

Director's Order Number
1-218350098

Director's Order

Director's Order Issued To:

677075 Ontario Limited
1696 Bayview Ave
Toronto, Ontario, M4G 3C4
Canada

880188 Ontario Limited, carrying on business as "Burdock's Dry Cleaners"
180 Wortley Rd
London, Ontario, N6C 3P7
Canada

Sherry Marie Gouthro
Suite 2 - 1028 Commissioners Rd W
London, Ontario, N6K 1C3
Canada

Edward Leo Gouthro
Suite 410 - 10 Beechwood Pl
London, Ontario, N6C 1H7
Canada

Site:

180 Wortley Road
London, County of Middlesex
Ontario, N6C 3P7

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 Sections 18, 196 and 197 of the EPA. I order you, jointly and severally, unless otherwise indicated, to do the following:

Item No. 1 **Compliance Due Date:** June 7, 2024

By June 7, 2024, retain a Qualified Person to conduct soil vapour monitoring, delineate the contamination from the Site and prepare and complete the written reports, as described in Work Ordered Item Nos. 3, 4, 5, 6 and 7 of this Order.

Item No. 2 **Compliance Due Date:** June 7, 2024

By June 7, 2024, submit to the Director via email to pierre.adrien@ontario.ca with a copy sent to the London District Office at environment.london@ontario.ca, written confirmation from the Qualified Person that they have (1) received a copy of this Order; (2) been retained to carry out the work specified in Work Ordered Item Nos. 3, 4, 5, 6 and 7 of this Order; and (3) the experience and qualifications to carry out the work.

Item No. 3 **Compliance Due Date:** July 8, 2024

By July 8, 2024, have a Qualified Person complete a soil vapour assessment as set out in the 2022 Technical Support Memorandum and address all other comments and recommendations in that report. The soil vapour assessment shall include, but not be limited to, re-sampling of all three existing soil vapour probes at the Site for the purpose of identifying and assessing the risk of PCE contamination being discharged to adjacent off-Site receptors.

Item No. 4 **Compliance Due Date:** July 8, 2024

By July 8, 2024, submit to the Director, by email to pierre.adrien@ontario.ca and to environment.london@ontario.ca, a written report, prepared by the Qualified Person, that includes the findings of the soil vapour assessment described in Work Ordered Item No. 3.

Item No. 5 **Compliance Due Date:** July 15, 2024

By July 15, 2024, submit to the Director, by email to pierre.adrien@ontario.ca and to environment.london@ontario.ca, a written plan, prepared by the Qualified Person, for the assessment of the soil and groundwater both on and off the Site, that includes at

minimum, a description of the steps necessary to carry out all work described in Work Ordered Item No. 7, and timelines for carrying out the work.

Item No. 6 **Compliance Due Date:** July 29, 2024

By July 29, 2024, have the Qualified Person initiate an assessment of the soil and groundwater both on and off the Site in accordance with the written plan described in Work Ordered Item No. 5 of this Order, subject to any written comments on the plan received from the Director.

Item No. 7 **Compliance Due Date:** October 4, 2024

By October 4, 2024, submit to the Director, via email to pierre.adrien@ontario.ca and to environment.london@ontario.ca, a written report prepared by the Qualified Person that includes, at minimum, the following information:

- a) the results of the completed assessment work described in Work Ordered Item No. 6 of this Order;
- b) an assessment of the full vertical and lateral extent and the source(s) of any contaminants of concern, including but not limited to PCE and PCE associated derivatives.
- c) a detailed interpretation of the hydrogeology of the Site and adjacent properties that may be impacted by contamination from the Site;
- d) characterization of the interaction between the groundwater flow, the contaminant distribution, and any buried infrastructure both on and off the Site;
- e) an assessment of potential adverse effects resulting from the off-Site discharge of contamination, including an assessment of potential adverse effects that may result from impacts to groundwater and soil vapour intrusion associated with PCE for off-Site receptors;
- f) recommendations to prevent or eliminate any adverse effects that may result from the presence of contaminants in the subsurface at the Site and the discharge of any contaminants from the Site;
- g) recommendations for monitoring contaminants that may result in an adverse effect on the Site and the discharge of any such contaminants from the Site; and
- h) a detailed work plan with a detailed schedule for the implementation of any recommended remedial measures and monitoring contained in the report.

Item No. 8 **Compliance Due Date:** May 23, 2024

Upon service of this Order, before dealing with the Site in any way, the Orderees shall 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 **Compliance Due Date:** May 23, 2024

Within thirty days of receipt of an acknowledgment and direction form signed by the Director enclosing a certificate of requirement, the Orderees 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 **Compliance Due Date:** May 23, 2024

Within five days of registering the certificate of requirement on title, as required by Work Ordered Item No. 9 of the Order, the Orderees shall provide written verification to the Director by email to pierre.adrien@ontario.ca and to environment.london@ontario.ca that the certificate of requirement has been registered on title for the Site by providing a copy of the registered document and a copy of the parcel register for the property identifier for the Site.

Item No. 11 **Compliance Due Date:** May 23, 2024

Upon service of this Order, the Orderees shall permit access to the Site by Gary Howard Fine and Christopher Hercule Morin, and any person and equipment considered necessary, for the purposes of assessing contamination on and off the Site.

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:

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

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

"Order" means this Director's Order No. 1-218350098 as it may be amended, and includes the Director's Report and any of its attachments.

"Director" means the District Manager of the MECP London District Office, or in the event that he is unable to act, any other director with the MECP authorized to act pursuant to the EPA.

"Site" refers to the property that is the subject of this Order, namely the property municipally described as 180 Wortley Road, London ON, N6C 3P7 and legally described as PT LTS 3 AND 4 E/S WORTLEY ROAD R.P. 1(4TH) DESIGNATED AS PART 2 33R-12068T/W 948117 LONDON.

"O. Reg. 153/04" means Ontario Regulation 153/04, "Records of Site Condition – Part XV.1 of the Act" under the EPA.

"Owner" means the current property owner of the Site, 677075 Ontario Limited.

"Operator" means the current operator at the Site, 880188 Ontario Limited, carrying on business as Burdock's Dry Cleaners.

"Orderees" means the persons named in this Order.

"Director" means Director Pierre Adrien, or in the event that he is unable to act, any other director with the MECP authorized to act pursuant to the EPA.

"Qualified Person" means a person who meets the qualifications described in Section 5 of O. Reg. 153/04 and possesses hydrogeological expertise and experience in completing subsurface soil, groundwater and soil vapour site assessments; and implementing appropriate measures for site remediation and evaluating human and ecological risks associated with PCE contamination and its associated derivatives.

"PCE" means perchloroethylene, also known as tetrachloroethylene, and includes its derivatives such as trichloroethylene, dichloroethylene and vinyl chloride.

"2022 Technical Support Memorandum" means the Ministry's Technical Support Memorandum dated August 19, 2022, addressed to Provincial Officer Jessica Ceneviva and prepared by Hydrogeologist Jeff Markle, regarding the review of Pinchin's DRAFT Soil Vapour Assessment.

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

The current Owner of the Site, 677075 Ontario Limited, has owned the Site since 1986. The current directors and officers of the Owner are Edward Leo Gouthro and Sherry Marie Gouthro, who became directors in 2015.

The current Operator of the Site, 880188 Ontario Limited, carrying on business as “Burdock's Dry Cleaners”, has operated at the Site since approximately 2001. The current directors of the Operator are Edward Leo Gouthro and Sherry Marie Gouthro, who have been directors since the company was incorporated in March 1990.

Since Sherry Marie Gouthro and Edward Leo Gouthro are current directors of the Owner and Operator, I have reasonable and probable grounds to believe that they are persons who have management and control of the Site.

Description of the Site and/or System/Facility

The Site is a 1270 square meter lot, surrounded by residential and commercial properties. It consists of a single-storey commercial building, currently occupied by the Operator who is operating a dry-cleaning business.

Dry cleaning operations appear to have been conducted at the Site since 1962. From approximately 1962 to 1989, the dry-cleaning operations operated under the names Forsyth Cleaners, Forsyth Launderers and Dry Cleaners, Forsyth Fabric Care Centre and Heritage Dry Cleaners Ltd. From approximately 1990 to present, the dry-cleaning operations operated under the name Burdock's Dry Cleaners.

Events Leading up to the Director's Order

On September 27, 2019, the MECP received copies of several environmental reports prepared for and conducted on the neighbouring property, 190 Wortley Road, London. Of these reports, the reports prepared by JFM Environmental entitled “Phase II Environmental Site Assessment Added Groundwater Delineation” dated June 27, 2017, and “2018 Annual Groundwater Sampling Program” dated January 21, 2019, identified groundwater contamination across the northern portion of the property. It was stated in both reports that the impacts were suspected to have originated from the dry-cleaning business located at the Site.

On October 15, 2019, at the request of the MECP, Mr. Gouthro's legal counsel provided a copy of the report entitled “Parkers Cleaners, Subsurface Investigation Report, 180 Wortley Road London, Ontario” prepared by Altech Environmental Consulting Ltd., dated January 30, 1995. This report identified PCE-impacted soil near the drum storage shed which was located at the northwest end of the building at the Site.

On February 21, 2020, the MECP received a copy of the report entitled “Final Phase II Environmental Site Assessment” for the Site, prepared by Pinchin Ltd., dated February 21, 2020, on behalf of 677075 Ontario Ltd. The report was prepared further to a written request by the MECP made on October 17, 2019, to the directors of 677075 Ontario Ltd. The report recommended that a soil vapour investigation be conducted at the Site, based on the identified groundwater contamination of mainly PCE in multiple locations at the Site, including around the “drum storage shed” as referenced in the 1995 report.

On October 19, 2020, Provincial Officer Nicole Does issued Provincial Officer’s Order No. 4110-BSVQGD to the Owner and Operator of the Site including the Owner’s corporate directors at that time, who included Mrs. Gouthro and Mr. Gouthro. The work ordered included requirements for the preparation and submission of a soil vapour investigation plan to identify and assess the potential risk of PCE contamination to adjacent off-Site receptors. This work focused on addressing the area in which the risk of impacts from soil vapour was highest. At the time, the MECP communicated its expectations to the Owner and Operator that a full delineation of the contamination would still be necessary to assess impacts related to subsurface contamination.

Several timeline extensions were granted by the MECP to comply with the work required by Provincial Officer’s Order No. 4110-BSVQGD, at the request of Mr. Gouthro, on the basis of financial constraints and impacts from the COVID-19 pandemic. On February 17, 2022, the MECP received a copy of the report entitled “DRAFT Soil Vapour Assessment”, prepared in respect of the Site by Pinchin Ltd. on behalf of 677075 Ontario Ltd. This report concluded that based on the results, the indoor air quality within neighbouring properties to the north and west of the Site are unlikely to be adversely affected by the volatile soil or groundwater impacts identified at the Site.

On August 19, 2022, the MECP technical staff completed their review of the report and submitted the 2022 Technical Support Memorandum to Officer Ceneviva. They found that additional work is required to confirm the report’s conclusions regarding off-Site soil vapour impacts, and made several recommendations for completing the additional work, including conducting a second soil vapor sampling event to confirm the results are representative of the long-term conditions at the Site.

On September 15, 2022, a meeting was held with MECP London District Office staff and Mr. Gouthro to discuss the comments in the 2022 Technical Support Memorandum related to the review of the draft soil vapour assessment report. Prior to the meeting, the directors of 677075 Ontario Ltd. indicated that Mr. Gouthro would be speaking on their behalf. During the meeting Mr. Gouthro indicated that he had limited financial resources to continue the work and expressed his concern that he was incurring costs in relation to contamination that he believes pre-existed his involvement and ownership of the Site. He believes that the contamination was the result of activities by previous owners of the Site.

On May 16, 2023, the MECP received a copy of a report entitled “FINAL Soil Vapour Assessment” for the Site, prepared by Pinchin Ltd. on behalf of 677075 Ontario Ltd., which did not contain any changes to the conclusion made within the draft report submitted on February 17, 2022, and did not address MECP technical staff’s comments on the draft report, as requested.

On June 6, 2023, Mr. Gouthro advised Provincial Officer Nicole Does via telephone that neither his business nor personal finances were sufficient to complete any further delineation work at the Site. The need for further work to be completed was discussed to determine the extent of the contamination from the Site, and Mr. Gouthro stated that he would not be able to comply with another Order, if issued, to the current Owner and Operator of the Site.

On July 12, 2023, a notice of the director’s intent to issue a director’s order was posted to the Environmental Registry of Ontario (ERO). This notice included a summary and copy of a draft of this director’s order. Listed as orderees in the draft director’s order included the Owner and Operator of the Site as well as the current directors and former directors. Within the 45-day public commenting period, 3 responses were received, including two from the orderees and one from a neighbouring property owner. These comments were reviewed and considered by the Director prior to the issuance of this Order. Responses to these comments are as follows:

- **Comment:** A Certificate of Requirement has already been put on title for the Site.
Response: There is currently a Certificate of Requirement (CofR) on title with regards to the Provincial Officer’s Order No. 4110-BSVQGD that was issued on October 19, 2020. Another CofR is required to be registered on title in accordance with this Director’s Order. The purpose of this CofR is to advise anyone with an interest in the lands of the existence of this Director’s Order.
- **Comment:** 880188 Ontario Ltd., Mr. Gouthro and Mrs. Gouthro did not cause or have any knowledge of the contamination at the Site, and only former directors of 677075 Ontario Ltd. should be named in this Order.
Response: Mr. Gouthro and Mrs. Gouthro are current directors of the Owner and Operator of the Site, 677075 Ontario Ltd. and 880188 Ontario Ltd., which is currently operating as a dry-cleaning business. It is appropriate to name the businesses and individuals in current management and control of the Site.
- **Comment:** The contamination likely originated from the neighbouring property, 190 Wortley Road, based on the groundwater flow direction and because the highest levels of contamination were found on that property.
Response: The movement of chlorinated solvents is not solely based on groundwater flow. Based on currently available information, including environmental assessments completed by Qualified Persons conducted at 190

and 180 Wortley Road, MECP has reasonable grounds to believe that the source of the contamination is originating from the Site located at 180 Wortley Road.

- **Comment:** The estate of a former director of 677075 Ontario Ltd. should be listed on this Order based on his previous involvement and ownership of the site.
Response: The former director passed away prior to the issuance of this Order. It is not necessary to name an estate of a former director where other viable orderes may be able to comply.
- **Comment:** The 1995 Altech Report did not indicate an environmental compliance issue as there were no enforceable provincial soil standards for the relevant contaminants at the time.
Response: The presence or absence of applicable soil standards at the time is not relevant to whether this Director's Order should be issued.
Comment: Work Ordered Item Nos. 1, 6 and 7 (previously Item No. 1, 3 and 4), should specifically address the contamination at 190 Wortley Road.
Response: This Order required the delineation of the full vertical and lateral extent of the contamination both on and off the Site. The scope and location of this work will be determined by a Qualified Person, however given the information that has been provided to the ministry to-date, it is likely that such work will include the property at 190 Wortley Road.
- **Comment:** The Director's Order does not include wording that the Qualified Person must identify the source area(s) of contamination at the Site.
Response: Work Ordered Item No. 7 has been updated to clarify that the source of the contamination needs to be identified.
- **Comment:** The issuance of the Order should be delayed until related civil court proceedings are completed.
Response: The purpose of this Order is to identify the source and extent of contamination in order to evaluate potential impacts, which may inform next steps such as remediation. Such assessment work should not be delayed for the purposes of determining liability in civil proceedings.
- **Comment:** Concerns raised regarding financial hardships or constraints to carry out the ordered work.
Response: In accordance with the Ministry's compliance policy titled "Compliance Policy Applying Abatement and Enforcement Tools", financial hardship or constraints to carry out requirements of an order are not grounds for removing an Orderes's name from an order.

I believe that the delineation work required by Work Ordered Items Nos. 1 to 7 are necessary to determine the level of risk and/or impacts to off-Site receptors, and to determine whether protective measures and/or remedial work is warranted to prevent or reduce an adverse effect.

I also believe that the requirements in Work Ordered Item Nos. 8 to 10 are necessary to ensure that any person who may acquire an interest in the Site is made aware of the issues and work described in this Order.

Lastly, I believe that the requirement in Work Ordered Item No. 11 for the Owner and Operator to provide access to the Site to Mr. Christopher Morin and Mr. Gary Fine, former directors of 660675 Ontario Ltd., as they are undertaking necessary assessment work at the Site further to discussions with the Ministry.

Authority to Issue the Director's Order

I am issuing this Order under my authority as a Director under s. 18, s. 196 and s. 197 of the EPA.

I have reasonable and probable grounds to believe that the requirements specified in this Order are necessary or advisable so as to prevent, or reduce the risk of any discharge of contaminants, namely PCE into the natural environment from the Site, or to prevent, decrease or eliminate an adverse effect, that may result from (i) the discharge of a contaminant from the undertaking, or (ii) the presence or discharge of a contaminant in, on or under the property.

Further, I have authority to make an order or direction affecting real property and to make an order requiring any person with an interest in the property, before dealing with the property in any way, to give a copy of the order or decision affecting the property to every person who will acquire an interest in the property as a result of the dealing and to have a certificate registered on title in the proper land registry office setting out that requirement, and reasonably believe that the requirements specified in this Order are necessary and advisable.

Attachments

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

- Attachment A – 2022 Technical Support Memorandum

ISSUING DIRECTOR

Name: Pierre Adrien

Job Title: District Manager

Badge Number: 2074

Address: 733 Exeter Road, London, Ontario, N6E 3T1

Director Email: pierre.adrien@ontario.ca

Office Email: environment.london@ontario.ca

Date: May 23, 2024

Signature:



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

and

Director
Ministry of the Environment,
Conservation and Parks
London District Office
733 EXETER RD
LONDON, ON N6E 1L3
Office Email: Environment.London@ontario.ca
Fax: (519) 873-5020

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

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.

ATTACHMENTS

Attachment A – 2022 Technical Support Memorandum

MEMORANDUM

19 August 2022

To: Jessica Ceneviva
Provincial Officer
London District Office

From: Jeff Markle
Scientist
Technical Support Section

Re: DRAFT Soil Vapour Assessment
180 Wortley Road, London, Ontario
prepared by Pinchin Limited
dated 3 February 2022

I have reviewed the DRAFT Soil Vapour Assessment (the Report) for 180 Wortley Road in London (the Site) and prepared by Pinchin Limited (Pinchin). The work detailed in the Report was completed as part of a voluntary abatement program and comprised the installation of three soil vapour probes (SVP-1 to SVP-3) on the Site to a depth of 3.81 m bgs, the collection of a soil vapour sample from each probe, and analyses for seven volatile contaminants of concern (COCs): Chloroform, 1,1-Dichloroethylene, cis-1,2-Dichloroethylene, trans-1,2-Dichloroethylene, Tetrachloroethylene, Trichloroethylene and Vinyl Chloride. The Report presents the results from the subsurface soil vapour monitoring completed in January 2022. The stated objective of the Report is “...to determine the potential for vapour intrusion at the off-Site properties to the north and west of the Site that may result from known subsurface soil and/or groundwater impact at the Site.” Pinchin compared these measured soil vapour concentrations to screening level criteria calculated with the ministry’s modified generic risk assessment (MGRA) model. My comments are provided below.

Comments on Soil Vapour Results

Using the MGRA model, Pinchin calculated soil vapour screening levels (SVSLs) for the seven volatile COCs noted above. These calculated SVSLs represent vapour concentrations that are protective of indoor air quality at sites where use of the MGRA model is valid. As such, if the measured soil vapour concentrations are less than the SVSLs, then the risk of soil vapour intrusion is acceptable provide all the assumptions made in the MGRA model are applicable to the Site. Note that in the Report, Pinchin’s use of the term Site-Specific Soil Vapour Criteria is equivalent to SVSLs. Pinchin compared these SVSLs to the measured soil vapour concentrations in the three soil vapour probes. Table 3 from the Report summarizes the results and is provided below.



TABLE 3 - SOIL VAPOUR CONCENTRATIONS
677075 Ontario Ltd.
180 Wortley Road, London, Ontario

Parameter	Lowest Reported Detection Limit (RDL)	Site-Specific Soil Vapour Criteria	Sample Location	North Property Boundary	North Property Boundary	West Property Boundary	
			Sample Depth (mbgs)	3.51	3.51	3.51	3.51
			Sample ID	SVP-1	SVP-2	SVP-3	DUP-1
		Non-Potable	Canister ID	420	6675	2494	9762
		Residential	Sample Date (dd/mm/yyyy)	07/01/2022	07/01/2022	07/01/2022	07/01/2022
			Laboratory Certificate No.	C207369	C207369	C207369	C207369
			Laboratory Sample ID	RPC798	RPC799	RPC800	RPC801
CHLORINATED VOLATILE ORGANIC COMPOUNDS							
Vinyl Chloride	0.26	67.9		<0.64	<0.26	<0.26	<0.26
1,1-Dichloroethylene	0.40	8398		<0.99	<0.40	<0.40	<0.40
cis-1,2-Dichloroethylene	0.40	19740		14.2	<0.40	<0.40	<0.40
trans-1,2-Dichloroethylene	0.40	8053		2.03	<0.40	<0.40	<0.40
Trichloroethylene	0.54	165		35.2	4.34	1.33	1.28
Tetrachloroethylene	0.68	2728		1750	833	241	246
O.REG.153/04 VOLATILE ORGANIC COMPOUNDS							
Chloroform	0.49	11295		4.5	1.32	1.22	1.22

Notes:

Site-Specific Soil vapour criteria (SSVC) calculated using MECP (2016) MGRA Approved Model and Site-specific input parameters (as presented in Appendix V)

Units All units provided as $\mu\text{g}/\text{m}^3$ unless otherwise noted.

< Not detected above RDL

mbgs metres below ground surface

 Parameter exceeds Soil Vapour Criteria

 Reportable detection limit exceeds Soil Vapour Criteria

Input By: PH

Checked By: SW

As shown in Table 3, the measured concentrations in each of the soil vapour probes are below the SVSLs calculated using the MGRA model. Based on these results, Pinchin concluded that *“The results of the SVA indicate that volatile soil or groundwater impacts identified at the Site are unlikely to be adversely affecting indoor air quality within neighbouring properties to the north and west, at this time.”*

I agree that the soil vapour concentrations measured at SVP-1 to SVP-3 were below the SVSLs for the seven COCs measured on 7 January 2022. However, it is worth noting that the concentration of Tetrachloroethylene measured at SVP-1 was $1750 \mu\text{g}/\text{m}^3$ and the calculated SVSL is $2728 \mu\text{g}/\text{m}^3$ (SVSL for coarse textured soil and residential land use). These numbers are

of the same order of magnitude. Furthermore, given numerous assumptions are made in the MGRA model and the fact that the validity of several of these assumptions has not been evaluated for the Site or the adjacent properties (see discussion below), it is my opinion that we can only conclude that the results indicate that the contaminants in the subsurface at the Site **may** not be adversely affecting indoor air quality within neighbouring properties. **It is my opinion that additional work is required to confirm that the conditions in the nearby buildings (specifically the basements) are in reasonable agreement with those factors assumed in the MGRA model. Only then could we conclude the COCs are unlikely to be adversely affecting the indoor air quality.**

Validity of use of MGRA Model to Estimate SVSLs

The validity of using the MGRA model to estimate the SVSLs at this Site is a key consideration. In developing the MGRA model, a conceptual site model (CSM) was developed to represent conditions at a 'Generic' site in Ontario. To develop the CSM, values for several parameters which characterize the subsurface and buildings on the 'Generic' site were adopted based on expert knowledge and literature reviews. Provided the conditions at the site under consideration are similar to those considered by the CSM, the MGRA model should be a reasonable representation of the real site. Thus, the MGRA model should provide reasonable estimates of the movement and behaviour of chemical in the subsurface as well as their potential impact on the indoor air for buildings on-site.

The User's Guide for the MGRA model lists six conditions that, if present at a site, would violate the assumptions of the MGRA conceptual site model. The presence of any of these conditions does not mean that use of the MGRA model is invalid, rather it requires consideration of how the presence of these conditions may affect the estimated SVSLs. As part of this review, I compared site conditions to these assumptions to ensure use of the MGRA model was appropriate. Each condition and comparison of the conditions on- and off-site are provided below:

1. Contaminated soil source zone volume > 340 m³ or a source length or width greater than 13 m.

Currently there is no evidence to suggest there is a source area in the soil that is larger than 340 m³.

2. High permeability zone in vadose zone that provides a direct preferential pathway to a building.

Pinchin notes that the building on-Site is slab-on-grade construction. They speculate that nearby off-site buildings may be slab-on-grade (179 Wortley Road) or may have basements. An assessment has yet been completed to confirm the type of construction, evaluate the condition of the basements and foundations, and investigate the presence or absence of high permeability

pathways. Thus, the potential presence of a high permeability pathway in the on- and off-site buildings can not be evaluated. **An evaluation should be completed to ensure use of the MGRA model is valid.**

3. The annual average capillary fringe of the water table is < 0.8 m from the outer edge of the gravel crush of the building foundation, or less than 1 m between the top of the water table or soil contamination and the gravel crush layer.

The water table is over 6 m bgs and the soils (silty loam) are coarse enough that the capillary fringe is likely less than 0.25 metres above the water table. Thus, this condition is not present.

4. The foc (fraction of organic carbon) of the soil in the vadose zone is < 0.002.

There are no foc data with which to assess this condition. **Should additional subsurface investigations be undertaken, then the collection and analyses of soil samples for foc should be included.**

5. There is a continuous source of contamination.

A continuous source would require an on-going release of contaminants or the presence of free phase liquid (NAPL) in the subsurface. There is no evidence of either of these conditions being present. However, should additional subsurface data show the presence of NAPL, the validity of the use of the MGRA model will need to be revisited.

6. Nearby surface water body having a total hardness of <70 mg/L and/or has a pH < 6.7.

Not applicable as the Thames River is 400 m to the northeast.

Though not conclusive, the existing information suggests none of these conditions are present at the Site. **However, additional work is required to confirm this tentative conclusion.**

The MGRA model uses the Johnson and Ettinger, (1991) mathematical model to estimate the migration of soil vapour from the subsurface into the building space. The Johnson and Ettinger model has several precluding conditions for use of the model. These conditions include:

1. Earthen basements;
2. Very high gas permeability media;
3. Gas under pressure;
4. Subsurface utility conduit connecting contamination source and building; and/or
5. Shallow depth to contamination.

The consultant should complete a survey of the nearby buildings to confirm that none of the assumptions in the MGRA are violated and that these precluding conditions for the J&E

model do not exist.

Johnson (2002; 2005) uses three dimensionless parameters to identify the critical input parameter and the controlling process governing vapour intrusion from the subsurface into a building. Based on Johnson (2005), for conditions considered in the MGRA model, advection through the foundation is the limiting process for the migration of vapour into the building and the critical relationship governing vapour migration into the enclosed space is

$$\frac{Q_{soil}}{Q_{building}}$$

where Q_{soil} is the pressure-driven soil-gas flow rate from the subsurface into the enclosed space, and $Q_{building}$ is the enclosed space volumetric air flow rate.

The USEPA (2001) suggests Q_{soil} may be estimated from the following theoretical expression

$$Q_{soil} = \frac{2\pi k \Delta P X_{crack}}{\mu \ln(2Z_{crack}/R_{crack})}$$

where k is the near-foundation soil permeability; ΔP is the indoor-subsurface pressure difference; X_{crack} is the total length of cracks through which soil-gas vapours are flowing; μ is the viscosity of air; Z_{crack} is the crack-opening depth below grade (generally taken to be L_{crack}); and R_{crack} is the effective crack radius or width.

$Q_{building}$ is given by

$$Q_{building} = V_B E_B$$

where V_B is the enclosed space volume; and E_B is the indoor air exchange rate. Most of these parameters relate to the dimensions of the basements, condition of the basement foundation and walls, and building air exchange rates. Currently, none of these have been assessed in the buildings on the nearby properties.

Pinchin should confirm that the conditions in the nearby buildings are in good agreement with the values assumed in the MGRA model for these parameters. If they are, then use of the SVSLs calculated using the MGRA model may be reasonable, but if they are not, then the SVSLs may not be protective of the indoor air quality and alternative assessment approaches and/or additional sampling may be required.

Other Comments

Where a Record of Site Condition (RSC) is being sought for a site and the MGRA model is used, the requirements listed in Schedule E, Table 4 of the regulation must be met. Pinchin notes that a RSC is not being sought at this Site. Rather, the MGRA model is used to assess potential impacts to indoor air from volatile chemicals present in the subsurface on the off-site properties to the north and west. As noted above, this is a valid approach provided conditions at these sites do not violate the generic assumptions made in the MGRA model related to the fate and transport of volatile chemicals. Even where the MGRA model is being used only as an assessment tool and not in support of a RSC, the majority of the requirements in Table 4 should be met. In particular, under the RSC process, use of the MGRA model requires at least two soil vapour sampling events separated by at least 3 months. Pinchin completed one soil vapour sampling event on 7 January 2022. **It is my opinion that a second soil vapour sampling event should be completed to confirm these results are representative of the long-term conditions at the Site.**

In their assessment, Pinchin adopted coarse-textured soil and residential land use. Grain size analysis for the 2 soil samples in the vadose zone (Phase II ESA, Pinchin, 2020), indicate the soil type is silt loam. Furthermore, the Dry Cleaning operation at the Site is an industrial land use. Therefore, assuming coarse-textured soils and residential land use for the assessment is a conservative approach at this specific Site. **However, the consultant should confirm that these are conservative assumptions for the nearby properties.**

Different benchmarks have been used for the subsurface investigations completed at 180 and 190 Wortley Road. At 180 Wortley Road, Pinchin used the centre of the maintenance cover 3 m south of the southeast corner of the on-site building as a benchmark and assumed an elevation of 100 m. At 190 Wortley Road JFM Environmental Limited used the top of the northwest corner of the on-site concrete transformer pad as a benchmark and also assumed an elevation of 100 m. As a result, accurate interpretation of the elevations of stratigraphic horizons and groundwater level elevations is not possible. **The elevation of the two benchmarks should be surveyed so that the subsurface data can be interpreted using a common datum.**

None of the reports prepared for 180 or 190 Wortley Road provide geologic cross sections. As a result, interpretation of the subsurface data is not as clear as it could be if cross sections were provided. Below I present three cross sections showing the stratigraphic information for the available borehole logs, Figure 1 to 4. Also included on the cross sections are Tetrachloroethylene concentrations in the soil, groundwater and soil vapour. When considering the information shown on these sections, one must recognize that the elevations for 180 and 190 do not use the same benchmark and thus may differ slightly from that shown.

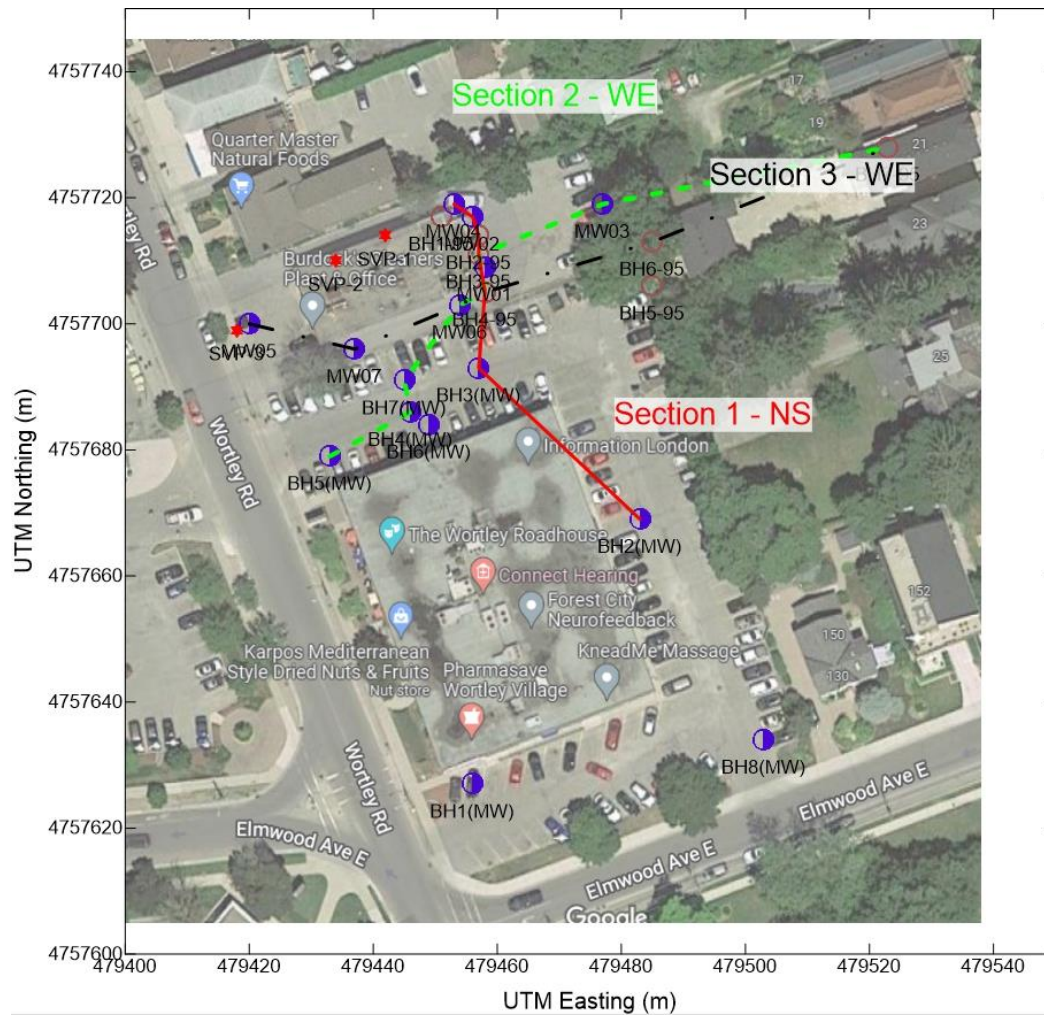


Figure 1. Geologic cross section location map.

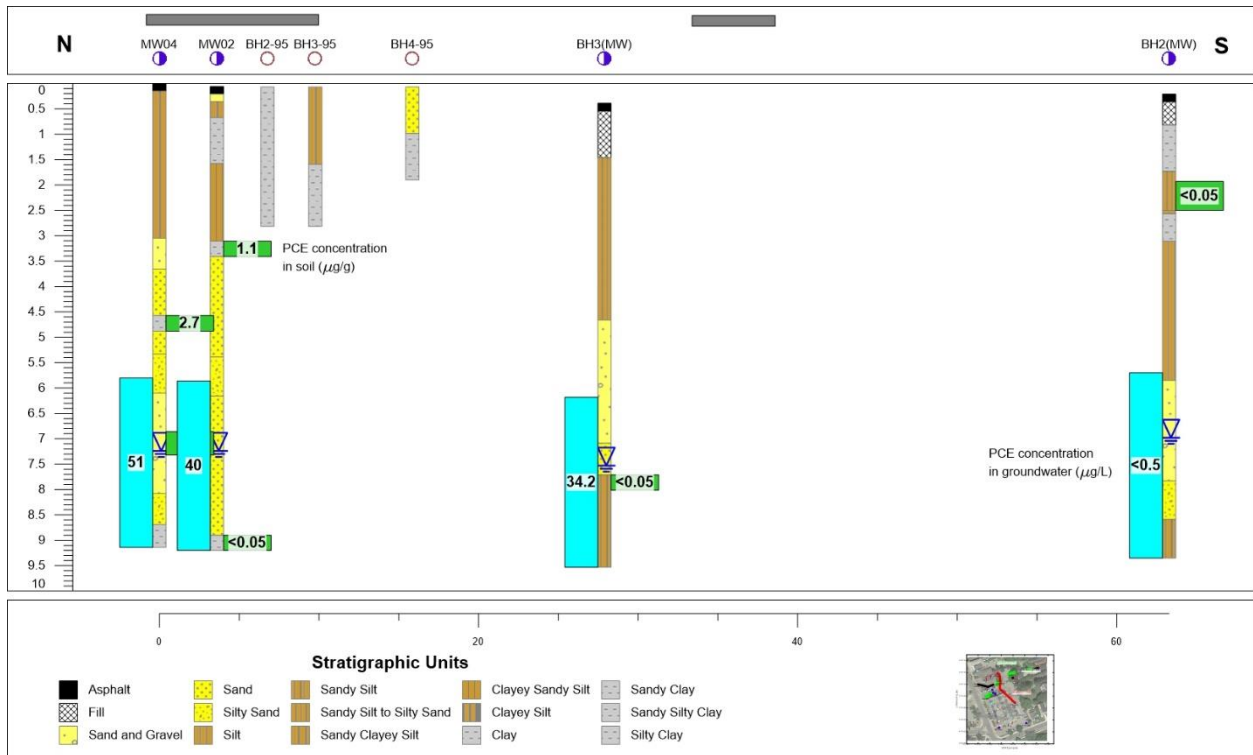


Figure 2. North-South geologic cross section 1. Tetrachloroethylene concentrations are shown for soil (sample interval shown in green with concentration in $\mu\text{g/g}$, Table 3 SCS = $4.5 \mu\text{g/g}$ for coarse-textured soil; residential land use), and groundwater (sand pack interval shown in blue with concentration in $\mu\text{g/L}$, Table 3 SCS = $1.6 \mu\text{g/L}$ for coarse-textured soil; residential land use). The grey rectangles above the section indicate the approximate location of buildings on the section.

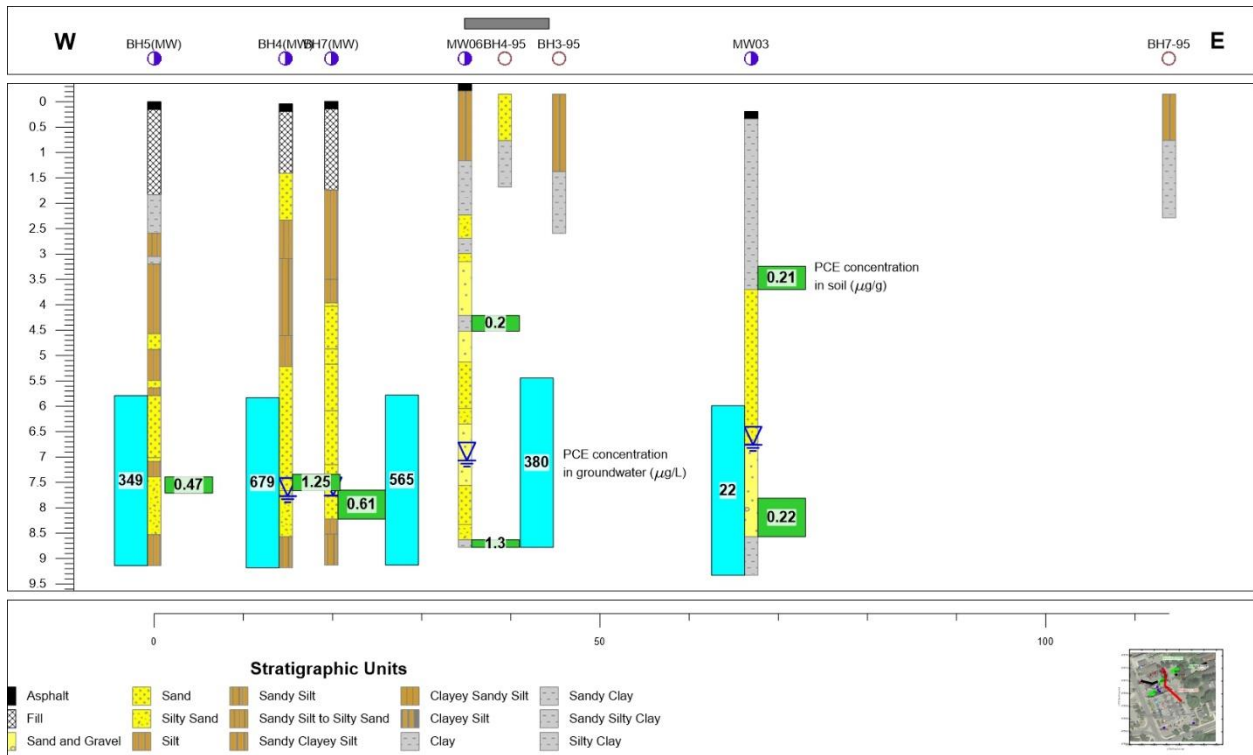


Figure 3. West to East geologic cross section 2. Tetrachloroethylene concentrations are shown for soil (sample interval shown in green with concentration in $\mu\text{g/g}$, Table 3 SCS = $4.5 \mu\text{g/g}$ for coarse-textured soil; residential land use), and groundwater (sand pack interval shown in blue with concentration in $\mu\text{g/L}$, Table 3 SCS = $1.6 \mu\text{g/L}$ for coarse-textured soil; residential land use). The grey rectangles above the section indicate the approximate location of buildings on the section.

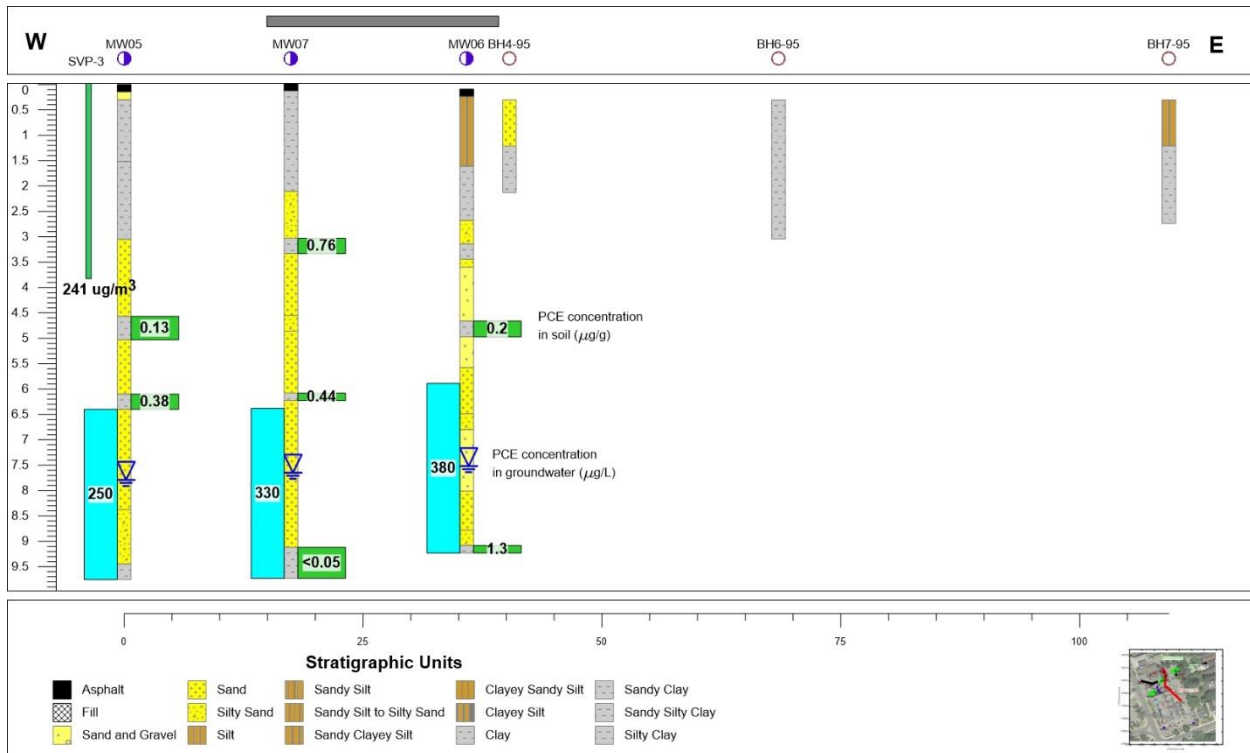


Figure 4. West to East geologic cross section 3. Tetrachloroethylene concentrations are shown for soil (sample interval shown in green with concentration in $\mu\text{g/g}$, Table 3 SCS = $4.5 \mu\text{g/g}$ for coarse-textured soil; residential land use), and groundwater (sand pack interval shown in blue with concentration in $\mu\text{g/L}$, Table 3 SCS = $1.6 \mu\text{g/L}$ for coarse-textured soil; residential land use), and soil vapour (concentration in $\mu\text{g/m}^3$, SVSL = $2728 \mu\text{g/m}^3$). The grey rectangles above the section indicate the approximate location of buildings on the section.

The following general observations can be made from the cross sections:

- A sand, silty sand aquifer is present across the entire area of investigation and likely extends off-site onto adjacent properties.
- The soil samples for the well and boreholes located on these sections do not exceed the Table 3 SCS of $4.5 \mu\text{g/g}$.
- In the soil, higher concentrations of Tetrachloroethylene tend to be associated with fine grained soils.
- With one exception, the concentration of Tetrachloroethylene in the groundwater exceeds the Table 3 SCS of $1.6 \mu\text{g/L}$ in all the monitoring wells along all these sections.
- The lateral extent of the impacted groundwater has not been delineated to the north, east or west. Additional subsurface investigations are required off-site.

- Even though the soil samples do not exceed the SCSs, groundwater samples at those locations are above the standard. This suggests that the most impacted soils may not have been encountered in the boreholes drilled at 180 and 190 Wortley Road.

These comments may be used to form the basis of our discussion with the Site owners and/or their representatives.

Limitations:

The purpose of the preceding review is to provide advice to the Ministry of the Environment, Conservation and Parks regarding subsurface conditions based on the information provided in the above referenced documents. The conclusions, opinions and recommendations of the reviewer are based on information provided by others, except where otherwise specifically noted. The Ministry cannot guarantee that the information that has been provided by others is accurate or complete. A lack of specific comment by the reviewer is not to be construed as endorsing the content or views expressed in the reviewed material.

If you have any questions, please contact me.

A handwritten signature in black ink, appearing to read "JM Markle". The initials "JM" are written in a stylized, cursive font, followed by the name "Markle" in a similar cursive script.

Jeff Markle
Scientist
Southwestern Region

cc. Todd Fleet MECP London District Office