

## Director's Order

Director's Order Number

1-230768005

### Director's Order Issued To

CREWS AUTO LTD.  
326 COLEMAN ST , BELLEVILLE, ON, K8P 3J2

CHARLES CREWS  
262 MURRAY ST , QUINTE WEST, ON, K8V 5P4  
MARGARET MILLINGTON  
48 NICKLAUS DR , BANCROFT, ON, K0L 1C0

### Site

One hour Martinizing Dry Cleaning  
322 PINNACLE ST, BELLEVILLE, ON, K8N 3B4

Refer to the Definitions section in Part B of this Director's Order, for the meaning of all the capitalized terms that are used in this Director's Order.

### PART A - WORK ORDERED

This work is ordered pursuant to my authority under **EPA | 18 | (1), EPA | 197 | (1)**, I order you, jointly and severally, unless otherwise indicated, to do the following:

#### Item No. 1

By two weeks after service of this Order, retain the services of a Qualified Person satisfactory to the Director to carry out the work as described in Work Ordered items 3 to 9.

#### Item No. 2

By three weeks after service of this Order, submit to the Director written confirmation from the Qualified Person(s) by email to [cathy.chisholm@ontario.ca](mailto:cathy.chisholm@ontario.ca) and to [sharilyn.kennedy@ontario.ca](mailto:sharilyn.kennedy@ontario.ca) that they have, (1) received a copy of the Order; (2) been retained to carry out the work as described in Work Ordered Item Nos. 3 to 9; and (3) the experience and qualifications to carry out such work.

#### Item No. 3

By no later than three months after service of this Order, have the Qualified Person(s) prepare a detailed Work Plan that shall include, at a minimum, the following:

1. Assess and evaluate the human health risk to residents and clients at all locations in the immediate vicinity, including on the subject lands, as per the

known pathways of exposure from dry-cleaning product (i.e., soil and groundwater to indoor air)

I. Consideration should be given to whether there is a risk at the sewer alignment works, which appear to have been recently active along Front Street and for which there is an active PTTW.

2. delineate the vertical and horizontal extent of Contaminants of Concern in soil and groundwater at the Site and that may have migrated off-site and include, at a minimum, the following:

I. Provide additional land use history assessment to ensure the full environmental conditions are understood at and around the Site (i.e., complete a Phase I ESA).

II. Provide additional characterization and documentation of fundamental hydrogeological conditions and buried infrastructure at and around the site.

III. Provide additional contaminant groundwater delineation (installation of groundwater monitoring wells) and documentation, on-site and off-site. Based on additional groundwater delineation, potential risk to on and off-site properties should be determined, and additional assessment undertaken as necessary (e.g., soil vapour probes, indoor air quality monitoring).

3. a copy of the site plan that identifies the locations of boreholes and monitoring wells that will form part of the soil and groundwater monitoring assessment.

4. a proposed schedule for implementing the work described in the Work Plan that results in the work being completed no later than twelve months after issuance of this Order.

**Item No. 4**

By four months after service of this Order, submit to the Director by email to [cathy.chisholm@ontario.ca](mailto:cathy.chisholm@ontario.ca) and to [sharilyn.kennedy@ontario.ca](mailto:sharilyn.kennedy@ontario.ca) the Work Plan prepared by the Qualified Person as required in Work Ordered Item No. 3 above.

**Item No. 5**

Upon receipt of the Director's written acceptance of the Work Plan, arrange for the Qualified Person(s) to implement the accepted Work Plan in accordance with the accepted implementation schedule.

**Item No. 6**

Before fifteen months after service of the Director's Order, have the Qualified Person(s) prepare a report, which includes but is not necessarily limited to: a) information collected through the implementation of the accepted Work Plan; and b) the steps, with a proposed implementation schedule, that will be taken to address soil and groundwater impacted by Contaminants of Concern which originates at and from the Site may have migrated off Site, as identified through the implementation of the accepted Work Plan (hereafter referred to as the 'Delineation Report').

**Item No. 7**

By fifteen months after service of the Director's Order, submit to the Director, by email to [cathy.chisholm@ontario.ca](mailto:cathy.chisholm@ontario.ca) and to [sharilyn.kennedy@ontario.ca](mailto:sharilyn.kennedy@ontario.ca), a copy of the Delineation Report referred to in Item No. 6 above.

**Item No. 8**

Upon service of this Order, Charles Crews and Crews Auto Ltd., and any other person with an interest in the Site shall, before dealing with the Site in any way, give a copy of this Order, including any amendments thereto, to every person who will acquire an interest in the Site as a result of the dealing.

**Item No. 9**

Within thirty days of receipt of an acknowledgment and direction form signed by the Director enclosing a certificate of requirement, Crews Auto Ltd. shall register the certificate of requirement issued under s. 197 (2) of the EPA, on title to the Site, in the appropriate land registry office.

**Item No. 10**

Within seven days of registration of the Certificate of Requirement on title, Crews Auto Ltd. shall provide written verification to the Director by email to [cathy.chisholm@ontario.ca](mailto:cathy.chisholm@ontario.ca) and to [sharilyn.kennedy@ontario.ca](mailto:sharilyn.kennedy@ontario.ca) that the Certificate of Requirement has been registered on title to the Site as required by Item No. 9 above.

## **PART B - BACKGROUND AND REASONS**

This Director's Order is being issued for the reasons set out below.

### **Definitions**

For the purposes of this Director's Order, the following capitalized terms shall have the meanings set out below:

"2021 Indoor Air Quality Report" means the report entitled Indoor Air Quality Sampling at 322 Pinnacle Street, in Belleville, ON. Prepared by Cambium and dated January 8, 2021.

"Adverse Effect" has the same meaning as in subsection 1(1) of the EPA

"Contaminants of Concern" are: volatile organic compounds (VOC) including organochlorine tetrachloroethylene.

"Director" means the undersigned, or any other person appointed for purposes of sections 18, and 197 of the EPA.

"Director's Order" means this Director's Order 1-230768005 dated xxx.

"EPA" means the Environmental Protection Act, R.S.O. 1990, c. E.19.

"November 2016 Report" means the report entitled Final Phase II Environmental Site Assessment 322 Pinnacle Street Belleville, Ontario dated November 30, 2016, and prepared by Pinchin Ltd.

"Ministry" means the Ontario Ministry of the Environment, Conservation and Parks.

"Proposal for Preliminary Remedial Action Plan" means the report entitled Proposal for Preliminary Remedial Action Plan 322 Pinnacle Street, Belleville, Ontario. Prepared by Pinchin and dated April 17, 2019.

"Provincial Officer" means Sharilyn Kennedy, or in the event that she is unable to act, any other provincial officer authorised to act pursuant to the EPA.

"Qualified Person" means a person who has obtained the appropriate education and training and has demonstrated experience and expertise in the areas relating to the work required to be carried out by this Order. For the purposes of this Director's Order, the person shall also meet the qualifications set out in Section 5 of Ontario Regulation 153/04 made under the EPA.

"Site" means the property located at 322 Pinnacle St. Belleville Ontario and legally described as: PT LT 7-8 PL 99 Thurlow as in QR421026; Belleville; County of Hastings with the Property Identifier Number (PIN) 40475-0044 (LT).

### **Description of Person(s) Subject to the Director's Order**

Crews Auto Ltd. is the current owner of the Site and has been the owner since March 15, 2019. Charles Crews is the sole director of Crews Auto Ltd., as such, both the corporation and Charles Crews are being issued this Order. In this capacity, Charles Crews currently has management and control of the Site and the Contaminants of Concern originating from the Site which may be migrating beyond the Site's property boundaries.

Crews Auto Ltd. purchased the Site from Margaret and Michael John Millington, who had been the owners of the Site since August 31, 1989, both of which exercised a certain degree of management and control of the Site, and the contaminants present on and beneath the Site. The Director has reason to believe that Michael John Millington is deceased.

### **Description of the Site and/or System/Facility**

The Site is located at 322 Pinnacle St. Belleville ON.

The Site consists of a rectangular parcel of land covering approximately 5,350 square feet with a two-story building which formerly operated as One Hour Martinizing Dry Cleaners. The Site is in a commercial land use area and is municipally serviced. The second floor of the building is occupied by a residential tenant. It is unknown if this residential tenancy is permitted by the City. The Site is located in downtown Belleville and surrounded by commercial properties to the north, west and south; and a Catholic church to the east.

### **Reasons for the Director's Order**

On November 30, 2016, Pinchin Ltd. (Pinchin) provided Margaret Millington the November 2016 report for the Site (attached). The report identified that tetrachloroethylene, a chemical used in dry-cleaning, was present in soil at a concentration of 9,460 ug/L and in groundwater at a concentration of 176,000 which greatly exceeded the MECP Table 7 Standard of 4.5 ug/L and 0.5 ug/L respectively. The concentration in the groundwater sample was indicative of pure product. The concentration of Contaminants of Concern was so high, the laboratory was required to elevate their detection limits to achieve an adequate dilution factor. As such, the detection limits for 22 of the 33 volatile organic compounds (VOCs) analyzed were above Table 7 Standards, indicating that additional VOC exceedances are possible.

The plume of Contaminants of Concern was identified at the western property boundary. The groundwater flow direction in the area is likely toward the Moira River located approximately 200 m west. Given the location of the plume of pure product on the western property boundary, it is expected that off-site migration has likely occurred.

The November 2016 report recommended a remedial excavation and dewatering program be completed to remove the soil and groundwater exceeding the Table 7 Standards. To the ministry's knowledge, this was never completed, and the property was sold to Charles Crews

in early 2019.

On April 17, 2019, Pinchin provided Charles Crews the Proposal for Preliminary Remedial Action Plan. The report recommended further assessment of the uninvestigated soil and groundwater beneath the Site building to further delineate the extent of VOC impacts identified in the November 2016 Report. As part of the delineation process, Pinchin recommended the advancement of four new boreholes, one of which would be drilled in the footprint of the building. To the ministry's knowledge, this work has not been initiated.

On January 8, 2021, Cambium provided Charles Crews the 2021 Indoor Air Quality Report (attached) for sampling conducted on the first floor of the onsite building over an 8-hour period on December 8, 2020. The report identified exceedances of the ministry's Health Based Indoor Air Criteria for Contaminants of Concern in the former dry-cleaning area (now a warehouse) and the store front (now a café). The report concluded that the building was unfit for its intended purpose as a commercial space. The report did not address the occupation of the upstairs 1-bedroom apartment by a residential tenant or include sampling of air quality on the second floor. The report recommended the remediation of contamination, or the implementation of an extraction system for the contamination prior to the Site being used for commercial application. To the Directors knowledge, Charles Crews installed a ventilation system in the rear of the building on the first floor in 2020.

On September 25, 2023, the Ministry's hydrogeologist completed a review of both the 2016 Phase II ESA and the 2019 RAP (attached). It was determined that the 2019 RAP was insufficient and needed to be updated before delineation work could commence. In addition, it was recommended that the Owner assess and evaluate the human health risk to residents and clients at all locations in the immediate vicinity and consideration should be given to whether there is risk at the sewer alignment works, which appear to have been recently active along Front Street.

To the Ministry's knowledge, soil impacted with Contaminants of Concern are present on the Site and contaminated soil is an ongoing source of contamination to groundwater beneath the Site. A full delineation of Contaminants of Concern originating from the Site as required by the November 2016 Report has not been conducted and it is still likely that Contaminants of Concern extend beyond the Site's property boundaries and have the potential to impact indoor air quality of neighboring businesses. The tenant residing in the 1-bedroom apartment on the second floor of the onsite building has the potential of being exposed to indoor air that exceeds ministry guideline values.

### **Authority to Issue the Director's Order**

I am issuing this Director's Order under my authority as a Director under the following legislation, which also includes the authority to take intermediate action and/or procedural steps:

I am issuing this Director's Order under my authority as a Director under the following legislation, which also includes the authority to take intermediate action and/or procedural steps:

- Section 18 of the EPA; and
- Section 197 of the EPA.

Therefore, based on the foregoing, I am of the opinion that Margaret Millington and Charles Crews were previously or are currently the owners or persons in charge, management or control of the Site that is contaminated with Contaminants of Concern and that the requirements specified in the Director's Order are in the public interest to ensure the protection of public health and the natural environment.

Based on the foregoing, I am of the opinion that it is reasonable to believe that the Site is currently contaminated, and has been contaminated for some time, with Contaminants of Concern and that the Site is a source of Contaminants of Concern which have likely migrated off Site and onto adjacent properties. The extent of the contamination on and off Site has not been fully delineated and, in the absence of an active groundwater remediation and/or containment program at and related to the Site and/or other appropriate remedial and/or monitoring programs, groundwater contaminated with Contaminants of Concern may have and may continue to migrate off the Site onto adjacent properties where adverse effects related to groundwater impacts may occur or have already occurred, posing a potential risk to human health and the natural environment as identified by indoor air quality exceedances.

I reasonably believe that the requirements of this Director's Order are necessary and advisable to prevent, decrease or eliminate any adverse effects that may result from such a discharge or have resulted from such discharges that occurred in the past or from the presence or discharge of the Contaminants of Concern in, on or under the Site.

### **Attachments**

The attachments listed below, if any, form part of this Director's Order:

Addendum A – 2016 Phase II ESA report

Addendum B – 2021 Indoor Air Quality Assessment

Addendum C – 2023 Technical Hydrogeological Review of PCE Contaminated Site One-hour Martinizing Dry Cleaning

**ISSUING DIRECTOR**



## APPEAL TO THE ONTARIO LAND TRIBUNAL INFORMATION

### REQUEST FOR HEARING

You may require a hearing before the Ontario Land Tribunal if, within 15 days of service of this Director's Order, you serve written notice of your appeal on the Ontario Land Tribunal and the Director as indicated in the Contact Information below. Your notice of appeal must state the portions of this Director's Order for which a hearing is required and the grounds on which you intend to rely at the hearing. Unless you receive leave (permission) from the Ontario Land Tribunal, you are not entitled to appeal a portion of this Director's Order or to rely on grounds of appeal that are not stated in the notice of appeal.

### CONTACT INFORMATION

The contact information for the Director and the Ontario Land Tribunal is the following:

Registrar  
Ontario Land Tribunal  
655 BAY STREET, SUITE 1500  
TORONTO, ON M5G 1E5  
Email: [OLT.Registrar@ontario.ca](mailto:OLT.Registrar@ontario.ca)

and

Director  
Ministry of the Environment,  
Conservation and Parks  
Drinking Water and Environmental  
Compliance Division  
135 ST CLAIR AVE W, 8TH FLR  
TORONTO, ON M4V 1P5  
Office Email: [DWECD](mailto:DWECD)  
Fax: () -

The contact information of the Ontario Land Tribunal and further information regarding its appeal requirements can be obtained directly from the Tribunal at:

Tel: (416) 212-6349, Toll Free: 1(866) 448-2248 or [www.olt.gov.on.ca](http://www.olt.gov.on.ca)

### SERVICE INFORMATION

Service of the documentation referred to above can be made personally, by mail, by fax (in the case of the Director only), by commercial courier or by email in accordance with the legislation under which this Director's Order is made and any corresponding Service Regulation.

## ADDITIONAL INFORMATION

Unless stayed by the Director or the Ontario Land Tribunal, this Director's Order is effective from the date of service.

Failure to comply with a requirement of this Director's Order constitutes an offence. Unless otherwise indicated, the obligation to comply with a requirement of this Director's Order continues on each day after the specified compliance date until the obligation has been satisfied.

The requirements of this Director's Order are minimum requirements only and do not mean that you are not required to comply with any other applicable legal requirements, including any:

- statute, regulation, or by-law;
- federal, provincial, or municipal law; or
- applicable requirements that are not addressed in this Director's Order.

The requirements of this Director's Order are severable. If any requirement of this Director's Order, or the application of any requirement to any circumstance, is held invalid, such finding does not invalidate or render unenforceable the requirement in other circumstances. It also does not invalidate or render unenforceable the other requirements of this Director's Order.

Further orders may be issued in accordance with the legislation as circumstances require.

This Director's Order is binding upon any successors or assignees of the persons to whom this Director's Order is issued.

**The procedures to request a hearing and an appeal of this Director's Order and other information provided above are intended as a guide. The legislation should be consulted for additional details and accurate reference. Further information can be obtained from e-Laws at [www.ontario.ca/laws](http://www.ontario.ca/laws).**



FINAL

# Phase II Environmental Site Assessment

322 Pinnacle Street  
Belleville, Ontario

Prepared for:

**Margaret Millington**  
106 North Front Street  
Belleville, ON K8P 3B4

November 30, 2016

Pinchin File: 119034



**Issued To:** Margaret Millington  
**Issued On:** November 30, 2016  
**Pinchin File:** 119034  
**Issuing Office:** 1456 Centennial Drive, 2nd Floor,  
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**Primary Pinchin Contact:** Mr. Ian Murdoch  
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## EXECUTIVE SUMMARY

Pinchin Ltd. (Pinchin) was retained through an Authorization to Proceed signed by Margaret Millington (Client) to conduct a Phase II Environmental Site Assessment (ESA) of the property located at 322 Pinnacle Street, Belleville, Ontario (hereafter referred to as the Site). The Site location is shown on Figure 1 (all Figures are provided in Appendix I).

The Site is developed with a two-storey commercial building (Site Building), which formerly operated as a dry-cleaning operation. The Site is a commercial property located within the City of Belleville. It is Pinchin's understanding that potable water for the Site and surrounding area is supplied by the City of Belleville municipal services, with the Bay of Quinte serving as the water source.

The purpose of this Phase II ESA was to address potential issues of environmental concern associated with the former dry cleaning operations on-Site in relation to the potential internal due diligence and financing of the Site.

Based on the historical operations on-Site, Pinchin identified the following potential issue of environmental concern:

- The Site historically operated as a dry-cleaning operation for an unknown duration.

Based on the above-mentioned finding, Pinchin recommended that a Phase II ESA be conducted at the Site in order to assess for the presence of environmental impacts.

The Phase II ESA was completed at the Site by Pinchin on November 3, 2016. A total of three (3) boreholes were advanced to a maximum depth of 9.1 meters below ground surface (mbgs) using a K-40 Limited Access Drill. The borehole (MW-1) was advanced to a maximum depth of 9.1mbgs and terminated within the underlying bedrock formation and boreholes (BH-2 and BH-3) terminated upon encountering the bedrock interface.

Select "worst case" soil samples collected during the borehole drilling program were submitted for laboratory analysis of volatile organic compounds (VOCs). Groundwater samples collected from the newly installed were submitted for laboratory analysis of VOCs.

Based on Site-specific information, the soil and groundwater quality was assessed based on the Ontario Ministry of the Environment and Climate Change *Table 7 Standards* for industrial/commercial/community land use and coarse-textured soil.

The reported concentrations of VOCs in the soil samples submitted for analysis met the *Table 7 Standards*, with the exception of soil sample SS-2 collected from between 0.5 and 1.4 mbgs at borehole BH-3, which had concentrations of tetrachloroethylene that exceeded the *Table 7 Standards*.



The reported concentration in the groundwater sample collected from BH-3, that was submitted for analysis of VOCs had a concentration of tetrachloroethylene that exceeded the *Table 7 Standards* that exceeded the *Table 7 Standards*.

The findings of this Phase II ESA identified VOC-impacted soil and groundwater at borehole BH-3. As such, it is Pinchin's recommendation that a remedial excavation and dewatering program be completed in the vicinity of this borehole to remove the soil and groundwater exceeding the *Table 7 Standards*.

*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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Table 3 - Volatile Organic Compound Analysis for Soil

Table 4 - Volatile Organic Compound Analysis for Groundwater





## 1.0 INTRODUCTION

Pinchin Ltd. (Pinchin) was retained through an Authorization to Proceed signed by Margaret Millington (Client) to conduct a Phase II Environmental Site Assessment (ESA) of the property located at 322 Pinnacle Street, Belleville, Ontario (hereafter referred to as the Site). The Site location is shown on Figure 1 (all Figures are provided in Appendix I).

The Site is developed with a two-storey commercial building (Site Building), which formerly operated as a dry-cleaning operation. The Site is a commercial property located within the City of Belleville. It is Pinchin's understanding that potable water for the Site and surrounding area is supplied by the City of Belleville municipal services, with the Bay of Quinte serving as the water source.

The purpose of this Phase II ESA was to address potential issues of environmental concern associated with the former dry cleaning operations on-Site in relation to the potential internal due diligence and financing of the Site.

This Phase II ESA was completed in general accordance with the Canadian Standards Association document entitled "*Phase II Environmental Site Assessment, CSA Standard Z769-00 (R2013)*", dated 2000 and reaffirmed in 2013 and the Technical Standards and Safety Authority document entitled "*Environmental Management Protocol for Fuel Handling Sites in Ontario, TSSA EMP-2012*", dated August 2012.

### 1.1 Background

The purpose of this Phase II ESA was to address potential issues of environmental concern associated with the former dry cleaning operations on-Site in relation to the potential internal due diligence and financing of the Site.

Based on the historical operations on-Site, Pinchin identified the following potential issue of environmental concern:

- The Site historically operated as a dry-cleaning operation for a unknown duration.

Based on the above-mentioned finding, Pinchin recommended that a Phase II ESA be conducted at the Site in order to assess for the presence of environmental impacts.

### 1.2 Scope of Work

The scope of work completed by Pinchin, as outlined in the Pinchin proposal entitled "*Proposal for Phase II Environmental Site Assessment, 322 Pinnacle Street, Belleville, Ontario*" submitted to the Client on September 23, 2016, included the following:



- Advancement of three boreholes following the clearance of underground services, all of which were to be instrumented with a monitoring well;
- Submission of select “worst case” soil samples for laboratory analysis of volatile organic compounds (VOCs);
- Collection of groundwater samples from each of the newly installed monitoring wells, following well development and purging, for laboratory analysis of VOCs;
- Comparison of the soil and groundwater laboratory analytical results to the applicable regulatory criteria; and
- Preparation of a factual report detailing the findings of the Phase II ESA and recommendations.

The scope of work described in the Pinchin proposal included three boreholes completed with monitoring wells; however, due to the fact that BH-2 encountered a potential underground storage tank (UST) and that BH-3 encountered a VOC plume, monitoring wells were not installed within these boreholes.

## **2.0 METHODOLOGY**

The investigation methodology was conducted in general accordance with the Ontario Ministry of the Environment and Climate Change (MOECC, formerly the Ontario Ministry of the Environment) document entitled “*Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario*” dated December 1996 (*MOECC Sampling Guideline*), the Association of Professional Geoscientists of Ontario document entitled “*Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended)*”, dated April 2011 (*APGO Guideline*) and Pinchin’s standard operating procedures (SOPs).

### **2.1 Borehole Investigation**

Pinchin retained Dedicated Environmental Services Inc. (Dedicated) to complete the borehole drilling program at the Site on November 3, 2016, following the clearance of underground services in the vicinity of the work area by public utility locators and a private utility locator retained by Pinchin. Dedicated is licensed by the MOECC in accordance with Ontario Regulation 903 (as amended) to undertake borehole drilling/well installation activities.

A total of three (3) boreholes were advanced to a maximum depth of 9.1 meters below ground surface (mbgs) using a K-40 Limited Access Drill. The borehole (MW-1) was advanced to a maximum depth of 9.1mbgs and terminated within the underlying bedrock formation and boreholes (BH-2 and BH-3) terminated upon encountering the bedrock interface. Soil samples were collected at continuous intervals using 3.8 centimetre (cm) inner diameter (ID) direct push soil samplers with dedicated single-use sample



liners. Discrete soil samples were collected from the single-use liners and containerized in laboratory-supplied glass sampling jars.

Subsurface soil conditions were logged on-Site by Pinchin personnel at the time of drilling. Soil samples were examined for visual and olfactory evidence of impacts and a portion of each sample was analyzed in the field for VOC and petroleum-derived vapour concentrations in soil headspace using a photoionization detector (PID).

The approximate locations of the boreholes are shown on Figure 2 and a description of the subsurface stratigraphy encountered during the drilling program is documented in the borehole logs included in Appendix II.

## **2.2 Monitoring Well Installation**

Groundwater monitoring wells were installed in borehole MW-1 to enable groundwater monitoring and sampling. The monitoring wells were constructed with 3.8 cm ID flush-threaded Schedule 40 polyvinyl chloride (PVC) risers, followed by a length of 3.8 cm ID No. 10 slot PVC screen that intersected the water table.

Each well screen was sealed at the bottom using a threaded cap and each riser was sealed at the top with a lockable J-plug cap. Silica sand was placed around and above the screened interval to form a filter pack around the well screen. A layer of bentonite was placed above the silica sand and was extended to just below the ground surface. A 5.2 cm ID Schedule 40 PVC outer casing, approximately 60 cm in length, was installed in each well around the top of the riser and into the top of the bentonite seal. A bentonite seal was then placed between the riser and outer casing. A protective flush-mount cover was installed at the ground surface over each riser pipe and outer casing and cemented in place.

## **2.3 Groundwater Monitoring**

The water levels within the monitoring wells were measured on November 10, 2016 using an interface probe. The presence/absence of non-aqueous phase liquid (NAPL) was also assessed during groundwater monitoring using the interface probe.

## **2.4 Sampling and Laboratory Analysis**

### **2.4.1 Soil**

One most apparent “worst case” soil sample, based on vapour concentrations as well as visual and/or olfactory considerations, recovered from each borehole was submitted for laboratory analysis of VOCs.

In addition, representative soil samples (MW-1 SS-3 and BH-3 SS-2) were submitted for pH analysis and grain size distribution analysis to confirm the Site Condition Standards applicable to the Site as 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 (*MOECC Standards*). A composite sample of the excess soil generated by the borehole drilling program was also submitted for analysis of leachate concentrations of VOCs and metals in accordance with the Toxicity Characteristic Leaching Procedure (TCLP) procedure as per Ontario Regulation 347 (as amended) to characterize the soil cuttings for possible off-Site disposal purposes.

The approximate borehole and monitoring well locations are shown on Figure 2. Table 1 provides a summary of the soil samples submitted for laboratory analysis.

#### 2.4.2 Groundwater

On November 3, 2016, Pinchin collected a groundwater sample from the open borehole (BH-3) with a dedicated bailer prior to the backfilling activities. The groundwater sample was submitted for laboratory analysis of VOCs.

Pinchin notes that there was no groundwater available for sampling at monitoring well MW-1.

#### 2.4.3 Analytical Laboratory

Selected soil and groundwater samples were delivered to Paracel Laboratories Ltd. (Paracel) in Ottawa, Ontario for analysis. Paracel is an independent laboratory accredited by the Standards Council of Canada and the Canadian Association for Laboratory Accreditation. Formal chain of custody records of the sample submissions were maintained between Pinchin and the staff at Paracel.

### 2.5 QA/QC Protocols

Various quality assurance/quality control (QA/QC) protocols were followed during the Phase II ESA to ensure that representative samples were obtained and that representative analytical data were reported by the laboratory.

Field QA/QC protocols that were employed by Pinchin included the following:

- Soil samples were extracted from the interior of the sampling device (where possible), rather than from areas in contact with the sampler walls to minimize the potential for cross-contamination;
- Soil and groundwater samples were placed in laboratory-supplied glass sample jars;
- The monitoring wells were developed following installation and were purged to remove stagnant water prior to sample collection so that representative groundwater samples could be obtained. Dedicated purging and sampling equipment was used for monitoring



well development, purging and sampling to minimize the potential for cross-contamination;

- Soil and groundwater samples were placed in coolers on ice immediately upon collection, with appropriate sample temperatures maintained prior to submission to the laboratory;
- Dedicated and disposable nitrile gloves were used for sample handling;
- Non-dedicated monitoring and sampling equipment (e.g., interface probe) was cleaned before initial use and between uses to minimize the potential for cross-contamination by washing with an Alconox™/potable water mixture followed by a deionized water rinse; and
- Sample collection and handling procedures were performed in general accordance with the *MOECC Sampling Guideline*, the *APGO Guideline* and Pinchin's SOPs for Phase II ESAs.

Paracel's internal laboratory QA/QC consisted of the analysis of laboratory duplicate, method blank, matrix spike and spiked blank samples, an evaluation of relative percent difference calculations for laboratory duplicate samples, and an evaluation of surrogate recoveries.

## **2.6 Ontario Water Well Records**

Ontario Regulation 903 (as amended) requires that all wells installed to depths greater than 3.0 mbgs have a water well record completed by a licensed well technician. The owner of the monitoring well must keep the water well record on file for a period of two years and the monitoring wells must be decommissioned as per Ontario Regulation 903 (as amended) if monitoring wells are no longer in use. Dedicated is a licensed well driller under Ontario Regulation 903 (as amended), and submitted a water well record to the MOECC and the Client to fulfill the requirements of Ontario Regulation 903 (as amended).

## **2.7 Site Condition Standards**

The Site is a commercial property located within the City of Belleville. It is Pinchin's understanding that potable water for the Site and surrounding area is supplied by the City of Belleville municipal services, with the Bay of Quinte serving as the water source.

Ontario Regulation 153/04 (as amended) states that a site 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, the pH of the subsurface soil (greater than 1.5 mbgs) is less than 5 or greater than 11, or if the site is an area of natural significance or is adjacent to or contains land within 30 metres of an area of natural significance. Two representative soil samples (MW-1 SS-3 and BH-3 SS-2) collected from the boreholes advanced at the



Site were submitted for pH analysis. The pH values measured in the submitted soil samples were within the limits for non-sensitive sites. The Site 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 Site is not an environmentally sensitive area.

Two representative soil samples (MW-1 SS-3 and BH-3 SS-2) collected from the boreholes advanced at the Site were submitted for 75 micron single-sieve grain size analysis. Based on the results of this analysis, the soil at the Site is interpreted to be coarse-textured for the purpose of selecting the appropriate *MOECC Standards*.

The pH and grain size analytical results are summarized in Table 2.

The results of the borehole drilling program indicated that the overburden was less than two metres thick over more than one-third of the Site area, classifying the Site as a “shallow soil property” as per Ontario Regulation 153/04 (as amended).

Based on the above, the appropriate Site Condition Standards for the Site are:

- “Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition”, provided in the *MOECC Standards (Table 7 Standards)* for:
  - Coarse-textured soils; and
  - Industrial/commercial/community property use.

As such, the analytical results have been compared to these *Table 7 Standards*.

### **3.0 RESULTS**

#### **3.1 Site Geology and Hydrogeology**

Based on the soil samples recovered during the borehole drilling program, the soil stratigraphy at the drilling locations below the gravel, concrete and asphalt surface generally consists of fill material comprised of silty clay to a depth between approximately 0.0 and 1.4 mbgs.

Native subsurface material underlying the fill material was not observed during the drilling activities. Moist to wet soil conditions were generally observed between 0.6 and 1.4 mbgs.

A detailed description of the subsurface stratigraphy encountered during borehole advancement is documented in the borehole logs located in Appendix II.

The depth to groundwater measured within the monitoring well MW-) and no groundwater was present.



The Moira River is located approximately 200 m west of the Site. The topography of the Site and surrounding area were observed to slope towards the west. Groundwater flow at the Site is inferred to be towards the west based on the topography of the Site area and the location of the Moira River.

### **3.2 Soil Headspace Vapour Concentrations**

Vapour concentrations measured in the headspace of soil samples collected during the drilling investigation are presented on the borehole logs in Appendix II and ranged from 0.0 parts per million by volume (ppm<sub>v</sub>) to a maximum of 4,000 ppm<sub>v</sub> in soil sample SS-2 collected at a depth of 0.6 to 1.4 mbgs in borehole BH-3.

### **3.3 Field Observations**

VOC-like odours and staining were observed in the soil sample SS-2 collected from borehole BH-3 at a depth of 0.6 to 1.4 mbgs; and, VOC-like odours and evidence of NAPL were observed during groundwater at borehole BH-3 during drilling. Groundwater and/or NAPL were not observed in MW-1 or BH-2.

### **3.4 Analytical**

#### *3.4.1 Soil*

As indicated in Table 2, reported concentrations of VOCs in the soil samples submitted for analysis met the Table 7 Standards, with the exception of soil sample SS-2 collected at borehole BH-3, which had a concentration of tetrachloroethylene (9,460 micrograms per gram (µg/g) vs. the *Table 7 Standards* of 4.5 µg/g) that exceeded the *Table 7 Standards*.

Due to elevated concentrations of tetrachloroethylene in soil, laboratory detection limits were raised above the *Table 7 Standards* for several VOC parameters; therefore additional VOC exceedances in soil cannot be ruled out.

The laboratory Certificate of Analysis for the soil samples is provided in Appendix IV.

#### *3.4.2 Groundwater*

As indicated in Table 4, reported concentrations of VOCs in the groundwater samples submitted for analysis met the *Table 7 Standards*, with the exception of the groundwater sample collected from borehole BH-3, which had a concentration of tetrachloroethylene (176,000 micrograms per litre (µg/L) vs. the *Table 7 Standards* of 0.5 µg/L) that exceeded the *Table 7 Standards*.



Due to elevated concentration of tetrachloroethylene in groundwater, laboratory detection limits were raised above the *Table 7 Standards* for several VOC parameters; therefore additional VOC exceedances in soil cannot be ruled out.

The laboratory Certificate of Analysis for the groundwater samples is provided in Appendix IV.

#### 4.0 FINDINGS AND CONCLUSIONS

Based on the work completed, the following is a summary of the activities and findings of this Phase II ESA:

- Pinchin retained Dedicated to advance three boreholes at the Site on November 3, 2016. A total of three (3) boreholes were advanced to a maximum depth of 9.1 mbgs using a K-40 Limited Access Drill. The borehole (MW-1) was advanced to a maximum depth of 9.1 mbgs and terminated within the underlying bedrock formation and boreholes (BH-2 and BH-3) terminated upon encountering the bedrock interface.
- The soil stratigraphy at the drilling locations generally consists of silty clay fill material to a depth between approximately 0.0 and 1.4 mbgs overlying limestone bedrock. The soil was generally observed to be moist to wet between 0.6 and 1.4 mbgs.
- Groundwater levels at the Site measured on November 10, 2016, and there was no indication of groundwater within MW-1. Inferred groundwater flow is expected to be west based on topography and the presence of the Moria River located 200 m west of the Site.
- Based on Site-specific information, the soil and groundwater quality was assessed based on the *Table 7 Standards* for industrial/commercial/community land use and coarse-textured soils.
- One “worst case” soil samples based on the results of field screening were submitted for laboratory analysis of VOCs.
- Groundwater samples were collected from borehole BH-3 collected during the drilling activities on November 3, 2016, and was submitted for laboratory analysis of VOCs.
- Reported concentrations in the soil samples submitted for analysis of VOCs satisfied their respective *Table 7 Standards*, with the exception of soil sample SS-2 collected at borehole BH-3, which had a concentration of tetrachloroethylene that exceeded the *Table 7 Standards*.
- Reported concentrations in the groundwater samples submitted for analysis of VOCs satisfied their respective *Table 7 Standards*, with the exception of the groundwater





sample collected at borehole BH-3, which had a concentration of tetrachloroethylene that exceeded the *Table 7 Standards*.

The findings of this Phase II ESA identified VOC-impacted soil and groundwater at borehole BH-3. As such, it is Pinchin's recommendation that a remedial excavation and dewatering program be completed in the vicinity of this borehole to remove the soil and groundwater exceeding the *Table 7 Standards*.

## **5.0 LIMITATIONS**

This Phase II ESA was performed for Margaret Millington (Client) in order to investigate potential environmental impacts at 322 Pinnacle Street, Belleville, 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 II ESA does not quantify the extent of the current and/or recognized environmental condition or the cost of any remediation.

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 II 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 II ESA was performed in general compliance with currently acceptable practices for environmental site investigations, and specific Client requests, as applicable to this Site. The scope of work completed by Pinchin, as part of this Phase II ESA, is not sufficient (in and of itself) to meet the requirements for the submission of a Record of Site Condition (RSC) in accordance with Ontario Regulation 153/04 (as amended). If an RSC is an intended end product of work conducted at the Site, further consultation and/or work will be required.

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.

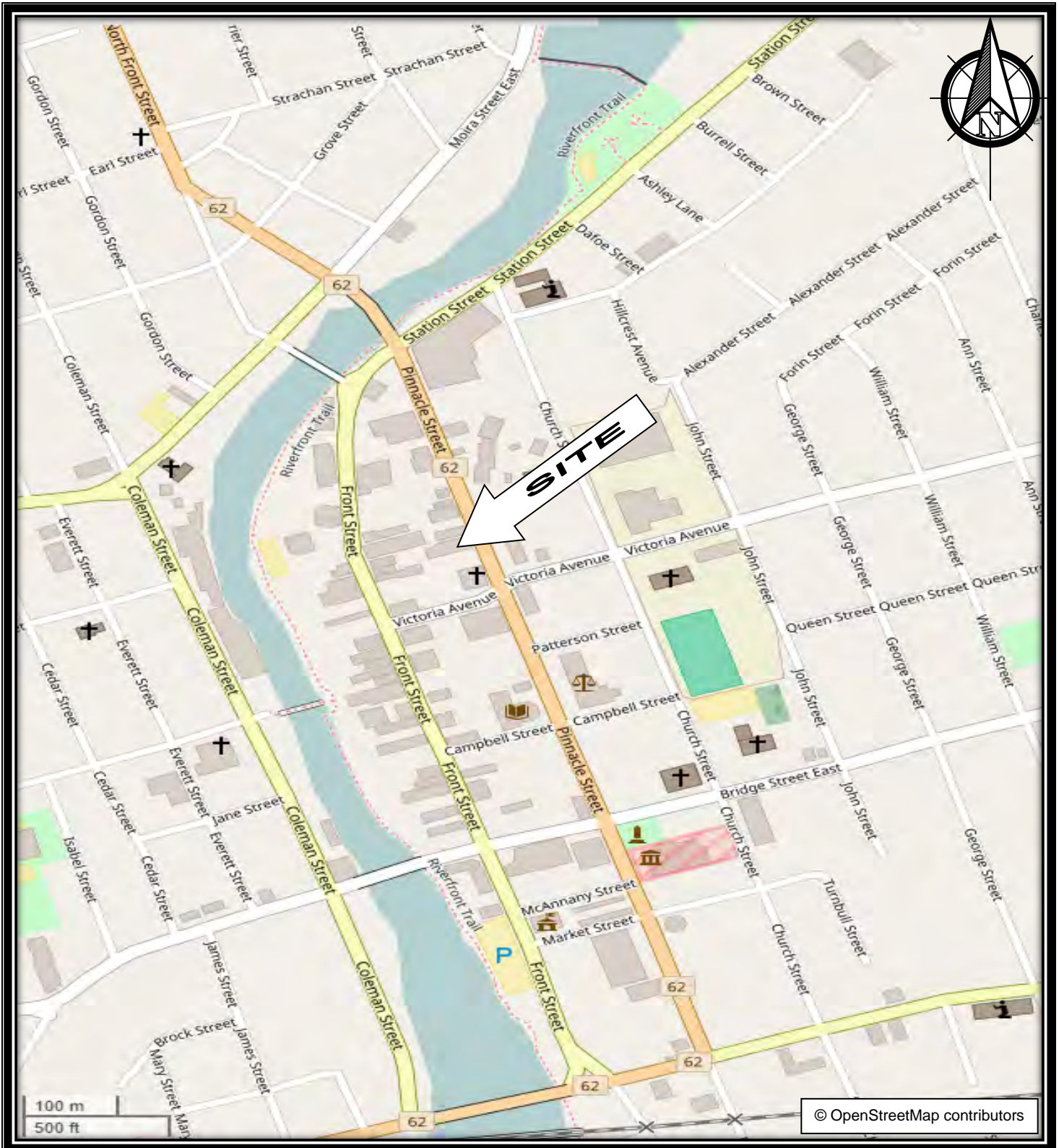



If additional parties require reliance on this report, written authorization from Pinchin will be required. Pinchin disclaims responsibility of consequential financial effects on transactions or property values, or requirements for follow-up actions and costs. No other warranties are implied or expressed. 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.

J:\119000s\119034 RE MAXQUINTEL,322PinnacleSt,DDIL,SA2\Report\119034 Report Phase II ESA 322 Pinnacle Street Belleville Margaret Millington November 2016.docx  
Template: Master Report for Phase II ESA - Stage 2 PSI, EDR, July 20, 2016

**APPENDIX I**  
**Figures**



	PROJECT NAME		PHASE II ENVIRONMENTAL SITE ASSESSMENT
	CLIENT NAME		MARGARET MILLINGTON
	PROJECT LOCATION		322 PINNACLE STREET, BELLEVILLE, ONTARIO
	FIGURE NAME		KEY MAP
	SCALE	PROJECT NO.	DATE:
AS SHOWN	119034	NOVEMBER 2016	



LEGEND	
	- SITE PERIMETER
	- SITE BUILDING
COM	- COMMERCIAL
	- BOREHOLE
	- MONITORING WELL
	- PARKING



PROJECT NAME			PHASE II ENVIRONMENTAL SITE ASSESSMENT		
CLIENT NAME			MARGARET MILLINGTON		
PROJECT LOCATION			322 PINNACLE STREET, BELLEVILLE, ONTARIO		
FIGURE NAME		BOREHOLE AND MONITORING WELL LOCATION PLAN		FIGURE NO.	
APPROXIMATE SCALE		PROJECT NO.	DATE	2	
AS SHOWN		119034	NOVEMBER 2016		

**APPENDIX II**  
**Borehole Logs**



**Pinchin Ltd.**  
1456 Centennial Drive 2nd Floor  
Kingston, Ontario

## Stratigraphic and Instrumentation Log: MW-1

**Project No.:** 119034

**Project:** Phase II ESA

**Client:** Margaret Millington

**Location:** 322 Pinnacle Street, Belleville, ON **Drill Date:** November 3, 2016

**Logged By:** JB

**Entered By:** JB

**Project Manager:** SM

SUBSURFACE PROFILE				SAMPLE					Well Completion Details	Vapour Data				
Depth	Symbol	Description	Depth (m)	Number	Type	Sample	N-Value	Recovery (%)		(% LEL)				
										20	40	60	80	
									(ppm)					
									250	750	1250			
0		Ground Surface	0.0											
1		<b>Asphalt</b>		1	SS		NA	10						
2		<b>Silty Clay</b>		2	SS		NA	10						
3		Brown silty clay material, dry with no odours.		3			NA							
4														
5		<b>Limestone Bedrock</b>	1.4											
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														
31		End of Borehole	9.1											
32														
33														
34														
35														

**Drilled By:** Dedicated Environmental Services Inc.

**Drill Method:** K-40 Limited Access Drill

**Vapour Instrument:** Photo Ionization Detector

**Well Casing Size:** 3.81 cm

**Datum:** Local

**Casing Elevation:** NA

**Ground Elevation:** NA

**Sheet:** 1 of 1



**Pinchin Ltd.**  
1456 Centennial Drive 2nd Floor  
Kingston, Ontario

**Stratigraphic and Instrumentation Log: BH-2**

<b>Project No.:</b> 119034	<b>Logged By:</b> JB
<b>Project:</b> Phase II ESA	<b>Entered By:</b> JB
<b>Client:</b> Margaret Millington	<b>Project Manager:</b> SM
<b>Location:</b> 322 Pinnacle Street, Belleville, ON	<b>Drill Date:</b> November 3, 2016

SUBSURFACE PROFILE				SAMPLE					Well Completion Details	Vapour Data				
Depth	Symbol	Description	Depth (m)	Number	Type	Sample	N-Value	Recovery (%)		(% LEL)				
										20	40	60	80	
									(ppm)					
									250	750	1250			
0		Ground Surface	0.0											
0		<b>Gravel</b>	0.0											
0.2		<b>Silty Clay</b> Brown silty clay material, dry with no odours.	0.2	1	SS		NA	10						
0.6		<b>Void</b> Empty void, inferred to be underground storage tank. No soil samples collected.	0.6											
1.4		End of Borehole Refusal on Inferred Limestone Bedrock	1.4											

NON MONITORING WELL INSTALLED

0.0

**Drilled By:** Dedicated Environmental Services Inc.  
**Drill Method:** K-40 Limited Access Drill  
**Vapour Instrument:** Photo Ionization Detector  
**Well Casing Size:** NA

**Datum:** Local  
**Casing Elevation:** NA  
**Ground Elevation:** NA  
**Sheet:** 1 of 1





**Pinchin Ltd.**  
1456 Centennial Drive 2nd Floor  
Kingston, Ontario

### Stratigraphic and Instrumentation Log: BH-3

<b>Project No.:</b> 119034	<b>Logged By:</b> JB
<b>Project:</b> Phase II ESA	<b>Entered By:</b> JB
<b>Client:</b> Margaret Millington	<b>Project Manager:</b> SM
<b>Location:</b> 322 Pinnacle Street, Belleville, ON	<b>Drill Date:</b> November 3, 2016

SUBSURFACE PROFILE				SAMPLE				Well Completion Details	Vapour Data					
Depth	Symbol	Description	Depth (m)	Number	Type	Sample	N-Value		Recovery (%)	(% LEL)				
										20	40	60	80	
									(ppm)					
									250	750	1250			
0		Ground Surface	0.0											
	■	<b>Concrete</b>	0.0											
1	▨	<b>Silty Clay</b> Brown silty clay material, dry with no odours.	0.2	1	SS		NA	10						
2														
3	▨	Brown silty clay material, wet with strong VOC-like odours.		2	SS		NA	10						
4														
5		End of Borehole Refusal on Inferred Limestone Bedrock	1.4											
6														
7														
8														
9														
10														

NON MONITORING WELL INSTALLED

5

4000

**Drilled By:** Dedicated Environmental Services Inc.  
**Drill Method:** K-40 Limited Access Drill  
**Vapour Instrument:** Photo Ionization Detector  
**Well Casing Size:** NA

**Datum:** Local  
**Casing Elevation:** NA  
**Ground Elevation:** NA  
**Sheet:** 1 of 1

**APPENDIX III**  
**Summary Tables**

**TABLE 1**  
**SAMPLES SUBMITTED FOR LABORATORY ANALYSIS**  
**Margaret Millington**  
**322 Pinnacle Street, Belleville, Ontario**

Samples			Parameters				Rationale/Notes	
Borehole / Monitoring Well ID	Sample ID	Sample Depth Range (mbgs)	SOIL SAMPLES	VOCs	pH	Grain Size Analysis		GROUNDWATER SAMPLES
MW-1	MW-1	NA					●	Groundwater assessment in source area
	SS-3	1.22- 1.37		●	●	●		Soil sample with maximum vapour readings.
BH-2	SS-1	0.15 - 0.51					●	Soil sample with maximum vapour readings.
BH-3	BH-3	NA					●	Groundwater assessment at the property boundary.
	SS-2	0.51 - 1.37		●				Soil sample with maximum vapour readings.

Notes:

VOCs Volatile Organic Compounds  
mbgs Metres Below Ground Surface  
MOECC Ontario Ministry of the Environment and Climate Change

**TABLE 2**  
**pH AND GRAIN SIZE ANALYSIS FOR SOIL**  
**Margaret Millington**  
**322 Pinnacle Street, Belleville, Ontario**

<i>Parameter</i>	<i>Units</i>	<i>MOECC Site Condition Standard Selection Criteria</i>	<i>Sample Designation</i>	
			<i>Sample Collection Date (dd/mm/yyyy)</i>	
			<i>Sample Depth (mbgs)</i>	
			<i>MW-1 SS-3</i>	<i>BH-3 SS-2</i>
			<i>03/11/2016</i>	<i>03/11/2016</i>
			<i>1.22- 1.37</i>	<i>0.51 - 1.37</i>
			<i>Surface</i>	<i>Surface</i>
pH		Surface: 5 < pH < 9 Subsurface: 5 < pH < 11	7.5	8.6
Sieve #200 <0.075 mm	%	50%	39.1	55.3
Sieve #200 >0.075 mm	%	50%	60.9	44.7
Grain Size Classification			COARSE	MEDIUM/FINE

Notes:

<b>BOLD</b>	Environmentally Sensitive Area (Based Upon pH of Surface Soil)
<b>BOLD</b>	Environmentally Sensitive Area (Based Upon pH of Sub-Surface Soil)
NA	Not Analysed
mbgs	Metres Below Ground Surface

**TABLE 3**  
**VOLATILE ORGANIC COMPOUND ANALYSIS FOR SOIL**  
Margaret Millington  
322 Pinnacle Street, Belleville, Ontario

Parameter	MOECC Table 7 Standards	Sample Designation		
		Sample Collection Date (dd/mm/yyyy)		
		Sample Depth (mbgs)		
		MW-1 SS-3	BH-2 SS-1	BH-3 SS-2
		03/11/2016	03/11/2016	03/11/2016
		1.22- 1.37	0.15 - 0.51	0.51 - 1.37
Acetone	16	ND (0.50)	ND (0.50)	<b>ND (50.0)</b>
Benzene	0.32	ND (0.02)	ND (0.02)	<b>ND (2.00)</b>
Bromodichloromethane	18	ND (0.05)	ND (0.05)	ND (5.00)
Bromoform	0.61	ND (0.05)	ND (0.05)	<b>ND (5.00)</b>
Bromomethane	0.05	ND (0.05)	ND (0.05)	<b>ND (5.00)</b>
Carbon Tetrachloride	0.21	ND (0.05)	ND (0.05)	<b>ND (5.00)</b>
Chlorobenzene	2.4	ND (0.05)	ND (0.05)	<b>ND (5.00)</b>
Chloroform	0.47	ND (0.05)	ND (0.05)	<b>ND (5.00)</b>
Dibromochloromethane	13	ND (0.05)	ND (0.05)	ND (5.00)
1,2-Dichlorobenzene	6.8	ND (0.05)	ND (0.05)	ND (5.00)
1,3-Dichlorobenzene	9.6	ND (0.05)	ND (0.05)	ND (5.00)
1,4-Dichlorobenzene	16	ND (0.05)	ND (0.05)	<b>ND (5.00)</b>
Dichlorodifluoromethane	0.2	ND (0.05)	ND (0.05)	ND (5.00)
1,1-Dichloroethane	17	ND (0.05)	ND (0.05)	ND (5.00)
1,2-Dichloroethane	0.05	ND (0.05)	ND (0.05)	<b>ND (5.00)</b>
1,1-Dichloroethylene	0.064	ND (0.05)	ND (0.05)	<b>ND (5.00)</b>
cis-1,2-Dichloroethylene	55	ND (0.05)	ND (0.05)	ND (5.00)
trans-1,2-Dichloroethylene	1.3	ND (0.05)	ND (0.05)	<b>ND (5.00)</b>
1,2-Dichloropropane	0.16	ND (0.05)	ND (0.05)	<b>ND (5.00)</b>
1,3-Dichloropropene (Total)	0.18	ND (0.05)	ND (0.05)	<b>ND (5.00)</b>
Ethylbenzene	9.5	ND (0.05)	ND (0.05)	ND (5.00)
Ethylene Dibromide	0.05	ND (0.05)	ND (0.05)	<b>ND (5.00)</b>
Hexane	46	ND (0.05)	ND (0.05)	ND (5.00)
Methyl Ethyl Ketone	70	ND (0.50)	ND (0.50)	ND (50.0)
Methyl Isobutyl Ketone	31	ND (0.50)	ND (0.50)	<b>ND (50.0)</b>
Methyl t-Butyl Ether (MTBE)	11	ND (0.05)	ND (0.05)	ND (5.00)
Methylene Chloride	1.6	ND (0.05)	ND (0.05)	<b>ND (5.00)</b>
Styrene	34	ND (0.05)	ND (0.05)	ND (5.00)
1,1,1,2-Tetrachloroethane	0.087	ND (0.05)	ND (0.05)	<b>ND (5.00)</b>
1,1,2,2-Tetrachloroethane	0.05	ND (0.05)	ND (0.05)	<b>ND (5.00)</b>
Tetrachloroethylene	4.5	2.18	2.74	<b>9460</b>
Toluene	68	ND (0.05)	ND (0.05)	ND (5.00)
1,1,1-Trichloroethane	6.1	ND (0.05)	ND (0.05)	ND (5.00)
1,1,2-Trichloroethane	0.05	ND (0.05)	ND (0.05)	<b>ND (5.00)</b>
Trichloroethylene	0.91	0.17	ND (0.05)	<b>ND (5.00)</b>
Trichlorofluoromethane	4	ND (0.05)	ND (0.05)	<b>ND (5.00)</b>
Vinyl Chloride	0.032	ND (0.02)	ND (0.02)	<b>ND (2.00)</b>
Xylenes (Total)	26	ND (0.05)	ND (0.05)	ND (5.00)

Notes:

MOECC Table 7 Standards\*

Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 7 Standards, Coarse-Textured Soils, Shallow-Soils Non-Potable Groundwater Condition, for Industrial/Commercial/Community Property Use.

<b>BOLD</b>
<b>BOLD</b>

Units  
mbgs

Exceeds Site Condition Standard  
Reportable Detection Limit Exceeds Site Condition Standard  
All Units in µg/g  
Metres Below Ground Surface

**TABLE 4**  
**VOLATILE ORGANIC COMPOUND ANALYSIS FOR GROUNDWATER**  
**Margaret Millington**  
**322 Pinnacle Street, Belleville, Ontario**

Parameter	MOECC Table 7 Standards	Sample Designation
		Sample Collection Date (dd/mm/yyyy)
		BH-3
		11/3/2016
Acetone	100000	ND (25000)
Benzene	0.5	<b>ND (2500)</b>
Bromodichloromethane	67000	ND (2500)
Bromoform	5	<b>ND (2500)</b>
Bromomethane	0.89	<b>ND (2500)</b>
Carbon Tetrachloride	0.2	<b>ND (1000)</b>
Chlorobenzene	140	<b>ND (2500)</b>
Chloroform	2	<b>ND (2500)</b>
Dibromochloromethane	65000	ND (2500)
1,2-Dichlorobenzene	150	<b>ND (2500)</b>
1,3-Dichlorobenzene	7600	ND (2500)
1,4-Dichlorobenzene	0.5	<b>ND (2500)</b>
Dichlorodifluoromethane	3500	<b>ND (5000)</b>
1,1-Dichloroethane	11	<b>ND (2500)</b>
1,2-Dichloroethane	0.5	<b>ND (2500)</b>
1,1-Dichloroethylene	0.5	<b>ND (2500)</b>
cis-1,2-Dichloroethylene	1.6	<b>ND (2500)</b>
trans-1,2-Dichloroethylene	1.6	<b>ND (2500)</b>
1,2-Dichloropropane	0.58	<b>ND (2500)</b>
1,3-Dichloropropene (Total)	0.5	<b>ND (2500)</b>
Ethylbenzene	54	<b>ND (2500)</b>
Ethylene Dibromide	0.2	<b>ND (1000)</b>
Hexane	5	<b>ND (5000)</b>
Methyl Ethyl Ketone	21000	<b>ND (25000)</b>
Methyl Isobutyl Ketone	5200	<b>ND (25000)</b>
Methyl t-Butyl Ether (MTBE)	15	<b>ND (10000)</b>
Methylene Chloride	26	<b>ND (25000)</b>
Styrene	43	<b>ND (2500)</b>
1,1,1,2-Tetrachloroethane	1.1	<b>ND (2500)</b>
1,1,2,2-Tetrachloroethane	0.5	<b>ND (2500)</b>
Tetrachloroethylene	0.5	<b>176000</b>
Toluene	320	<b>ND (2500)</b>
1,1,1-Trichloroethane	23	<b>ND (2500)</b>
1,1,2-Trichloroethane	0.5	<b>ND (2500)</b>
Trichloroethylene	0.5	<b>ND (2500)</b>
Trichlorofluoromethane	2000	<b>ND (5000)</b>
Vinyl Chloride	0.5	<b>ND (2500)</b>
Xylenes (Total)	72	<b>ND (2500)</b>

Notes:

MOECC Table 7 Standards\*

Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 7 Standards, Coarse-Textured Soils, Shallow-Soils Non-Potable Groundwater Condition, for Industrial/Commercial/Community Property Use.

<b>BOLD</b>
<b>BOLD</b>

Exceeds Site Condition Standard  
Reportable Detection Limit Exceeds Site Condition Standard

Units

All Units in µg/L

**APPENDIX IV**  
**Laboratory Certificates of Analysis**

## Certificate of Analysis

**Pinchin Ltd. (Kingston)**

1456 Centennial Drive, Suite 2  
Kingston, ON K7P 0K4  
Attn: Jessica Brown

Client PO: 322 Pinnacle  
Project: 119034  
Custody: 34030

Report Date: 9-Nov-2016  
Order Date: 3-Nov-2016

**Order #: 1645370**

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

<b>Parcel ID</b>	<b>Client ID</b>
1645370-01	BH-3

Approved By:



Mark Foto, M.Sc.  
Lab Supervisor



Certificate of Analysis  
Client: Pinchin Ltd. (Kingston)  
Client PO: 322 Pinnacle

Report Date: 09-Nov-2016

Order Date: 3-Nov-2016

Project Description: 119034

### Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	7-Nov-16	9-Nov-16

Certificate of Analysis  
 Client: Pinchin Ltd. (Kingston)  
 Client PO: 322 Pinnacle

Report Date: 09-Nov-2016

Order Date: 3-Nov-2016

Project Description: 119034

<b>Client ID:</b>	BH-3	-	-	-
<b>Sample Date:</b>	03-Nov-16	-	-	-
<b>Sample ID:</b>	1645370-01	-	-	-
<b>MDL/Units</b>	Water	-	-	-

**Volatiles**

Acetone	5.0 ug/L	<25000 [1]	-	-	-
Benzene	0.5 ug/L	<2500 [1]	-	-	-
Bromodichloromethane	0.5 ug/L	<2500 [1]	-	-	-
Bromoform	0.5 ug/L	<2500 [1]	-	-	-
Bromomethane	0.5 ug/L	<2500 [1]	-	-	-
Carbon Tetrachloride	0.2 ug/L	<1000 [1]	-	-	-
Chlorobenzene	0.5 ug/L	<2500 [1]	-	-	-
Chloroform	0.5 ug/L	<2500 [1]	-	-	-
Dibromochloromethane	0.5 ug/L	<2500 [1]	-	-	-
Dichlorodifluoromethane	1.0 ug/L	<5000 [1]	-	-	-
1,2-Dichlorobenzene	0.5 ug/L	<2500 [1]	-	-	-
1,3-Dichlorobenzene	0.5 ug/L	<2500 [1]	-	-	-
1,4-Dichlorobenzene	0.5 ug/L	<2500 [1]	-	-	-
1,1-Dichloroethane	0.5 ug/L	<2500 [1]	-	-	-
1,2-Dichloroethane	0.5 ug/L	<2500 [1]	-	-	-
1,1-Dichloroethylene	0.5 ug/L	<2500 [1]	-	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<2500 [1]	-	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<2500 [1]	-	-	-
1,2-Dichloropropane	0.5 ug/L	<2500 [1]	-	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<2500 [1]	-	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<2500 [1]	-	-	-
1,3-Dichloropropene, total	0.5 ug/L	<2500 [1]	-	-	-
Ethylbenzene	0.5 ug/L	<2500 [1]	-	-	-
Ethylene dibromide (dibromoethane)	0.2 ug/L	<1000 [1]	-	-	-
Hexane	1.0 ug/L	<5000 [1]	-	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<25000 [1]	-	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<25000 [1]	-	-	-
Methyl tert-butyl ether	2.0 ug/L	<10000 [1]	-	-	-
Methylene Chloride	5.0 ug/L	<25000 [1]	-	-	-
Styrene	0.5 ug/L	<2500 [1]	-	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<2500 [1]	-	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<2500 [1]	-	-	-
Tetrachloroethylene	0.5 ug/L	176000	-	-	-
Toluene	0.5 ug/L	<2500 [1]	-	-	-
1,1,1-Trichloroethane	0.5 ug/L	<2500 [1]	-	-	-

Certificate of Analysis  
 Client: Pinchin Ltd. (Kingston)  
 Client PO: 322 Pinnacle

Report Date: 09-Nov-2016

Order Date: 3-Nov-2016

Project Description: 119034

	Client ID:	BH-3	-	-	-
	Sample Date:	03-Nov-16	-	-	-
	Sample ID:	1645370-01	-	-	-
	MDL/Units	Water	-	-	-
1,1,2-Trichloroethane	0.5 ug/L	<2500 [1]	-	-	-
Trichloroethylene	0.5 ug/L	<2500 [1]	-	-	-
Trichlorofluoromethane	1.0 ug/L	<5000 [1]	-	-	-
Vinyl chloride	0.5 ug/L	<2500 [1]	-	-	-
m,p-Xylenes	0.5 ug/L	<2500 [1]	-	-	-
o-Xylene	0.5 ug/L	<2500 [1]	-	-	-
Xylenes, total	0.5 ug/L	<2500 [1]	-	-	-
4-Bromofluorobenzene	Surrogate	111%	-	-	-
Dibromofluoromethane	Surrogate	102%	-	-	-
Toluene-d8	Surrogate	88.3%	-	-	-

Certificate of Analysis  
 Client: Pinchin Ltd. (Kingston)  
 Client PO: 322 Pinnacle

Report Date: 09-Nov-2016

Order Date: 3-Nov-2016

Project Description: 119034

**Method Quality Control: Blank**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Volatiles</b>									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroform	ND	0.5	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Ethylene dibromide (dibromoethane)	ND	0.2	ug/L						
Hexane	ND	1.0	ug/L						
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L						
Methyl Isobutyl Ketone	ND	5.0	ug/L						
Methyl tert-butyl ether	ND	2.0	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Styrene	ND	0.5	ug/L						
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L						
1,1,1,2,2-Tetrachloroethane	ND	0.5	ug/L						
Tetrachloroethylene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
1,1,1-Trichloroethane	ND	0.5	ug/L						
1,1,2-Trichloroethane	ND	0.5	ug/L						
Trichloroethylene	ND	0.5	ug/L						
Trichlorofluoromethane	ND	1.0	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: 4-Bromofluorobenzene	35.6		ug/L		111	50-140			
Surrogate: Dibromofluoromethane	24.7		ug/L		77.1	50-140			
Surrogate: Toluene-d8	33.7		ug/L		105	50-140			

Certificate of Analysis  
 Client: Pinchin Ltd. (Kingston)  
 Client PO: 322 Pinnacle

Report Date: 09-Nov-2016

Order Date: 3-Nov-2016

Project Description: 119034

**Method Quality Control: Duplicate**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Volatiles</b>									
Acetone	ND	5.0	ug/L	ND				30	
Benzene	ND	0.5	ug/L	ND				30	
Bromodichloromethane	ND	0.5	ug/L	ND				30	
Bromoform	ND	0.5	ug/L	ND				30	
Bromomethane	ND	0.5	ug/L	ND				30	
Carbon Tetrachloride	ND	0.2	ug/L	ND				30	
Chlorobenzene	ND	0.5	ug/L	ND				30	
Chloroform	ND	0.5	ug/L	ND				30	
Dibromochloromethane	ND	0.5	ug/L	ND				30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND				30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
1,2-Dichloroethane	ND	0.5	ug/L	ND				30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND				30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
1,2-Dichloropropane	ND	0.5	ug/L	ND				30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Ethylene dibromide (dibromoethane)	ND	0.2	ug/L	ND				30	
Hexane	ND	1.0	ug/L	ND				30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND				30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND				30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Styrene	ND	0.5	ug/L	ND				30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
Tetrachloroethylene	ND	0.5	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND				30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND				30	
Trichloroethylene	2.77	0.5	ug/L	2.63			5.2	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: 4-Bromofluorobenzene	36.9		ug/L		115	50-140			
Surrogate: Dibromofluoromethane	29.1		ug/L		90.9	50-140			
Surrogate: Toluene-d8	33.2		ug/L		104	50-140			

Certificate of Analysis  
 Client: Pinchin Ltd. (Kingston)  
 Client PO: 322 Pinnacle

Report Date: 09-Nov-2016

Order Date: 3-Nov-2016

Project Description: 119034

### Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Volatiles</b>									
Acetone	77.9	5.0	ug/L		77.9	50-140			
Benzene	28.2	0.5	ug/L		70.5	60-130			
Bromodichloromethane	31.3	0.5	ug/L		78.4	60-130			
Bromoform	44.6	0.5	ug/L		112	60-130			
Bromomethane	32.0	0.5	ug/L		80.0	50-140			
Carbon Tetrachloride	33.6	0.2	ug/L		83.9	60-130			
Chlorobenzene	42.6	0.5	ug/L		106	60-130			
Chloroform	29.1	0.5	ug/L		72.7	60-130			
Dibromochloromethane	49.5	0.5	ug/L		124	60-130			
Dichlorodifluoromethane	29.6	1.0	ug/L		74.0	50-140			
1,2-Dichlorobenzene	34.0	0.5	ug/L		84.9	60-130			
1,3-Dichlorobenzene	34.6	0.5	ug/L		86.5	60-130			
1,4-Dichlorobenzene	34.9	0.5	ug/L		87.2	60-130			
1,1-Dichloroethane	33.6	0.5	ug/L		84.1	60-130			
1,2-Dichloroethane	30.6	0.5	ug/L		76.5	60-130			
1,1-Dichloroethylene	33.9	0.5	ug/L		84.8	60-130			
cis-1,2-Dichloroethylene	29.0	0.5	ug/L		72.4	60-130			
trans-1,2-Dichloroethylene	31.6	0.5	ug/L		79.0	60-130			
1,2-Dichloropropane	36.8	0.5	ug/L		91.9	60-130			
cis-1,3-Dichloropropylene	41.6	0.5	ug/L		104	60-130			
trans-1,3-Dichloropropylene	48.1	0.5	ug/L		120	60-130			
Ethylbenzene	34.9	0.5	ug/L		87.4	60-130			
Ethylene dibromide (dibromoethane)	39.0	0.2	ug/L		97.6	60-130			
Hexane	29.4	1.0	ug/L		73.6	60-130			
Methyl Ethyl Ketone (2-Butanone)	74.7	5.0	ug/L		74.7	50-140			
Methyl Isobutyl Ketone	56.2	5.0	ug/L		56.2	50-140			
Methyl tert-butyl ether	61.3	2.0	ug/L		61.3	50-140			
Methylene Chloride	32.2	5.0	ug/L		80.4	60-130			
Styrene	40.0	0.5	ug/L		100	60-130			
1,1,1,2-Tetrachloroethane	46.5	0.5	ug/L		116	60-130			
1,1,2,2-Tetrachloroethane	27.8	0.5	ug/L		69.5	60-130			
Tetrachloroethylene	40.0	0.5	ug/L		100	60-130			
Toluene	43.2	0.5	ug/L		108	60-130			
1,1,1-Trichloroethane	27.4	0.5	ug/L		68.6	60-130			
1,1,2-Trichloroethane	29.8	0.5	ug/L		74.5	60-130			
Trichloroethylene	29.1	0.5	ug/L		72.6	60-130			
Trichlorofluoromethane	32.4	1.0	ug/L		81.0	60-130			
Vinyl chloride	37.7	0.5	ug/L		94.2	50-140			
m,p-Xylenes	86.4	0.5	ug/L		108	60-130			
o-Xylene	45.6	0.5	ug/L		114	60-130			
Surrogate: 4-Bromofluorobenzene	28.5		ug/L		89.1	50-140			

Certificate of Analysis  
**Client: Pinchin Ltd. (Kingston)**  
**Client PO: 322 Pinnacle**

Report Date: 09-Nov-2016

Order Date: 3-Nov-2016

**Project Description: 119034**

**Qualifier Notes:**

***Sample Qualifiers :***

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

**Sample Data Revisions**

None

**Work Order Revisions / Comments:**

None

**Other Report Notes:**

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

Client Name: <i>Pineham</i>	Project Reference: <i>19034 322 Pinnacle</i>	<b>Turnaround Time:</b> <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular Date Required: _____
Contact Name: <i>Jessica Brun</i>	Quote #	
Address: <i>Kingsden</i>	PO #	
Telephone:	Email Address: <i>Stephan, Pet, Jess</i>	

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

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

Parcel Order Number: <i>1645370</i>		Matrix	Air Volume	# of Containers	Sample Taken		VOCs	Required Analyses													
Sample ID/Location Name					Date	Time															
1	<i>BH-3</i>	<i>GW</i>		<i>2</i>	<i>Nov. 3/16</i>	<i>AM</i>	<i>X</i>														
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					

Comments: \_\_\_\_\_ Method of Delivery: *Walk in*

Relinquished By (Sign): <i>[Signature]</i>	Received By (Driver/Depot): <i>[Signature]</i>	Received at Lab: <i>[Signature]</i>	Verified By: <i>[Signature]</i>
Relinquished By (Print): <i>Jessica Brun</i>	Date/Time: <i>Nov. 3/16 2:07pm</i>	Date/Time: <i>NOV 4/16</i>	Date/Time: <i>NOV 4/16</i>
Date/Time: <i>Nov 3/16 2:07pm</i>	Temperature: <i>12.7 °C</i>	Temperature: <i>6.5 °C 8:55a</i>	pH Verified   By: <i>N/A</i>



## Certificate of Analysis

**Pinchin Ltd. (Kingston)**

1456 Centennial Drive, Suite 2  
Kingston, ON K7P 0K4  
Attn: Jessica Brown

Client PO: 322 Pinnacle  
Project: 119034  
Custody: 34031

Report Date: 9-Nov-2016  
Order Date: 3-Nov-2016

**Order #: 1645371**

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

<b>Parcel ID</b>	<b>Client ID</b>
1645371-01	MW-1 SS-3
1645371-02	BH-2 SS-1
1645371-03	BH-3 SS-2

Approved By:



Mark Foto, M.Sc.  
Lab Supervisor

Certificate of Analysis  
Client: Pinchin Ltd. (Kingston)  
Client PO: 322 Pinnacle

Report Date: 09-Nov-2016

Order Date: 3-Nov-2016

Project Description: 119034

## Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	4-Nov-16	5-Nov-16
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	4-Nov-16	8-Nov-16
Solids, %	Gravimetric, calculation	7-Nov-16	7-Nov-16
Texture - Coarse Med/Fine	Based on ASTM D2487	9-Nov-16	9-Nov-16

Certificate of Analysis  
 Client: Pinchin Ltd. (Kingston)  
 Client PO: 322 Pinnacle

Report Date: 09-Nov-2016

Order Date: 3-Nov-2016

Project Description: 119034

<b>Client ID:</b>	MW-1 SS-3	BH-2 SS-1	BH-3 SS-2	-
<b>Sample Date:</b>	03-Nov-16	03-Nov-16	03-Nov-16	-
<b>Sample ID:</b>	1645371-01	1645371-02	1645371-03	-
<b>MDL/Units</b>	Soil	Soil	Soil	-

**Physical Characteristics**

% Solids	0.1 % by Wt.	86.3	78.9	75.6	-
>75 um	0.1 %	60.9	-	44.7	-
<75 um	0.1 %	39.1	-	55.3	-
Texture	0.1 %	Coarse	-	Med/Fine	-

**General Inorganics**

pH	0.05 pH Units	7.50	-	8.60	-
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**Volatiles**

Acetone	0.50 ug/g dry	<0.50	<0.50	<50.0 [1]	-
Benzene	0.02 ug/g dry	<0.02	<0.02	<2.00 [1]	-
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
Bromoform	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
Chloroform	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
Ethylene dibromide (dibromoethane)	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
Hexane	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<50.0 [1]	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<50.0 [1]	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-

Certificate of Analysis  
 Client: Pinchin Ltd. (Kingston)  
 Client PO: 322 Pinnacle

Report Date: 09-Nov-2016

Order Date: 3-Nov-2016

Project Description: 119034

	Client ID:	MW-1 SS-3	BH-2 SS-1	BH-3 SS-2	-
	Sample Date:	03-Nov-16	03-Nov-16	03-Nov-16	-
	Sample ID:	1645371-01	1645371-02	1645371-03	-
	MDL/Units	Soil	Soil	Soil	-
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
Styrene	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
Tetrachloroethylene	0.05 ug/g dry	2.18	2.74	9460	-
Toluene	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
Trichloroethylene	0.05 ug/g dry	0.17	<0.05	<5.00 [1]	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<2.00 [1]	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<5.00 [1]	-
4-Bromofluorobenzene	Surrogate	96.3%	97.5%	98.7%	-
Dibromofluoromethane	Surrogate	112%	114%	111%	-
Toluene-d8	Surrogate	102%	104%	96.3%	-

Certificate of Analysis  
 Client: Pinchin Ltd. (Kingston)  
 Client PO: 322 Pinnacle

Report Date: 09-Nov-2016

Order Date: 3-Nov-2016

Project Description: 119034

**Method Quality Control: Blank**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Volatiles</b>									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane)	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	7.95		ug/g		99.3	50-140			
Surrogate: Dibromofluoromethane	9.17		ug/g		115	50-140			
Surrogate: Toluene-d8	8.16		ug/g		102	50-140			

Certificate of Analysis  
 Client: Pinchin Ltd. (Kingston)  
 Client PO: 322 Pinnacle

Report Date: 09-Nov-2016

Order Date: 3-Nov-2016

Project Description: 119034

**Method Quality Control: Duplicate**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>General Inorganics</b>									
pH	7.77	0.05	pH Units	7.79			0.3	10	
<b>Physical Characteristics</b>									
% Solids	90.7	0.1	% by Wt.	90.6			0.2	25	
<b>Volatiles</b>									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	
Bromodichloromethane	ND	0.05	ug/g dry	ND				50	
Bromoform	ND	0.05	ug/g dry	ND				50	
Bromomethane	ND	0.05	ug/g dry	ND				50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND				50	
Chlorobenzene	ND	0.05	ug/g dry	ND				50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Dibromochloromethane	ND	0.05	ug/g dry	ND				50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND				50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Ethylene dibromide (dibromoethane)	ND	0.05	ug/g dry	ND				50	
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND				50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND				50	
Methylene Chloride	ND	0.05	ug/g dry	ND				50	
Styrene	ND	0.05	ug/g dry	ND				50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND				50	
Trichloroethylene	ND	0.05	ug/g dry	ND				50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND				50	
Vinyl chloride	ND	0.02	ug/g dry	ND				50	
m,p-Xylenes	ND	0.05	ug/g dry	ND				50	
o-Xylene	ND	0.05	ug/g dry	ND				50	
Surrogate: 4-Bromofluorobenzene	6.06		ug/g dry		96.4	50-140			
Surrogate: Dibromofluoromethane	7.19		ug/g dry		114	50-140			
Surrogate: Toluene-d8	6.49		ug/g dry		103	50-140			

Certificate of Analysis  
 Client: Pinchin Ltd. (Kingston)  
 Client PO: 322 Pinnacle

Report Date: 09-Nov-2016

Order Date: 3-Nov-2016

Project Description: 119034

### Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Volatiles</b>									
Acetone	6.71	0.50	ug/g		67.1	50-140			
Benzene	3.73	0.02	ug/g		93.2	60-130			
Bromodichloromethane	3.51	0.05	ug/g		87.7	60-130			
Bromoform	3.94	0.05	ug/g		98.5	60-130			
Bromomethane	3.15	0.05	ug/g		78.8	50-140			
Carbon Tetrachloride	3.18	0.05	ug/g		79.6	60-130			
Chlorobenzene	3.63	0.05	ug/g		90.7	60-130			
Chloroform	3.48	0.05	ug/g		87.1	60-130			
Dibromochloromethane	3.71	0.05	ug/g		92.7	60-130			
Dichlorodifluoromethane	2.21	0.05	ug/g		55.1	50-140			
1,2-Dichlorobenzene	3.99	0.05	ug/g		99.6	60-130			
1,3-Dichlorobenzene	4.09	0.05	ug/g		102	60-130			
1,4-Dichlorobenzene	3.90	0.05	ug/g		97.6	60-130			
1,1-Dichloroethane	3.12	0.05	ug/g		78.0	60-130			
1,2-Dichloroethane	3.25	0.05	ug/g		81.4	60-130			
1,1-Dichloroethylene	3.32	0.05	ug/g		82.9	60-130			
cis-1,2-Dichloroethylene	3.44	0.05	ug/g		85.9	60-130			
trans-1,2-Dichloroethylene	3.45	0.05	ug/g		86.3	60-130			
1,2-Dichloropropane	3.38	0.05	ug/g		84.6	60-130			
cis-1,3-Dichloropropylene	2.82	0.05	ug/g		70.4	60-130			
trans-1,3-Dichloropropylene	2.64	0.05	ug/g		66.1	60-130			
Ethylbenzene	3.39	0.05	ug/g		84.6	60-130			
Ethylene dibromide (dibromoethane)	3.74	0.05	ug/g		93.6	60-130			
Hexane	2.46	0.05	ug/g		61.4	60-130			
Methyl Ethyl Ketone (2-Butanone)	6.49	0.50	ug/g		64.9	50-140			
Methyl Isobutyl Ketone	6.71	0.50	ug/g		67.1	50-140			
Methyl tert-butyl ether	8.37	0.05	ug/g		83.7	50-140			
Methylene Chloride	3.23	0.05	ug/g		80.7	60-130			
Styrene	3.43	0.05	ug/g		85.8	60-130			
1,1,1,2-Tetrachloroethane	3.69	0.05	ug/g		92.3	60-130			
1,1,1,2,2-Tetrachloroethane	3.65	0.05	ug/g		91.2	60-130			
Tetrachloroethylene	3.92	0.05	ug/g		97.9	60-130			
Toluene	3.49	0.05	ug/g		87.3	60-130			
1,1,1-Trichloroethane	3.25	0.05	ug/g		81.2	60-130			
1,1,2-Trichloroethane	3.21	0.05	ug/g		80.3	60-130			
Trichloroethylene	2.98	0.05	ug/g		74.5	60-130			
Trichlorofluoromethane	3.04	0.05	ug/g		76.0	50-140			
Vinyl chloride	3.82	0.02	ug/g		95.4	50-140			
m,p-Xylenes	7.30	0.05	ug/g		91.2	60-130			
o-Xylene	3.25	0.05	ug/g		81.3	60-130			
Surrogate: 4-Bromofluorobenzene	7.76		ug/g		97.0	50-140			

Certificate of Analysis  
**Client: Pinchin Ltd. (Kingston)**  
**Client PO: 322 Pinnacle**

Report Date: 09-Nov-2016

Order Date: 3-Nov-2016

**Project Description: 119034**

**Qualifier Notes:**

***Sample Qualifiers :***

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

**Sample Data Revisions**

None

**Work Order Revisions / Comments:**

None

**Other Report Notes:**

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.

Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.





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**Chain of Custody**  
(Lab Use Only)  
**№ 34031**

Page 1 of 1

Client Name: Pnehm  
 Contact Name: Jessica Bann  
 Address: Kingsley  
 Telephone: \_\_\_\_\_  
 Project Reference: 119034 322 Pinnacle  
 Quote #: \_\_\_\_\_  
 PO #: \_\_\_\_\_  
 Email Address: Stephan, Pete, Jess.

**Turnaround Time:**  
 1 Day       3 Day  
 2 Day       Regular  
 Date Required: \_\_\_\_\_

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

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

Parcel Order Number: <u>1645371</u>		Matrix	Air Volume	# of Containers	Sample Taken		VOCs	PH	Particle Size (texture)	Required Analyses												
Sample ID/Location Name					Date	Time																
1	MW-1 SS-3	S		2	Nov 3/16	Am	+	+	+													
2	BH-2 SS-1	↓		2	↓	Am	+															
3	BH-3 SS-2	↓		2	↓	Am	+	+	+													
4																						
5																						
6																						
7																						
8																						
9																						
10																						

Comments: \_\_\_\_\_ Method of Delivery: Walk in

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot: <u>[Signature]</u>	Received at Lab: <u>[Signature]</u>	Verified By: <u>[Signature]</u>
Relinquished By (Print): <u>Jessica Bann</u>	Date/Time: <u>Nov. 3/16 2:06pm</u>	Date/Time: <u>NOV 4/16</u>	Date/Time: <u>NOV 4/16</u>
Date/Time: <u>Nov 3/16 2:06pm</u>	Temperature: <u>12.7°C</u>	Temperature: <u>6.5°C 8:50am</u>	pH Verified [ ] By: <u>N/A</u>

Chain of Custody (Blank) - Rev 0.4 Feb 2016 8:50am

## Certificate of Analysis

**Pinchin Ltd. (Kingston)**

1456 Centennial Drive, Suite 2  
Kingston, ON K7P 0K4  
Attn: Jessica Brown

Client PO: 322 Pinnacle  
Project: 119034  
Custody: 34031

Report Date: 16-Nov-2016  
Order Date: 15-Nov-2016

**Order #: 1647089**

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

<b>Parcel ID</b>	<b>Client ID</b>
1647089-01	BH-3 SS-2

Approved By:



Mark Foto, M.Sc.  
Lab Supervisor

Certificate of Analysis  
**Client: Pinchin Ltd. (Kingston)**  
**Client PO: 322 Pinnacle**

Report Date: 16-Nov-2016

Order Date: 15-Nov-2016

**Project Description: 119034**

### Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Metals, ICP-MS	EPA 6020 - Digestion - ICP-MS	16-Nov-16	16-Nov-16
REG 558 - Mercury by CVAA	EPA 7470A - Cold Vapour AA	16-Nov-16	16-Nov-16
Solids, %	Gravimetric, calculation	15-Nov-16	15-Nov-16

Certificate of Analysis  
 Client: Pinchin Ltd. (Kingston)  
 Client PO: 322 Pinnacle

Report Date: 16-Nov-2016

Order Date: 15-Nov-2016

Project Description: 119034

<b>Client ID:</b>	BH-3 SS-2	-	-	-
<b>Sample Date:</b>	03-Nov-16	-	-	-
<b>Sample ID:</b>	1647089-01	-	-	-
<b>MDL/Units</b>	Soil	-	-	-

**Physical Characteristics**

% Solids	0.1 % by Wt.	75.6	-	-	-
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**EPA 1311 - TCLP Leachate Inorganics**

Arsenic	0.05 mg/L	<0.05	-	-	-
Barium	0.05 mg/L	0.50	-	-	-
Boron	0.05 mg/L	0.08	-	-	-
Cadmium	0.01 mg/L	<0.01	-	-	-
Chromium	0.05 mg/L	<0.05	-	-	-
Lead	0.05 mg/L	<0.05	-	-	-
Mercury	0.005 mg/L	<0.005	-	-	-
Selenium	0.05 mg/L	<0.05	-	-	-
Silver	0.05 mg/L	<0.05	-	-	-
Uranium	0.05 mg/L	<0.05	-	-	-

Certificate of Analysis  
 Client: Pinchin Ltd. (Kingston)  
 Client PO: 322 Pinnacle

Report Date: 16-Nov-2016

Order Date: 15-Nov-2016

Project Description: 119034

**Method Quality Control: Blank**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	---------------	------	------------	-----	-----------	-------

**EPA 1311 - TCLP Leachate Inorganics**

Arsenic	ND	0.05	mg/L						
Barium	ND	0.05	mg/L						
Boron	ND	0.05	mg/L						
Cadmium	ND	0.01	mg/L						
Chromium	ND	0.05	mg/L						
Lead	ND	0.05	mg/L						
Mercury	ND	0.005	mg/L						
Selenium	ND	0.05	mg/L						
Silver	ND	0.05	mg/L						
Uranium	ND	0.05	mg/L						

Certificate of Analysis  
 Client: Pinchin Ltd. (Kingston)  
 Client PO: 322 Pinnacle

Report Date: 16-Nov-2016

Order Date: 15-Nov-2016

Project Description: 119034

**Method Quality Control: Duplicate**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>EPA 1311 - TCLP Leachate Inorganics</b>									
Arsenic	ND	0.05	mg/L	ND			0.0	29	
Barium	0.866	0.05	mg/L	0.888			2.4	34	
Boron	0.063	0.05	mg/L	0.058			7.2	33	
Cadmium	ND	0.01	mg/L	ND			0.0	33	
Chromium	ND	0.05	mg/L	ND			0.0	32	
Lead	ND	0.05	mg/L	ND			0.0	32	
Mercury	ND	0.005	mg/L	ND			0.0	30	
Selenium	ND	0.05	mg/L	ND			0.0	28	
Silver	ND	0.05	mg/L	ND			0.0	28	
Uranium	ND	0.05	mg/L	ND			0.0	27	
<b>Physical Characteristics</b>									
% Solids	76.7	0.1	% by Wt.	75.7			1.3	25	

Certificate of Analysis  
 Client: Pinchin Ltd. (Kingston)  
 Client PO: 322 Pinnacle

Report Date: 16-Nov-2016

Order Date: 15-Nov-2016

Project Description: 119034

### Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>EPA 1311 - TCLP Leachate Inorganics</b>									
Arsenic	50.2		ug/L	ND	100	83-119			
Barium	135		ug/L	88.8	92.7	83-116			
Boron	56.3		ug/L	5.83	101	71-128			
Cadmium	49.1		ug/L	0.180	97.9	78-119			
Chromium	50.1		ug/L	2.09	95.9	80-124			
Lead	54.0		ug/L	3.68	101	77-126			
Mercury	0.0277	0.005	mg/L	ND	92.3	70-130			
Selenium	48.5		ug/L	0.186	96.6	81-125			
Silver	48.1		ug/L	ND	96.2	70-128			
Uranium	48.0		ug/L	0.314	95.3	70-131			

Certificate of Analysis  
**Client: Pinchin Ltd. (Kingston)**  
**Client PO: 322 Pinnacle**

Report Date: 16-Nov-2016

Order Date: 15-Nov-2016

**Project Description: 119034**

**Qualifier Notes:**

None

**Sample Data Revisions**

None

**Work Order Revisions / Comments:**

None

**Other Report Notes:**

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

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







Environmental

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**Telephone**

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**Website**

[cambium-inc.com](http://cambium-inc.com)

**Mailing Address**

P.O. Box 325  
52 Hunter Street East  
Peterborough, ON  
K9H 1G5

**Locations**

Peterborough  
Kingston  
Barrie  
Oshawa

**Laboratory**

Peterborough



January 8, 2021

Crews Auto Ltd.  
322 Pinnacle Street,  
Belleville ON K8N 3B4

Attn: Charles Crews  
Owner

**Re: Indoor Air Quality Sampling at 322 Pinnacle Street, in Belleville, ON.  
Cambium Reference # 12131-001**

---

Dear Mr. Crews,

Cambium Inc. (Cambium) is pleased to provide the following report on the potential airborne concentrations of organochlorides at the building that is located at 322 Pinnacle Street, in Belleville, Ontario (the Site).

Cambium understands that the Site previously operated as a dry cleaner, which is understood to have contaminated the soil below grade with organochlorides. As requested, we have conducted a sampling program to test for vapour intrusion of the following six organochlorides:

- Trichloroethylene
- Tetrachloroethylene
- 1,2-dichloroethane
- 1,1,1-trichloroethane
- 1,1,2-trichloroethane
- Vinyl chloride

The sampling program was completed by Cambium on December 8, 2020 where 8-hour samples were collected from both the warehouse and storefront areas of the building. We compared the results with Ministry's Occupational Health and Safety Act Exposure Limits as set by the Government of Ontario as well as the Ministry's Technical Guidance for Soil Vapour Intrusion Assessments.

Based on the results of this sampling program, Cambium considers the building unfit for its intended purpose as a commercial space as it currently exists. However, the measured concentrations did not exceed the Ontario occupational limits, and therefore Cambium does not expect the building to pose a significant risk to health as it is currently used. Cambium recommends remediation of the contamination, or the implementation of an extraction system for the contamination prior to the Site being used for a commercial application.



Environmental

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Building Sciences

Construction  
Monitoring

**Telephone**

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(705) 742.7907

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[cambium-inc.com](http://cambium-inc.com)

**Mailing Address**

P.O. Box 325  
52 Hunter Street East  
Peterborough, ON  
K9H 1G5

**Locations**

Peterborough  
Kingston  
Barrie  
Oshawa

**Laboratory**

Peterborough

January 8, 2021

## BACKGROUND

Recent studies have reported significant levels of soil and groundwater contamination of organochlorides (specifically chloroethylenes and chloroethanes) on the Site. Chloroethylenes and chloroethanes are volatile and can seep into buildings through opening in the foundation as they are released from the soil and groundwater. These volatile organic compounds (VOCs) can accumulate in the indoor air creating a significant health risk through inhalation. The factors contributing to the intrusion of vapours into a building are generally consistent over a short time scale, and deteriorate on a longer time scale as the source is depleted.

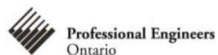
These chemicals are common solvents and we did not identify any current activities producing airborne emissions of organochlorides in significant quantities. However, there were a number of vehicles in the warehouse that may have been treated with degreasing/cleaning solvents, which could contribute to the overall concentration measured. Cambium did not identify any odours or evidence that would support significant interference from materials in the building.

## METHODOLOGY & SAMPLING STRATEGY

Cambium used two vacuum canisters to collect samples over eight hours in the building on December 8, 2020 from 0930 to 1730, which was unoccupied at the time of sampling. The samples were set up in locations that would be representative of the air quality in the building, and would be most susceptible to contamination through vapour intrusion. One sample was collected in the centre of the warehouse, which is on the west side of the building, and the second in the middle of the storefront on the east side of the building.

It was noted to Cambium that the greatest soil concentration was previously recorded near the south-west corner of the building just outside the warehouse. The wall dividing the warehouse from the storefront was under repair at the time of sampling leaving a large opening, but it had a large plastic vapour barrier sheet being used to separate the spaces. The building was closed from the outside prior to and during sampling; however, there appeared to be no insulation or vapour barrier in the warehouse.

The sample units draw an aliquot of air into a 1 L SUMMA canister at a continuous and regulated rate for eight hours. The air samples were preserved in the sealed canister after the sampling period had elapsed and was analyzed at a certified laboratory, SGS Galson, for trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, 1,1,2-trichloroethane, vinyl chloride.





January 8, 2021

**LIMITS AND RESULTS**

Ontario Regulation 833 – *Control of Exposure to Biological or Chemical Agents* defines the maximum allowable Time-Weighted Average (TWA) and Short-Term Exposure Limit (STEL) for worker exposure to regulated agents. We have listed the Occupational Exposure limits of all the measured contaminants of concern from Table 1 of O. Reg. 833 below in Table 1 along with the laboratory results. We have appended the certificate of analysis from the laboratory to this report.

We have also compared the results to the limits set by the Ministry for the specific type of occupancy that exists onsite to determine if there is risk to such occupants. Therefore, the 2016 Health Based Indoor Air Criteria (HBIAC) were obtained from Modified Generic Risk Assessment (MGRA) prepared by the Ministry of Ontario and utilized for comparison with non-potable commercial/industrial sectors.

We did not expect the measured contaminants to vary significantly over any eight-hour period, and therefore have not measured a STEL quantity. Typically, the TWA is an adequate indicator of worker exposure risks in the absence of substantial contaminant variability over time.

**Table 1 Sample Results**

Contaminant Sampled	O. Reg. 833 TWA <sup>1</sup>	Ministry HBIAC <sup>2</sup>	Storefront Results	Warehouse Results
	(ppmv)	(µg/m <sup>3</sup> )	(ppbv) (µg/m <sup>3</sup> ) <sup>3</sup>	
<b>Trichloroethylene</b>	10	0.872	1.0 <b>5.3</b>	1.5 <b>7.95</b>
<b>Tetrachloroethylene</b>	25	13.8	23 <b>153</b>	39 <b>260</b>
<b>1,2-dichloroethane</b>	n/d	0.138	<0.8 <3.2	<0.8 <3.2
<b>1,1,1-trichloroethane</b>	n/d	71.5	<0.8 <4.3	<0.8 <4.3
<b>1,1,2-trichloroethane</b>	10	0.223	<0.8 <4.3	<0.8 <4.3
<b>Vinyl chloride</b>	1	0.406	<0.8 <2.0	<0.8 <2.0

\* "<" indicates the collected sample was less than the limit of detection.

\* "n/d" indicates no data available.

1. The 2017 ACGIH table referenced in O. Reg. 833 was used if the agent was not listed in the O. Reg. 833 table.

2. Health Based Indoor Air Criteria for Non-Potable Industrial Commercial Community (2016).

3. Reported concentration by volume was converted to a weight basis assuming an ideal gas at SATP (24.79 L/mol)

All concentrations of contaminants were less than the detection limit of the laboratory with the exception of trichloroethylene and tetrachloroethylene, which were both greater than the Ministry's HBAIC limit.

Environmental  
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January 8, 2021

## CONCLUSIONS AND RECOMENDATIONS

Based on the results of this one time sampling program, Cambium would note that the building is not fit for its intended purpose as a commercial space as it currently exists. Trichloroethylene and tetrachloroethylene significantly exceeded the HBIAC for the commercial sector limits, at approximately 600% and 1,100% respectively in the storefront and indicate an increase in airborne contamination towards the known source of contamination in the warehouse area.

Although Cambium did not record any exceedance with the occupational limits set out in O. Reg. 833, these limits do not apply for the intended use of the Site. The Occupational Health and Safety limits are considered safe for the majority of healthy workers, for an eight-hour work shift, and a forty-hour work week over their entire working lifetime. The workers are expected to be aware of the contaminants they are being subjected to and trained on the risks associated with them and the controls available. Therefore, Cambium does not expect the current occupancy of the building to be an immediate health risk based on these values used for the sake of comparison.

Cambium recommends remediation of the contamination, or the implementation of an extraction system for the contamination prior to the Site being used for a commercial application.

## CLOSING

We trust that this report addresses meets your immediate requirements. If you have any questions or require clarification of any aspect of this submission, please do not hesitate to contact the undersigned at (705) 742-7900 extension 213.

Best regards,

**Cambium Inc.**

Sadie Bachynski, P.Eng.  
Senior Project Manager

Cody Given, EIT  
Technician

Encl. Copy of Laboratory Certificate of Analysis

\\camfile\Projects\12100 to 12199\12131-001 Charles Crews - Vapour Intrusion Sampling 322 Pinnacle St, Belleville\Deliverables\IAQ\Draft\2020-12-17 - LTR - Pinnacle Street IAQ.docx



GALSON

Mr. Cody Given  
Cambium Inc.  
52 Hunter Street East  
Peterborough, ON K9H 1G5  
Canada

December 16, 2020

Account# 23721

Login# L525507

Dear Cody Given:

Enclosed are the analytical results for the samples received by our laboratory on December 14, 2020. All samples on the chain of custody were received in good condition unless otherwise noted. Any additional observations will be noted on the chain of custody.

Please contact client services at (888) 432 5227 if you would like any additional information regarding this report. Thank you for using SGS Galson.

Sincerely,

SGS Galson

A handwritten signature in black ink that reads 'Lisa Swab'.

Lisa Swab  
Laboratory Director

Enclosure(s)



LABORATORY ANALYSIS REPORT

LELAP Lab ID #04083

6601 Kirkville Road  
East Syracuse, NY 13057  
(315) 432-5227  
FAX: (315) 437-0571  
www.sgsgalson.com

Client : Cambium Inc.  
Site : PINNACLE STREET  
Project No. : PINNACLE STREET IAQ

Date Sampled : 08-DEC-20  
Date Received : 14-DEC-20  
Date Analyzed : 15-DEC-20  
Report ID : 1223506

Account No.: 23721  
Login No. : L525507  
Units : ppbv

Galson ID: L525507-1  
Client ID: ppbv  
FO1

L525507-2  
BO1

Vinyl Chloride	0.80	<0.80	<0.80
1,2-Dichloroethane	0.80	<0.80	<0.80
1,1,1-Trichloroethane	0.80	<0.80	<0.80
Trichloroethylene	0.80	1.0	1.5
1,1,2-Trichloroethane	0.80	<0.80	<0.80
Tetrachloroethylene	0.80	23	39

Analytical Method: mod. OSHA PV2120/mod. EPA TO15; GC/MS  
Collection Media : Mini Can  
Submitted by : JAV  
Approved by : JMR  
Date : 16-DEC-20  
Supervisor: SAP



**GALSON**

LABORATORY FOOTNOTE REPORT

Client Name : Cambium Inc.  
Site : PINNACLE STREET  
Project No. : PINNACLE STREET IAQ  
Date Sampled : 08-DEC-20  
Date Received: 14-DEC-20  
Date Analyzed: 15-DEC-20  
Account No.: 23721  
Login No. : I525507

6601 Kirkville Road  
East Syracuse, NY 13057  
(315) 432-5227  
FAX: (315) 437-0571  
www.sgsgalson.com

L525507 (Report ID: 1223506):  
SOPs: in-vocs (39)

L525507-2 (Report ID: 1223506):  
Sample canister was received at/near ambient pressure.

L525507 (Report ID: 1223506):

Accuracy and mean recovery data presented below is based on a 95% confidence interval (k=2). The estimated accuracy applies to the media, technology, and SOP referenced in this report and does not account for the uncertainty associated with the sampling process. The accuracy is based solely on spike recovery data from internal quality control samples. Where N/A appears below, insufficient data is available to provide statistical accuracy and mean recovery values for the associated analyte.

Parameter	Accuracy	Mean Recovery
1,1,1-Trichloroethane	+/-13.6%	103%
1,1,2-Trichloroethane	+/-11.3%	100%
1,2-Dichloroethane	+/-14.5%	102%
Tetrachloroethylene	+/-13%	101%
Trichloroethylene	+/-10.7%	102%
Vinyl Chloride	+/-16%	102%



**Ministry of the  
Environment,  
Conservation and Parks**  
Eastern Region  
1259 Gardiners Road, Unit 3  
Kingston ON K7P 3J6  
Phone: 613.549.4000  
or 1.800.267.0974

**Ministère de l'Environnement,  
de la Protection de la nature  
et des Parcs**  
Région de l'Est  
1259, rue Gardiners, unité 3  
Kingston (Ontario) K7P 3J6  
Tél: 613 549-4000  
ou 1 800 267-0974



## MEMORANDUM

September 25, 2023

**TO:** S. Kennedy, Environmental Officer  
Belleville Area Office  
Eastern Region

**FROM:** C. Milloy, M.Sc., P.Geo., Hydrogeologist  
Water Resources Unit  
Kingston Regional Office  
Eastern Region

**RE:** Technical Hydrogeological Review of PCE Contaminated Site  
One hour Martinizing Dry Cleaning  
322 Pinnacle St., Belleville, Ontario  
*Echo Ref: 1-225200792*

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On behalf of the Ministry of the Environment, Conservation, and Parks (MECP), I have reviewed the following technical submissions:

**FINAL Phase II Environmental Site Assessment 322 Pinnacle  
Street Belleville, Ontario (Pinchin Ltd., November 30, 2016)**

**Proposal for Preliminary Remedial Action Plan 322 Pinnacle  
Street, Belleville, Ontario (Pinchin Ltd., April 17, 2019)**

A summary of the hydrogeological technical review is presented following the outcomes.

### **Review Outcomes**

At this time, the MECP should conclude the following based on my review:

- 1) The subject lands are contaminated with Tetrachloroethylene, Trichloroethylene, and potentially other contaminants from activities which occurred at the former dry-cleaning operation on the property.
- 2) The contaminants were found at the property boundary and should be assumed to be migrating offsite. Therefore, there is substantial risk that adverse impacts may be occurring on adjacent properties from the natural migration of the contaminants under those properties. However, the distribution and amount of offsite contamination is unknown.
- 3) Information contained in the above documents is insufficient to fully understand the distribution and amount of contamination on and off site and the risk thereof.

- 4) It is understood that no one is, nor will be drinking groundwater in the vicinity.

The MECP should now require the following actions to be taken:

- 1) Assess and evaluate the human health risk to residents and clients at all locations in the immediate vicinity, including on the subject lands, as per the known pathways of exposure from dry-cleaning product (i.e., soil and groundwater to indoor air)
  - a. Consideration should be given to whether there is risk at the sewer alignment works, which appear to have been recently active along Front Street and for which there is an active PTTW.
- 2) Require additional site investigation to be undertaken by qualified professionals in accordance with provincial and professional standards. This should:
  - a. Provide additional land use history assessment to ensure the full environmental conditions are understood at and around the site (i.e., complete a Phase 1 ESA).
  - b. Provide additional characterization and documentation of fundamental hydrogeological conditions and buried infrastructure at and around the site.
  - c. Provide additional contaminant groundwater delineation (installation of groundwater monitoring wells) and documentation, on-site and off-site. Based on additional groundwater delineation, potential risk to on and off-site properties should be determined, and additional assessment undertaken as necessary (e.g., soil vapour probes, indoor air quality monitoring).

It is recommended that the above be done to established environmental site assessment standards in Ontario and to MECP's satisfaction.

- 3) Following completion of the above recommendations, immediate update of the *remedial action plan* should be completed by a Qualified Professional. The updated action plan should then be submitted to the ministry for review and approval prior to implementation.
- 4) Consider any additional action that may be required, given the existing use of the subject lands (a café) and adjacent properties (theater and other).

Discussion on the above items is presented below in the *Review Summary*.

## Review Summary

### Purpose and Standards

This technical review aimed to ensure that the subject lands and the above submissions provide for the reasonable protection of provincial and public interests, including:

- Assurances that contaminants, which may cause an adverse effect, are not being discharged / migrating offsite, in accordance with the Environmental Protection Act.
- Assurance that any contaminants, which may be migrating off-site, are in compliance with Ontario's Brownfield standards (O. Reg. 153/04: Records of Site Condition)

This technical review also ensures that the submission provides for the reasonable protection of public interests in accordance with professional geoscience standards.

In addition to the above, the technical professionals representing the landowner should address the following standards in future submissions.

- Present qualifications to undertake this type of work.
- Address the guide for completing phase one environmental site assessments under Ontario Regulation 153/04
- Address the guide for completing phase two environmental site assessments under Ontario Regulation 153/04

With respect to the most relevant contaminant standards, the consultant references Table 7 Standards, which I concur is suitable. These are relevant to sites with less than 2 m of overburden deposits above bedrock or very high groundwater tables. See Soil, ground water and sediment standards for use under Part XV.1 of the Environmental Protection Act | Ontario.ca

### Background

#### ***geology***

Regional / background geologic conditions, well records etc. were not presented but should be in all future technical submissions. The consultant indicates that 322 Pinnacle St. is underlain primarily by fill with no natural overburden. The surrounding well records bear this out.

I note that the site is located on Paleozoic bedrock (limestone plain) adjacent to the edge of a locally discontinuous glacial till plain.

Bedrock is of the Verulam Formation. Weathered and / or sloping bedrock surfaces should be considered as a potential major control on contaminant migration at this site.

Further, a former Belleville Natural Gas & Oil Co. well is located in the vicinity and one of the old Creamery well records indicate the local limestone is shaley. Therefore, care should be taken to monitor **natural gas** emissions during all drilling and monitoring in the vicinity. Related contingency plans should be in place.

### ***groundwater dynamics***

The consultant assumes groundwater migration is westerly towards the Moira River and reports that conditions at part of the site are wet within the upper 2 metres of overburden / fill.

I note that the available information was insufficient to determine overall groundwater flow direction(s) but this should be determined as soon as possible, as to inform plans for the necessary contaminant delineation and transport work.

Towards this I also note that the orientation of groundwater migration, which will influence contaminant transport, is likely much more nuanced. For instance, there is some indication that surface drainage flows towards the back alley from several directions. Further, consideration should be given to the role that buried infrastructure alignments and building subdrains may play in contaminant transport. Infrastructure design and alignments should be available from the City's municipal operations. However, given the potentially deep water-table, groundwater controls may be more regional.

The consultant notes that MW-1 did not provide groundwater. This should be explained. MW-1 was 9 metres deep. A water well record for 322 Pinnacle St. indicates that a groundwater bearing zone was found at 25 feet or 7.6 metres below grade. Presumably these are the same wells. The old creamery wells indicate deeper water bearing zones as well with little head-rise, so the water table may be very deep at the site.

### ***site***

The site is located in the *City Centre Intensification Area* and zoned C2-6, *General Commercial with Special Provisions* (Bylaw 10245). It is within the municipally serviced part of urban of Bellville. Numerous private properties surround the site, all of which may contain residences, offices, restaurants, community venues (theater) etc.

A two-story commercial building is located on site and is reported to have been a dry cleaner. No other site history is provided. The operations may have been called Northtown Cleaners and Martinizing Dry Cleaning at various times. It is understood that the property currently operates as a café: Home | Tropical Blends Cafe.

As indicated above, additional background land use history is required for the site and adjacent properties, in accordance with Phase 1 environmental site assessment standards.

Based on the current information, contamination associated with the site may pose concerns to onsite and to offsite properties in the vicinity of the site, and the District Engineer should be consulted in regards to potential offsite indoor air risks in the area.

### **Potentially contaminating activities and areas of potential environmental concern**

As indicated above, additional background land use history is required for the site and adjacent properties, in accordance with Phase 1 environmental site assessment standards.

The consultant indicates that further assessment of hereto uninvestigated soils and groundwater beneath the building and in groundwater west of the site is needed. MECF agrees this should be added to a revised Phase II environmental site assessment.

Prior to continuing with additional contaminant delineation, however, a conceptual model for the site and potential contaminant transport should be established to support the rationale for the locations and depths of any additional testing. It is noteworthy that product is accumulating in the shallow soil at BH 3 and that the water table might be up to 10 metres below grade at the site. Further, the fact that some contaminants are detected in the other testing locations at shallow depths may indicate lateral spreading is important at the site - perhaps as migration along the soil-bedrock interface.

Surveying work may be needed to understand the bedrock slope here.

### **Contaminants of potential concern**

As indicated above, the primary contaminants of concern to date are Tetrachloroethylene and Trichloroethylene. The preliminary evidence indicates that degradation products are not present. The consultants note that they encountered pure product at BH3, which is located at the rear property boundary. They indicate that other VOCs may be of concern at this location but that this remains to be determined. Lesser amounts of tetrachloroethylene were found in the soil at BH1 and BH2 and trichloroethylene was found in soil at BH1.

However, given that a phase 1 environmental site assessment was not undertaken (but now should be), additional contaminants of concern should not be ruled out at this time. A Phase 1 assessment may indicate additional contaminants of concern (e.g. PFAS from firefighting, petroleum hydrocarbons such as from the potential underground storage tanks).

I agree that the potential underground storage tank should be investigated and removed / replaced. I would note that the amount of soil testing should comply with regulations.

**Other**

If site remediation occurs concurrently with the additional investigation, I recommend that the remedial activities be documented to obtain additional information (photos of product and soil, photos of underground storage tank, additional sensory observations (colour, sheens, odours, etc.))

Please consult O.Reg.153 for all minimum reporting standards.

**Closure**

If you have any questions regarding the above comments or recommendations, I would be pleased to discuss them with you.

A handwritten signature in cursive script, appearing to read "Clare Milloy". The signature is written in black ink on a white background.

C. Milloy, M.Sc., P.Geo.

ec: Victor Castro (WRU Supervisor)  
Kyle Stephenson (Groundwater Team Lead)