs (Soil)	OC Pesticides (Soil)	PCBs (Soil)	# of Bottles	Comments
1		Dup-1	2017/11/06	—	SOIL				X	X	1	
2		Dup-2	↓	—	SOIL				X	X	1	
3		Dup-3	↓	—	SOIL		X	X			3	
4					SOIL							
5					SOIL							
6					SOIL							
7					SOIL							
8					SOIL							
9					SOIL							
10					SOIL							

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Recei	Custody Seal Present	Yes ✓	No
Jason Laplante	2017/11/07	11:40	KARREESHARPE	2017/11/07	16:56				Intact		

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

9/9 F

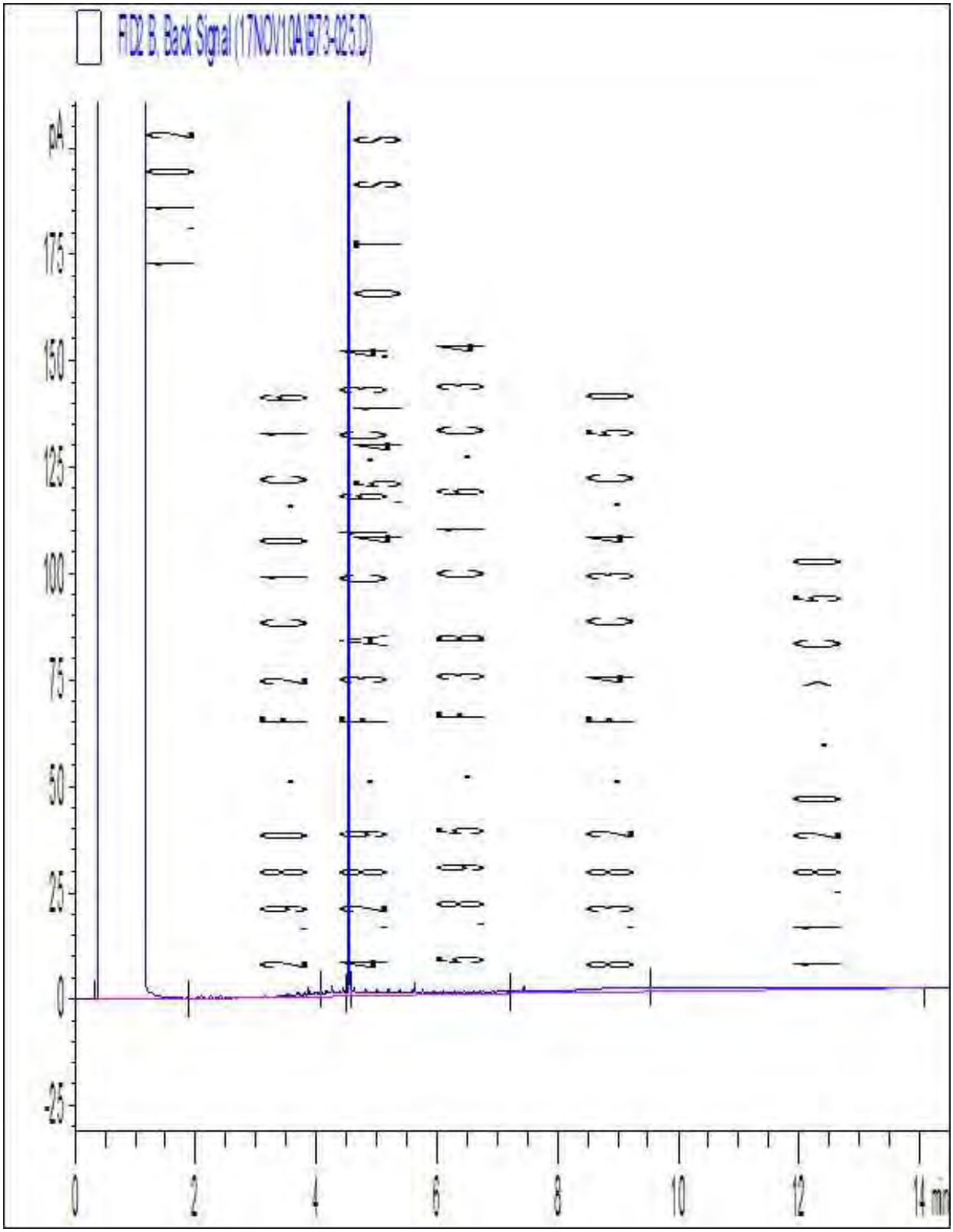
#407908

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam Job #: B7P0185
Report Date: 2017/11/20
Maxxam Sample: FMU629

Pinchin Ltd
Client Project #: 210701.001
Project name: PHASE II/12300 COLERAINE DR, CALEDON
Client ID: BH01-4

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

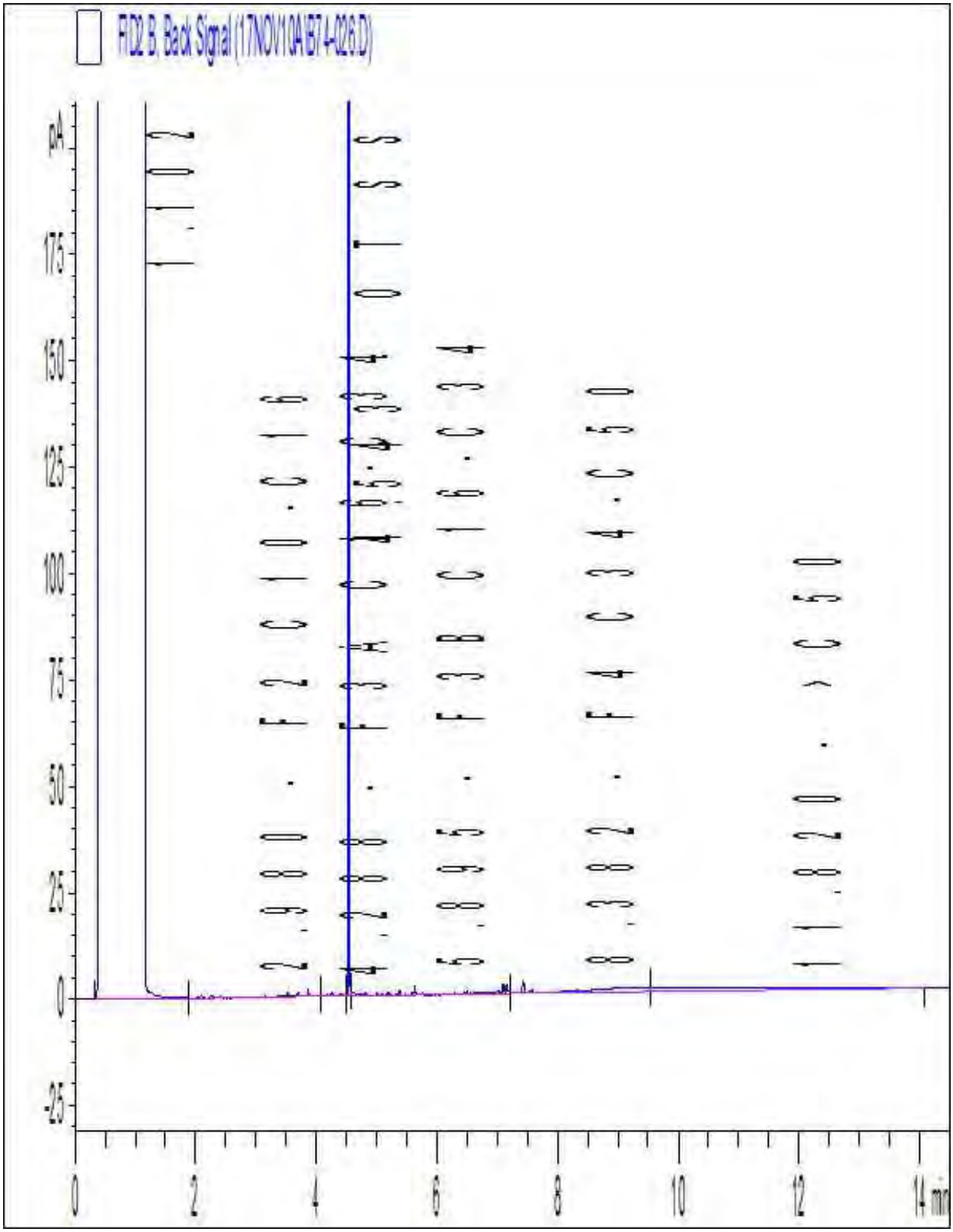


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7P0185
Report Date: 2017/11/20
Maxxam Sample: FMU630

Pinchin Ltd
Client Project #: 210701.001
Project name: PHASE II/12300 COLERAINE DR, CALEDON
Client ID: BH02-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

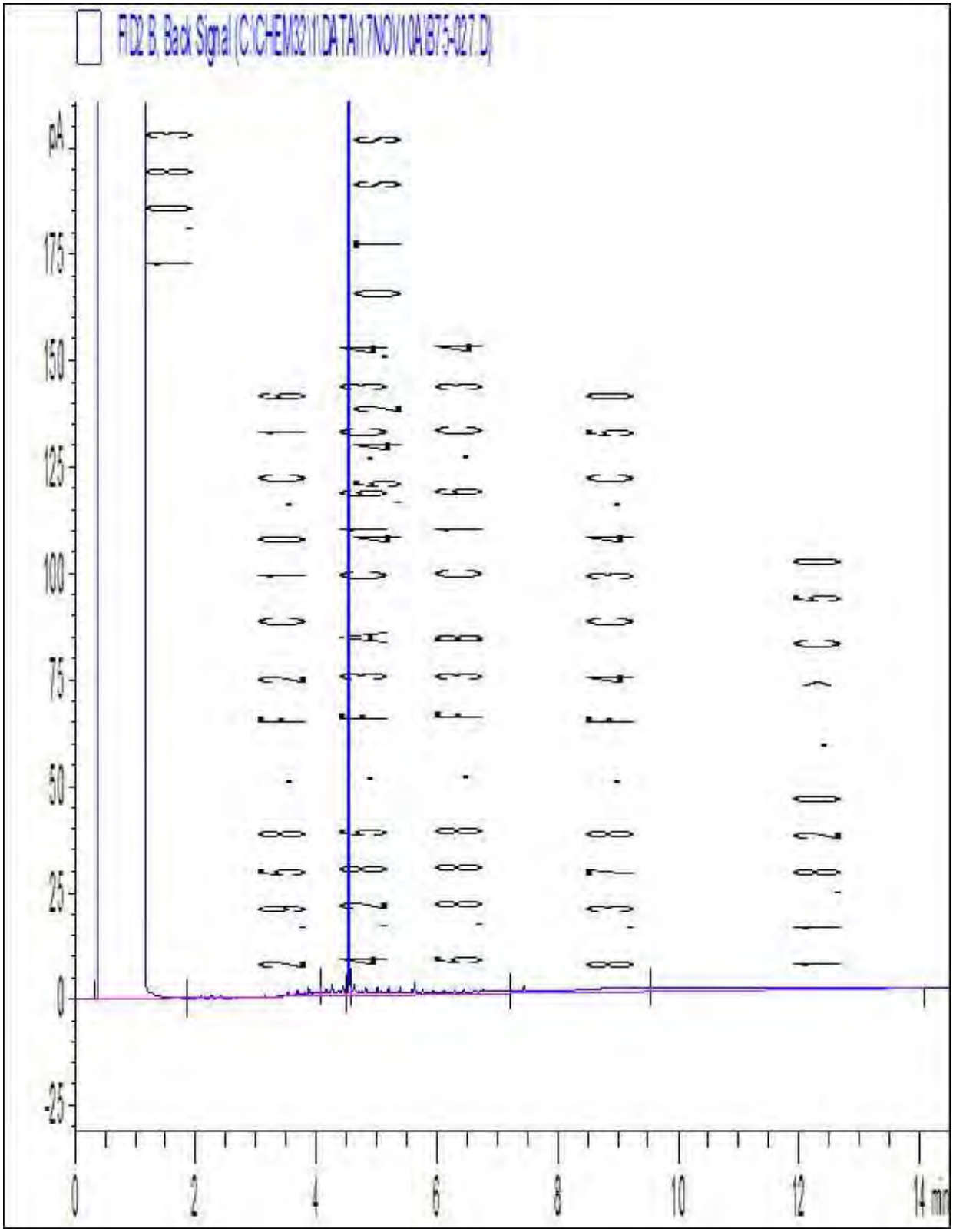


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7P0185
Report Date: 2017/11/20
Maxxam Sample: FMU658

Pinchin Ltd
Client Project #: 210701.001
Project name: PHASE II/12300 COLERAINE DR, CALEDON
Client ID: DUP-3

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Grain Size Analysis Report

Client Sample ID: BH02-3 (FMU631)
Maxxam Sample ID: SM1869-01
Maxxam Job #: B7A1467

Tot. Sample Wt (g)*: 8.72
> 2 mm Sample Wt (g)*: 0.23
* Dry mass based on Sieve Aliquot

Batch # (Sieve): 8833342
Batch # (Hydro): 8833347

Analysis Date (Sieve): 2017/11/17
Analysis Date (Hydro): 2017/11/17

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	97.4
	Sieve 20	0.850	95.8
	Sieve 40	0.425	95.2
	Sieve 100	0.150	91.7
	Sieve 200	0.075	91.2
Hydrometer	R1min	0.0431	85.4
	R3min	0.0253	81.7
	R10min	0.0142	75.6
	R30min	0.0084	69.5
	R90min	0.0050	58.6
	R270min	0.0030	47.6
	R1080min	0.0015	36.6

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	11.0
Silt	0.002	0.050	47.7
Clay	-	0.002	41.3

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

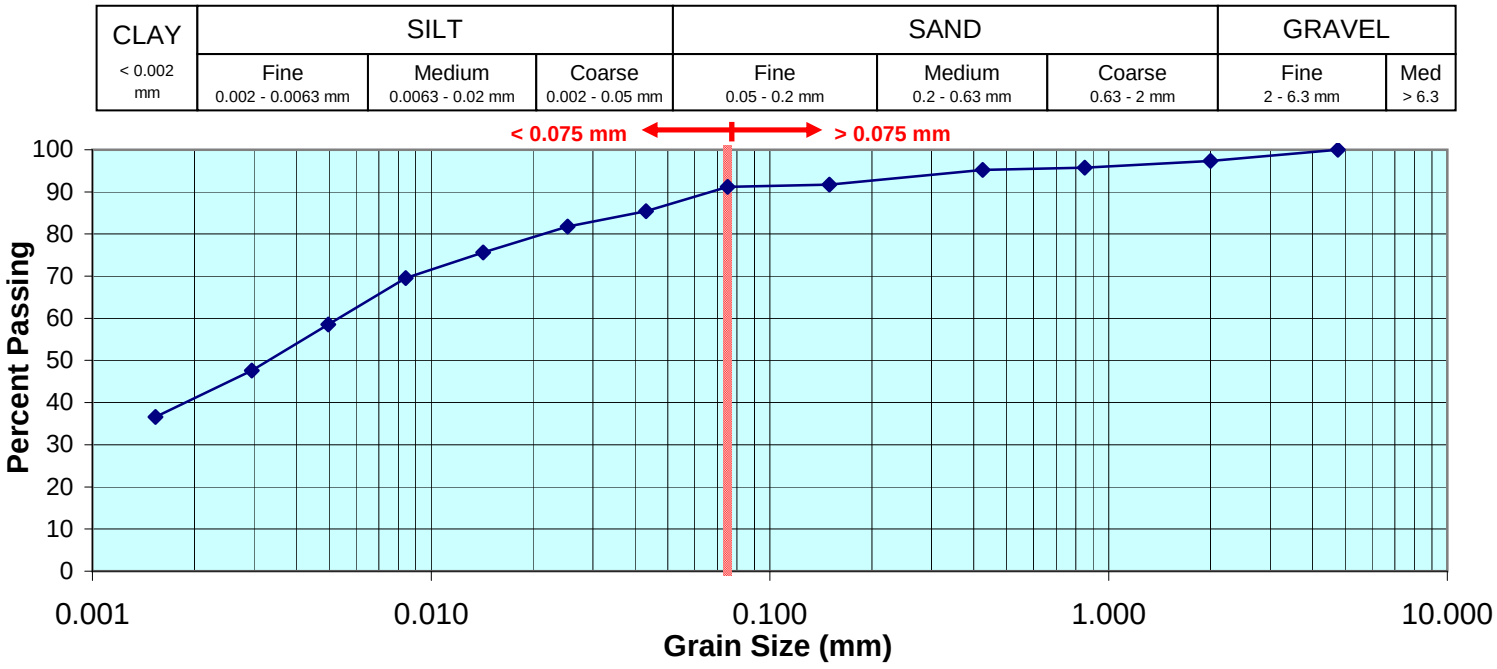
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 91.2
Classification = Fine Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 93.6
Classification = Fine Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report

Client Sample ID: BH02-3 (FMU631)
Maxxam Sample ID: DUP SM1869-01
Maxxam Job #: B7A1467

Tot. Sample Wt (g)*: 9.68
> 2 mm Sample Wt (g)*: 0.23
* Dry mass based on Sieve Aliquot

Batch # (Sieve): 8833342
Batch # (Hydro): 8833347

Analysis Date (Sieve): 2017/11/17
Analysis Date (Hydro): 2017/11/17

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	97.6
	Sieve 20	0.850	96.4
	Sieve 40	0.425	94.9
	Sieve 100	0.150	90.7
	Sieve 200	0.075	89.6
Hydrometer	R1min	0.0445	84.3
	R3min	0.0261	80.2
	R10min	0.0147	74.8
	R30min	0.0086	68.0
	R90min	0.0051	58.5
	R270min	0.0030	46.2
	R1080min	0.0015	38.1

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	12.7
Silt	0.002	0.050	45.7
Clay	-	0.002	41.6

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

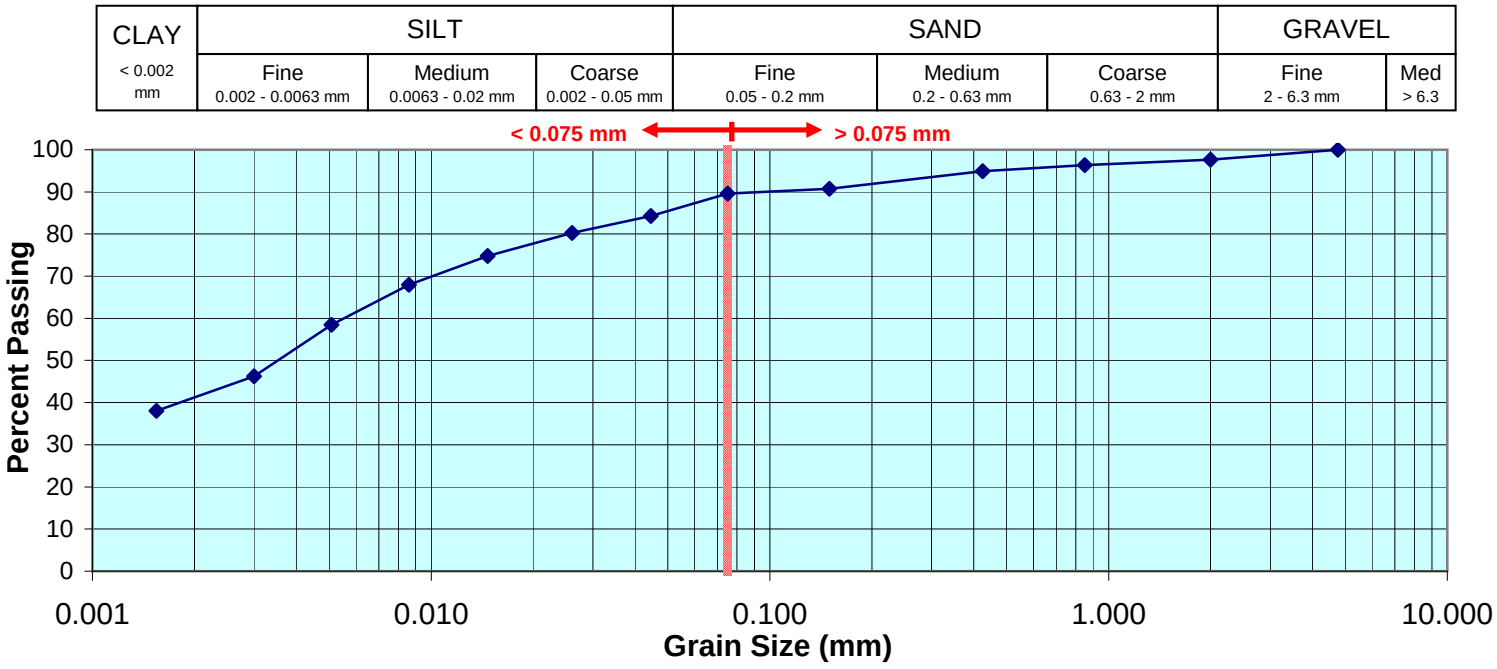
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 89.6
Classification = Fine Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 91.7
Classification = Fine Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report

Client Sample ID: BH05-1 (FMU633)
Maxxam Sample ID: SM1870-01
Maxxam Job #: B7A1467

Tot. Sample Wt (g)*: 10.37
> 2 mm Sample Wt (g)*: 0.00
* Dry mass based on Sieve Aliquot

Batch # (Sieve): 8833342
Batch # (Hydro): 8833347

Analysis Date (Sieve): 2017/11/17
Analysis Date (Hydro): 2017/11/17

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	100.0
	Sieve 20	0.850	99.5
	Sieve 40	0.425	98.2
	Sieve 100	0.150	91.9
	Sieve 200	0.075	83.7
Hydrometer	R1min	0.0452	65.8
	R3min	0.0269	55.8
	R10min	0.0153	46.9
	R30min	0.0091	37.9
	R90min	0.0053	31.3
	R270min	0.0031	25.7
	R1080min	0.0016	20.1

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	31.3
Silt	0.002	0.050	47.1
Clay	-	0.002	21.6

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

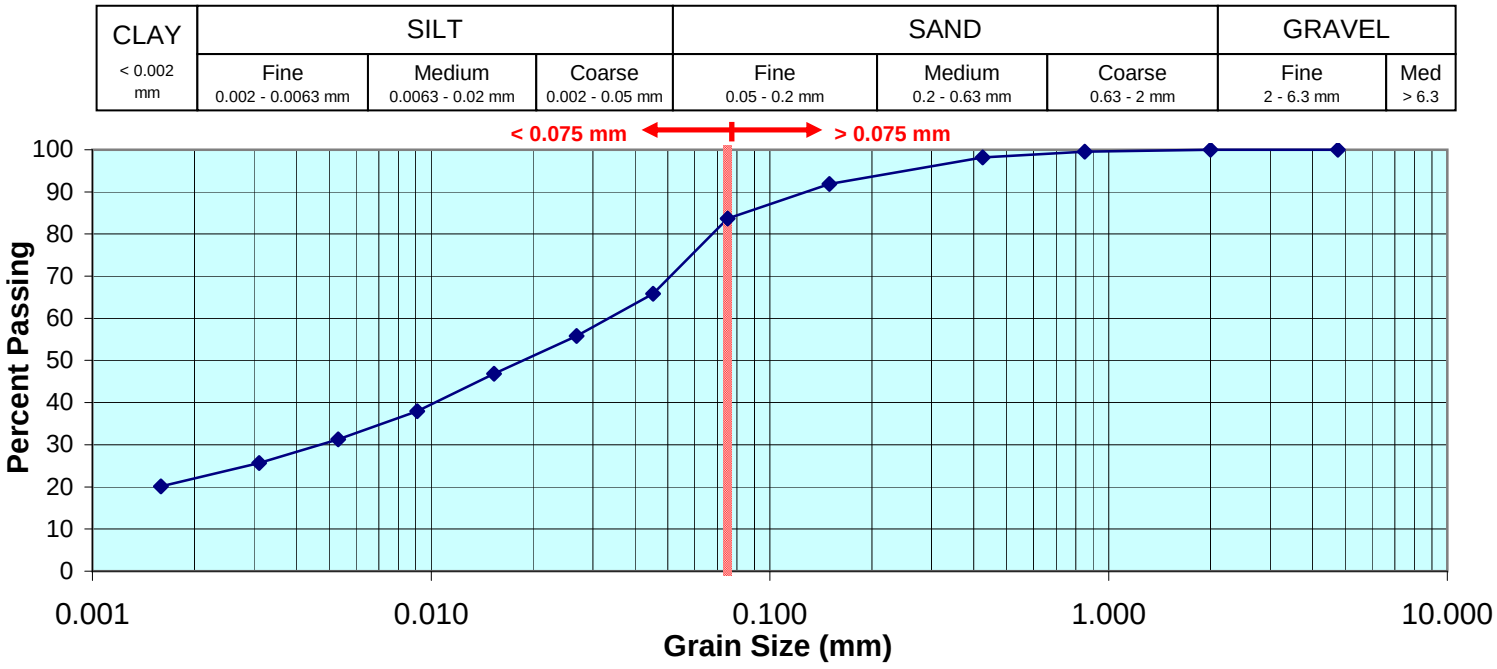
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 83.7
Classification = Fine Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 83.7
Classification = Fine Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report

Client Sample ID: BH17-1 (FMU634)
Maxxam Sample ID: SM1871-01
Maxxam Job #: B7A1467

Tot. Sample Wt (g)*: 10.02
> 2 mm Sample Wt (g)*: 0.08
* Dry mass based on Sieve Aliquot

Batch # (Sieve): 8833342
Batch # (Hydro): 8833347

Analysis Date (Sieve): 2017/11/17
Analysis Date (Hydro): 2017/11/17

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	99.2
	Sieve 20	0.850	98.3
	Sieve 40	0.425	95.2
	Sieve 100	0.150	94.0
	Sieve 200	0.075	80.4
Hydrometer	R1min	0.0455	66.8
	R3min	0.0271	57.2
	R10min	0.0154	47.7
	R30min	0.0092	38.2
	R90min	0.0054	28.6
	R270min	0.0032	19.1
	R1080min	0.0016	13.1

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	30.6
Silt	0.002	0.050	54.7
Clay	-	0.002	14.7

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

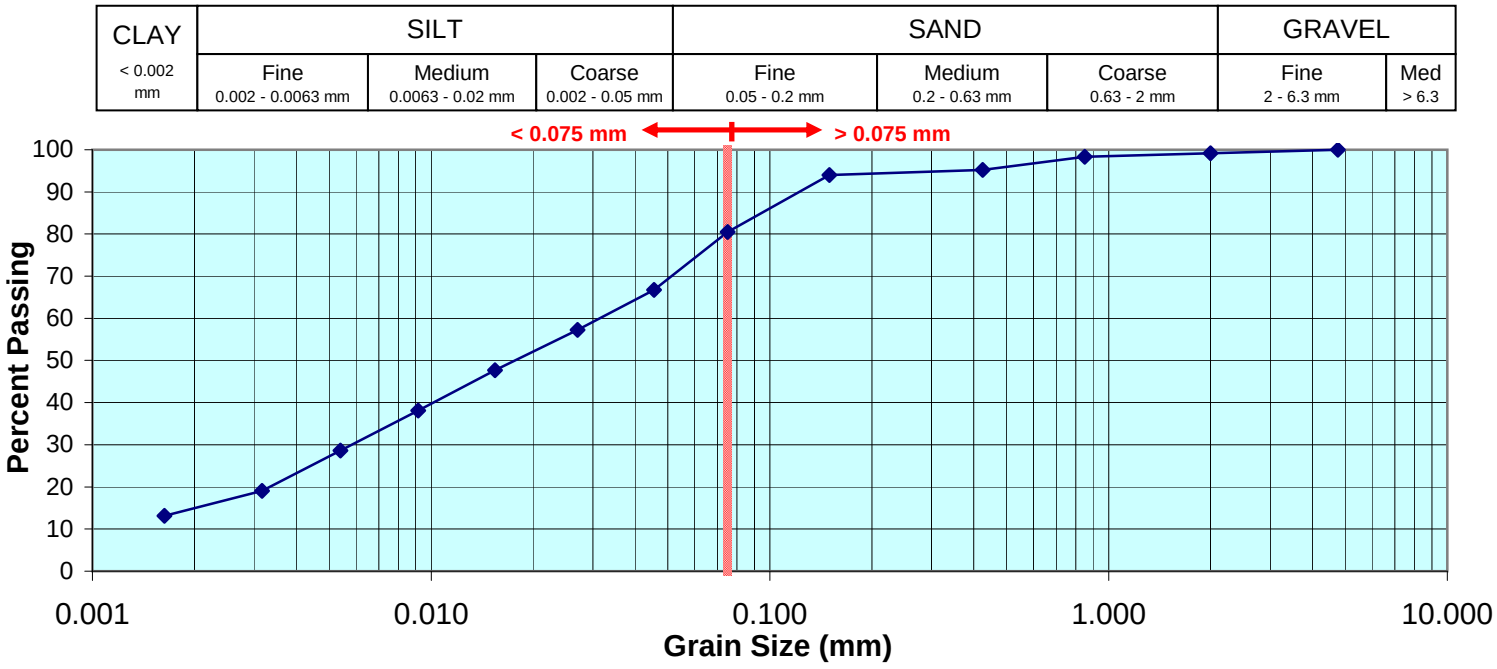
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 80.4
Classification = Fine Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 81.1
Classification = Fine Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report (QA-SRM)

Sieve Batch #: 8833342
Hydrometer Batch #: 8833347

Standard Reference Material

			Acceptance Limits	
	Fraction	% Recovery	Minimum	Maximum
Sieve	> 0.075 mm	99	86	114
	< 0.075 mm	100	91	109
Hydrometer	Sand	95	75	125
	Silt	99	75	125
	Clay	107	75	125

Grain Size Analysis Report (QA-DUP)

Sieve Batch #: 8833342
Hydrometer Batch #: 8833347
Maxxam Job #: B7A1467

Duplicate Sample ID: SM1869

			Acceptance Limit
	Fraction (mm)	% RPD	Maximum
Sieve	4.750	NC	35
	2.000	10.5	35
	0.850	25.7	35
	0.425	NC	35
	0.150	20.7	35
	0.075	NC	35
Hydrometer	0.0445	1.6	35
	0.0261	2.2	35
	0.0147	1.4	35
	0.0086	2.5	35
	0.0051	0.4	35
	0.0030	3.2	35
	0.0015	3.7	35