AtkinsRéalis

1440 Prince of Wales Drive, Ottawa, Ontario

Shell Canada Products

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Final – Updated Phase Two Environmental Site Assessment

Signature Page

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Qualifications of The Assessors

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Notice

This report has been prepared and the work referred to in this report has been undertaken by AtkinsRéalis Canada Inc[1]. (AtkinsRéalis) for the exclusive use of Shell Canada Products (the Client), who has been party to the development of the scope of work and understands its limitations. The methodology, findings, conclusions, and recommendations in this report are based solely upon the scope of work and subject to the time and budgetary considerations described in the proposal and/or contract pursuant to which this report was issued. Any use, reliance on, or decision made by a third party based on this report is the sole responsibility of such third party. AtkinsRéalis accepts no liability or responsibility for any damages that may be suffered or incurred by any third party as a result of the use of, reliance on, or any decision made based on this report.

The findings, conclusions, and recommendations in this report (i) have been developed in a manner consistent with the level of skill normally exercised by professionals currently practicing under similar conditions in the area, and (ii) reflect AtkinsRéalis' best judgment based on information available at the time of preparation of this report. No other warranties, either expressed or implied, are made as to the professional services provided under the terms of our original contract and included in this report. The findings and conclusions contained in this report are valid only as of the date of this report and may be based, in part, upon information provided by others. If any of the information is inaccurate, new information is discovered, site conditions change, or applicable standards are amended, modifications to this report may be necessary. The results of this assessment should in no way be construed as a warranty that the subject site is free from any and all contamination.

Any soil and rock descriptions in this report and associated logs have been made with the intent of providing general information on the subsurface conditions of the site. This information should not be used as geotechnical data for any purpose unless specifically addressed in the text of this report. Groundwater conditions described in this report refer only to those observed at the location and time of observation noted in the report.

This report must be read as a whole, as sections taken out of context may be misleading. If discrepancies occur between the preliminary (draft) and final versions of this report, it is the final version that takes precedence. Nothing in this report is intended to constitute or provide a legal opinion.

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[1] Formerly SNC-Lavalin Inc.

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Introduction

AtkinsRéalis Canada Inc. (AtkinsRéalis) was retained by Shell Canada Products (Shell) to prepare an Updated Phase Two Environmental Site Assessment (ESA) documenting available soil and groundwater analytical results in accordance with the provision of Ontario Regulation (O.Reg.) 153/04 (as amended) report format for the property located at 1440 Prince of Wales Drive, Ottawa, Ontario (herein referred to as the Phase Two Property). The Phase Two Property is currently operated as retail fuel outlet.

A Knock Down and Redevelop (KDR) program is currently planned for the Phase Two Property and is tentatively scheduled for 2024. In regard to this, a teleconference meeting with the City of Ottawa (the City), Shell and AtkinsRéalis was conducted on August 23, 2023. During the meeting, the City indicated that both a Phase One ESA report and a Phase Two ESA report, in O.Reg. 153/04 format, are required to be submitted as part of the Site Plan Approval (SPA) process and in support of the redevelopment application for the Phase Two Property. During this teleconference meeting, Shell informed the City that soil data (between 1998 and 2001 and limited additional data as recently as 2023 collected as part of a geotechnical investigation), and groundwater data (from 1998/2000 to present) are already available. Shell further indicated that although historical data (total petroleum hydrocarbons [TPH] gas/diesel from 2000/2001) would not meet the O.Reg.153/04 petroleum hydrocarbon (PHC) fractionation requirement, the most recent limited soil sampling and groundwater data with PHC fractionation exists and the available historical data can be used to document overall soil and groundwater conditions at the Phase Two Property. Shell confirmed to the City that impacts are present on and off-site and the reports documenting soil and groundwater conditions on and off-site have previously been provided to the City, Ministry of Environment, Conservation and Parks (MECP) and the off-site property owners. The City indicated that they will accept utilizing existing and available historical data to prepare the Phase Two ESA report in O.Reg. 153 format. The City further indicated that they would expect the Phase Two ESA report to be updated with an addendum post KDR documenting the resultant conditions.

Based on the above, Shell has requested that AtkinsRéalis prepare an Updated Phase Two ESA of the Phase Two Property documenting available soil and groundwater analytical results in O.Reg. 153/04 (as amended) report format to support the future redevelopment and SPA process, but not for the purpose of filing a Record of Site Condition (RSC) with the MECP.

The final proposed site plan for the redevelopment is currently under development by others. The boundaries for the Phase Two Property for purposed of this Phase Two ESA is based on the existing site plan provided to AtkinsRéalis at the time of writing the Updated Phase Two ESA report.

Site Description and Background

The Phase Two Property is located at the northwest corner of the intersection of Prince of Wales Drive and Meadowlands Drive in Ottawa, Ontario. The Phase Two Property is bound by a commercial property (Rideauview shopping mall) to the north and west, with the Rideauview shopping mall parking lot to the north, commercial property (Great Canadian Oil Change) to the south (across Meadowale Drive) and residential (apartment buildings) to the east (across Prince of Wales Drive).

The Phase One ESA identified the following seven (7) Areas of Potential Environmental Concern (APECs):

- APEC 1 – Tank Nest and Pump Islands. There are five (5) underground storage tanks (USTs) present in the tank nest, located by the northern portion of the Phase One Property and four pump islands located by the eastern portion of the Phase One Property.
- APEC 2 – Former Waste Oil Tank. The former waste oil tank associated with historical operation of a rapid lube facility located south of the convenience store.
- APEC 3 – Former Motor Oil Storage Tanks. The two former motor oil tanks associated with historical operation of a rapid lube facility located northwest of the convenience store.
- APEC 4 (4a and 4b) – Potential Historical Backfill Material. Fill material was identified at the Phase One Property during previous investigations. Potential importation of fill of unknown quality during construction/development in 1958/1960 of the gas station and rapid lube facility and tank upgrades in 1985/1986 at the Phase One Property.

  Potential dry-cleaning operation (Sentinel Cleaners) and ERIS database identified waste generator of halogenated solvents on property 1430 Prince of Wales Drive located adjacent north/northwest of the Phase One Property. Potential dry-cleaning business (Meadowland Cleaners) and ERIS database identified waste generator of halogenated solvents on property 888 Meadowlands Drive located south/southwest of the Phase One Property.
- APEC 5– Former Gas Station. Top-Valu Gas Bar was identified adjacent north (1430 Prince of Wales Drive) of the Phase One Property.
- APEC 6 – Potential Former Gas Station. Based on the 1998 ESA report and aerial photographs, a former gasoline station appeared to be located at 1375 Prince of Wales Drive east of the Phase One Property.
- APEC 7 – Current Oil Changing Facility and Potential Dry-Cleaning Operation. Historically, a service station and currently oil changing business/facility exist on the property at 1448 Prince of Wales Drive located south/southeast of the Phase One Property.

Based on the APECs identified above that are a result of current and historical Potential Contaminating Activities (PCAs) identified in the Phase One ESA, one or more of potential contaminants of concern (PCOC) were identified as benzene, toluene, ethylbenzene, xylene (BTEX), petroleum hydrocarbon compounds fractions F1 to F4 (PHCs F1 to F4), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs) and metals in soil and/or groundwater.

Given the status of the Phase One Property and the presence of seven (7) APECs, an Updated Phase Two ESA will be required prior to the submission of a Record of Site Condition (RSC) with the Ministry of the Environment, Conservation and Parks (MECP)

Updated Phase Two ESA Report (O.Reg. 153 format)

The review of available current and historical soil and groundwater analytical results (2022/203) indicated concentrations exceeding the selected MECP Table 3 SCSs are present at the Phase Two Property.

Elevated sodium adsorption ratio (SAR) and electrical conductivity (EC) values in soil are considered to be a result of historic and current road salt application activities at the Phase Two Property and within surrounding road allowances. Elevated vanadium in sub-surface (>1.5 m bgs) soil is potentially naturally occurring (not handled by Shell). Localized surficial lead and vanadium concentration in soil is most likely attributable to imported fill brought to the Phase Two Property. BTEX and PHC impacts in soil and groundwater are most likely related to the retail gas station and former rapid fuel facility at the Phase Two Property.

Summary of COC exceeding the applicable MECP Table 3 SCS in soil and ground water is presented below:

Location Exceeding SCS	Depth (m bgs)	Contaminant of Concern	Table 3 SCS	Max. Concentration Soil µg/g) Groundwater (µg/L)
Soil				
BH23-01-011	0.0-0.8	SAR	12	32
BH23-01-03	1.5-1.8	EC	1.4	2.6
BH23-01-04	1.8-2.4	Vanadium	88	120
BH23-03-01	0.0-0.8	Lead	120	180
BH-5-6	4.5-5.1	Benzene	0.4	29
BH-5-6	4.5-5.1	Toluene	78	125
BH-5-6	4.5-5.1	Ethylbenzene	19	30.1
BH-5-6	4.5-5.1	Xylenes	30	169.8
BH23-01-06	3.0-3.7	PHC F1	65	430
BH23-01-06	3.0-3.7	PHC F2	250	810
Ground Water				
MW-22	-	Benzene	430	5,100
MW-22	-	Xylenes	4,200	7,700
98-2	-	PHC F1	750	13,000
98-2	-	PHC F2	150	14,000
98-3	-	PHC F3	500	32,000
98-3	-	PHC F4	500	17,000

Conclusions

Concentrations exceeding the selected MECP Table 3 SCSs are present in soil and groundwater at the Phase Two Property. Following KDR (planned to be conducted in 2024), the report will be updated with an addendum documenting conditions remaining at the Phase Two Property. Further, AtkinsRéalis on behalf of Shell will complete a screening/due diligence Human Health Risk Assessment (HHRA) based on resultant conditions (post KDR).

This Executive summary provides a brief overview of the Phase Two ESA findings. It is not intended to substitute for the complete report, nor does it detail specific issues discussed within the report. This summary is not to be adopted *in lieu* of reading the complete report.

1. INTRODUCTION

AtkinsRéalis Canada Inc. (AtkinsRéalis) was retained by Shell Canada Products (Shell) to prepare an Updated Phase Two Environmental Site Assessment (ESA) documenting available soil and groundwater analytical results in accordance with the provision of Ontario Regulation (O.Reg.) 153/04 (as amended) report format for the property located at 1440 Prince of Wales Drive, Ottawa, Ontario (herein referred to as the Phase Two Property). The Phase Two Property is currently operated as retail fuel outlet. The geographical location of the Phase Two Property is shown on Figure 1.

A Knock Down and Redevelop (KDR) program is currently planned for the Phase Two Property and is tentatively scheduled for 2024. In regard to this, a teleconference meeting with the City of Ottawa (the City), Shell and AtkinsRéalis was conducted on August 23, 2023. During the meeting, the City indicated that both a Phase One ESA report and a Phase Two ESA report, in O.Reg. 153/04 format, are required to be submitted as part of the Site Plan Approval (SPA) process and in support of the redevelopment application for the Phase Two Property. During this teleconference meeting, Shell informed the City that soil data (between 1998 and 2001 and limited additional data as recently as 2023 collected as part of a geotechnical investigation), and groundwater data (from 1998/2000 to present) are already available. Shell further indicated that although historical data (total petroleum hydrocarbons [TPH] gas/diesel from 2000/2001) would not meet the O.Reg.153/04 petroleum hydrocarbon (PHC) fractionation requirement, the most recent limited soil sampling and groundwater data with PHC fractionation exists and the available historical data can be used to document overall soil and groundwater conditions at the Phase Two Property. Shell confirmed to the City that impacts are present on and off-site and the reports documenting soil and groundwater conditions on and off-site have previously been provided to the City, Ministry of Environment, Conservation and Parks (MECP) and the off-site property owners. The City indicated that they will accept utilizing existing and available historical data to prepare the Phase Two ESA report in O.Reg. 153 format. The City further indicated that they would expect the Phase Two ESA report to be updated with an addendum post KDR documenting the resultant conditions.

Based on the above, Shell has requested that AtkinsRéalis prepare an Updated Phase Two ESA of the Phase Two Property documenting available soil and groundwater analytical results in O.Reg. 153/04 (as amended) report format to support the future redevelopment and SPA process, but not for the purpose of filing a Record of Site Condition (RSC) with the MECP.

The final proposed site plan for the redevelopment is currently under development by others. The boundaries for the Phase Two Property for purposed of this Phase Two ESA is based on the existing site plan provided to AtkinsRéalis at the time of writing the Updated Phase Two ESA report.

1.1 Site Description

The Phase Two Property is located at the northwest corner of the intersection of Prince of Wales Drive and Meadowlands Drive in Ottawa, Ontario. The Phase Two Property is bound by a commercial property (Rideauview shopping mall) to the north and west, with the Rideauview shopping mall parking lot to the north, commercial property (Great Canadian Oil Change) to the south (across Meadowale Drive) and residential (apartment buildings) to the east (across Prince of Wales Drive). All directions are relative to discussion north as shown on the Figures.

The Phase Two Property comprises an 0.18 hectare parcel of land and is currently occupied by an operational retail fuel station, as shown on **Error! Reference source not found.**. Further property information for the Phase Two Property is provided in the table below.

1.2 Property Ownership

Details	Description
Municipal Address(es)	1440 Prince of Wales Drive, Ottawa
Property Owner	Shell Canada Products Limited
Property Identification Number(s) (PIN)	0401-0109 (LT)
Legal Description(s)	PT LT 34, CON BRF, AS IN CR399041 & CR357545 EXCEPT CR4639, CR481854; OTTAWA/NEPEAN
Building(s)	One single storey convenience store with a basement

The Phase Two ESA was authorised by Lee Howell of Shell. Mr. Howell's contact details are listed below.

Person Requesting the Phase Two ESA	Ms. Lee Howell, P.Geo. Program Manager, Soil and Groundwater Solutions Shell Canada Products 400-4th Avenue SW Calgary, Alberta T2P 2H5 Telephone: (416) 995-1674

1.3 Current and Proposed Future Uses

The current property use of the Phase Two Property is commercial and is expected to remain unchanged following the proposed redevelopment activities, scheduled for 2024. As such, the future property use of the Phase Two Property is commercial as defined by O. Reg. 153/ 04 (as amended).

1.4 Applicable Site Condition Standards

The site condition standards (SCSs) for use at this site were selected from the MECP (formerly Ministry of the Environment (MOE)) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act using the approach described by O. Reg. 153/04, as amended. The SCS applicable to the Site have been selected based on the following information:

- The Phase Two Property is not considered an environmentally sensitive area as defined by Section 41 of O. Reg. 153/04 since:
  - The Phase Two Property is not located within an area of natural significance;
  - The Phase Two Property does not include land that is within 30 metres (m) of an area of natural significance or part of such an area; and,
  - The pH of soils measured during the limited soil sampling completed at the Phase Two Property in 2023 were within the required range for comparison to the SCSs (i.e., 5 to 9 for surface soils and 5 to 11 for sub-surface

soils) with the exception of slight pH exceeding the SCS (9.4/9.5 vs 9.0) in two surface soil samples (including its duplicate) out of five soil samples collected from borehole BH23-01 (as discussed in Section 5.6.1). The remainder of the surface and sub-surface soil samples analyzed for pH from boreholes BH23-01 to BH23-03 are within the SCS range of 7.63-7.75 for surface soil and 7.04-7.73 for sub-surface soil.

- The Phase Two Property does not include all, or part of a water body, nor is it adjacent to a water body or include land within 30 m of water body.
- The Phase Two Property is serviced by a municipal drinking water system as defined in the Safe Drinking Water Act, 2002. In addition, six (6) domestic water supply wells, four (4) commercial/irrigation wells and one (1) public water supply well were identified within the Phase Two Study Area (AtkinsRéalis, 2023) based on water well records. These wells were indicated as installed between 1950 and 1967 and likely not in use as the Phase Two Study Area are serviced by the municipal drinking water distribution system (Ottawa River/Britannia Plant). If an RSC is to be submitted for the Phase Two Property, confirmation on the presence of these wells may be required.
- The property is not located within an area designated as a well-head protection area (or equivalent).
- The current property use is commercial and the future property use is proposed to remain as commercial. As such, the industrial/commercial/community property use standards apply to the Phase Two Property.
- Grain size analyses conducted during previous investigations (AquaTerre, 2000) indicated that the predominant soil type at the Phase Two Property comprises medium/fine textured soil.
- The Phase Two Property is not considered a shallow soil property as defined by O. Reg. 153/04 (as amended) since more than 2/3 of the Phase Two Property has more than 2 m of overburden above bedrock.

Based upon the information above, the Table 3 full depth generic site condition standards (Table 3 SCS) for industrial/commercial/community property use in medium and fine textured soils, were selected for comparison with measured soil and ground water concentrations.

2. BACKGROUND INFORMATION

2.1 Physical Setting

2.1.1 Water Bodies

The nearest surface water bodies are Rideau River and Rideau Canal located 200 m east of the Phase Two Property. Based on a review of the topography, regional groundwater flow appears to be northeast/east towards Rideau River.

2.1.2 Areas of Natural Significance

Review of the National Heritage Information Centre (NHIC) database search, the Ministry of Natural Resources and Forestry maps of Natural Heritage System and Areas of Natural and Scientific Interest (ANSI), and the ANSI map provided by ERIS, identified Hogs Back Falls as an ANSI located approximately 420 m east from the Phase Two Property (AtkinsRéalis, 2023).

2.1.3 Topography and Surface Water Drainage

The Phase Two Property is relatively flat with an approximate elevation of 82.88 m above mean sea level (amsl) and slopes gently to the east. With respect to the Phase Two Study Area, the topography generally slopes from the northwest/southwest (84 m amsl) to the east/northeast (80 m amsl).

Regionally, groundwater flows predominantly to the east/northeast. Surface and storm water run-off drain into catch-basins located on the Phase Two Property before being discharged into the municipal storm sewer system within the Prince of Wales Drive and Meadowlands Drive.

2.1.4 Well-Head Protection Areas

The Phase Two Property is not located within a well-head protection area or other such area designed by the City in the official plan for the protection of ground water.

2.1.5 Drinking Water Systems

The Phase Two Property is serviced by a municipal drinking water system as defined in the Safe Drinking Water Act, 2002. In addition, six (6) domestic water supply wells, four (4) commercial/irrigation wells and one (1) public water supply well were identified withing the Phase Two Study Area (AtkinsRéalis, 2023) based on water well records. These wells were indicated as installed between 1950 and 1967 and likely not in use as the Phase Two Study Area are serviced by the municipal drinking water distribution system (Ottawa River/Britannia plant).

2.1.6 Regional Geology

Based on review of the surficial geology and bedrock geology maps presented in the ERIS database report, the stratigraphy of the Phase Two Property is generally described as consisting of Offshore marine deposits - primary material clay and silt underlying erosional terraces (fluvial erosion). The Offshore marine deposits are in turn underlain by limestone, dolostone, shale, arkose, sandstone bedrock (i.e., Shadow Lake Formation).

The review of the previous environmental reports (as discussed in Section 2.2) indicated stratigraphy encountered during drilling generally consisted of fill (sand or sand and gravel) to depths of 1.5 to 3 m underlain by silt or silty clay to a depth of at least 6.7 m. A sandy silt layer (1.5 to 2 m thick) is present at a depth of 4 to 5 m.

2.1.7 Hydrogeology

Based on review of the previous environmental reports (as discussed in Section 2.2), the permeability of the native overburden is relatively low, on the order of 2 x 10^{-7} m/s to an average of 2.3 x 10^{-6} m/s. The water table measurement was completed over the years (as discussed in Section 2.2). Based on the groundwater monitoring results from 2022 and 2023 (as discussed in Section 5.2), the water table is generally encountered in the overburden at depth of approximately 1.22 to 3.97 m below ground surface (bgs). It should be noted that groundwater levels will fluctuate seasonally and water table potentially higher during wet periods (i.e. early spring or fall), or following heavy rainfall. Regionally groundwater flows predominantly to the east/northeast, although measured water levels at the Phase Two Property show evidence of perturbations due to the tank nest (and associated pea gravel backfill) and underground services.

2.2 Past Investigations

A series of environmental reports documenting previous investigations and assessments undertaken at the Phase Two Property between March 1988 and March 2023 were available to AtkinsRéalis for review, including:

1. "*Phase II Environmental Site Assessment, 1440 Prince of Wales Drive, Ottawa, Ontario*", prepared for Shell Canada Products Limited by Jacques Whitford Environmental Ltd. (JWEL), dated March 27, 1998 (Phase II ESA, JWEL, 1998)
2. *"Soils Investigation, C03311, 1440 Prince of Wales Drive, Ottawa, Ontario*", prepared for Shell Canada Products Limited by Aqua Terre Solutions Inc. (Aqua Terre), dated August 28, 2000 (Soils Investigation, Aqua Terre, 2000)
3. *"2001 Remedial Activities, Shell Retail Outlet, 1440 Prince of Wales Drive, Ottawa, Ontario (C03311)*", prepared for Shell Canada Products Limited by Aqua Terre, dated March 26, 2002 (2001 Remedial Activities, Aqua Terre, 2002)
4. *"2002-2003 Remedial Activities, Shell Retail Outlet, 1440 Prince of Wales Drive, Ottawa, Ontario (C03311)",* prepared for Shell Canada Products Limited by Aqua Terre, dated February 3, 2004 (2002-2003 Remedial Activities, Aqua Terre, 2004)
5. "*2004 Progress Report on Remedial Activities, Shell Retail Outlet, 1440 Prince of Wales Drive, Ottawa, Ontario (C03311)",* prepared for Shell Canada Products Limited by Aqua Terre, dated April 9, 2005 (Aqua Terre, 2005)
6. "*2005 Progress Report on Remedial Activities, Shell Retail Outlet, 1440 Prince of Wales Drive, Ottawa, Ontario (C03311)",* prepared for Shell Canada Products Limited by Aqua Terre, dated April 3, 2006 (Aqua Terre, 2006)
7. "*2006 Annual Progress Report, Remedial Activities, Shell Retail Fuel Outlet (C03311), 1440 Prince of Wales Drive Ottawa, Ontario*", prepared for Shell Canada Products Limited by Aqua Terre, dated April 5, 2007 (Aqua Terre, 2007)
8. "*2008-2009 Progress Report on Remedial Activities, Shell Retail Outlet (C03311), 1440 Prince of Wales Drive, Ottawa, Ontario*", prepared for Shell Canada Products Limited by SNC-Lavalin Environment (SLE), dated March 11, 2010 (SLE, 2010)
9. "*2010 Progress Report on Remedial Activities, Shell Retail Fuel Outlet (C03311), 1440 Prince of Wales Drive, Ottawa, Ontario"*, prepared for Shell Canada Products Limited by SLE, dated March 29, 2011 (SLE, 2011)
10. *"2011 Annual Groundwater Monitoring and Sampling Program, 1440 Prince of Wales Drive, Ottawa, Ontario (C03311)*", prepared for Shell Canada Products Limited by CRA, dated April 5, 2012 (CRA, 2012)
11. *"2012 Annual Groundwater Monitoring and Sampling Program, 1440 Prince of Wales Drive, Ottawa, Ontario (C03311)*", prepared for Shell Canada Products Limited by CRA, dated March 15, 2013 (CRA, 2013)

12. *"2013 Annual Groundwater Monitoring and Sampling Program, 1440 Prince of Wales Drive, Ottawa, Ontario (C03311)*", prepared for Shell Canada Products Limited by CRA, dated March 27, 2014 (CRA, 2014)
13. "*2015 Annual Groundwater Monitoring and Sampling Program, 1440 Prince of Wales Drive, Ottawa, Ontario (C03311)*", prepared for Shell Canada Products Limited by GHD Limited (GHD), dated March 14, 2016 (GHD, 2016)
14. "*2016 Annual Groundwater Monitoring and Sampling Program, 1440 Prince of Wales Drive, Ottawa, Ontario (C03311)*", prepared for Shell Canada Products Limited by GHD, dated March 23, 2017 (GHD, 2017)
15. "*2017 Annual Groundwater Monitoring and Sampling Program, Shell Retail Fuel Outlet (C03311), 1440 Prince of Wales Drive, Ottawa, Ontario*", prepared for Shell Canada Products Limited by GHD, dated March 29, 2018 (GHD, 2018)
16. "*2018 Annual Groundwater Monitoring and Sampling Program, Shell Retail Fuel Outlet (C03311), 1440 Prince of Wales Drive, Ottawa, Ontario*", prepared for Shell Canada Products Limited by GHD, dated April 1, 2019 (GHD, 2019)
17. *"Multi-Phase Vacuum Extraction System Removal, Shell Retail Fuel Outlet, 1440 Prince of Wales Drive, Ottawa, Ontario (C03311)"*, prepared for Shell Canada Products Limited by GHD, dated December 2, 2019 (Multi-Phase Vacuum Extraction System Removal, GHD, 2019)
18. "*2019 Annual Groundwater Monitoring and Sampling Program, Shell Retail Fuel Outlet (C03311), 1440 Prince of Wales Drive, Ottawa, Ontario"*, prepared for Shell Canada Products Limited by GHD, dated February 24, 2020 (GHD, 2020)
19. *"2020 Annual Groundwater Monitoring and Sampling Program, Shell Retail Fuel Outlet (C03311), 1440 Prince of Wales Drive, Ottawa, Ontario"*, prepared for Shell Canada Products Limited by GHD, dated August 13, 2020 (GHD, 2020)
20. "*2020 Groundwater Monitoring and Sampling Program, Shell Retail Fuel Outlet (C03311), 1440 Prince of Wales Drive, Ottawa, Ontario*", prepared for Shell Canada Products Limited by SNC-Lavalin Inc. (SNC-Lavalin), dated March 4, 2021 (SNC-Lavalin, 2021)
21. "*2021 Groundwater Monitoring and Sampling Program, Shell Retail Fuel Outlet (C03311), 1440 Prince of Wales Drive, Ottawa, Ontario*", prepared for Shell Canada Products Limited by SNC-Lavalin, dated February 18, 2022 (SNC-Lavalin, 2022)
22. "*2022 Groundwater Monitoring and Sampling Program, Shell Retail Fuel Outlet (C03311), 1440 Prince of Wales Drive, Ottawa, Ontario*", prepared for Shell Canada Products Limited by SNC-Lavalin, dated March 10, 2023 (SNC-Lavalin, 2023)
23. "*Geotechnical Investigation, Proposed Shell Service Station, 1440 Prince of Wales Drive, Ottawa, Ontario"*, prepared for AECOM Canada Ltd. by GEMTEC, dated September 12, 2023 (GEMTEC, 2023)
24. *"Phase One Environmental Site Assessment, 1440 Prince of Wales Drive, Ottawa, Ontario"*, prepared for Shell Canada Products Limited by AtkinsRéalis dated November 21, 2023.

Various off-site investigations were also completed over the years, results of which were provided to the respective off-site property owners under separate cover. Key items and findings derived from the reports related to the Phase Two Property are summarized below.

Phase II ESA (JWEL, 1998):

- A Phase I ESA was completed by JWEL on the Phase One Property in February 1998. Potential for environmental concern was identified from the present on-site land use, and from the adjacent land use to the south (both retail gasoline outlets). Also, environmental concern was associated with former neighbouring land uses to the north and east (retail gasoline outlets). A Phase II ESA was conducted by JWEL in March 1998. The purpose of the investigation was to confirm the presence or absence of subsurface petroleum hydrocarbon contaminated soil and groundwater associated with off-site sources.

- Six (6) boreholes (three [3] monitoring wells included) were advanced on the site. Each of the six (6) boreholes were drilled to a depth of 6.1 m below grade.
- The stratigraphic information recorded during the investigation generally consisted of a surficial covering of asphalt or topsoil followed by silty clay to silty sand. Limestone bedrock was not encountered. The apparent fill layers ranged in depth from approximately 1.4 m to 4.0 m.
- One soil sample which exhibited the greatest vapour concentration was recovered from each borehole and submitted for analyses of benzene, toluene, ethylbenzene, and xylenes (BTEX), total petroleum hydrocarbons (TPH) (gas/diesel), and TPH (heavy oils). One groundwater sample from each monitoring well was submitted for analyses of the parameters listed above. TPH (heavy oils) was not included as no criteria was currently provided from the MOE for this parameter in groundwater.
- Petroleum hydrocarbon staining and light non-aqueous phase liquid (LNAPL) was observed in one soil sample collected from location 98-3.
- Laboratory soil analyses indicated soil samples recovered from locations 98-2 and 98-3 had concentrations of petroleum hydrocarbons that exceeded the MOE, 1997 Table B criteria. The remainder of the tested parameters returned values lower than each of the MOE criteria.
- The concentrations of petroleum hydrocarbons in soil samples analysed from the remainder of the borehole locations BH98-1, BH98-4, BH98-5 and BH98-6 met the MOE, 1997 Table B criteria.
- Laboratory groundwater analyses indicated that concentrations of petroleum hydrocarbons at monitoring wells 98-2 and 98-3 exceeded the MOE, 1997 non-potable groundwater criteria.
- The average hydraulic conductivity of the soil was calculated to be 2.3×10^{-6} cm/s from a rising head test.

Soils Investigation (Aqua Terre, 2000):

- Four (4) boreholes (BH-1 to BH-4) were drilled to investigate soil conditions adjacent to the former Rapid Lube and two (2) of the boreholes (BH-5 and BH-6) were drilled to investigate soil conditions in the vicinity of the pump island to a maximum depth of 6.7 m.
- The stratigraphy was generally described as consisting of fluvial deposits - gravel, sand, silt and clay deposited in modem flood plains (Barnett, 1991). Stratigraphy encountered during drilling consisted of fill to depths of 1.5 to 3 m underlain by silt or silty clay to a minimum depth of 6.7 m.
- The grain size analysis indicated soil at the Phase Two Property comprises medium/fine textured soil.
- Free phase petroleum hydrocarbon was encountered in on-site monitoring wells 98-2 and 98-3 located east and west of the underground gasoline storage tanks on August 8, 2000; passive skimmers were installed in these two wells.
- Analytical results for a sample of the LNAPL suggested the product resembled weathered gasoline.
- All seven soil samples submitted for petroleum hydrocarbon analyses from the on-site drilling program satisfied MOE Table B criteria for medium to fine textured soil, industrial/commercial land use in a non-potable groundwater situation with the exception of the sample from BH-5 which exceeded the Table B criteria for benzene and TPH (gas/diesel).

2001 Remedial Activities (Aqua Terre, 2002):

- Site infrastructure consisted of five (5) underground fibreglass reinforced plastic (FRP) gasoline storage tanks (installed in 1985), a pump island with four (4) dispensers and a steel canopy, and a service station building occupied by a convenience store and the service station kiosk.
- Three (3) boreholes (BH-20, BH-21 and BH-22) were advanced to depths ranging from 6.7 to 7.5 m bgs and were instrumented with monitoring wells (MW-20, MW-21 and MW-22).
- Concentrations of BTEX and TPH (gas/diesel) in analysed soil samples satisfied the selected MOE, 1997 Table B criteria.
- A measurable thickness (i.e., greater than 1 mm) of LNAPL was found in observation/recovery wells OW-1 and OW-2 (which were installed during scheduled piping upgrade in October 2000 at the southeast and northwest

corners of the UST nest to facilitate groundwater management and to allow future monitoring), 98-2, 98-3 and MW-21.
- Groundwater samples collected from three (3) monitoring wells (MW98-1, MW-20 and MW-21) satisfied the selected MOE Table B criteria.
- Passive skimmers were installed in 98-2, 98-3, OW-1 and OW-2.
- Hydraulic conductivity testing (i.e. slug tests) conducted indicated that the conductivity measured in silty clay is on the order of $2x10^{-7}$ m/s.

Progress Reports on Remedial Activities (Aqua Terre, 2004-2007, SLE, 2010 and 2011) and Multi-Phase Vacuum Extraction System Removal report (GHD, 2019):

- Between 2001 to 2010, monitoring and sampling activities continued on the Phase One Property as per the contaminant management plan (CMP) with the MOE.
- Groundwater analytical results between 2001 and 2004 were compared to the MOE, 1997 Table B criteria and between 2004/2005 and 2010 were compared to MOE, 2004 Table 3 standards.
- The groundwater flow based on water levels measured previously indicate gw flow to the east with significant mounding within the existing tank nest
- In 2002, monitoring was conducted approximately biweekly for the majority of the year. A measurable thickness of LNAPL was found in on-site observation/recovery wells OW-1 and OW-2, and monitoring wells 98-2, 98-3, MW-20, MW-21 and MW-22.
- Product recovery from wells using absorbent socks, passive skimmers and manual bailing during routine site visits was initiated in 2000 and continued until February 2004.
- To enhance remediation efforts, in 2003, a multi-phase vacuum extraction (MPVE) system was installed at the Phase Two Property. The MPVE treatment system began operation in February 2004 to remove LNAPL, remediate soil and groundwater to applicable MOE standards at the time and prevent LNAPL from migrating off-site.
- A total of approximately 1,230 L of LNAPL was removed between 2004 and 2008. Measurable thickness of LNAPL were not observed in 2008 or 2009, however a hydrocarbon sheen was observed on groundwater from wells on the Phase Two Property.
- Based on the reduced occurrence and amount of LNAPL in the subsurface, decreased recovery rates of petroleum and the apparent improvement of groundwater quality, MPVE system was shut down in 2008 and decommissioned and removed from the Phase Two Property in 2019.

Groundwater Monitoring and Sampling Programs Reports (CRA 2012 to 2014, GHD 2016 to 2020 and SNC-Lavalin 2021 to 2023):

- Between 2011 and 2022, groundwater monitoring and sampling programs were completed at the Phase One Property as per CMP with the MECP.
- The programs included monitoring headspace organic vapours, water levels, potential presence of LNAPL, manual bailing as required and sampling from six (6) monitoring wells (98-1, 98-2, 98-3, MW-20, MW-21 and MW-22) for analysis of BTEX and petroleum hydrocarbon PHC fractions F1 to F4.
- During these years, some fluctuations in hydrocarbons concentrations, LNAPL and sheen were observed in monitoring well locations (98-2, 98-3, MW-20, MW-21 and MW-22).
- The analytical results were compared with MECP, 2011 Table 3 standards for non-potable groundwater in medium to fine-textured soil.
- During the 2022 groundwater monitoring and sampling program the following results were obtained:
    - Approximately 0.1 L of LNAPL in the form of globules was recovered from monitoring well MW-22. Sheen was observed in four monitoring wells (98-2, 98-3, MW-20, MW-21 and MW-22); this is generally consistent with historical results.

- Concentrations of one or more of benzene, xylenes and/or PHC F1 to F4 (including F4 gravimetric [F4G]) in the analysed groundwater samples collected from three monitoring wells (98-2, 98-3 and MW-21) were above the selected MECP 2011 Table 3 standards.
- Concentrations of PHC F3/F4/F4G noted in the wells in 2022 may be due to the presence of sediment in the samples. Sediment was also noted in wells during well purging prior to sampling. In an attempt to remove sediment from the wells during future groundwater sampling program, monitoring wells were proposed to redevelop and sample using low-flow sampling methodology.

Geotechnical Investigation (GEMTEC, 2023):

- Three boreholes (BH23-01 and BH23-03) were advanced to depths of 9.8 to 10.4 m bgs at the Phase Two Property as part of the Geotechnical investigation conducted in August 2023.
- A layer of fill material was observed in the open hydro-vacuumed holes below the asphalt in borehole BH23-2 and below the pavement structure at boreholes BH23-1 and BH23-3.
- The fill material consisted of grey-brown silt clay/clayey gravel with trace to some sand, trace organic material and extended to a depth of about 1.7 m bgs.
- Grain size analysis conducted from soil sample collected from BH23-01 indicated predominant soil type at the Phase Two Property comprises medium/fine textured soil.

Phase One ESA (AtkinsRéalis, 2023)

- The first developed use of the Phase One Property was determined to be between 1895 and 1945 for residential/agricultural purposes based on the review of aerial photographs and chain of title. The current retail fuel outlet, the Phase One Property was developed for commercial use in 1958.
- Based on the findings of the Phase One ESA, seven (7) on-site Areas of Potential Environmental Concern (APECs) associated with current and historical Potential Contaminating Activities (PCAs) were identified.
- Potential contaminants of concern (PCOCs) were identified as BTEX, PHCs F1 to F4, volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs) and metals in soil and/or ground water.
- Given the status of the Phase One Property as an enhanced property and the presence of seven (7) APECs, an Updated Phase Two ESA was required.

3. SCOPE OF THE INVESTIGATION

3.1 Overview of Site Investigation

The objective of this work program was to document historical soil data, limited additional soil sampling (conducted in 2023 in conjunction with a geotechnical investigation in 2023 to proactively collect soil samples in support of future excess soil management during site redevelopment) and available groundwater analytical results for the Phase Two Property in accordance with the O.Reg.153/04 (as amended) report format to support the future redevelopment and SPA process, but not for the purpose of filing an RSC with the MECP.

The review of the reports indicated that the ESA programs previously implemented (prior to 2023) as well as field programs completed in 2023 included the following:

- Public and private utility locates to confirm the location of subsurface utilities;
- Daylighting to avoid underground utilities;
- Borehole drilling, soil sampling and monitoring well installation;
- Elevation surveying of borehole and monitoring well locations;
- Monitoring well development and purging;
- Ground water monitoring and sampling;
- Laboratory analyses of soil and ground water samples collected;
- Disposal of investigation wastes; and,
- Reporting.

3.2 Media Investigated

3.2.1 Rationale for Media Sampled

The review of past investigations identified soil and groundwater impacts on the Phase Two Property. The Phase One ESA identified a total of ten on-site and off-site PCAs, as shown on **Error! Reference source not found.**. The PCAs resulted in the classification of seven (7) APECs, as shown on **Error! Reference source not found.**.

Potentially affected media in each APEC were soil and ground water. No water bodies are present on the Phase Two Property, therefore, neither surface water quality nor sediment were investigated.

3.2.2 Overview of the Field Investigation

A review of previous investigation reports indicated the field investigation program were conducted as per the scope of work as identified in the report.

3.2.2.1 Soil

The soil investigation conducted at the Phase Two Property included the following (based on the review of previous reports [1998, 2000 and 2001] and 2023 geotechnical soil sampling program):

- Fifteen (15) boreholes to approximate depths of 6.1 to 7.5 m bgs;

    - Soil samples were collected at various depths and submitted for laboratory analysis of BTEX and PHC F1 to F4.
- Soil samples collected from three (3) geotechnical boreholes drilled to approximate depth of 10.4 m bgs.;
    - Soil samples were collected at various depths and submitted for laboratory analysis of one (1) or more of BTEX, PHC F1 to F4, VOCs, metals (including antimony [Sb], arsenic [As], selenium [Se], chromium six [Cr(VI)], mercury [Hg]), cyanide (CN-), pH, hot water soluble boron (B-HWS), electrical conductivity (EC) and sodium adsorption ratio (SAR); and,
- Collected and submitted a representative soil sample for waste classification analysis.

3.2.2.2 Ground Water

The groundwater investigations conducted since 1998/2000 at the Phase Two Property included:

- Instrumentation of three (3) monitoring wells with 3 m screens and three (3) monitoring wells with 4.5 m screens;
- Monitoring headspace vapour readings, measuring water levels and LNAPL recovery (as required); and,
- Well development and collection of groundwater samples from six (6) monitoring wells for laboratory analyses of one (1) or more of BTEX, PHC F1 to F4 and VOCs.

3.3 Phase One Conceptual Site Model

The Phase One Conceptual Site Model (CSM) is based on the information gathered and reviewed as part of the Phase One ESA (AtkinsRéalis, 2023). The Phase One CSM is represented on **Error! Reference source not found.** and **Error! Reference source not found.**, which outline and describe the following features:

- Site features and structures;
- Water bodies located within the Phase Two Study Area;
- Roads (including names);
- Uses of the properties adjacent to the Phase Two Property;
- Areas where PCAs and APECs have been identified; and,
- Any other pertinent on-site or off-site features which serve as potential environmental receptors or contaminant transport mechanisms (e.g., utilities, drains, etc.).

Based on the findings of the Phase One ESA, a total of four (4) on-site PCAs and six (6) PCAs at four (4) off-site properties were identified, as shown on **Error! Reference source not found.**. The on-site and off-site PCAs identified were considered to give rise to seven (7) APECs, which are shown on **Error! Reference source not found.** and summarized in the table below. Associated PCOC are also included in the table below.

Area of Potential Environmental Concern [1]	Location of Area of Potential Environmental Concern on Phase One Property	Potential Contaminating Activity[2]	Location of PCA (on-site or off-site)	Contaminants of Potential Concern[3]	Media Potentially Impacted (Ground water, Soil and/or Sediment)
1	Tank nest and Pump islands	PCA Item 28 – Gasoline and associated products storage in fixed tanks	On-site	PHCs and BTEX	Soil and groundwater
2	Former waste oil tank	PCA Item 52 - Storage, maintenance, fueling and repair of equipment, vehicles and materials used to maintain transportation systems	On-site	PHCs and BTEX	Soil and groundwater
				Metals	Soil
3	Two former motor oil storage tanks	PCA Item 52 - Storage, maintenance, fueling and repair of equipment, vehicles and materials used to maintain transportation systems	On-site	PHCs and BTEX	Soil and groundwater
				Metals	Soil
4a	General area on the Phase One Property	PCA Item 30 – Importation of fill material of unknown quality	On-site	PHCs and BTEX	Soil and groundwater
				VOCs, Metals and PAH	Soil

Area of Potential Environmental Concern [1]	Location of Area of Potential Environmental Concern on Phase One Property	Potential Contaminating Activity[2]	Location of PCA (on-site or off-site)	Contaminants of Potential Concern[3]	Media Potentially Impacted (Ground water, Soil and/or Sediment)
4b		PCA Item 37 - Operation of dry-cleaning equipment		VOCs	Soil and groundwater
5	Northern boundary of Phase One Property	PCA Item 28 – Gasoline and associated products storage in fixed tanks	Off-site	PHCs and BTEX	Soil and groundwater
6	Eastern boundary of Phase One Property	PCA Item 28 – Gasoline and associated products storage in fixed tanks	Off-site	PHCs and BTEX	Soil and groundwater
7	Southern boundary of Phase One Property	PCA Item 28 – Gasoline and associated products storage in fixed tanks	Off-site	PHCs and BTEX	Soil and groundwater
		PCA Item 52 - Storage, maintenance, fueling and repair of equipment, vehicles and materials used to maintain transportation systems		Metals	Soil

Area of Potential Environmental Concern [1]	Location of Area of Potential Environmental Concern on Phase One Property	Potential Contaminating Activity[2]	Location of PCA (on-site or off-site)	Contaminants of Potential Concern[3]	Media Potentially Impacted (Ground water, Soil and/or Sediment)
1. Area of potential environmental concern means the area on, in or under a Phase One Property where one or more contaminants are potentially present, as determined through the Phase One Environmental Site Assessment, including through, (a) identification of past or present uses on, in or under the Phase One Property, and (b) identification of potentially contaminating activity. 2. Potentially contaminating activity means a use or activity set out in Column A of Table 2 of Schedule D that is occurring or has occurred in a Phase One Study Area. 3. When completing this column, identify all contaminants of potential concern using the Method Groups as identified in the "Protocol for in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, March 9, 2004, amended as of July 1, 2011, as specified below: ABNs, CPs, 1,4-Dioxane, Dioxins/Furans, PCDDs/PCDF, OCs, PHCs, PCBs, PAHs, THMs, VOCs, BTEX, Ca, Mg, Metals, As, Sb, Se, Na, B-HWS, Cl-, CN-, Electrical Conductivity, Cr (VI), Hg, Methyl Mercury, high pH, low pH, SAR					

3.4 Deviations from Sampling and Analysis Plan

Review of the previous investigation reports indicated sampling had been completed according to the scope of work documented in the report and no deviations were noted.

In conjunction with the geotechnical investigation completed in 2023, additional soil sampling was collected in support of future excess soil management during site redevelopment as per the scope of work established. As well, routine annual groundwater monitoring and sampling was completed as per the existing CMP for the Phase Two Property. No deviations were noted from the established scope of work for soil and groundwater sampling.

3.5 Impediments

The review of previous investigations did not indicate any impediments during the implementation of the scope of work.

No physical impediments were encountered during the completion of the 2023 field program (i.e., soil sampling and routine annual groundwater monitoring and sampling).

4. INVESTIGATION METHOD

4.1 General

The field programs (soil and groundwater investigations) between 1998 and 2010 were conducted using field and laboratory analysis protocols based on applicable regulatory requirements at time. Soil and/or groundwater investigations post 2011 were conducted using field and laboratory analysis protocols in general accordance with O.Reg. 153/04, preferred operating procedures (POPs) utilized by the consultant at the time, generally accepted industry practices and a quality assurance/quality control (QA/QC) program as described within the reports.

4.1.1 Health and Safety

Health and Safety Plans (HASP) was developed in compliance with regulatory requirements at the time, as well as Shell and AtkinsRéalis programs and policies and implemented during the field programs between 2000 and 2010 and 2020 and 2023.

4.1.2 Utility Clearances

A review of past investigation reports indicated public and/or private utilities prior to intrusive investigations were completed and are documented in those reports.

The 2023 soil sampling program was completed in conjunction with the geotechnical investigation program. Public and private utilities, as well as hydro-vacuum, was completed prior to the geotechnical drilling (completed by others) to ensure boreholes were clear of potential underground infrastructure in advance of drilling.

4.2 Drilling and Excavating

Drilling at the Phase Two property was completed by various contractors over the years under field supervision by JWEL in 1998 and AtkinsRéalis in 2000 and 2001.

In 2023, geotechnical drilling was completed on August 10 and 11, 2023 by George Downing Estate Drilling Ltd. of Grenville-Sur-La-Rouge, Quebec under the field supervision by GEMTEC Consulting Engineers and Scientists Limited (GEMTEC). Hydro-vacuum was also completed to verify that the boreholes were clear of potential underground infrastructure/utilities in advance of drilling. Each borehole location was cleared to an approximate depth of 2.0 m bgs.

Boreholes at the Phase Two Property were advanced using a truck-mounted drill-rig. During previous investigations completed prior to 2023, boreholes were drilled to approximate depths of 6.1-7.5 m bgs. In 2023, the three (3) geotechnical investigation boreholes were drilled to approximate depths of 10.4 m bgs.

No test pits or excavations were completed at the Phase Two Property during previous investigations (1998, 2000 and 2001) or during the geotechnical drilling in 2023.

4.3 Soil: Sampling

Soil samples were collected from the drilled portion of each borehole using the split spoon samplers. In addition, in 2023, soil samples from the daylighted portion of the geotechnical boreholes were collected every 0.6 m using a long-handled sampling tool, where possible.

Recovered soil samples were divided into two (2) portions, the first for possible laboratory analysis and the second for field logging/screening. The portion retained for possible laboratory analysis was collected in laboratory-supplied sampling containers as described in Section 4.12.1 and submitted for analysis. The second portion was placed in a sealable sample bag for field logging/screening. A new pair of nitrile gloves were donned between contact with each sample. Details of field screening methodology are described in Section 4.4

During previous investigations, soil samples were submitted as per requirements of the laboratory at the time.

During the 2023 limited soil sampling program, soil samples were placed immediately in coolers equipped with ice to initiate cooling. Samples were maintained in a cold state until submitted to Bureau Veritas Laboratories (BV) located in Mississauga, Ontario. Soil samples which were collected for PHC F1/BTEX analysis were collected in pre-weighed laboratory supplied vials containing methanol preservative. The soil characteristics logged at each borehole location are provided within the borehole logs presented in Appendix A.

4.4 Soil: Field Screening Measurements

Soil samples collected for field logging/screening were inspected and logged for soil type, moisture, colour, structure, texture and visual evidence of impact. Maximum headspace vapour readings were measured using an organic vapour meter (OVM), operated in methane elimination mode and calibrated in the field to a known hexane standard.

Potential worst-case sample selection for non-volatile parameters (e.g., metals & inorganics) was based on visual observation of the sample (e.g., staining), geology/hydrogeology and knowledge of contaminant behaviour.

4.5 Ground water Monitoring Well Installation

4.5.1 Installation Details

Six (6) monitoring wells were installed at the Phase Two Property during previous investigations. Monitoring well locations are shown on **Error! Reference source not found.**.

Monitoring wells 98-1 to 98-3 were constructed using 5.1 cm diameter flush threaded PVC piping and installed with 3 m long screens to depths of approximately 6.1 m bgs. Monitoring wells MW-20 to MW-22 were installed with 4.5 m long screens. All wells were completed with solid risers above the screens to ground surface. A clean silica sand pack was placed around each screen and isolated with hydrated bentonite to slightly below grade. The wells were completed with flushmount protective casings set in concrete and capped with clean j-plugs.

Monitoring well construction details are presented in the borehole logs (Appendix A).

4.5.2 Development Details

Monitoring well development after installation in 1998 and 2001 was completed based on applicable regulatory requirements and field protocols at the time. The monitoring wells were equipped with dedicated low-density polyethylene (LDPE) tubing and inertial foot valves.

In 2023, due to the presence of sediment observed during groundwater sampling program in 2022, six (6) monitoring wells on the Phase Two Property were redeveloped by purging approximately one (1) borehole volume of water (calculated as the volume of standing water plus the volume of water in the sand pack surrounding the well screen) or purging the well dry to obtain representative groundwater samples prior to the 2023 annual groundwater monitoring and sampling program. The monitoring wells were developed by manually moving the inertial foot valve from the top of the screened area to the bottom to ensure development of the whole screen, occasionally agitating the bottom of the well to stir up and remove any sediment built up.

4.6 Ground Water: Field Measurement of Water Quality Parameters

Groundwater monitoring and sampling has been completed from the six (6) monitoring wells on the Phase Two Property since 1998. Groundwater monitoring and sampling during previous investigations (between 1998 and 2020) was completed as per the regulatory requirements and field protocols at the time.

During the 2021 to 2023 groundwater monitoring and sampling programs, to assess the progress of well purging, pH, conductivity, oxidation reduction potential (ORP), dissolved oxygen (DO), turbidity and temperature readings were measured using a Horiba U-22/U-52 Water Quality meter (Horiba) calibrated by the rental equipment supplier or in the field by AtkinsRéalis personnel. Alternatively, pH, conductivity and temperature readings were measured using a Hanna Instruments H198129 meter. Readings were taken between well volumes purged. Purging was stopped, and ground water samples collected when readings stabilized (generally within 10%) and the water was visually free from silt, where possible. This was to ensure standing water was removed from the well, and groundwater that is representative of the aquifer is sampled.

4.7 Ground water Sampling

Groundwater monitoring and sampling has been completed at the Phase Two Property since 1998. Further, since 2001, an ongoing groundwater monitoring and sampling program, as per the established CMP with the MECP, is being completed at the Phase Two Property from one or more of monitoring wells 98-1 to 98-3 and MW-20 to MW-22.

Prior to groundwater sampling, headspace vapour readings in each monitoring well were measured upon removal of the well cap with an OVM operated in methane elimination mode and calibrated in the field to a known hexane standard. Water levels were measured relative to the top of riser pipe using an oil-water interface probe. Wells were also examined for the presence of LNAPL using the interface probe and a clean bailer.

Groundwater samples were previously collected using standards purging methodology or low-flow sampling using peristaltic pump. During the 2023 annual groundwater sampling program, groundwater samples were collected using low-flow purging and sampling techniques using a peristaltic pump. The pump was equipped with disposable LDPE tubing and flexible silicon tubing. The pump was installed with the inlet placed at the approximate mid-point of the wetted screen interval of the monitoring well (ASTM, 2009) to facilitate ground water sampling near the zone of saturated soil impact and was connected to the peristaltic pump. Dedicated, disposable LDPE tubing was also connected from the pump to a flow-through cell equipped with a Horiba U-22/U-52 water quality monitoring system.

Prior to sampling, all wells were purged until a minimum of three (3) consistent readings were obtained for pH, ORP, DO, conductivity, turbidity temperature and (where possible) while maintaining a consistent drawdown that was less than 25% of the distance from the top of the screened interval to the pump intake. The parameters were measured as described in Section 4.6.

Samples submitted for laboratory analysis were collected in the field following protocols designed to minimize the loss of volatile constituents and using laboratory supplied sampling containers as described in Section 4.12.1. Collected ground water samples were submitted for laboratory analyses of one or more of BTEX, PHC F1-F4 and VOCs.

4.8 Sediment: Sampling

No surface water bodies or sediment are present on the Phase Two Property and as such, no sediment sampling was undertaken.

4.9 Analytical Testing

Laboratory analyses of soil and groundwater was completed by BV of Mississauga, Ontario [previously Philip Analytical Services Corporation (PASC), PSC Analytical Services (PSC) and Maxxam Analytics Inc. (Maxxam)]. The BV Mississauga facility is accredited by the Standards Council of Canada (SCC) and follow analytical protocols outlined in O. Reg. 153/04 (as amended).

4.10 Residue Management Procedures

Waste materials generated during the field programs included:

- Hydro-vacuum slurry
- Soil cuttings
- Purge water

Hydro-vacuum slurry generated during borehole daylighting and soil auger cuttings generated during drilling programs were classified as non-hazardous waste and disposed off-site in accordance with O. Reg. 347.

Purged groundwater generated during well development and groundwater monitoring and sampling programs were temporarily stored in 205 L drums and subsequently disposed off-site in accordance with O. Reg. 347.

4.11 Elevation Surveying

An elevation survey during past investigations was completed relative to a local benchmark (i.e., a fire hydrant on the east side of Prince of Wales Drive), which was assigned an elevation of 100 m above local datum (ald).

4.12 Quality Assurance and Quality Control Measures

A QA/QC program was implemented to minimize and quantify impacts introduced during sample collection, handling, shipping and analysis. As part of the QA/QC program, sampling protocols included minimizing sample handling;

submitting field QA/QC samples; using dedicated sampling equipment; using sample specific identification and labelling procedures; and using chain of custody records.

4.12.1 Sample Containers, Preservation, Labelling and Handling

Soil and groundwater samples submitted for laboratory analysis during past investigations were collected following the regulatory requirements and field protocols at the time.

The 2023 soil and groundwater sampling program was completed as per the current field protocols (SNC-Lavalin, 2022) as described below and in subsequent Sections 4.12.2.

A new pair of nitrile gloves were donned by field staff between each soil and ground water sample location and when handling dedicated supplies.

During the field work, a permanent waterproof marker was used to label the sample containers. Upon sample retrieval, samples for analysis were collected directly into laboratory containers (with or without preservatives depending on analytical suites) and placed into coolers with ice. Soil and ground water samples for laboratory analysis were collected following protocols designed to minimize the loss of volatile constituents, where applicable. The requested chemical analyses for the samples were documented on a chain of custody that was placed in the cooler with the samples. Prior to shipment, signed and dated custody seals were affixed to the coolers. The coolers were then delivered to the laboratory.

A consistent approach to identifying samples was applied to ensure proper identification of each sample, validity of analytical results and continuity between multiple series of site investigations. The approach for soil sample labelling was to use a three-component sample name:

Sample prefix (i.e., BH, EX);

Location number (i.e., BH-101); and,

Sequential sample number (i.e., BH-101-02).

For ground water sample labelling, a two (2) component sample number was used (i.e., MW-101). All water samples collected from the same location, over a period of time, typically have the same sample prefix and location number, and the sampling date is used to differentiate between sample programs.

4.12.2 Sample Equipment Cleaning Procedure

The non-dedicated soil sampling equipment (e.g., hand tools,) was brushed to remove loose soil and subsequently cleaned with detergent (Liquinox®) and distilled water between sample collection to minimize the potential for cross-contamination between samples. Dedicated disposable nitrile gloves were worn during the handling of each sample.

Prior to use of non-dedicated field equipment for ground water monitoring and sampling, the interface probe was washed using Liquinox and rinsed with distilled water to minimize the potential for cross-contamination between each well.

4.12.3 Field and Laboratory QA/QC Samples

Field QA/QC samples for soil and/or ground water during previous investigations were completed as per regulatory requirement and field protocol at the time. For the 2023 soil sampling and annual groundwater monitoring and sampling program field QA/QC samples included the following:

- A total of two (2) field duplicate soil samples were collected and submitted for laboratory analysis of BTEX, PHC F1 to F4, VOCs and metals. The results are presented in Table B.1.
- One trip blank (methanol vial) was placed in a cooler and submitted for laboratory analysis of VOCs and PHC F1. The results are presented in Table B.2.
- One (1) field duplicate of groundwater sample was collected and submitted for laboratory analysis of VOCs (including BTEX). The results are presented in Table C.1 and Table C.3.
- One field and trip blank water sample was submitted for laboratory analysis of BTEX and/or PHC F1 to F4. The results are presented in Table C.2.
- One trip and field blank water sample was submitted for laboratory analysis of VOCs. The results are presented in Table C.4.

4.12.4 Deviations from QA/QC Program

For the 2023 soil sampling and groundwater monitoring and sampling program, the QA/QC program was generally completed in accordance with the regulatory requirement and field protocol prior to the implementation of the field program.

4.12.5 Data Review and Validation

Sampling data generated during past investigations by AtkinsRéalis, and including the 2023 investigation, were reviewed and verified by AtkinsRéalis personnel to ensure that data conforms to and satisfies project objectives[2]. Data verification included ensuring that calibration of field instruments was satisfactory and field blank and field duplicates meet acceptable criteria. The data verification and reporting process for the laboratory data involved ensuring that the holding times, precision, accuracy, laboratory blanks, and detection limits are within acceptance criteria. If significant variances were identified, the final report was reviewed to determine if the overall project objectives are met and/or if additional investigations or corrective actions are required.

[2] Except where indicated in this Report, additional samples were collected by others during previous investigations. AtkinsRéalis makes no claim for accuracy of results in relation to project objectives and does not accept related liability.

5. REVIEW AND EVALUATION

5.1 Geology

Details of soil stratigraphy observed in the boreholes advanced at the Phase Two Property during previous investigations in 1998, 2000 and 2001 and during geotechnical investigations in 2023 are presented on the borehole logs provided in Appendix A.

The regional surficial geology consists of Offshore marine deposits - primary material clay and silt underlying erosional terraces (fluvial erosion). The bedrock geology in the area belongs to the group of the Shadow Lake Formation consisting of limestone, dolostone, shale, arkose, sandstone bedrock.

In general, the soil stratigraphy at the Phase Two Property consisted of fill (sand or sand and gravel) to depths of 1.5 to 3 m underlain by silt or silty clay to a depth of at least 6.7 m. The grey silty clay layer extends to depth of 8.2 to 8.4 m and grey silt with trace to some clay and trace gravel was encountered below the grey silty clay layer at depths of 8.2 to 8.4 m. A sandy silt layer (1.5 to 2 m thick) is present at a depth of 4 to 5 m bgs and at depths of 9.8 to 10.4 m bgs. Bedrock was not encountered to the maximum depth of investigation (10.4 m bgs) during the past or current investigations at the Phase Two Property.

Given that the average thickness of overburden is greater than 2.0 m, the Phase Two Property is not considered to be a shallow soil property as defined by O. Reg. 153/04 (as amended).

The review of previous investigations indicated that based on the encountered geology and the measured depth to ground water (discussed in Section 5.2) it appears that only one aquifer was investigated, and an aquitard was not identified.

5.2 Ground water: Elevations and Flow Direction

Ground water wells screened to straddle water table were used to determine ground water flow direction. As only one aquifer was investigated, only one ground water contour pattern was determined.

Ongoing groundwater monitoring have been completed at the Phase Two Property since 2000 and discussed under various past investigation reports (discussed in Section 2.2). Groundwater levels were measured at the six (6) monitoring wells at the Phase Two Property between 2022 and 2023 and the results are summarized in Table 1.

The ground water elevations were measured with respect to a local datum and were used to establish the inferred shallow horizontal ground water flow direction at the Phase Two Property. The depth to ground water ranged from approximately 1.22 m bgs (98-2) to 3.97 m bgs (98-1). Corresponding water elevations in the monitoring wells ranged from 96.36 m ald (98-1) to 98.46 m ald (98-2). The ground elevations and the interpreted ground water flow direction for June 2022 and June 2023 are depicted on Figures 6A and 6B, respectively. The inferred shallow ground water flow is interpreted to be towards the south based on the contour maps however, the regional groundwater flow is to the east/northeast. Based on the previous investigation reports (SNC-Lavalin, 2008-2009; SNC-Lavalin, 2010), the direction of groundwater flow was interpreted as generally to the east with significant mounding and appeared to be radial, emanating from the existing tank nest. The groundwater flow interpretation in 2022/2023 is different from previous investigations mentioned above, likely due the absence of monitoring wells located along the Prince of Wales Right of Way and associated ground water table measurements. The depths to groundwater are within the range of historical groundwater elevation data collected since 2005.

As discussed under various past investigation reports (discussed in Section 2.2), LNAPL has been identified in monitoring wells 98-2, 98-3, OW-1, OW-2, MW-20, MW-21 and MW-22 at the Phase Two Property. Manual LNAPL recovery was initiated in 2000 and continued until February 2004 with passive skimmers and manual bailing of accumulated LNAPL. In February 2004, a MPVE system was installed to recover LNAPL and petroleum hydrocarbon impacted groundwater following an assessment of remedial alternatives. A total of 1,230 litres of LNAPL was removed between 2004 and 2008. Measurable thickness of LNAPL were not observed in 2008 or 2009 however a hydrocarbon sheen was observed on groundwater from several on-site monitoring wells. Based on the reduced occurrence and amount of LNAPL in the subsurface, decreased recovery rates of petroleum hydrocarbons and the improvement of groundwater quality at the Phase Two Property, the MPVE system was shut down in 2008.

Subsequent to this, as part of the on-going monitoring CMP for the Phase Two Property, monitoring wells continued to be monitored for presence or absence of LNAPL in monitoring wells at the Phase Two Property. Minimal amount of LNAPL was observed intermittently in monitoring wells 98-3 and/or MW-22 between 2013 and 2022 (GHD, 2020; SNC-Lavalin, 2023).

During the 2023 CMP groundwater and monitoring sampling program, no measurable LNAPL was observed, however, sheen was observed in monitoring wells 98-2, 9-3, MW-21 and MW-22. This is consistent with previous monitoring events at the Phase Two Property (as discussed above and in Section 2.2).

Based on the review of City of Ottawa engineering design standards for water main and sewer services and based on the water table depth (1.22 to 3.97 m bgs) at the Phase Two Property, there is potential for the utility services to intercept the shallow ground water.

5.3 Ground water: Hydraulic Gradients

The horizontal hydraulic gradient at the Phase Two Property, calculated using two sets of ground water level triangulation data (2022 and 2023) was determined to be 0.04 metres per metre (m/m). Vertical hydraulic gradients were not assessed as part of this Updated Phase Two ESA Report.

5.4 Fine-Medium Soil Texture

Grain size analysis completed at the Phase Two Property (Aqua Terre, 2000 and GEMTEC, 2023) indicated that the overburden would be considered medium to fine textured as defined by O. Reg. 153/04 (as amended). As such, the SCS for medium/fine textured soil were selected.

5.5 Soil: Field Screening

Soil field screening techniques employed during the field assessment included recording visual observations of soil characteristics and measurement of headspace vapour concentrations.

During the limited additional soil sampling program in 2023, maximum OVM reading of 24% LEL was measured in soil sample collected from borehole BH23-01 at depth of 3.0 to 3.7 m bgs. OVM readings measured from soil samples collected from the remaining boreholes were generally less than 5 ppmv.

Field observations and field screening results for soil samples are provided in the borehole logs included in Appendix A.

5.6 Soil Quality

The soil analytical results from the 2023 limited soil sampling program along with the soil analytical results from previous investigations are presented in **Error! Reference source not found.** to 5. Copies of the laboratory Certificates of Analysis are provided in Appendix B. The following sections discuss the soil sample analytical results.

5.6.1 Soil: pH

Five (5) surface soil (< 1.5 m bgs) samples which includes one (1) duplicate sample and fifteen (15) sub-surface soil (> 1.5 m bgs) samples which includes one (1) duplicate sample were analysed for pH. The pH analytical results are presented in Table 2.

The surface sample pH values in three soil samples were measured between 7.63 - 7.75, which are within the acceptable range for surface soils (i.e., 5 – 9) collected from boreholes BH23-01 to BH23-03. Two (2) pH values including one (1) duplicate were above the upper limit of the acceptable range in an analysed surface soil samples collected from borehole BH23-01 at depths of 0.0-0.8 m bgs; however, the average pH result (including BH23-01) of surface soil samples collected was 8.41, which is within the acceptable range of 5 to 9. As such, the result for the sample collected at BH23-01 is considered to be within the acceptable range of 5 to 9 and does not establish the Phase Two Property as an environmentally sensitive area.

The sub-surface samples pH values were measured between 7.04 – 7.73, which are within the acceptable range for sub-surface soils (i.e., 5 – 11) collected from boreholes BH23-01 to BH23-03.

Based on the above, the Phase Two Property is not considered sensitive, as per Section 41 of O. Reg. 153/04 (as amended).

5.6.2 Soil: Total Metals and Inorganics

A total of twenty (20) soil samples, which included two (2) duplicate samples, were analysed for metals and inorganic parameters. Analytical results for soil samples analyzed for metals and inorganic parameters are shown in Table 2.

Concentrations of SAR and/or electrical conductivity exceeded the selected standards in soil samples collected from boreholes BH23-01 to BH23-03 at depth between 0.0 to 5.2 m bgs. The vertical extent of the impacts were delineated at these locations. The locations of the SAR and/or electrical conductivity exceeding the MECP Table 3 SCS are shown on Figure 7.

Concentration of lead exceeded the selected standards in one soil sample collected from borehole BH23-03 at depth of 0.0 to 0.8 m bgs. The vertical extent of the impact is delineated at this location. The location of lead exceeding the MECP Table 3 SCS is shown on Figure 8.

Concentration of vanadium exceeded the selected standards in soil samples collected from boreholes BH23-01 to BH23-03 at depths between 0.0 and 3.7 m bgs. The vertical extent of the impacts were delineated at these locations. The location of vanadium exceeding the MECP Table 3 SCS are shown on Figure 8.

Concentrations of metals and inorganics in all remaining analysed soil samples were below the selected standards.

The SAR exceeding the SCS is believed to be a result of current and historical application of road salt (e.g., application of salt to adjacent roadways, walkways, driveways and/or parking lots). In accordance with O. Reg. 153/04 (as amended), if the QP determines that an applicable SCS is exceeded solely because a substance has been applied to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both, the applicable SCS is

deemed not to be exceeded for the purposes of an RSC. Although an RSC is not being pursued for the Phase Two Property, following the approach defined by O. Reg. 153/04 (as amended), the SAR value identified in boreholes BH23-01 to BH23-03 is not considered as exceeding the SCSs and SAR is not considered a COC for the Phase Two Property.

5.6.3 Soil: PHCs & BTEX

Soil analytical results for BTEX and PHC F1 to F4 (as applicable) are shown in Table 3 and Figure 9.

During the 2023 limited soil sampling program, a total of twenty (20) soil samples, which included two (2) duplicate samples, were analysed for PHC F1 to F4 and BTEX. Concentrations of one or more of benzene, ethylbenzene, xylenes, PHC F1 and PHC F2 exceeded the selected MECP Table 3 SCS in soil samples collected from borehole BH23-01 at depths between 0.0 and 7.5 m bgs. Benzene concentration is not vertically delineated at this location. Concentrations of BTEX and PHC F1 to F4 in all soil samples collected from boreholes BH23-02 and BH23-03 were below the selected MECP Table 3 SCS.

Previous investigations soil analytical results of BTEX and petroleum hydrocarbons extracted from the 2000 and 2001 reports are shown in Tables 3a and 3b, respectively. Soil analytical results table from the 1998 Phase II ESA report was not available, as such, it was not included in this report. The previous investigations soil analytical results were compared to the selected MECP Table 3 standards (as applicable) and shown in Figure 9. The soil analytical results for the 1998 Phase II ESA was not available for comparison to the selected MECP Table 3 SCS, however, the review of the report indicated that concentration of BTEX in soil samples from 98-2 and 98-3 locations exceeded the selected standards at the time and consequently exceeded the selected MECP Table 3 SCS. Concentrations of BTEX and petroleum hydrocarbons in soil samples collected from boreholes BH98-1, BH98-4, BH98-5 and BH98-6 satisfied the standard at the time.

Overall, concentrations of benzene, ethylbenzene, toluene, xylenes, PHC F1 and F2 exceeding the selected MECP Table 3 SCSs are present at the Phase Two Property.

5.6.4 Soil: VOCs

A total of twenty (20) soil samples, which included two (2) duplicate samples, were analysed for VOCs. Soil analytical results for VOCs are shown in Table 4.

Concentrations of VOCs in all analysed soil samples were below the selected standards.

5.6.5 Soil: Waste Characterization

During the 2023 limited soil sampling program, one (1) soil sample was submitted for waste characterization, including Toxicity Characteristic Leaching Potential (TCLP) and ignitability analysis. The results of the TCLP analyses were compared to the O. Reg. 347 (as amended) Schedule 4 Leachate Quality Criteria and are presented in Table 5. The analytical results indicated that the soil was non-flammable and that the leachate concentrations were below the Schedule 4 Leachate Criteria for all parameters analysed. Therefore, the soil was characterized as non-hazardous for the purposes of off-site disposal in the Province of Ontario. Laboratory Certificates of Analysis for the waste characterization sample are provided in Appendix B.

Soil waste characterization analytical results from previous investigations (2000 and 2001) are presented as Tables 5a and 5b, respectively. The analytical results indicated that the soil was non-flammable and that the leachate concentrations were below the Schedule 4 Leachate Criteria at the time for all parameters analysed.

5.6.6 Chemical and Biological Transformation of Contaminants

In general, the products of the chemical and biological transformation of chlorinated solvent are considered more likely to pose a concern than the parent compounds. Selected groundwater samples from the Phase Two Property were submitted for laboratory analysis of VOCs, which included both chlorinated solvents and their degradation products. Neither chlorinated solvents nor their degradation products were identified above the selected standards in soil and concentrations were generally below laboratory detection limits.

The metal (lead and vanadium) and inorganic (EC/SAR) COCs detected at concentrations exceeding the MECP Table 3 SCS are not expected to undergo transformation to more hazardous breakdown products.

PHCs may biodegrade under ideal subsurface conditions; degradation of petroleum hydrocarbons generally produces compounds less harmful than parent compounds.

5.6.7 Does Soil Serve as a Contaminant Source for Other Media

One or more of BTEX and PHCs impacts in soil are present at depths between 0.0 and 7.5. In 2022/2023, the depth to ground water ranged from approximately 1.22 m bgs (98-2) to 3.97 m bgs (98-1). Given the presence of measured concentrations of analysed parameters in soil samples above the selected MECP Table 3 SCS within the saturated zone, concentrations of these parameters in soil may serve as a contaminant source for groundwater.

Concentrations of SAR exceeded the selected standards in soil samples collected from boreholes BH23-01 to BH23-03 at depth between 0.0 to 5.2 m bgs. SAR is a quality parameter of soil and not a contaminant; however, it is an indicator of sodium-affected soils. As such, soil may serve as a contaminant source for groundwater.

5.6.8 Evaluation of Light or Dense Non-Aqueous Liquids (Soil)

The MECP generic standards were established considering the potential presence of free phase (non-aqueous) product by calculating ‘free phase thresholds’ or concentrations above which suggest the potential presence of NAPL. Contaminants exceeding the selected MECP Table 3 SCS in analysed soil samples (BTEX, PHC F1, PHC F2, lead and vanadium) were considered in the evaluation of the potential presence of LNAPL. The identified (non-metal) parameters are considered more likely associated with LNAPL. No contaminants associated with dense non-aqueous phase liquids (DNAPL) were identified at the Phase Two Property.

The MECP “Rationale for the Development of Soil and Groundwater Standards for Use at Contaminated Sites in Ontario” (MECP, 2011e) provides the free phase thresholds in fine to medium textured soil for contaminants for which generic standards were developed. The free-phase thresholds for contaminants exceeding the MECP Table 3 SCS are summarized below with maximum concentrations (based on historical 2000/2001 investigations or 2023 limited soil sampling; 1998 Phase II ESA soil analytical results were not available) measured at the Phase Two Property. PHC F1 and F2 maximum concentrations are based on 2023 available soil analytical soil results as historically PHC fractions F1 and F2 were not available:

Parameter	Free Phase Threshold (µg/g)	Max. Concentration(s) Updated Phase Two ESA (µg/g)	Sampling Location
Benzene	6,200	29	BH-5
Toluene	4,400	125	BH-5
Ethylbenzene	3,800	30.1	BH-5

Parameter	Free Phase Threshold (µg/g)	Max. Concentration(s) Updated Phase Two ESA (µg/g)	Sampling Location
Xylenes	3,400	169.8	BH-5
PHC F1	2,600	430	BH23-01
PHC F2	3,900	810	BH23-01
Vanadium	11,000	120	BH23-01 to BH23-03
Lead	38,000	180	BH23-03

Concentrations in the analysed samples were below their respective free phase threshold values, indicating no theoretical potential for free phase liquid to be present at these locations. As discussed in Section 5.2, LNAPL has been identified historically in monitoring wells 98-2, 98-3, OW-1, OW-2, MW-20, MW-21 and MW-22 at the Phase Two Property. Historically, petroleum staining and LNAPL globules were observed in the soil. In February 2004, a MPVE system was installed to recover LNAPL in both soil and groundwater, and petroleum hydrocarbon impacted groundwater following an assessment of remedial alternatives. A total of 1,230 litres of LNAPL was removed between 2004 and 2008. Measurable thickness of LNAPL were not observed in 2008 or 2009, however a hydrocarbon sheen was observed on groundwater from several on-site monitoring wells. Based on the reduced occurrence and amount of LNAPL in the subsurface, decreased recovery rates of petroleum hydrocarbons and the improvement of groundwater quality at the Phase Two Property, the MPVE system was shut down in 2008.

During the 2023 soil sampling program, field observations did not indicate presence of sheen/LNAPL in soil samples collected.

5.7 Ground Water Quality

The ground water analytical results are presented in Tables 6 and 7. Copies of the laboratory Certificates of Analysis are provided in Appendix C. The following sections discuss the ground water sample analytical results.

5.7.1 Ground Water: PHC & BTEX

A total of ten (10) ground water samples, which included one (1) duplicate sample, were analysed for PHC F1 to F4 and BTEX during the 2023 groundwater sampling program. The analytical results indicated that concentrations of one or more of benzene, xylenes, PHC F1 and F2 in analysed groundwater samples collected from monitoring wells 98-2, 98-3 and MW-20 to MW-22 were above the selected MECP Table 3 SCSs. Concentrations of PHC F3 and F4 measured during the 2023 groundwater sampling program were below the MECP selected SCS. Concentration of BTEX and PHC F1 to F4 in groundwater sample collected from monitoring well 98-1 was below the selected MECP Table 3 SCSs.

Prior to 2023, concentrations of PHC F3 and/or PHC F4 exceeded the selected MECP Table 3 SCSs.

The analytical results are tabulated in Table 6. The current 2022/2023 ground water analytical results are shown on Figure 10.

As discussed under various past investigation reports, LNAPL has been identified in monitoring wells 98-2, 98-3, OW-1, OW-2, MW-20, MW-21 and MW-22 at the Phase Two Property. MPVE system operated at the site from 2004 to 2008. Based on the reduced occurrence and amount of LNAPL in the subsurface, decreased recovery rates of petroleum

hydrocarbons and the improvement of groundwater quality at the Phase Two Property, the MPVE system was shut down in 2008.

Subsequent to this, as part of the on-going monitoring CMP for the Phase Two Property, monitoring wells continued to be monitored for presence or absence of LNAPL in monitoring wells at the Phase Two Property. Minimal amount of LNAPL was observed intermittently in monitoring wells 98-2, 98-3 and/or MW-22 and mainly sheen on the purge water between 2013 and 2022 (GHD, 2020; SNC-Lavalin, 2023).

During the 2023 CMP groundwater and monitoring sampling program, no measurable LNAPL was observed, however, sheen on purge water was observed in monitoring wells 98-2, 9-3, MW-21 and MW-22. This is consistent with previous monitoring events at the Phase Two Property (as discussed above and in Section 2.2).

5.7.2 Ground Water: VOCs

A total of four (4) ground water samples, which included one (1) duplicate sample, were analysed for VOCs. The analytical results indicated that concentrations for VOCs analysed were below the selected for all samples analysed. The analytical results are tabulated in Table 7.

5.7.3 Chemical and Biological Transformation of Contaminants

In general, the products of the chemical and biological transformation of a chlorinated solvent are considered more likely to pose a concern than the parent compounds. Selected groundwater samples from the Phase Two Property were submitted for laboratory analysis of VOCs, which included both chlorinated solvents and their degradation products. Neither chlorinated solvents nor their degradation products were identified above the selected standards in groundwater and concentrations were generally below laboratory detection limits.

Degradation of petroleum hydrocarbons generally produces less harmful than parent compounds.

5.7.4 Evaluation of Light or Dense Non-Aqueous Liquids (Ground Water)

The MECP generic standards were established considering the potential presence of free phase (non-aqueous) product by establishing ½ solubility limits, concentrations above which may indicate the presence of free phase product. Contaminants exceeding the MECP Table 3 SCS (benzene, xylenes and PHC F1 to PHC F4) were considered in the evaluation of the potential presence of LNAPL. No contaminants associated with DNAPL were identified at the Phase Two Property.

Parameter	**½ Solubility (µg/L)**	**Max. Concentration(s) – (2022/2023) Updated Phase Two ESA (µg/L)**	**Sampling Location**
Benzene	900,000	5,100	MW-22
Xylenes	53,000	7,700	MW-22
PHC F1	1,900	13,000	98-2
PHC F2	150	**14,000**	**98-2**
PHC F3	4.9×10^{-8}	**32,000**	98-3

Parameter	½ Solubility (µg/L)	Max. Concentration(s) – (2022/2023) Updated Phase Two ESA (µg/L)	Sampling Location
PHC F4	3.9×10^{-12}	**17,000**	98-3

Concentrations exceeded the half solubility value of PHC F1 and/or PHC F2 in one (1) or more analysed samples collected from monitoring wells MW-21, MW-22, 98-2 and 98-3, indicating a theoretical potential for free phase liquid to be present at these locations. As discussed in Section 5.7.1, LNAPL has been historically identified in monitoring wells 98-2, 98-3, OW-1, OW-2, MW-20, MW-21 and MW-22 at the Phase Two Property. In February 2004, a MPVE system was installed to recover LNAPL and petroleum hydrocarbon impacted groundwater following an assessment of remedial alternatives. A total of 1,230 litres of LNAPL was removed between 2004 and 2008. Measurable thickness of LNAPL were not observed in 2008 or 2009 however a hydrocarbon sheen was observed on groundwater from several on-site monitoring wells. Based on the reduced occurrence and amount of LNAPL in the subsurface, decreased recovery rates of petroleum hydrocarbons and the improvement of groundwater quality at the Phase Two Property, the MPVE system was shut down in 2008.

Subsequent to this, as part of the on-going monitoring CMP for the Phase Two Property, monitoring wells continued to be monitored for presence or absence of LNAPL in monitoring wells at the Phase Two Property. Minimal amount of LNAPL was observed intermittently in monitoring wells 98-2, 98-3 and/or MW-22 and mainly sheen on the purge water between 2013 and 2022 (GHD, 2020; SNC-Lavalin, 2023).

During the 2023 CMP groundwater and monitoring sampling program, no measurable LNAPL was observed, however, sheen on purge water was observed in monitoring wells 98-2, 9-3, MW-21 and MW-22. This is consistent with previous monitoring events at the Phase Two Property (as discussed above and in Section 2.2).

5.8 Sediment Quality

As no water bodies are present at the Phase Two Property, sediment sampling was not conducted as part of the Phase Two ESA.

5.9 Quality Assurance and Quality Control Results

The QA/QC program was implemented to minimize and quantify impacts introduced during sample collection, handling, shipping and analysis.

5.9.1 Laboratory Quality Control

Laboratory analysis was completed in accordance with O. Reg. 153/04 (as amended) and generally accepted industry practices. Laboratory QA/QC measures included analysis of method blank, spiked blank, duplicate and matrix spike samples. A certificate of analysis has been received for each sample submitted for soil and ground water analysis and all certificates of analysis have been included in full in Appendices B and C, respectively. All certificates of analysis received from the contract analytical laboratory comply with sub-section 47(3) of the regulation.

The QP conducted a review of the laboratory QC reports within each certificate of analysis. In summary, there were no laboratory QC qualifiers (i.e., QC sample results reported outside of the applicable acceptance criteria) which could have a material affect on the interpretation of the soil and/or ground water data.

5.9.2 Field Quality Control Samples

As part of the QA/QC program, two soil and two ground water duplicate samples were collected as part of the QA/QC program for the Phase Two ESA. For blind field duplicate samples, the relative percent difference (RPD) was calculated to assess correlation between duplicate samples and their analytical pairs. The RPD is calculated by the following formula:

$$RPD = \frac{|X_1 - X_2|}{X_{avg}} \times 100$$

where X_1 and X_2 are the duplicate sample concentrations and X_{avg} is the mean of X_1 and X_2. Analytical error increases near the RDL; therefore, the RPD is not typically calculated unless the concentrations of the duplicate samples are greater than five (5) times the RDL. Generally accepted RPDs for laboratory duplicates are approximately 40 to 50% for soil and 20 to 40% for ground water. For field duplicates, acceptable limits for RPDs are 40 to 80% for soil inorganic parameters, 80 to 100% for soil organic parameters, 100% for soil vapour parameters, 40% for ground water inorganic parameters and 60% for ground water organic parameters. If the RPD for a field duplicate sample and its analytical pair did not meet acceptable RPD limits, an explanation is provided below.

Analytical results for field duplicate soil and ground water samples generally showed acceptable correlation to their corresponding analytical pairs for analysed parameters. Results for field and trip blanks samples were generally below the laboratory RDLs for all analysed parameters. The results of the RPD calculations for soil and ground water field duplicate samples are presented in Table B.1 and in Tables C.1 and C.3 respectively, while Table B.2 and Tables C.2 and C.4 shows the results of the field and trip blanks.

5.9.3 QA/QC Summary

All hold times were met, and the appropriate preservation methods were used. Samples were collected in the appropriate clean sample containers provided by BV and were stored on sufficient ice to keep the temperature between 0 and 10°C. A chain-of-custody accompanied all analyzed samples, and they are included with the laboratory certificates of analyses provided in Appendices B and C.

In summary, no issues with laboratory analysis, sample shipping, sample preservation, or field sampling techniques that could have a material effect on the interpretation of the reported results were identified as part of the QA/QC program. Therefore, the soil and groundwater analytical laboratory data is considered reliable.

5.9.4 QA/QC Statement

With respect to Subsection 47 (3) of O. Reg. 153/04 (as amended), the following statements apply to this Phase Two ESA:

- All Certificates of Analyses, pursuant to Clause 47 (2) (b) of the regulation, comply with Subsection 47 (3);
- A Certificate of Analysis report has been received for each sample submitted for analysis; and,
- All Certificates of Analysis have been included, in full, within **Error! Reference source not found.** and **Error! Reference source not found.**.

5.10 Phase Two Conceptual Site Model

The following Phase Two CSM has been prepared in accordance with Schedule E, Part V, Table 1, Section 6(x) of (O. Reg.) 153/04 (as amended). The Phase Two CSM has been developed through analysis and interpretation of the field and analytical data gathered during the Phase Two ESA.

A summary of the PCAs and APECs associated with the Phase Two Property are provided in the following sections along with a narrative description of the Phase Two CSM. The Phase Two CSM narrative description is supported with the figures provided within this report which illustrate the physical setting of the Phase Two Property and contaminants which are present on the Phase Two Property at a concentration greater than the applicable Table 3 SCS.

5.10.1 Potentially Contaminating Activities, Areas of Potential Environmental Concern and Utilities

5.10.1.1 Potentially Contaminating Activities and Areas of Potential Environmental Concern

The Phase One ESA identified APECs at the Phase Two Property due to both on-site and off-site PCAs as discussed in Section 3.3 and shown in Figures 3 and 4. Available historical/current soil and groundwater analytical results utilized from boreholes and monitoring wells during the Update Phase Two ESA are shown relative to the APECs in Figure 5.

5.10.1.2 Approximate Locations of Utilities and Other Subsurface Structures

The underground utilities and other subsurface structures are presented on **Error! Reference source not found.**.

The depth of the utility services has not been determined as part of this assessment however, based on the review of City of Ottawa engineering design standards for water main and sewer services and based on the water table depth (1.22 to 3.97 m bgs) at the Phase Two Property, there is potential for the utility services to intercept the shallow ground water at the Phase Two Property.

5.10.2 Physical Setting of Phase Two Property

5.10.2.1 Stratigraphy

In general, the soil stratigraphy at the Phase Two Property consisted of fill (sand or sand and gravel) to depths of 1.5 to 3 m underlain by silt or silty clay to a depth of at least 6.7 m. The grey silty clay layer extends to depth of 8.2 to 8.4 m and grey silt with trace to some clay and trace gravel was encountered below the grey silty clay layer at depths of 8.2 to 8.4 m. A sandy silt layer (1.5 to 2 m thick) is present at a depth of 4 to 5 m bgs and at depths of 9.8 to 10.4 m bgs.

Given that the average thickness of overburden is greater than 2.0 m, the Phase Two Property is not considered to be a shallow soil property as defined by O. Reg. 153/04 (as amended).

5.10.2.2 Hydrogeological Settings

The Phase Two Property is relatively flat with an approximate elevation of 82.88 m amsl and slopes gently to the east. With respect to the Phase Two Study Area, the topography generally slopes from the northwest/southwest (84 m amsl) to the east/northeast (80 m amsl). The nearest surface water bodies are Rideau River and Rideau Canal located 200 m east of the Phase Two Property.

The water table is generally encountered in the overburden at depth of approximately 1.22 to 3.97 m bgs. Regionally groundwater flows predominantly to the east/northeast, although measured water levels at the Phase Two Property show evidence of perturbations due to the tank nest (and associated pea gravel backfill) and underground services. Surface and storm water run-off drain into catch-basins located on the Phase Two Property before being discharged into the municipal storm sewer system within the Prince of Wales Drive and Meadowlands Drive.

The inferred shallow ground water flow based on the groundwater elevations at the Phase Two Property is interpreted to be towards the south, however, the regional groundwater flow is to the east/northeast. Based on the previous investigation reports, the direction of groundwater flow was interpreted as generally to the east with significant mounding and appeared to be radial, emanating from the existing tank nest. The groundwater flow interpretation in 2022/2023 is different from previous investigations mentioned above, likely due the absence of monitoring wells located along the Prince of Wales Right of Way and associated ground water table measurements. The depths to groundwater are within the range of historical groundwater elevation data collected since 2005.

The horizontal hydraulic gradient at the Phase Two Property, calculated using two sets of ground water level triangulation data (2022 and 2023) was determined to be 0.04 m/m. The permeability of the native overburden is relatively low, on the order of 2×10^{-7} m/s to an average of 2.3×10^{-6} m/s.

5.10.2.3 Approximate Depth to Bedrock

Bedrock was not encountered to the maximum depth of investigation (10.4 m bgs) during 2023 soil sampling or during past investigations at the Phase Two Property.

Based on MECP public water supply well record in the vicinity of the Phase Two Property (Well ID 1508679), grey limestone was encountered at an approximate depth of 27 m bgs.

5.10.3 Approximate Depth to Water Table

Based on the ground water levels collected from monitoring wells in 2022/2023, ground water at the Phase Two Property measured at depths of approximately 1.22 to 3.97 m bgs. It should be noted that groundwater levels will fluctuate seasonally and water table potentially higher during wet periods (i.e., early spring or fall), or following heavy rainfall.

5.10.3.1 Applicability of Section 35, 41 or 43.1

Section 35 of O. Reg. 153/04 (as amended) applies to the Phase Two Property as the Phase Two Property is serviced by a municipal drinking water system as defined in the Safe Drinking Water Act, 2002. The Phase Two Property is not located within an area designated as a well-head protection area (or equivalent). The current property use is commercial and the future property use is proposed to remain as commercial. As such, the industrial/commercial/community property use standards apply to the Phase Two Property.

Section 41 of O. Reg. 153/04 (as amended) does not apply to the Phase Two Property as the Phase Two Property is not within an area of natural significance, is not adjacent to an area of natural significance or includes land that is within 30 meters of an area of natural significance. In addition, soil pH at the Phase Two Property falls within the prescribed ranges of 5 to 9 for surface soil and 5 to 11 for subsurface soil.

Section 43.1 of O. Reg. 153/04 (am amended) does not apply to the Phase Two Property as the Phase Two Property is not a shallow soil property and does not include all or part of a water body or is adjacent to a water body or includes land that is within 30 metres of a water body.

5.10.3.2 Areas On, In or Under the Phase Two Property Where Excess Soil Is Finally Placed

In general, the soil stratigraphy at the Phase Two Property consisted of fill (sand or sand and gravel) to depths of 1.5 to 3 m bgs underlain by silt or silty clay to a depth of at least 6.7 m bgs. Information on the source of fill is unknown. Analysed soil samples collected from the fill layer exceeded the selected MECP Table 3 SCSs for select analyzed parameters.

5.10.3.3 Approximate Locations of Proposed Buildings and Other Structures

Structures at the Phase Two Property includes a service station building located in the central area, measuring approximately 114 square metres (m^2) with fuel pumps. The service station building operated as a convenience store with a utility room, washroom and a basement. Surrounding the building is a paved parking lot.

The proposed future use of the Phase Two Property is to remain commercial, with similar buildings and other structures as currently present at the Phase Two Property. The final location of proposed buildings has not been confirmed to AtkinsRéalis at the time of writing.

5.10.4 Areas of Site Where a Contaminant is Present On, In, or Under the Phase Two Property At a Concentration Greater Than the Applicable Site Condition Standard

Areas where contaminants are present above the Table 3 SCSs in soil are shown in Figures 7 to 9 and in ground water are shown in Figure 10. Contaminants exceeding the selected Table 3 SCSs were present in one (1) or more analysed samples collected within the Phase Two Property in soil and ground water.

5.10.4.1 Contaminants of Exceeding Applicable Standards

Based on the review of available historical and current soil and groundwater analytical results completed as part of the Update Phase Two ESA report, contaminants of concern which exceeded the applicable Table 3 SCS were identified in soil (benzene, toluene, ethylbenzene, xylenes, PHC F1, PHC F2, lead, vanadium, SAR and electrical conductivity) and ground water (benzene, xylenes and PHC F1 to F4).

No water bodies are present on the Phase Two Property, therefore neither surface water quality nor sediment were investigated.

5.10.5 Distribution of Contaminants

Distribution of contaminants of concern which exceed the applicable Table 3 SCS in soil and ground water at the Phase Two Property are discussed below.

5.10.5.1 SAR/EC (Soil)

An exceedance of the Table 3 SCS for SAR and EC was identified within a native soil sample Phase Two Property (i.e., borehole BH-109). The presence of elevated SAR in soil at the Phase Two Property is considered to be a result of historic and current road salt application activities, as further discussed below.

- Lateral limits (**Error! Reference source not found.**): The lateral extents of the SAR and EC impacts were identified on-site and are interpreted to extend to the entire Phase Two Property boundaries.

- Vertical limits (Figure 11): The vertical extent of the soil with SAR and EC values exceeding the Table 3 SCS was delineated by analysing an underlying sample.

With regards to the SAR and EC (soil) exceeding the SCS, it is understood that de-icing salt is applied on the asphalt surfaces throughout the Phase Two Property for snow and ice control during the winter months, and on the sidewalks and roads adjacent to the property. The application of road salt presents a potential source of contamination, (i.e., EC and SAR in soil). However, as per Section 49.1 of O. Reg. 153/04 (as amended under O. Reg. 407/19) exceeding the SCS arising solely due to the application of a substance for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both are not considered exceeding the SCS for the purposes of filing an RSC. Although an RSC is not being pursued for the Phase Two Property, following the approach defined by O. Reg. 153/04 (as amended), SAR and EC in soil are not considered contaminants at the Phase Two Property.

5.10.5.2 Metals – Lead and Vanadium (Soil)

Concentration of lead exceeded the selected standards in one (1) soil sample collected from borehole BH23-03 (located by the southern portion of the Phase Two Property) at depth of 0.0 to 0.8 m bgs. The vertical extent of the impact is delineated at this location. The location of the lead exceeding the MECP Table 3 SCS is shown on Figure 8.

Concentration of vanadium exceeded the selected standards in soil samples collected from boreholes BH23-01 to BH23-03 at depths between 0.0 and 3.7 m bgs. The vertical extent of the impacts were delineated at these locations. The location of the vanadium exceeding the MECP Table 3 SCS are shown on Figure 8.

- Lateral limits (Figure 8): The lateral extents of the lead and vanadium impacts were identified on-site and are interpreted to extend to the entire Phase Two Property boundaries.
- Vertical limits (Figure 12): The vertical extent of the soil with lead and vanadium values exceeding the Table 3 SCS was delineated by analysing an underlying sample.

Localized lead exceeding the SCS in soil in one (1) soil sample analysed from borehole BH23-03 (located by the southern portion of the Phase Two Property) could be associated with potential presence of fill of unknown quality (brought to the Phase Two Property). Fill material was identified during 2023 soil sampling program and past investigations. Vanadium concentrations exceeded the selected SCS in select soil samples analyzed from all three boreholes (BH23-01 to BH23-03); it is possible that surficial (<1.5 m bgs) elevated vanadium concentration potentially related to fill of unknown quality and the sub-surface (>1.5 m bgs) concentration potentially naturally occurring.

5.10.5.3 BTEX and PHC F1 to F4 (Soil)

BTEX and PHC F1 to F4 in soil and groundwater are considered to be related to the historical and ongoing operation of the Phase Two Property as retail gas station since at least 1960s. The lateral and vertical limits inferred below is based on historical and current soil analytical results available for the Phase Two Property.

- Lateral limits (Figure 9): Based on measured concentrations of analysed parameters in soil samples, it is inferred that concentrations of benzene, ethylbenzene, toluene, xylenes, PHC F1 and F2 exceeding the selected MECP Table 3 SCSs are generally present by the northern portion of the Phase Two Property (east and west of the USTs/Pump Islands and in the vicinity of former two waste oil tanks, north of former rapid lube facility).
- Vertical limits (Figure 13): Benzene, ethylbenzene, toluene, xylenes, PHC F1 and F2 exceeding the selected MECP Table 3 SCSs in soil identified from 0.0 and 7.5 m bgs. Concentrations of benzene extends between the depths of 0.0 and 7.5 m bgs, Concentrations of ethylbenzene, toluene and xylenes extends between the depths of 4.5 and 5.1 m bgs. Concentrations of PHC F1 and F2 extends between the depths of 2.4 and 5.9 m bgs (inferred depth based on historical available analytical results from past investigations). The vertical extent of the benzene concentrations was not confirmed based on the available data.

5.10.5.4 BTEX and PHC F1 to F4 (Ground Water)

The lateral and vertical limits inferred below is based on 2022/2023 groundwater analytical results conducted at the Phase Two Property.

- Lateral limits (Figure 10): Based on the groundwater results from the available monitoring wells at the Phase Two Property, it is inferred that concentrations of benzene, xylenes and/or PHC F1 to F4 parameters exceeding the selected MECP Table 3 SCSs are present on the entire Phase Two Property. However, based on the available soil analytical results and groundwater concentrations in monitoring well (98-1) by the southern portion of the Phase Two Property which are below the selected MECP Table 3 SCSs, it is inferred that groundwater impacts at the Phase Two Property are generally present by the northern portion (east and west of the USTs/Pump Islands and in the vicinity of former two waste oil tanks, north of former rapid lube facility).
- Vertical limits (Figure 14): Concentrations exceeding the MECP Table 3 SCSs were identified in analysed groundwater samples collected from monitoring wells screened to a maximum depth of 6.1 m bgs. The vertical extent of the impacts was not confirmed based on the available data.

5.10.5.5 Migration of Contaminants

Given the historic nature of the PHC related impacts and the operation of remedial system between 2004 and 2008 to remove LNAPL from the subsurface which resulted in significant decrease of LNAPL (only minimal amount of LNAPL or sheen on purge water observed during recent monitoring events) and improved groundwater quality, the soil and groundwater concentrations are likely in equilibrium. Consequently, although some impacts likely extend beyond the property limits to the north and northeast/east, it is unlikely that PHC-related contamination at the Phase Two Property will migrate further beyond its current extents.

Elevated SAR and EC values in soil are considered to be a result of historic and current road salt application activities at the Phase Two Property and within surrounding road allowances.

Elevated vanadium in surface (<1.5 m bgs) soil is considered to be related to potential use of fill of unknown quality brought to the Phase Two Property. Elevated vanadium in sub-surface (>1.5 m bgs) soil is potentially naturally occurring with high concentrations found in shales and clay (Geology at the Phase Two Property; see Section 2.1.6). Vanadium content in soil is related to weathering of parent rock which increases vanadium content in soil (SQGEH, 1997). Vanadium is considered likely to be associated with a regional issue and consequently elevated concentrations may exist off-site.

Localized surficial lead concentrations in soil is attributed to potentially imported soil brought to the Phase Two Property.

Utility trenches may serve as preferential pathways for contaminant distribution and may intercept the shallow groundwater table at the Phase Two Property.

5.10.5.6 Meteorological and Climatic Considerations

It is noted that climatic or meteorological conditions may influence the distribution and migration of COCs at the Phase Two Property. Seasonal fluctuations in ground water due to cyclical increases and decreases in precipitation can affect ground water recharge. However, existing COCs exceeding the MECP Table 3 SCSs are generally present near the water table (shallow water table 1.22 m to 3.97 m bgs) and therefore infiltration is not expected to result in leaching of contaminants deeper into the subsurface. Furthermore, given the historic nature of PHC-related impacts, it is anticipated that the soil impacts are already in equilibrium with respect to leaching to groundwater. It is possible that vertical smearing of impacts may have historically occurred due to seasonal water table fluctuation; however, in the

absence of LNAPL (only sheen observed on purge water; Section 5.7.4) and based on the historical nature of PHC impacts, worsening conditions are not expected.

5.10.6 Cross Sections

The lateral and vertical distribution of contaminants in each area where contaminants are present at concentrations greater than the Table 3 SCS in soil and ground water, the approximate depth to the water table, and stratigraphy are shown in Figures 11 to 14, as discussed in the previous sections.

5.10.7 Diagrams Showing Release Mechanisms, Exposure Pathways and Receptors

Elevated SAR and EC values in soil are considered to be a result of historic and current road salt application activities at the Phase Two Property and within surrounding road allowances. Elevated vanadium in sub-surface (>1.5 m bgs) soil is potentially naturally occurring. Localized surficial lead and vanadium concentration in soil is attributed to imported fill potentially brought to the Phase Two Property. BTEX and PHC impacts in soil and groundwater related to retail gas station and former rapid fuel facility at the Phase Two Property. The human health and ecological receptor CSMs, including transport pathway, receptors and routes of exposure are shown on Figures 15 and 16.

6. CONCLUSIONS

6.1 Summary of Exceedances

COC exceeding the applicable MECP Table 3 SCS were identified in soil and ground water based on the review of available current and historical soil and groundwater analytical results (2022/2023) in the following locations:

Location Exceeding SCS	Depth (m bgs)	Contaminant of Concern	Table 3 SCS	Max. Concentration Soil µg/g) Groundwater (µg/L)
Soil				
BH23-01-011	0.0-0.8	SAR	12	32
BH23-01-03	1.5-1.8	EC	1.4	2.6
BH23-01-04	1.8-2.4	Vanadium	88	120
BH23-03-01	0.0-0.8	Lead	120	180
BH-5-6	4.5-5.1	Benzene	0.4	29
BH-5-6	4.5-5.1	Toluene	78	125
BH-5-6	4.5-5.1	Ethylbenzene	19	30.1
BH-5-6	4.5-5.1	Xylenes	30	169.8
BH23-01-06	3.0-3.7	PHC F1	65	430
BH23-01-06	3.0-3.7	PHC F2	250	810
Ground Water				
MW-22	-	Benzene	430	5,100
MW-22	-	Xylenes	4,200	7,700
98-2	-	PHC F1	750	13,000
98-2	-	PHC F2	150	14,000
98-3	-	PHC F3	500	32,000
98-3	-	PHC F4	500	17,000

6.2 Conclusions

Concentrations exceeding the selected MECP Table 3 SCSs are present in soil and groundwater at the Phase Two Property. Following KDR (planned to be conducted in 2024), the report will be updated with an addendum documenting conditions remaining at the Phase Two Property. Further, AtkinsRéalis on behalf of Shell will complete a screening/due diligence Human Health Risk Assessment (HHRA) based on resultant conditions (post KDR).

7. REFERENCES

Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health – Vanadium, 1997.

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Ontario Ministry of the Environment (MOE), 2011a. “Ontario Regulation 153/04, Record of Site Condition - Part XV.1 of the Environmental Protection Act”. October 31, 2011.

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MOE, 2011e. Soil, Groundwater and Sediment Standards for Use at Contaminated Sites in Ontario. April 15, 2011.

SNC-Lavalin Inc. (SNC-Lavalin), 2022. Field Work Guidance Manual. July 2022 (as amended).

SNC-Lavalin, 2023. “2022 Groundwater Monitoring and Sampling Program, Shell Retail Fuel Outlet (C03311), 1440 Prince of Wales Drive, Ottawa, Ontario”. March 10, 2023.

FIGURES

SCALE 1:7,000

0 140 280m

KEY MAP

NOTES

1. SCALE AND SITE INFRASTRUCTURE LOCATIONS ARE APPROXIMATE
2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PRINTED, PHOTOCOPIED OR FAXED IN OTHER THAN ITS ORIGINAL SIZE AND COLOURS
3. 'm' : METRES

SOURCES

1. GOOGLE EARTH PRO IMAGE, JUNE 9, 2018

AtkinsRéalis

Client Name:	Location:
SHELL CANADA PRODUCTS	1440 PRINCE OF WALES DRIVE (C03311), OTTAWA, ON

Title:

PHASE TWO PROPERTY LOCATION

Drawn:	Date:	Project No:
AG	DECEMBER 2023	694129
Verified:	Project Manager:	Dwg No:
AA	AA	FIGURE 1

PAGE FORMAT: 8.5x11

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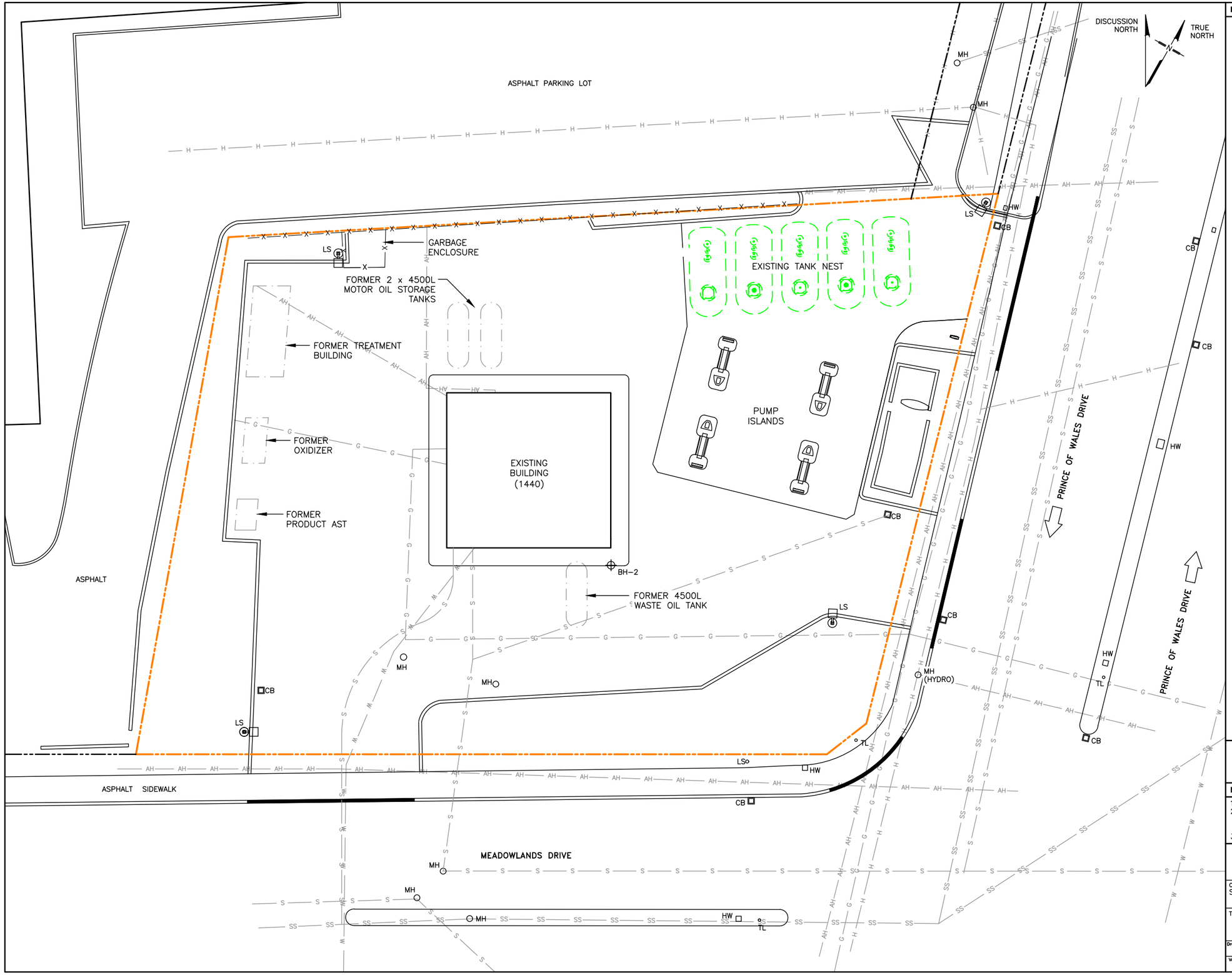

LEGEND

LS	LIGHT STANDARD
HW	HAND WELL
	MANHOLE
	CATCH BASIN
	PHASE TWO PROPERTY LINE
	PROPERTY LINE
	EXISTING BUILDING
X X	FENCE LINE
	INFRASTRUCTURE
	FORMER INFRASTRUCTURE
	UNDERGROUND TANK
AH	ABOVE GROUND HYDRO SERVICE
G	UNDERGROUND GAS SERVICE
H	UNDERGROUND HYDRO SERVICE
W	WATER SERVICE
S	STORM SERVICE
SS	SANITARY SERVICE

SCALE 1:250

0 5 10m

NOTES

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AtkinsRéalis

Client Name: SHELL CANADA PRODUCTS

Location: 1440 PRINCE OF WALES DRIVE (C03311), OTTAWA, ON

Title:

PHASE TWO PROPERTY LAYOUT

Drawn:	Date:	Project No:
AG	DECEMBER 2023	694129
Verified:	Project Manager:	Dwg No:
AA	AA	**FIGURE 2**

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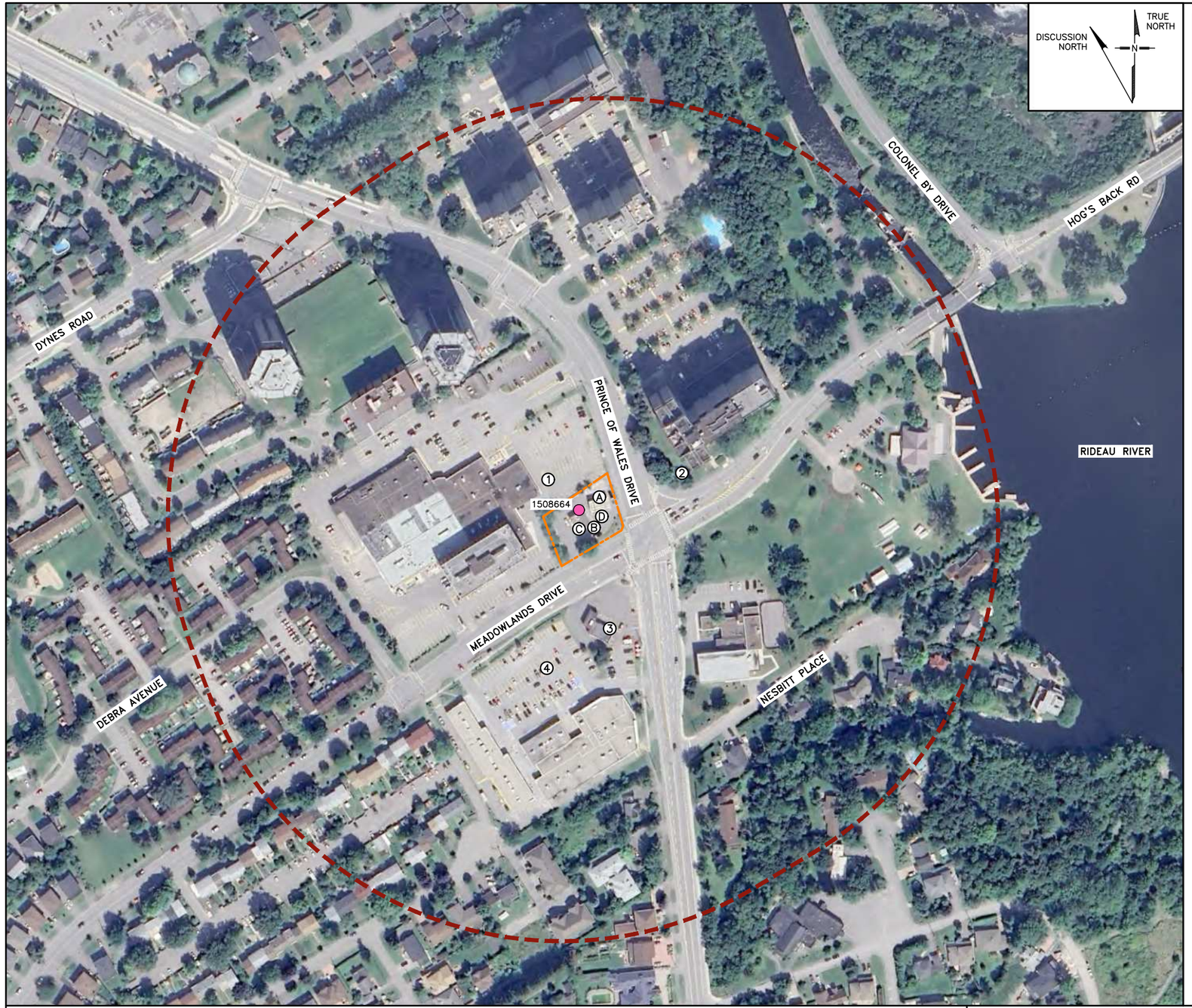

ON PHASE ONE STUDY PROPERTY ARE THERE?		
ROADS	YES	SEE FIGURE
WATER WELLS	YES	1– COMMERCIAL WATER SUPPLY WELL, CONSTRUCTED IN 1959; POSSIBLY ABANDONED. THE PHASE ONE PROPERTY IS CONNECTED TO MUNICIPAL WATER SUPPLY. SEE FIGURE
IN PHASE ONE STUDY AREA ARE THERE?		
ROADS	YES	SEE FIGURE
WATER BODIES	NO	
AREA OF NATURAL SIGNIFICANCE	NO	

ON–SITE LOCATION	PCA No.	POTENTIALLY CONTAMINATING ACTIVITY TYPE	DESCRIPTION
A	28	GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS	UNDER GROUND STORAGE TANKS WITHIN TANK NEST AND PUMP ISLANDS
B	52	STORAGE, MAINTENANCE, FUELING AND REPAIR OF EQUIPMENT, VEHICLES AND MATERIALS USED TO MAINTAIN TRANSPORTATION SYSTEMS	FORMER WASTE OIL TANK
C	52	STORAGE, MAINTENANCE, FUELING AND REPAIR OF EQUIPMENT, VEHICLES AND MATERIALS USED TO MAINTAIN TRANSPORTATION SYSTEMS	TWO FORMER MOTOR OIL STORAGE TANKS
D	30	IMPORTATION OF FILL MATERIAL OF UNKNOWN QUALITY	FILL MATERIAL OF UNKNOWN QUALITY IDENTIFIED AT PHASE ONE PROPERTY DURING PREVIOUS INVESTIGATION
OFF–SITE LOCATION	**PCA No.**	**POTENTIALLY CONTAMINATING ACTIVITY TYPE**	**DESCRIPTION**
1	28	GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS	LOCATED IN AN INFERRED HYDRAULICALLY UPGRADIENT POSITION FROM THE PHASE ONE PROPERTY
	37	OPERATION OF DRY CLEANING EQUIPMENT	
2	28	GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS	LOCATED IN AN INFERRED HYDRAULICALLY DOWNGRADIENT POSITION FROM THE PHASE ONE PROPERTY IN CLOSE PROXIMITY TO THE PHASE ONE PROPERTY
3	28	GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS	LOCATED IN AN INFERRED HYDRAULICALLY CROSS–GRADIENT POSITION FROM THE PHASE ONE PROPERTY
	52	STORAGE, MAINTENANCE, FUELING AND REPAIR OF EQUIPMENT, VEHICLES AND MATERIALS USED TO MAINTAIN TRANSPORTATION SYSTEMS	
4	37	OPERATION OF DRY CLEANING EQUIPMENT	LOCATED IN AN INFERRED HYDRAULICALLY CROSS–GRADIENT POSITION FROM THE PHASE ONE PROPERTY

SCALE 1:2,500

0 50 100m

LEGEND

- Ⓐ① LOCATION IDENTIFIER FOR POTENTIALLY CONTAMINATING ACTIVITY
- COMMERCIAL WATER SUPPLY WELL
- PHASE ONE PROPERTY LINE
- MINIMUM 250m FROM PHASE ONE PROPERTY LINE

NOTES

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SOURCES

1. GOOGLE EARTH PRO IMAGE, AUGUST 19, 2022

AtkinsRéalis

Client Name: SHELL CANADA PRODUCTS

Location: 1440 PRINCE OF WALES DRIVE (C03311), OTTAWA, ON

Title: **PHASE ONE CONCEPTUAL SITE MODEL SHOWING POTENTIAL CONTAMINATING ACTIVITIES**

Drawn: AG	Date: DECEMBER 2023	Project No: 694129
Verified: AA	Project Manager: AA	Dwg No: **FIGURE 3**

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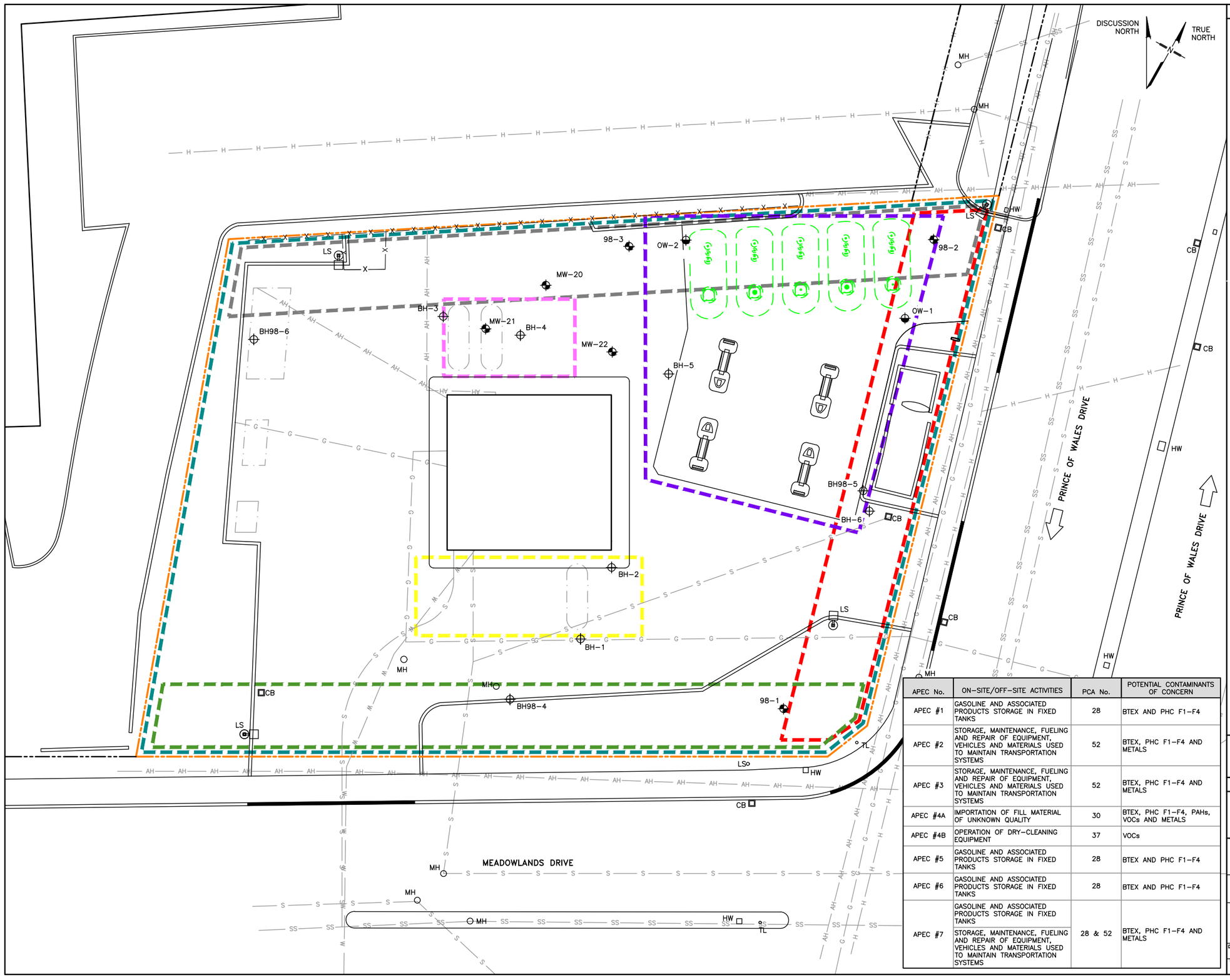

LEGEND

- LS — LIGHT STANDARD
- HW — HAND WELL
- MANHOLE
- CATCH BASIN
- BOREHOLE
- MONITORING WELL
- OBSERVATION/RECOVERY WELL
- PHASE ONE PROPERTY LINE
- PROPERTY LINE
- EXISTING BUILDING
- FENCE LINE
- INFRASTRUCTURE
- FORMER INFRASTRUCTURE
- UNDERGROUND TANK
- AH — ABOVE GROUND HYDRO SERVICE
- G — UNDERGROUND GAS SERVICE
- H — UNDERGROUND HYDRO SERVICE
- W — WATER SERVICE
- S — STORM SERVICE
- SS — SANITARY SERVICE

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN (APEC)

- APEC #1
- APEC #2
- APEC #3
- APEC #4A/B
- APEC #5
- APEC #6
- APEC #7

APEC No.	ON-SITE/OFF-SITE ACTIVITIES	PCA No.	POTENTIAL CONTAMINANTS OF CONCERN
APEC #1	GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS	28	BTEX AND PHC F1-F4
APEC #2	STORAGE, MAINTENANCE, FUELING AND REPAIR OF EQUIPMENT, VEHICLES AND MATERIALS USED TO MAINTAIN TRANSPORTATION SYSTEMS	52	BTEX, PHC F1-F4 AND METALS
APEC #3	STORAGE, MAINTENANCE, FUELING AND REPAIR OF EQUIPMENT, VEHICLES AND MATERIALS USED TO MAINTAIN TRANSPORTATION SYSTEMS	52	BTEX, PHC F1-F4 AND METALS
APEC #4A	IMPORTATION OF FILL MATERIAL OF UNKNOWN QUALITY	30	BTEX, PHC F1-F4, PAHs, VOCs AND METALS
APEC #4B	OPERATION OF DRY-CLEANING EQUIPMENT	37	VOCs
APEC #5	GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS	28	BTEX AND PHC F1-F4
APEC #6	GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS	28	BTEX AND PHC F1-F4
APEC #7	GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS STORAGE, MAINTENANCE, FUELING AND REPAIR OF EQUIPMENT, VEHICLES AND MATERIALS USED TO MAINTAIN TRANSPORTATION SYSTEMS	28 & 52	BTEX, PHC F1-F4 AND METALS

SCALE 1:250

0 5 10m

NOTES

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AtkinsRéalis

Client Name: SHELL CANADA PRODUCTS

Location: 1440 PRINCE OF WALES DRIVE (C03311), OTTAWA, ON

Title: **PHASE ONE CONCEPTUAL SITE MODEL SHOWING AREAS OF POTENTIAL ENVIRONMENTAL CONCERN**

Drawn:	Date:	Project No:
AG	DECEMBER 2023	694129
Verified:	Project Manager:	Dwg No:
AA	AA	**FIGURE 4**

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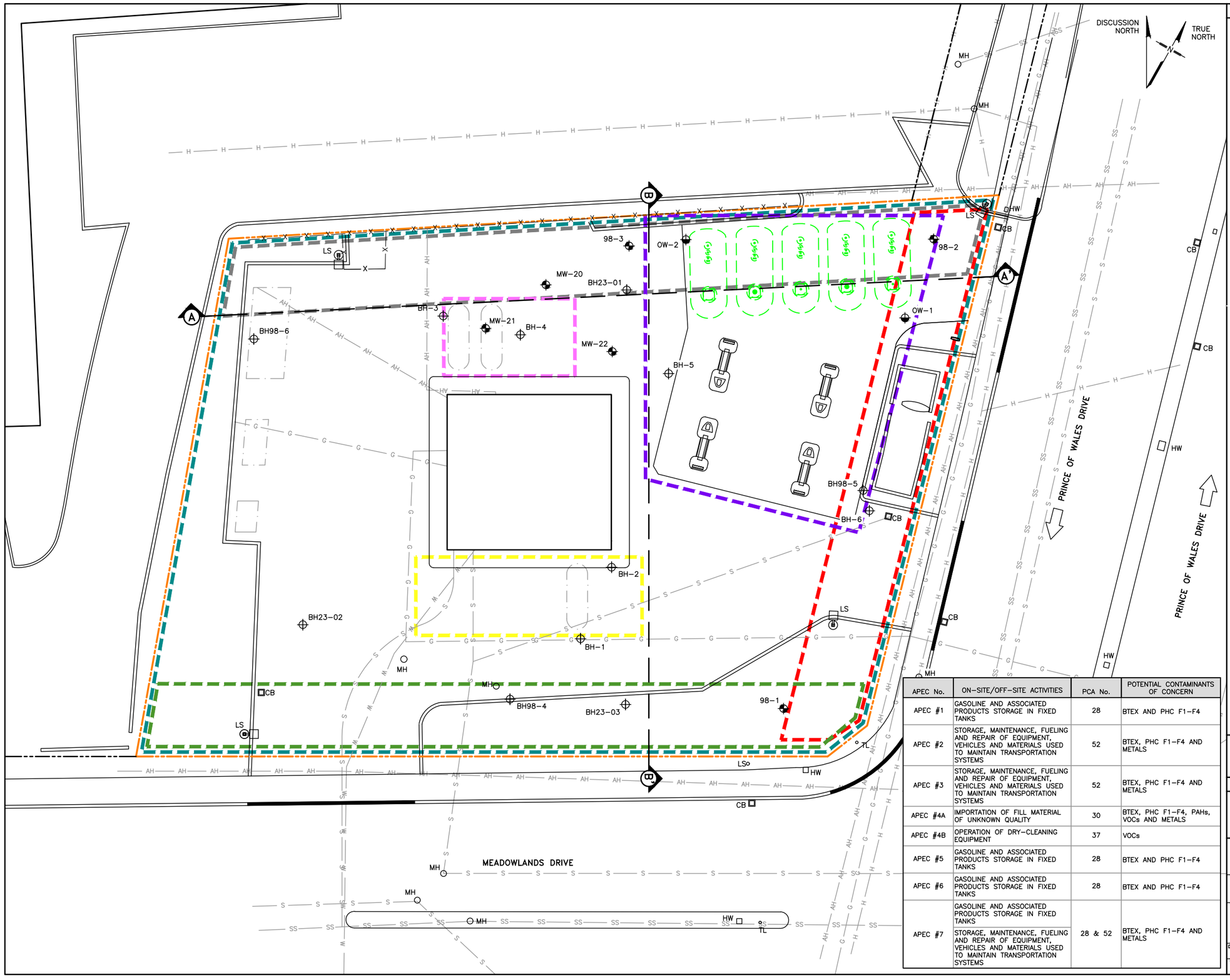

LEGEND

- LS — LIGHT STANDARD
- HW — HAND WELL
- MH — MANHOLE
- CB — CATCH BASIN
- BOREHOLE
- MONITORING WELL
- OBSERVATION/RECOVERY WELL
- A — CROSS-SECTIONAL LINE
- PHASE ONE PROPERTY LINE
- PROPERTY LINE
- EXISTING BUILDING
- FENCE LINE
- INFRASTRUCTURE
- FORMER INFRASTRUCTURE
- UNDERGROUND TANK
- AH — ABOVE GROUND HYDRO SERVICE
- G — UNDERGROUND GAS SERVICE
- H — UNDERGROUND HYDRO SERVICE
- W — WATER SERVICE
- S — STORM SERVICE
- SS — SANITARY SERVICE

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN (APEC)

- APEC #1
- APEC #2
- APEC #3
- APEC #4A/B
- APEC #5
- APEC #6
- APEC #7

APEC No.	ON-SITE/OFF-SITE ACTIVITIES	PCA No.	POTENTIAL CONTAMINANTS OF CONCERN
APEC #1	GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS	28	BTEX AND PHC F1-F4
APEC #2	STORAGE, MAINTENANCE, FUELING AND REPAIR OF EQUIPMENT, VEHICLES AND MATERIALS USED TO MAINTAIN TRANSPORTATION SYSTEMS	52	BTEX, PHC F1-F4 AND METALS
APEC #3	STORAGE, MAINTENANCE, FUELING AND REPAIR OF EQUIPMENT, VEHICLES AND MATERIALS USED TO MAINTAIN TRANSPORTATION SYSTEMS	52	BTEX, PHC F1-F4 AND METALS
APEC #4A	IMPORTATION OF FILL MATERIAL OF UNKNOWN QUALITY	30	BTEX, PHC F1-F4, PAHs, VOCs AND METALS
APEC #4B	OPERATION OF DRY-CLEANING EQUIPMENT	37	VOCs
APEC #5	GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS	28	BTEX AND PHC F1-F4
APEC #6	GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS	28	BTEX AND PHC F1-F4
APEC #7	GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS STORAGE, MAINTENANCE, FUELING AND REPAIR OF EQUIPMENT, VEHICLES AND MATERIALS USED TO MAINTAIN TRANSPORTATION SYSTEMS	28 & 52	BTEX, PHC F1-F4 AND METALS

SCALE 1:250

0 5 10m

NOTES

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AtkinsRéalis

Client Name: SHELL CANADA PRODUCTS

Location: 1440 PRINCE OF WALES DRIVE (C03311), OTTAWA, ON

Title:

SAMPLING LOCATIONS AND CROSS-SECTIONAL LINES

Drawn:	Date:	Project No:
AG	DECEMBER 2023	694129
Verified:	Project Manager:	Dwg No:
AA	AA	FIGURE 5

PAGE FORMAT: 11x17

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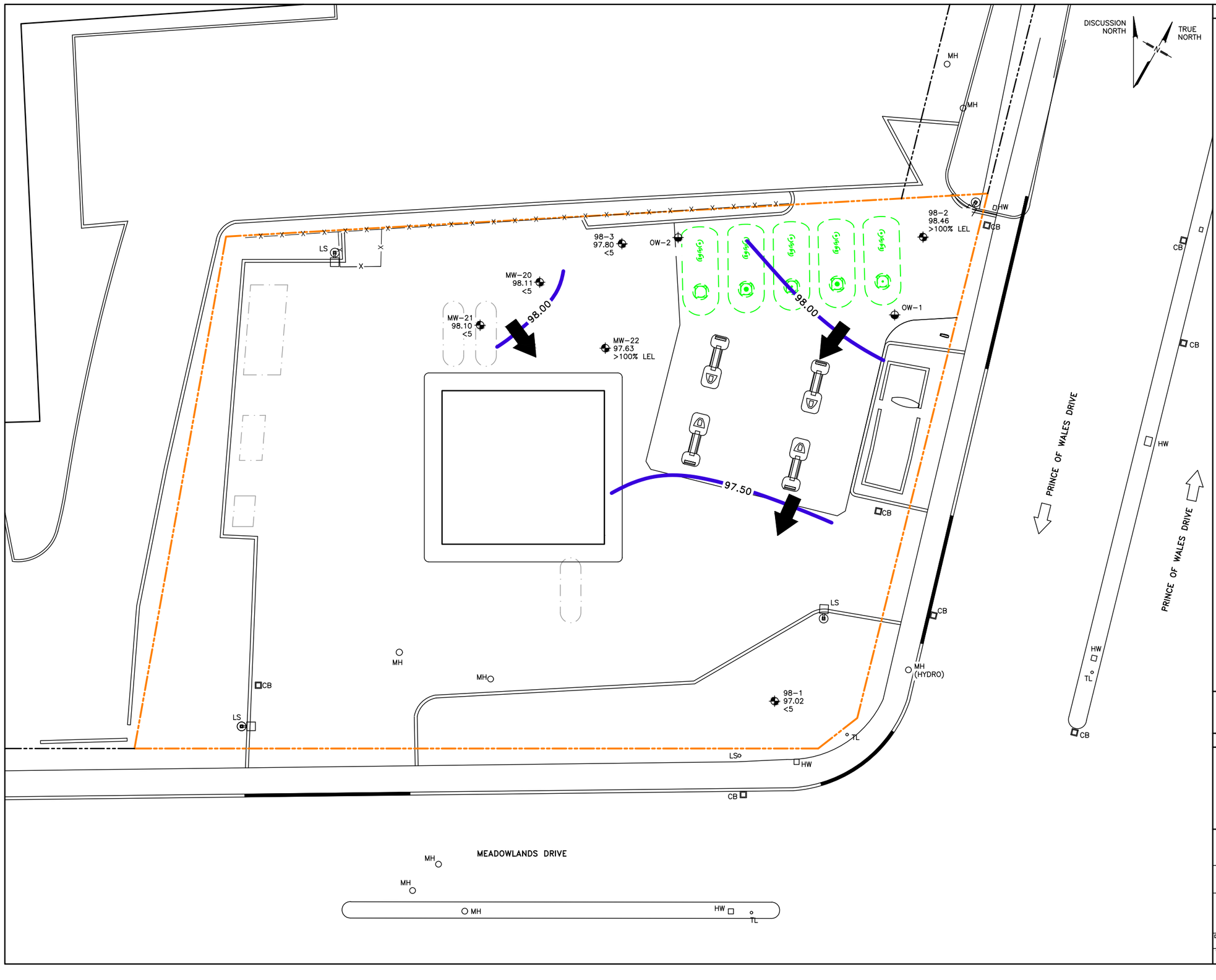


LEGEND

LS	LIGHT STANDARD
HW	HAND WELL
	MANHOLE
	CATCH BASIN
	BOREHOLE
	MONITORING WELL
	OBSERVATION/RECOVERY WELL
	PHASE ONE PROPERTY LINE
	PROPERTY LINE
	EXISTING BUILDING
— X — X —	FENCE LINE
	INFRASTRUCTURE
	FORMER INFRASTRUCTURE
	UNDERGROUND TANK
97.00	INTERPRETED WATER LEVEL ELEVATION CONTOUR (m)
	INTERPRETED SHALLOW HORIZONTAL GROUNDWATER FLOW DIRECTION
MW-20	IDENTIFICATION
98.11	WATER LEVEL ELEVATION (m) (JUNE 9, 2022)
<5	OVM READING

SCALE 1:250

0 5 10m

NOTES

1. SCALE AND SITE INFRASTRUCTURE LOCATIONS ARE APPROXIMATE
2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PRINTED, PHOTOCOPIED OR FAXED IN OTHER THAN ITS ORIGINAL SIZE AND COLOURS
3. ALL OVM READINGS ARE IN ppmv UNLESS OTHERWISE NOTED
4. 'OVM' : ORGANIC VAPOUR METER
5. 'ppmv' : PARTS PER MILLION BY VOLUME
6. '% LEL' : PERCENT OF THE LOWER EXPLOSIVE LIMIT OF HEXANE
7. 'm' : METRES

AtkinsRéalis

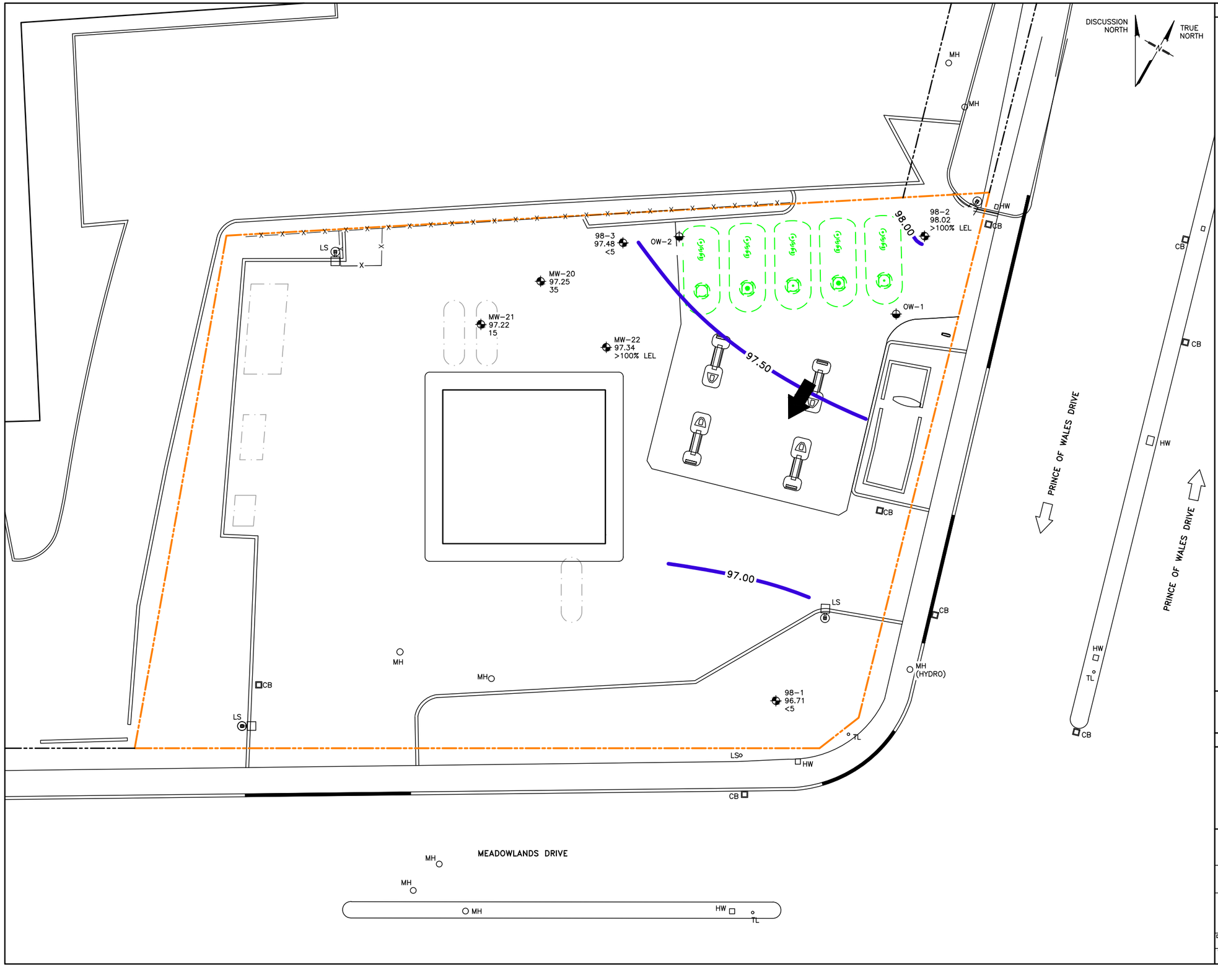
Client Name: SHELL CANADA PRODUCTS	Location: 1440 PRINCE OF WALES DRIVE (C03311), OTTAWA, ON

Title: **INTERPRETED SHALLOW HORIZONTAL GROUNDWATER FLOW DIRECTION (JUNE 9, 2022)**

Drawn: AG	Date: DECEMBER 2023	Project No: 694129
Verified: AA	Project Manager: AA	Dwg No: **FIGURE 6A**

PAGE FORMAT: 11x17

PATH: P:\SHELL\1440 PRINCE OF WALES DR, OTTAWA\694129\40_EXECUTION\45_CAD_DWGS\005 (2023 PHASE II)\005F6A_694129.DWG



LEGEND

LS	LIGHT STANDARD
HW	HAND WELL
	MANHOLE
	CATCH BASIN
	BOREHOLE
	MONITORING WELL
	OBSERVATION/RECOVERY WELL
	PHASE ONE PROPERTY LINE
	PROPERTY LINE
	EXISTING BUILDING
	FENCE LINE
	INFRASTRUCTURE
	FORMER INFRASTRUCTURE
	UNDERGROUND TANK
97.00	INTERPRETED WATER LEVEL ELEVATION CONTOUR (m)
	INTERPRETED SHALLOW HORIZONTAL GROUNDWATER FLOW DIRECTION
MW-20	IDENTIFICATION
97.25	WATER LEVEL ELEVATION (m) (JUNE 20, 2023)
35	OVM READING

SCALE 1:250

0 5 10m

NOTES

1. SCALE AND SITE INFRASTRUCTURE LOCATIONS ARE APPROXIMATE
2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PRINTED, PHOTOCOPIED OR FAXED IN OTHER THAN ITS ORIGINAL SIZE AND COLOURS
3. ALL OVM READINGS ARE IN ppmv UNLESS OTHERWISE NOTED
4. 'OVM' : ORGANIC VAPOUR METER
5. 'ppmv' : PARTS PER MILLION BY VOLUME
6. '% LEL' : PERCENT OF THE LOWER EXPLOSIVE LIMIT OF HEXANE
7. 'm' : METRES

AtkinsRéalis

Client Name: SHELL CANADA PRODUCTS

Location: 1440 PRINCE OF WALES DRIVE (CO3311), OTTAWA, ON

Title: **INTERPRETED SHALLOW HORIZONTAL GROUNDWATER FLOW DIRECTION (JUNE 20, 2023)**

Drawn:	Date:	Project No:
AG	DECEMBER 2023	694129
Verified:	Project Manager:	Dwg No:
AA	AA	**FIGURE 6B**

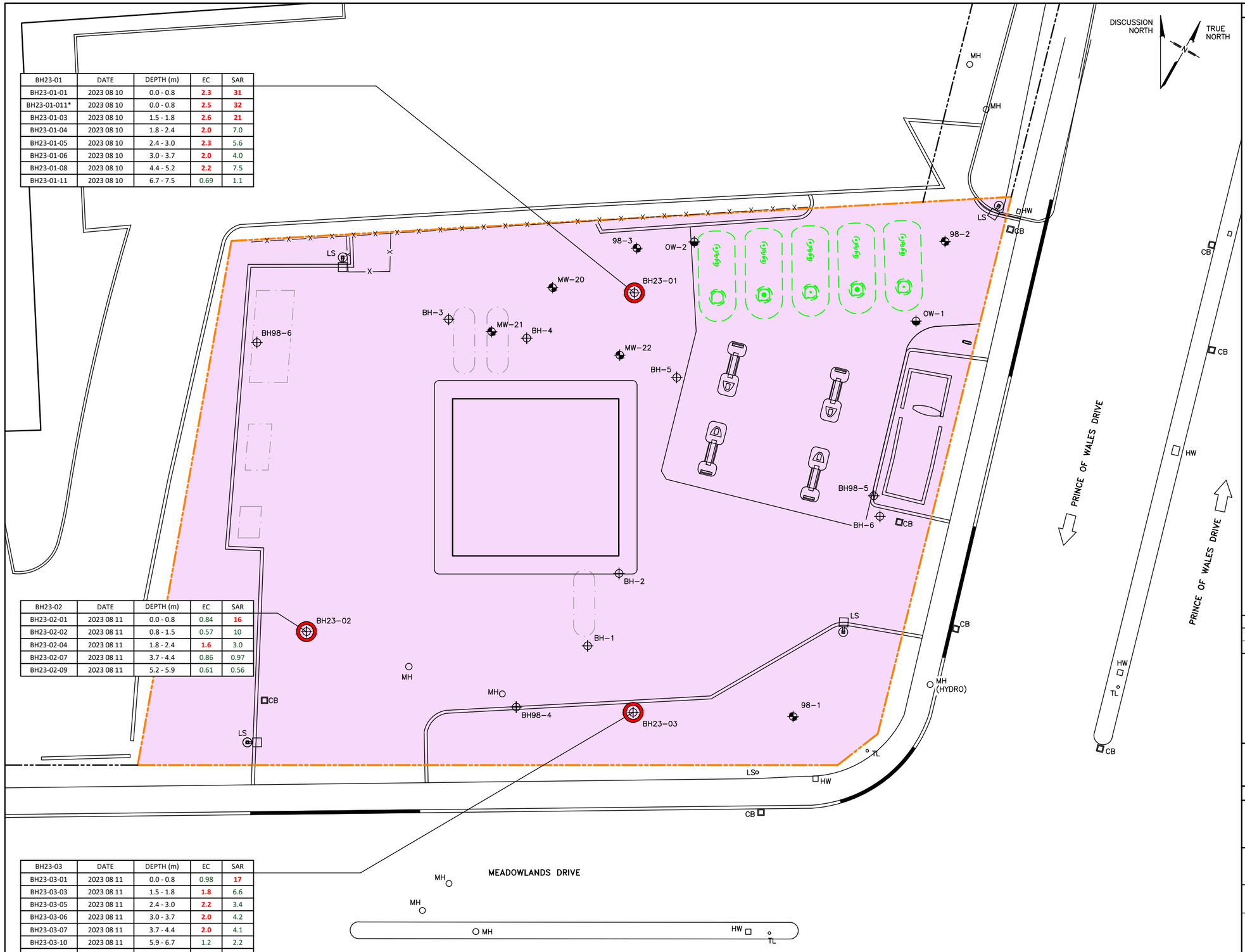
PAGE FORMAT: 11x17

PATH: P:\SHELL\1440 PRINCE OF WALES DR, OTTAWA\694129\40_EXECUTION\45_GIS_DWGS\005 (2023 PHASE II)\005F6B_694129.DWG

BH23-01	DATE	DEPTH (m)	EC	SAR
BH23-01-01	2023 08 10	0.0 - 0.8	2.3	31
BH23-01-011*	2023 08 10	0.0 - 0.8	2.5	32
BH23-01-03	2023 08 10	1.5 - 1.8	2.6	21
BH23-01-04	2023 08 10	1.8 - 2.4	2.0	7.0
BH23-01-05	2023 08 10	2.4 - 3.0	2.3	5.6
BH23-01-06	2023 08 10	3.0 - 3.7	2.0	4.0
BH23-01-08	2023 08 10	4.4 - 5.2	2.2	7.5
BH23-01-11	2023 08 10	6.7 - 7.5	0.69	1.1

BH23-02	DATE	DEPTH (m)	EC	SAR
BH23-02-01	2023 08 11	0.0 - 0.8	0.84	16
BH23-02-02	2023 08 11	0.8 - 1.5	0.57	10
BH23-02-04	2023 08 11	1.8 - 2.4	1.6	3.0
BH23-02-07	2023 08 11	3.7 - 4.4	0.86	0.97
BH23-02-09	2023 08 11	5.2 - 5.9	0.61	0.56

BH23-03	DATE	DEPTH (m)	EC	SAR
BH23-03-01	2023 08 11	0.0 - 0.8	0.98	17
BH23-03-03	2023 08 11	1.5 - 1.8	1.8	6.6
BH23-03-05	2023 08 11	2.4 - 3.0	2.2	3.4
BH23-03-06	2023 08 11	3.0 - 3.7	2.0	4.2
BH23-03-07	2023 08 11	3.7 - 4.4	2.0	4.1
BH23-03-10	2023 08 11	5.9 - 6.7	1.2	2.2
BH23-03-100*	2023 08 11	5.9 - 6.7	1.1	2.0



LEGEND

- LS — LIGHT STANDARD
- HW — HAND WELL
- MH — MANHOLE
- CB — CATCH BASIN
- BOREHOLE
- BOREHOLE/MONITORING WELL
- OBSERVATION/RECOVERY WELL
- GREEN — GREEN COLOURED CONCENTRATION MET THE MOE STANDARD
- RED — RED COLOURED CONCENTRATION EXCEEDED THE MOE STANDARD
- LOCATION WHERE ALL SOIL SAMPLES ANALYSED MET THE SELECTED STANDARD FOR ALL PARAMETERS ANALYSED
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE ANALYSED EXCEEDED THE SELECTED STANDARD FOR AT LEAST ONE PARAMETER ANALYSED
- INFERRED LIMITS OF CONTAMINATION AS DEFINED IN ACCORDANCE WITH O.REG 153/04 SCHEDULE E, PART III, SECTION 7(4)
- PHASE ONE PROPERTY LINE
- PROPERTY LINE
- EXISTING BUILDING
- FENCE LINE
- INFRASTRUCTURE
- FORMER INFRASTRUCTURE
- UNDERGROUND TANK

PARAMETERS	ABBREVIATION	MOE TABLE 3
ELECTRICAL CONDUCTIVITY	EC	1.4
SODIUM ADSORPTION RATIO	SAR	12

STANDARDS:
- TABLE 3 FULL DEPTH GENERIC SITE CONDITION STANDARDS IN A NON-POTABLE GROUNDWATER CONDITION FOR INDUSTRIAL/COMMERCIAL/COMMUNITY PROPERTY USE, MEDIUM AND FINE TEXTURED SOILS (MOE, 2011)

GENERAL NOTES:
1. ELECTRICAL CONDUCTIVITY CONCENTRATIONS IN MILLISIEMENS/CENTIMETRE (mS/cm)
2. '*' : FIELD DUPLICATE OF PREVIOUSLY LISTED SAMPLE

SCALE 1:250

0 5 10m

NOTES

1. SCALE AND SITE INFRASTRUCTURE LOCATIONS ARE APPROXIMATE
2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PRINTED, PHOTOCOPIED OR FAXED IN OTHER THAN ITS ORIGINAL SIZE AND COLOURS
3. 'm' : METRES

AtkinsRéalis

Client Name: SHELL CANADA PRODUCTS

Location: 1440 PRINCE OF WALES DRIVE (C03311), OTTAWA, ON

Title:

SOIL ANALYTICAL RESULTS (EC/SAR)

Drawn:	Date:	Project No:
AG	DECEMBER 2023	694129
Verified:	Project Manager:	Dwg No:
AA	AA	FIGURE 7

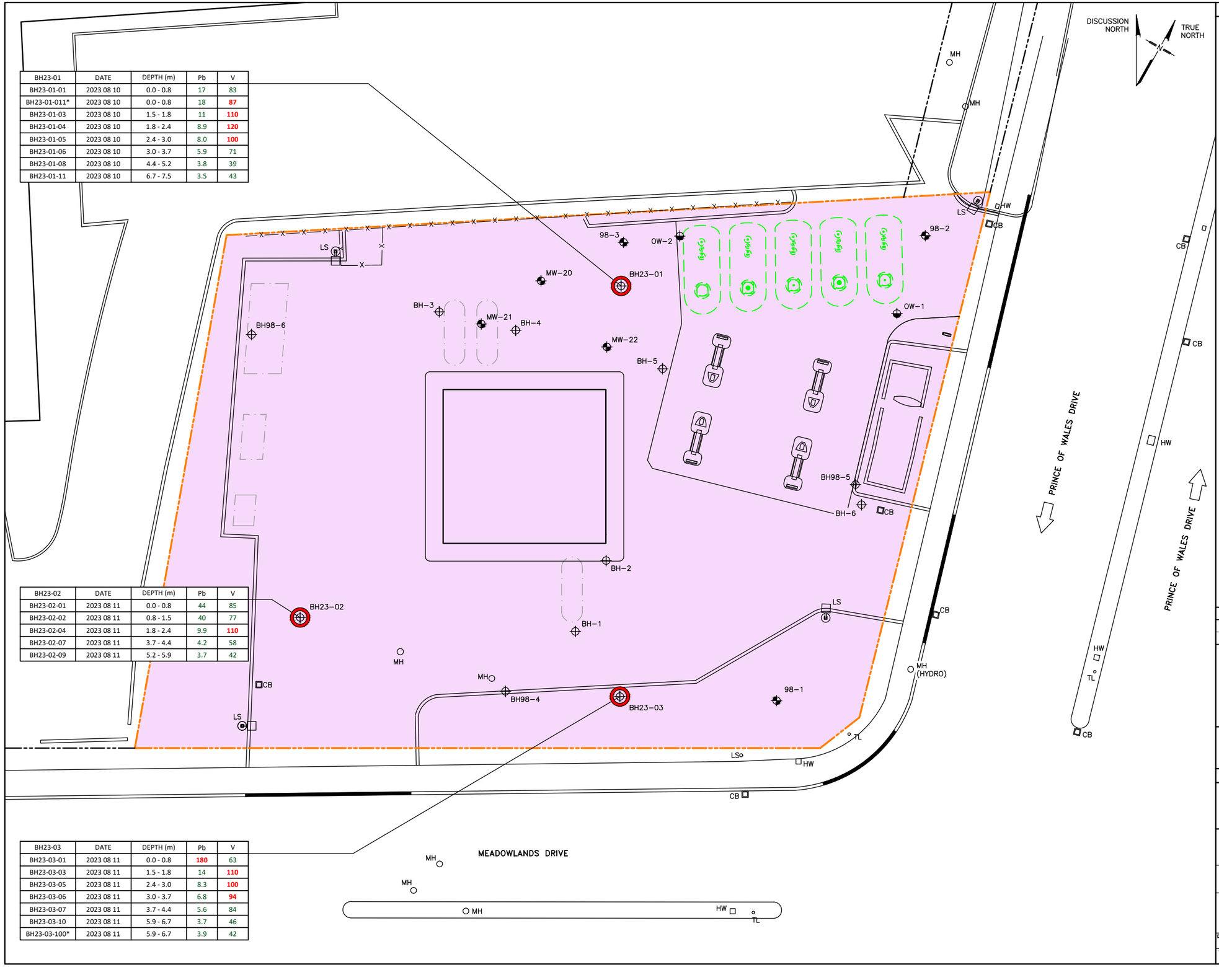
PAGE FORMAT: 11x17

PATH: P:\SHELL\1440 PRINCE OF WALES DR, OTTAWA\694129\40_EXECUTION\45_GIS_DWGS\005 (2023 PHASE II)\005f07_694129.DWG

BH23-01	DATE	DEPTH (m)	Pb	V
BH23-01-01	2023 08 10	0.0 - 0.8	17	83
BH23-01-011*	2023 08 10	0.0 - 0.8	18	87
BH23-01-03	2023 08 10	1.5 - 1.8	11	110
BH23-01-04	2023 08 10	1.8 - 2.4	8.9	120
BH23-01-05	2023 08 10	2.4 - 3.0	8.0	100
BH23-01-06	2023 08 10	3.0 - 3.7	5.9	71
BH23-01-08	2023 08 10	4.4 - 5.2	3.8	39
BH23-01-11	2023 08 10	6.7 - 7.5	3.5	43

BH23-02	DATE	DEPTH (m)	Pb	V
BH23-02-01	2023 08 11	0.0 - 0.8	44	85
BH23-02-02	2023 08 11	0.8 - 1.5	40	77
BH23-02-04	2023 08 11	1.8 - 2.4	9.9	110
BH23-02-07	2023 08 11	3.7 - 4.4	4.2	58
BH23-02-09	2023 08 11	5.2 - 5.9	3.7	42

BH23-03	DATE	DEPTH (m)	Pb	V
BH23-03-01	2023 08 11	0.0 - 0.8	180	63
BH23-03-03	2023 08 11	1.5 - 1.8	14	110
BH23-03-05	2023 08 11	2.4 - 3.0	8.3	100
BH23-03-06	2023 08 11	3.0 - 3.7	6.8	94
BH23-03-07	2023 08 11	3.7 - 4.4	5.6	84
BH23-03-10	2023 08 11	5.9 - 6.7	3.7	46
BH23-03-100*	2023 08 11	5.9 - 6.7	3.9	42



LEGEND

- LS — LIGHT STANDARD
- HW — HAND WELL
- MANHOLE
- CATCH BASIN
- BOREHOLE
- BOREHOLE/MONITORING WELL
- OBSERVATION/RECOVERY WELL
- GREEN — GREEN COLOURED CONCENTRATION MET THE MOE STANDARD
- RED — RED COLOURED CONCENTRATION EXCEEDED THE MOE STANDARD
- LOCATION WHERE ALL SOIL SAMPLES ANALYSED MET THE SELECTED STANDARD FOR ALL PARAMETERS ANALYSED
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE ANALYSED EXCEEDED THE SELECTED STANDARD FOR AT LEAST ONE PARAMETER ANALYSED
- INFERRED LIMITS OF CONTAMINATION AS DEFINED IN ACCORDANCE WITH O.REG 153/04 SCHEDULE E, PART III, SECTION 7(4)
- PHASE ONE PROPERTY LINE
- PROPERTY LINE
- EXISTING BUILDING
- FENCE LINE
- INFRASTRUCTURE
- FORMER INFRASTRUCTURE
- UNDERGROUND TANK

PARAMETERS	ABBREVIATION	MOE TABLE 3
LEAD	Pb	120
VANADIUM	V	86

STANDARDS:
- TABLE 3 FULL DEPTH GENERIC SITE CONDITION STANDARDS IN A NON-POTABLE GROUNDWATER CONDITION FOR INDUSTRIAL/COMMERCIAL/COMMUNITY PROPERTY USE, MEDIUM AND FINE TEXTURED SOILS (MOE, 2011)

GENERAL NOTES:
1. ALL CONCENTRATIONS IN MICROGRAMS/LITRE (µg/L)
2. '*' : FIELD DUPLICATE OF PREVIOUSLY LISTED SAMPLE

SCALE 1:250

0 5 10m

NOTES
1. SCALE AND SITE INFRASTRUCTURE LOCATIONS ARE APPROXIMATE
2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PRINTED, PHOTOCOPIED OR FAXED IN OTHER THAN ITS ORIGINAL SIZE AND COLOURS
3. 'm' : METRES

AtkinsRéalis

Client Name: SHELL CANADA PRODUCTS

Location: 1440 PRINCE OF WALES DRIVE (C03311), OTTAWA, ON

Title:

SOIL ANALYTICAL RESULTS (LEAD AND VANADIUM)

Drawn:	Date:	Project No:
AG	DECEMBER 2023	694129
Verified:	Project Manager:	Dwg No:
AA	AA	FIGURE 8

PAGE FORMAT: 11x17

PATH: P:\SHELL\1440 PRINCE OF WALES DR, OTTAWA\694129\40_EXECUTION\45_GIS_DWGS\005 (2023 PHASE II)\005F08_694129.DWG

BH23-01	DATE	DEPTH (m)	B	T	E	X	F1	F2	F3	F4
BH23-01-01	2023 08 10	0.0 - 0.8	**1.0**	0.18	0.66	0.14	27	< 10	56	51
BH23-01-011*	2023 08 10	0.0 - 0.8	**0.44**	0.092	0.77	0.12	31	< 10	< 50	< 50
BH23-01-03	2023 08 10	1.5 - 1.8	0.11	< 0.020	0.14	< 0.020	< 10	< 10	55	< 50
BH23-01-04	2023 08 10	1.8 - 2.4	**1.1**	0.14	1.9	7.4	27	51	< 50	< 50
BH23-01-05	2023 08 10	2.4 - 3.0	**4.1**	24	13	**72**	**260**	110	< 50	< 50
BH23-01-06	2023 08 10	3.0 - 3.7	**5.8**	43	**20**	**110**	**430**	**810**	120	< 50
BH23-01-08	2023 08 10	4.4 - 5.2	**1.1**	0.21	1.6	1.5	< 10	< 10	< 50	< 50
BH23-01-11	2023 08 10	6.7 - 7.5	**1.3**	0.028	0.037	< 0.020	< 10	< 10	< 50	< 50

BH-20	DATE	DEPTH (m)	B	T	E	X	TPH	TEH	TPH(GD)
BH-20-5	2001 07 12	3.8 - 4.4	**2.53**	10.1	5.05	24.36	187	528	715
BH-20-7	2001 07 12	5.3 - 5.9	ND	0.80	0.84	3.11	59	100	159

BH-21	DATE	DEPTH (m)	B	T	E	X	TPH	TEH	TPH(GD)
BH-21-6	2001 07 12	4.8 - 5.2	**5.36**	22.4	9.08	**39.5**	308	148	456

BH-3	DATE	DEPTH (m)	B	T	E	X	TPH	TEH	TPH(GD)	TPH (HO)
BH-3-6	2000 07 31	4.5 - 5.4	ND	ND	ND	ND	ND	ND	ND	ND

BH-4	DATE	DEPTH (m)	B	T	E	X	TPH	TEH	TPH(GD)	TPH (HO)
BH-4-6	2000 07 31	4.5 - 5.1	**10.3**	47.2	10.5	**54.7**	698	86.2	784.2	ND

BH-22	DATE	DEPTH (m)	B	T	E	X	TPH	TEH	TPH(GD)
BH-22-5	2001 07 12	3.8 - 4.4	**4.27**	12.3	3.47	16.95	121	116	237

BH-5	DATE	DEPTH (m)	B	T	E	X	TPH	TEH	TPH(GD)	TPH (HO)
BH-5-6	2000 07 31	4.5 - 5.1	**29**	**125**	**30.1**	**169.8**	2,040	328	2,368	ND
DUPLICATE*	2000 07 31	4.5 - 5.1	**10.8**	**77.6**	**24.2**	**154.8**	1,520	191	1,711	ND

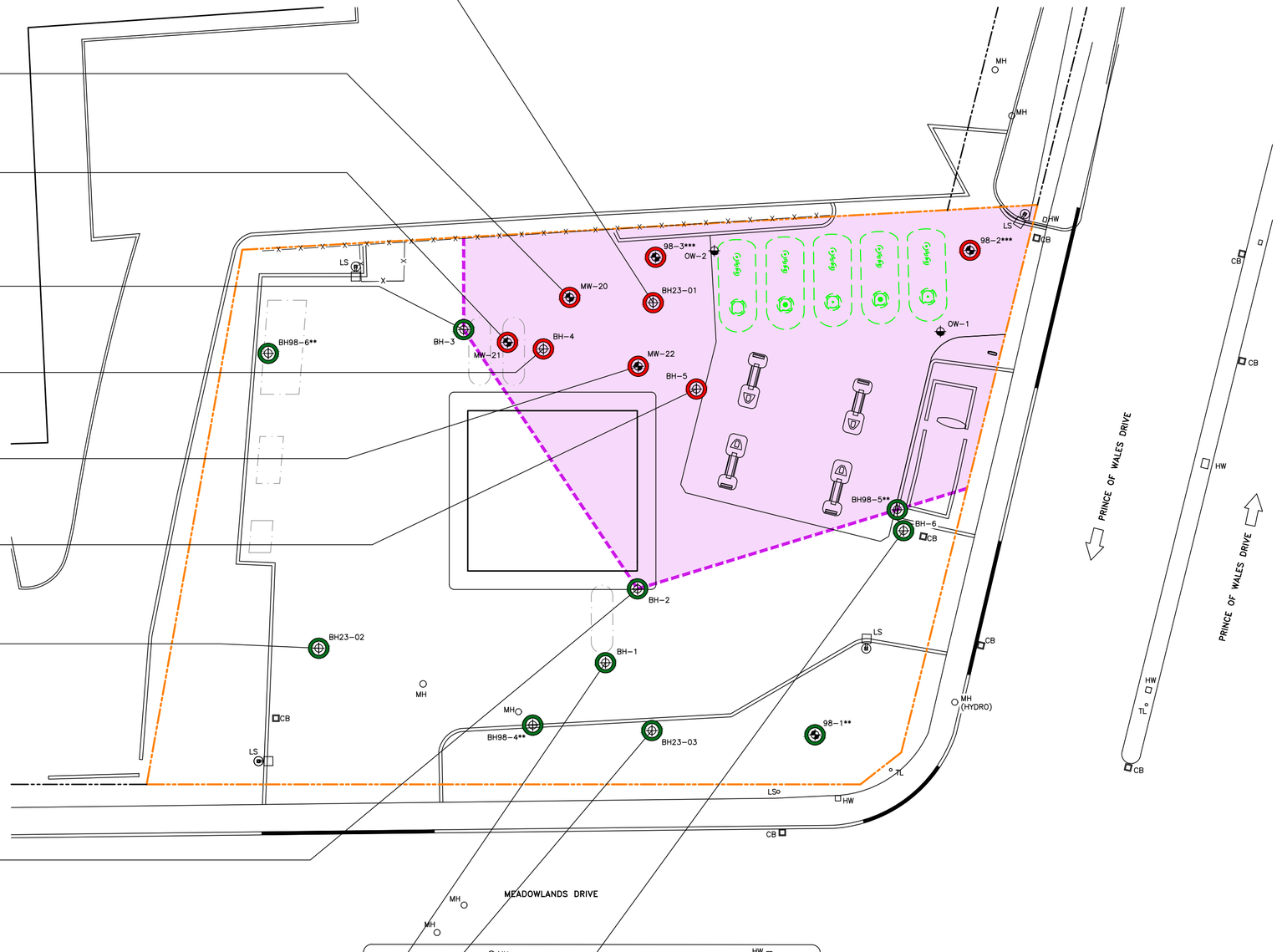
BH23-02	DATE	DEPTH (m)	B	T	E	X	F1	F2	F3	F4
BH23-02-01	2023 08 11	0.0 - 0.8	< 0.0060	< 0.020	< 0.010	< 0.020	< 10	< 10	< 50	82
BH23-02-02	2023 08 11	0.8 - 1.5	< 0.0060	< 0.020	< 0.010	< 0.020	< 10	< 10	< 50	51
BH23-02-04	2023 08 11	1.8 - 2.4	< 0.0060	< 0.020	< 0.010	< 0.020	< 10	< 10	< 50	< 50
BH23-02-07	2023 08 11	3.7 - 4.4	< 0.0060	< 0.020	< 0.010	< 0.020	< 10	< 10	< 50	< 50
BH23-02-09	2023 08 11	5.2 - 5.9	< 0.0060	< 0.020	< 0.010	< 0.020	< 10	< 10	< 50	< 50

BH-2	DATE	DEPTH (m)	B	T	E	X	TPH	TEH	TPH(GD)	TPH (HO)
BH-2-4	2000 07 31	3.0 - 3.6	ND	TR	TR	TR	ND	ND	ND	ND

BH-1	DATE	DEPTH (m)	B	T	E	X	TPH	TEH	TPH(GD)	TPH (HO)
BH-1-5	2000 07 31	3.8 - 4.4	ND	ND	ND	TR	ND	ND	ND	ND

BH23-03	DATE	DEPTH (m)	B	T	E	X	F1	F2	F3	F4
BH23-03-01	2023 08 11	0.0 - 0.8	< 0.0060	< 0.020	< 0.010	< 0.020	< 10	< 10	100	< 50
BH23-03-03	2023 08 11	1.5 - 1.8	< 0.0060	< 0.020	< 0.010	< 0.020	< 10	< 10	< 50	< 50
BH23-03-05	2023 08 11	2.4 - 3.0	< 0.0060	< 0.020	< 0.010	< 0.020	< 10	< 10	< 50	< 50
BH23-03-06	2023 08 11	3.0 - 3.7	< 0.0060	< 0.020	< 0.010	< 0.020	< 10	< 10	< 50	< 50
BH23-03-07	2023 08 11	3.7 - 4.4	< 0.0060	< 0.020	< 0.010	< 0.020	< 10	< 10	< 50	< 50
BH23-03-10	2023 08 11	5.9 - 6.7	< 0.0060	< 0.020	< 0.010	0.025	< 10	< 10	< 50	< 50
BH23-03-100*	2023 08 11	5.9 - 6.7	< 0.0060	< 0.020	< 0.010	< 0.020	< 10	< 10	< 50	< 50

BH-6	DATE	DEPTH (m)	B	T	E	X	TPH	TEH	TPH(GD)	TPH (HO)
BH-6-5	2000 07 31	3.8 - 4.4	ND	0.09	0.38	0.23	25	ND	25	ND



LEGEND

- LS — LIGHT STANDARD
- HW — HAND WELL
- MANHOLE
- CATCH BASIN
- BOREHOLE
- BOREHOLE/MONITORING WELL
- OBSERVATION/RECOVERY WELL
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- RED — RED COLOURED CONCENTRATION EXCEEDED THE MOE STANDARD
- LOCATION WHERE ALL SOIL SAMPLES ANALYSED MET THE SELECTED STANDARD FOR ALL PARAMETERS ANALYSED
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE ANALYSED EXCEEDED THE SELECTED STANDARD FOR AT LEAST ONE PARAMETER ANALYSED
- INFERRED LIMITS OF CONTAMINATION AS DEFINED IN ACCORDANCE WITH O.REG 153/04 SCHEDULE E, PART III, SECTION 7(4)
- PHASE ONE PROPERTY LINE
- PROPERTY LINE
- EXISTING BUILDING
- — X —— X — FENCE LINE
- INFRASTRUCTURE
- FORMER INFRASTRUCTURE
- UNDERGROUND TANK

PARAMETERS	ABBREVIATION	MOE TABLE 3
BENZENE	B	0.4
TOLUENE	T	78
ETHYLBENZENE	E	19
TOTAL XYLENES	X	30
PHC F1	F1	65
PHC F2	F2	250
PHC F3	F3	2,500
PHC F4	F4	6,600
TOTAL PURGEABLE HYDROCARBONS	TPH	NS
TOTAL EXTRACTABLE HYDROCARBONS	TEH	NS
TPH (GAS/DIESEL)	TPH (GD)	NS
TPH (HEAVY OIL)	TPH (HO)	NS

STANDARDS:

- TABLE 3 FULL DEPTH GENERIC SITE CONDITION STANDARDS IN A NON-POTABLE GROUNDWATER CONDITION FOR INDUSTRIAL/COMMERCIAL/COMMUNITY PROPERTY USE, MEDIUM AND FINE TEXTURED SOILS (MOE, 2011)

GENERAL NOTES:

1. ALL CONCENTRATIONS IN MICROGRAMS/GRAM (µg/g) BY DRY WEIGHT BASIS
2. 'NS' : NO STANDARD
3. 'ND' : NOT DETECTED
4. 'TR' : TRACE LEVELS DETECTED
2. '*' : FIELD DUPLICATE OF PREVIOUSLY LISTED SAMPLE
3. HISTORICALLY TPH GAS/DIESEL ETC. ANALYSED HOWEVER EXCEEDS TABLE 3 STANDARDS
4. '**' : LOCATION MET APPLICABLE STANDARD AT THE TIME OF SAMPLING (ANALYTICAL RESULTS NOT AVAILABLE FOR THESE LOCATIONS TO COMPARE TO THE CURRENT STANDARDS)
5. '***' : LOCATION EXCEEDED APPLICABLE STANDARD AT THE TIME OF SAMPLING (ANALYTICAL RESULTS NOT AVAILABLE FOR THESE LOCATIONS TO COMPARE TO THE CURRENT STANDARDS)

SCALE 1:250

0 5 10m

NOTES

1. SCALE AND SITE INFRASTRUCTURE LOCATIONS ARE APPROXIMATE
2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PRINTED, PHOTOCOPIED OR FAXED IN OTHER THAN ITS ORIGINAL SIZE AND COLOURS
3. 'm' : METRES

AtkinsRéalis

Client Name: SHELL CANADA PRODUCTS

Location: 1440 PRINCE OF WALES DRIVE (C03311), OTTAWA, ON

Title:

SOIL ANALYTICAL RESULTS (BTEX AND PHCs)

Drawn:	Date:	Project No:
AG	DECEMBER 2023	694129
Verified:	Project Manager:	Dwg No:
AA	AA	**FIGURE 9**

PAGE FORMAT: 17x22

PATH: P:\SHELL\1440 PRINCE OF WALES DR, OTTAWA\694129\02_EXECUTION\KS_GIS_DWGS\005 (2023 PHASE II)\005F09_694129.DWG

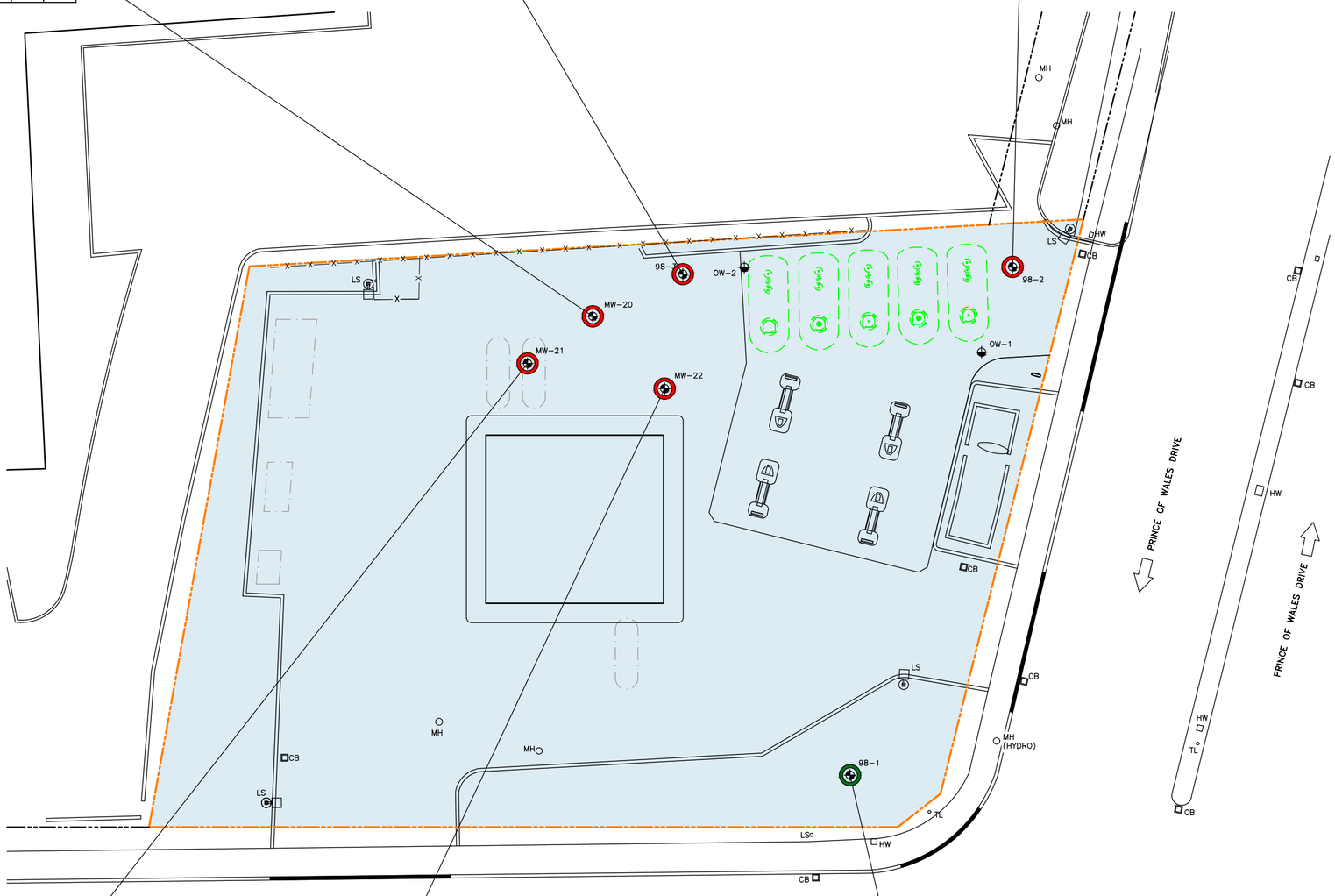
DISCUSSION NORTH

TRUE NORTH

98-3								
SAMPLE DATE	B	T	E	X	F1	F2	F3	F4
2022 06 09	700	8.7	430	230	5,100	13,000	32,000	17,000
2023 06 21	740	7.6	450	110	1,500	720	250	< 200

98-2									
SAMPLE DATE	B	T	E	X	F1	F2	F3	F4	F4G
2022 06 09	1,200	130	1,200	4,900	13,000	14,000	1,500	1,200	11,000
2023 06 21	1,500	330	1,000	4,000	5,000	3,200	< 200	< 200	-
2023 11 27	1,800	450	1,200	4,700	-	-	-	-	-

MW-20									
SAMPLE DATE	B	T	E	X	F1	F2	F3	F4	F4G
2022 06 09	0.69	< 0.20	< 0.20	< 0.40	28	140	370	230	-
2023 06 21	2.0	< 0.20	< 0.20	< 0.40	30	< 100	< 200	< 200	-
2023 11 27	540	8.6	410	78	-	-	-	-	-



MW-21								
SAMPLE DATE	B	T	E	X	F1	F2	F3	F4
2022 06 09	150	5.1	66	16	400	1,300	26,000	4,400
2023 06 21	490	27	360	350	630	520	300	< 200

MW-22								
SAMPLE DATE	B	T	E	X	F1	F2	F3	F4
2023 06 21	5,100	1,600	1,500	7,700	6,700	3,800	220	< 200

98-1								
SAMPLE DATE	B	T	E	X	F1	F2	F3	F4
2023 06 21	< 0.20	< 0.20	< 0.20	< 0.40	< 25	< 100	< 200	< 200
2023 11 27	< 0.20	< 0.20	< 0.20	< 0.20	-	-	-	-
2023 11 27*	< 0.20	< 0.20	< 0.20	< 0.20	-	-	-	-

LEGEND

- LS — LIGHT STANDARD
- HW — HAND WELL
- MANHOLE
- CB — CATCH BASIN
- MONITORING WELL
- OBSERVATION/RECOVERY WELL
- GREEN — GREEN COLOURED CONCENTRATION MET THE MOE STANDARD
- RED — RED COLOURED CONCENTRATION EXCEEDED THE MOE STANDARD
- LOCATION WHERE MOST RECENT GROUNDWATER SAMPLE MET STANDARDS FOR ALL PARAMETERS THAT WERE ANALYSED
- LOCATION WHERE MOST RECENT GROUNDWATER SAMPLE EXCEEDED STANDARDS FOR AT LEAST ONE PARAMETER THAT WAS ANALYSED
- INFERRED LIMITS OF CONTAMINATION AS DEFINED IN ACCORDANCE WITH O.REG 153/04 SCHEDULE E, PART III, SECTION 7(4)
- PHASE ONE PROPERTY LINE
- PROPERTY LINE
- EXISTING BUILDING
- FENCE LINE
- INFRASTRUCTURE
- FORMER INFRASTRUCTURE
- UNDERGROUND TANK

PARAMETERS	ABBREVIATION	STANDARDS
BENZENE	B	430
TOLUENE	T	18,000
ETHYLBENZENE	E	2,300
TOTAL XYLENES	X	4,200
PHC F1	F1	750
PHC F2	F2	150
PHC F3	F3	500
PHC F4	F4	500
PHC F4 (GRAVIMETRIC)	F4G	500

STANDARDS:
- TABLE 3 FULL DEPTH GENERIC SITE CONDITION STANDARDS IN A NON-POTABLE GROUNDWATER CONDITION FOR ALL TYPES OF PROPERTY USE, MEDIUM AND FINE TEXTURED SOILS (MOE, 2011)

GENERAL NOTES:
1. ALL CONCENTRATIONS IN MICROGRAMS/LITRE (µg/L)
2. '*' : FIELD DUPLICATE OF PREVIOUSLY LISTED SAMPLE

SCALE 1:250

0 5 10m

NOTES
1. SCALE AND SITE INFRASTRUCTURE LOCATIONS ARE APPROXIMATE
2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PRINTED, PHOTOCOPIED OR FAXED IN OTHER THAN ITS ORIGINAL SIZE AND COLOURS
3. 'm' : METRES

AtkinsRéalis

Client Name: SHELL CANADA PRODUCTS

Location: 1440 PRINCE OF WALES DRIVE (C03311), OTTAWA, ON

Title:

GROUNDWATER ANALYTICAL RESULTS (BTEX AND PHCs)

Drawn:	Date:	Project No:
AG	DECEMBER 2023	694129
Verified:	Project Manager:	Dwg No:
AA	AA	**FIGURE 10**

PAGE FORMAT: 17x22

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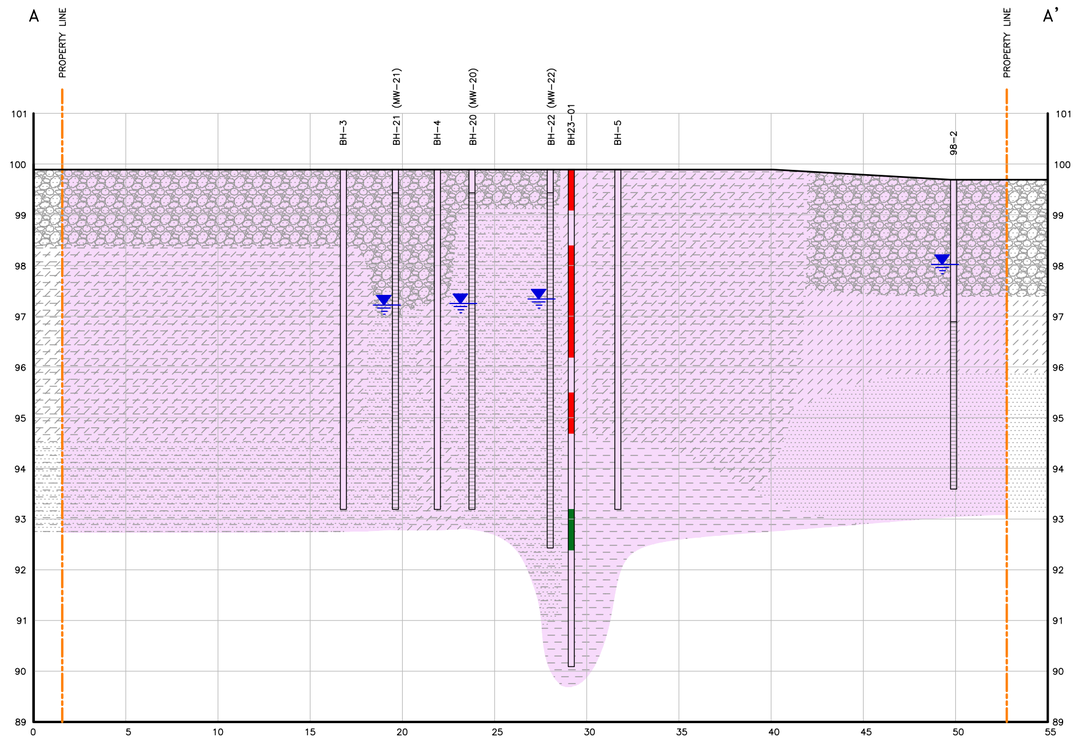

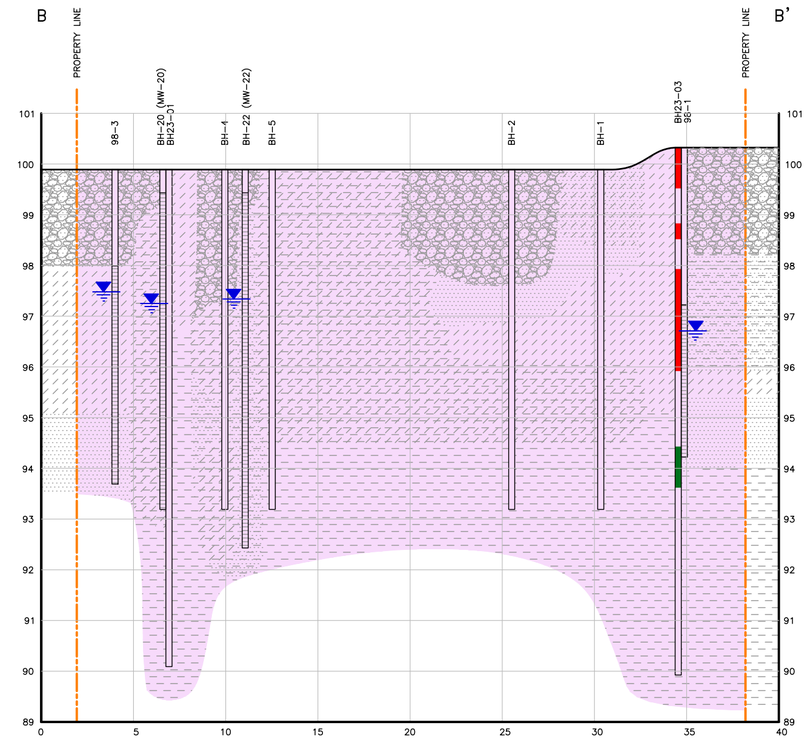

SCALE 1:250

0 5 10m

LEGEND

- GROUNDWATER ELEVATIONS (JUNE 20, 2023)
- BOREHOLE
- MONITORING WELL
- SAND AND GRAVEL FILL
- SAND
- SILT
- SILTY SAND, SANDY SILT
- CLAY
- SILT AND CLAY, CLAYEY SILT
- SAND AND CLAY
- LOCATION WHERE ALL SOIL SAMPLES ANALYSED MET THE SELECTED STANDARD FOR ALL PARAMETERS ANALYSED
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE ANALYSED EXCEEDED THE SELECTED STANDARD FOR AT LEAST ONE PARAMETER ANALYSED
- INFERRED LIMITS OF CONTAMINATION AS DEFINED IN ACCORDANCE WITH O.REG 153/04 SCHEDULE E, PART III, SECTION 7(4)

NOTES

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2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PRINTED, PHOTOCOPIED OR FAXED IN OTHER THAN ITS ORIGINAL SIZE AND COLOURS
3. 'm' : METRES

AtkinsRéalis

Client Name: SHELL CANADA PRODUCTS

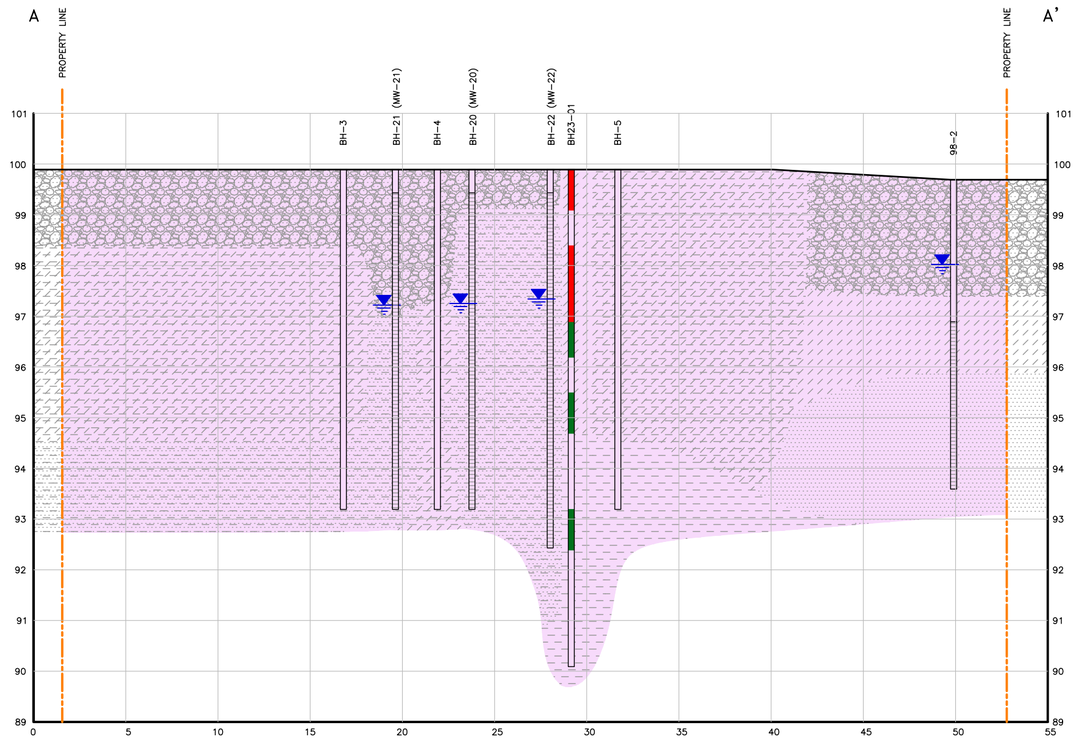
Location: 1440 PRINCE OF WALES DRIVE (C03311), OTTAWA, ON

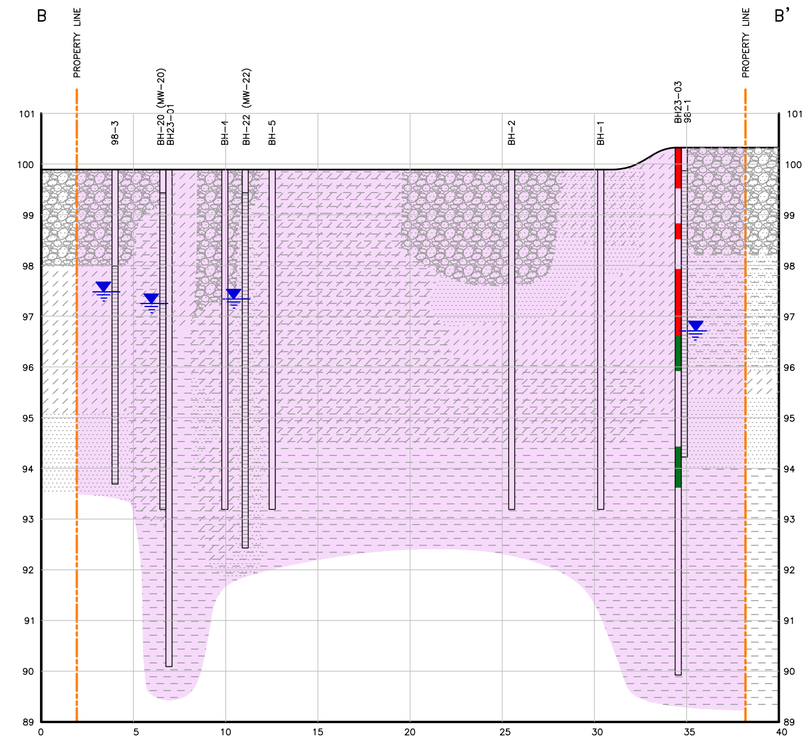
Title: **GENERALIZED GEOLOGICAL CROSS SECTION (A-A' AND B-B') WITH SOIL ANALYTICAL RESULTS FOR EC/SAR**

Drawn:	Date:	Project No:
AG	DECEMBER 2023	694129
Verified:	Project Manager:	Dwg No:
AA	AA	**FIGURE 11**

PAGE FORMAT: 17x22

PATH: P:\SHELL\1440 PRINCE OF WALES DR, OTTAWA\694129\10_EXECUTION\45_GIS_DWGS\005 (2023 PHASE II)\005F11_694129.DWG





SCALE 1:250

0 5 10m

LEGEND

- GROUNDWATER ELEVATIONS (JUNE 20, 2023)
- BOREHOLE
- MONITORING WELL
- SAND AND GRAVEL FILL
- SAND
- SILT
- SILTY SAND, SANDY SILT
- CLAY
- SILT AND CLAY, CLAYEY SILT
- SAND AND CLAY
- LOCATION WHERE ALL SOIL SAMPLES ANALYSED MET THE SELECTED STANDARD FOR ALL PARAMETERS ANALYSED
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE ANALYSED EXCEEDED THE SELECTED STANDARD FOR AT LEAST ONE PARAMETER ANALYSED
- INFERRED LIMITS OF CONTAMINATION AS DEFINED IN ACCORDANCE WITH O.REG 153/04 SCHEDULE E, PART III, SECTION 7(4)

NOTES

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2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PRINTED, PHOTOCOPIED OR FAXED IN OTHER THAN ITS ORIGINAL SIZE AND COLOURS
3. 'm' : METRES

AtkinsRéalis

Client Name: SHELL CANADA PRODUCTS

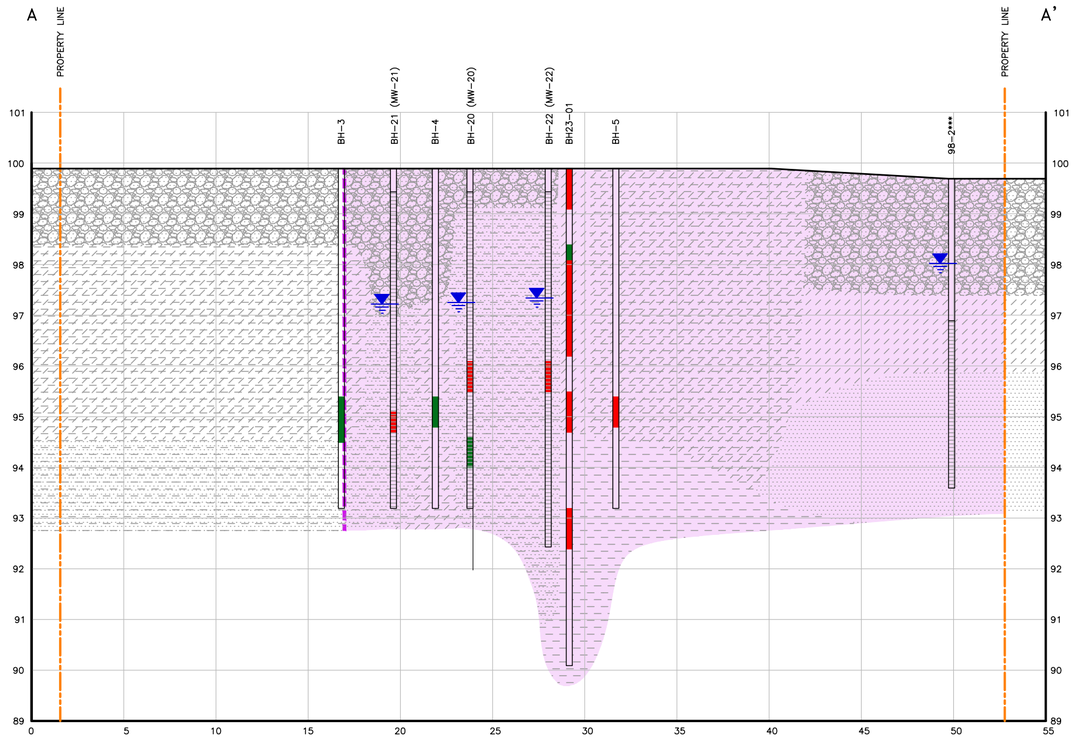
Location: 1440 PRINCE OF WALES DRIVE (C03311), OTTAWA, ON

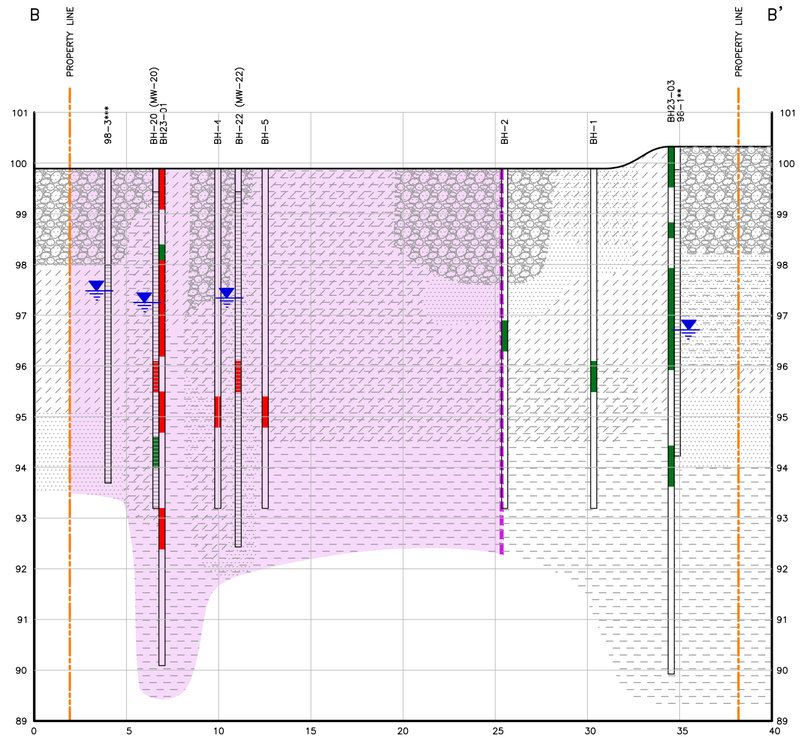
Title: **GENERALIZED GEOLOGICAL CROSS-SECTION (A-A' AND B-B') WITH SOIL ANALYTICAL RESULTS FOR LEAD AND VANADIUM**

Drawn:	Date:	Project No:
AG	DECEMBER 2023	694129
Verified:	Project Manager:	Dwg No:
AA	AA	**FIGURE 12**

PAGE FORMAT: 17x22

PATH: P:\SHELL\1440 PRINCE OF WALES DR, OTTAWA\694129\10_EXECUTION\45_GIS_DWGS\005 (2023 PHASE II)\005F12_694129.DWG





SCALE 1:250

0 5 10m

LEGEND

- GROUNDWATER ELEVATIONS (JUNE 20, 2023)
- BOREHOLE
- MONITORING WELL
- SAND AND GRAVEL FILL
- SAND
- SILT
- SILTY SAND, SANDY SILT
- CLAY
- SILT AND CLAY, CLAYEY SILT
- SAND AND CLAY
- LOCATION WHERE ALL SOIL SAMPLES ANALYSED MET THE SELECTED STANDARD FOR ALL PARAMETERS ANALYSED
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE ANALYSED EXCEEDED THE SELECTED STANDARD FOR AT LEAST ONE PARAMETER ANALYSED
- INFERRED LIMITS OF CONTAMINATION AS DEFINED IN ACCORDANCE WITH O.REG 153/04 SCHEDULE E, PART III, SECTION 7(4)

NOTES

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2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PRINTED, PHOTOCOPIED OR FAXED IN OTHER THAN ITS ORIGINAL SIZE AND COLOURS
4. '**' : LOCATION MET APPLICABLE STANDARD AT THE TIME OF SAMPLING (ANALYTICAL RESULTS NOT AVAILABLE FOR THESE LOCATIONS TO COMPARE TO THE CURRENT STANDARDS)
5. '***' : LOCATION EXCEEDED APPLICABLE STANDARD AT THE TIME OF SAMPLING (ANALYTICAL RESULTS NOT AVAILABLE FOR THESE LOCATIONS TO COMPARE TO THE CURRENT STANDARDS)
6. 'm' : METRES

AtkinsRéalis

Client Name: SHELL CANADA PRODUCTS

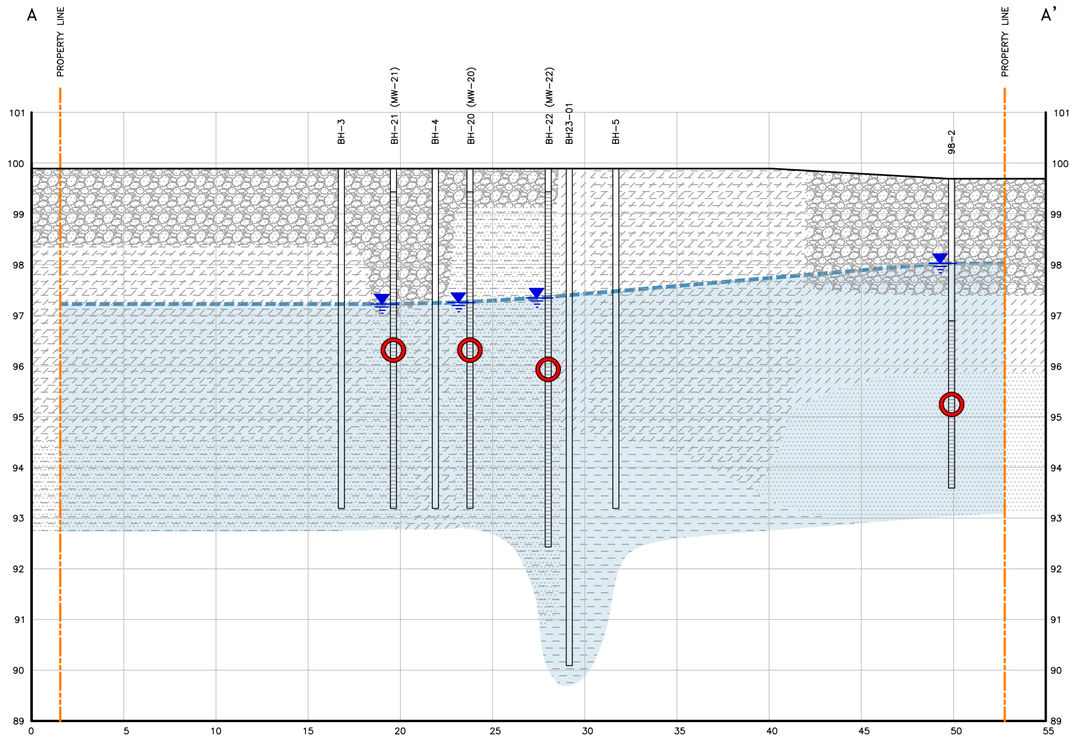
Location: 1440 PRINCE OF WALES DRIVE (C03311), OTTAWA, ON

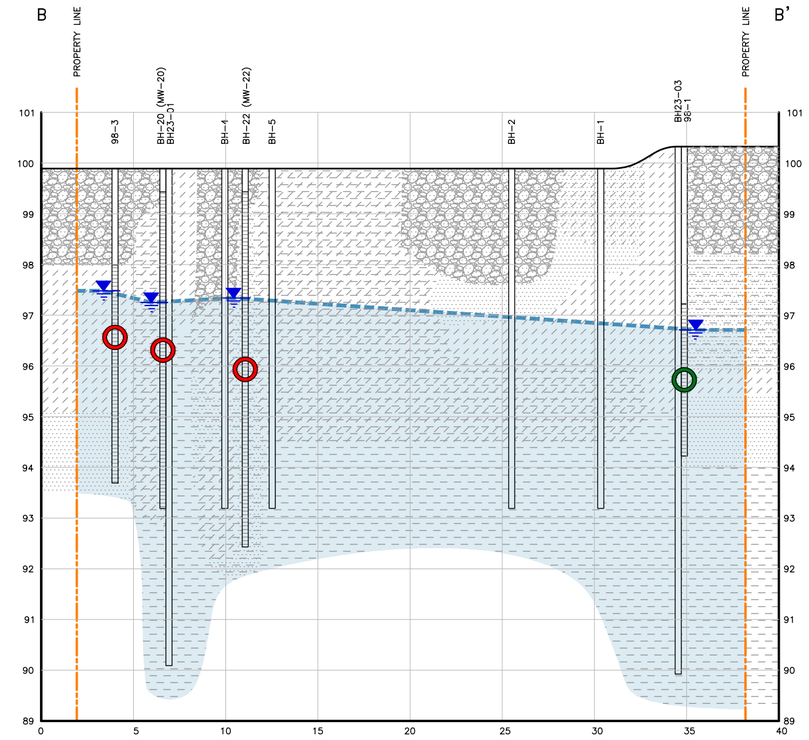
Title: **GENERALIZED GEOLOGICAL CROSS SECTION (A-A' AND B-B') WITH SOIL ANALYTICALRESULTS FOR BTEX AND PHCs**

Drawn:	Date:	Project No:
AG	DECEMBER 2023	694129
Verified:	Project Manager:	Dwg No:
AA	AA	**FIGURE 13**

PAGE FORMAT: 17x22

PATH: P:\SHELL\1440 PRINCE OF WALES DR, OTTAWA\694129\45_EXECUTION\45_05_DWGS\05 (2023 PHASE 9)\05913_694129.DWG





SCALE 1:250

0 5 10m

LEGEND

- GROUNDWATER ELEVATIONS (JUNE 20, 2023)
- BOREHOLE
- MONITORING WELL
- SAND AND GRAVEL FILL
- SAND
- SILT
- SILTY SAND, SANDY SILT
- CLAY
- SILT AND CLAY, CLAYEY SILT
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- LOCATION WHERE MOST RECENT GROUNDWATER SAMPLE EXCEEDED STANDARDS FOR AT LEAST ONE PARAMETER THAT WAS ANALYSED
- INFERRED LIMITS OF CONTAMINATION AS DEFINED IN ACCORDANCE WITH O.REG 153/04 SCHEDULE E, PART III, SECTION 7(4)

NOTES

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2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PRINTED, PHOTOCOPIED OR FAXED IN OTHER THAN ITS ORIGINAL SIZE AND COLOURS
3. 'm' : METRES

AtkinsRéalis

Client Name: SHELL CANADA PRODUCTS

Location: 1440 PRINCE OF WALES DRIVE (C03311), OTTAWA, ON

Title: **GENERALIZED GEOLOGICAL CROSS SECTION (A-A' AND B-B') WITH GROUNDWATER ANALYTICAL RESULTS FOR BTEX AND PHCs**

Drawn:	Date:	Project No:
AG	DECEMBER 2023	694129
Verified:	Project Manager:	Dwg No:
AA	AA	**FIGURE 14**

PAGE FORMAT: 17x22

PATH: P:\SHELL\1440 PRINCE OF WALES DR, OTTAWA\694129\10_EXECUTION\KS_GIS_DWGS\005 (2023 PHASE II)\005F14_694129.DWG

LEGEND

✓ POTENTIALLY OPERABLE PATHWAY

INOPERABLE PATHWAY

AtkinsRéalis

Client Name: SHELL CANADA PRODUCTS

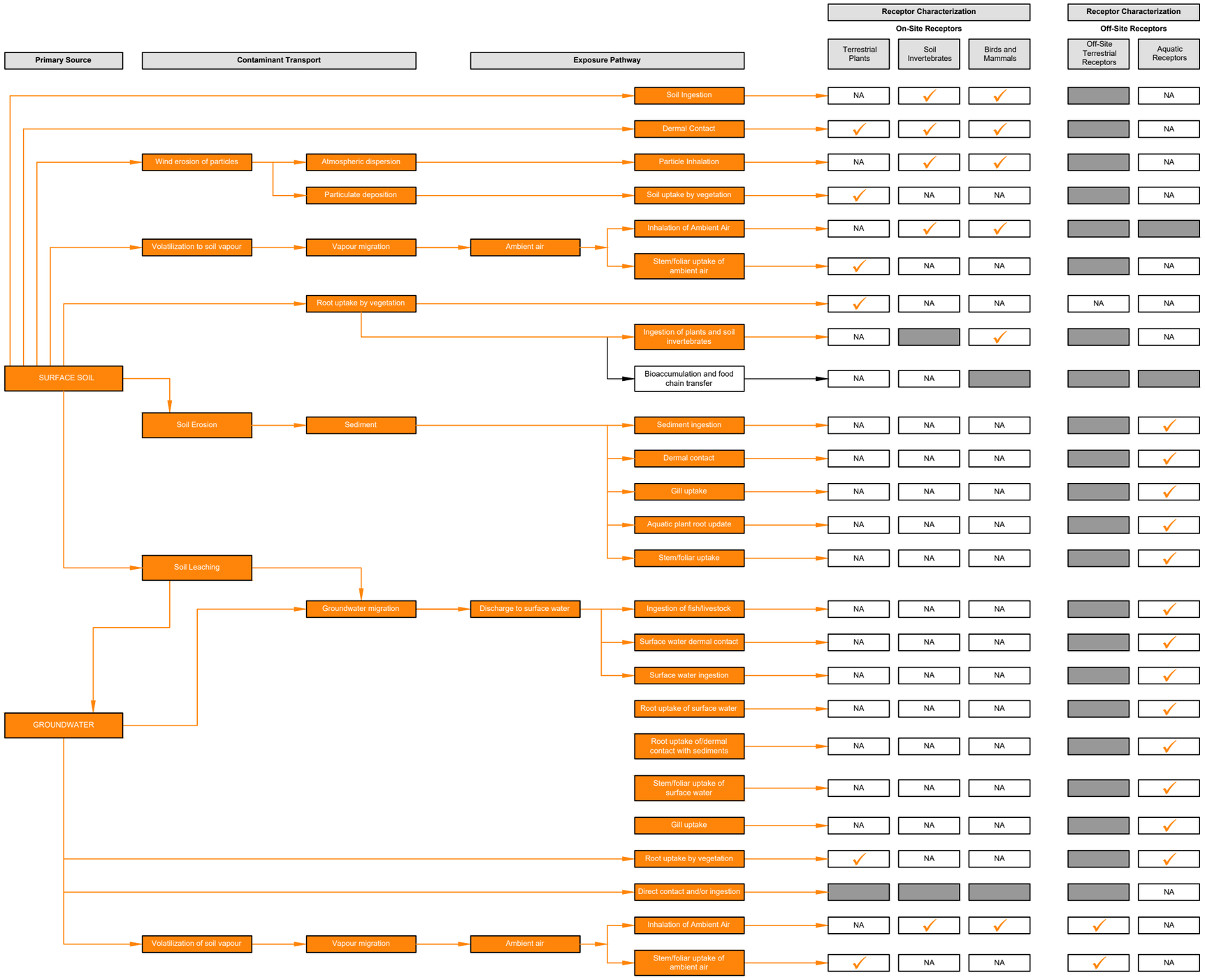
Location: 1440 PRINCE OF WALES DRIVE (C03311), OTTAWA, ON

Title: **HUMAN HEALTH CONCEPTUAL SITE MODEL (WITHOUT RISK MANAGEMENT MEASURES)**

Drawn:	Date:	Project No:
AC	DECEMBER 2023	694129
Verified:	Project Manager:	Dwg No:
AA	AA	**FIGURE 15**

PAGE FORMAT: 11x17

PATH: P:\SHELL\1440 PRINCE OF WALES DR, OTTAWA\694129\40_EXECUTION\45_GIS_DWGS\005 (2023 PHASE II)\005F15_694129.DWG



LEGEND

- ✓ POTENTIALLY OPERABLE PATHWAY
- INOPERABLE PATHWAY
- NA NOT APPLICABLE

AtkinsRéalis

Client Name: SHELL CANADA PRODUCTS	Location: 1440 PRINCE OF WALES DRIVE (C03311), OTTAWA, ON

Title: **ECOLOGICAL CONCEPTUAL SITE MODEL (STRATIFIED APPROACH)**

Drawn: AG	Date: DECEMBER 2023	Project No: 694129
Verified: AA	Project Manager: AA	Dwg No: **FIGURE 16**

PAGE FORMAT: 11x17

PATH: P:\SHELL\1440 PRINCE OF WALES DR, OTTAWA\694129\40_EXECUTION\45_CAD_DWGS\005 (2023 PHASE II)\005F16_694129.DWG

TABLES

TABLE 1: Groundwater Monitoring
1440 Prince of Wales Drive & Vicinity, Ottawa, Ontario

Sampling Location	Property Owner	Top of Riser Elevation[1] (m rld)	Ground Surface Elevation[1] (m rld)	Sample Date	OVM Reading[2]	LNAPL Thicknes Thickness in Well (m)	Depth to Water (m btr)	Depth to Water (m bgs)	Water Level Elevation[1] (m rld)
98-1	**Shell**	**100.25**	**100.33**	09-Jun-22	<5	nd	3.23	3.30	97.02
				18-Nov-22	<5	nd	3.89	3.97	96.36
				20-Jun-23	<5	nd	3.54	3.61	96.71
98-2	**Shell**	**99.47**	**99.69**	09-Jun-22	>100% LEL	nd	1.01	1.22	98.46
				18-Nov-22	>100% LEL	Sheen	1.21	1.43	98.26
				20-Jun-23	>100% LEL	Sheen	1.45	1.66	98.02
98-3	**Shell**	**99.69**	**99.89**	09-Jun-22	<5	Sheen	1.89	2.09	97.80
				18-Nov-22	440	nd	3.38	3.57	96.31
				20-Jun-23	<5	Sheen	2.22	2.41	97.48
MW-20	**Shell**	**99.68**	**99.89**	09-Jun-22	<5	nd	1.57	1.78	98.11
				18-Nov-22	<5	nd	3.05	3.26	96.63
				20-Jun-23	35	nd	2.44	2.64	97.25
MW-21	**Shell**	**99.67**	**99.89**	09-Jun-22	<5	nd	2.18	2.41	97.49
				18-Nov-22	<5	Sheen	3.21	3.43	96.46
				20-Jun-23	15	Sheen	2.45	2.67	97.22
MW-22	**Shell**	**99.67**	**99.90**	09-Jun-22	>100% LEL	0.005	2.04	2.27	97.63
				18-Nov-22	>100% LEL	Sheen	2.90	3.12	96.78
				20-Jun-23	>100% LEL	Sheen	2.33	2.56	97.34

Notes:

[1] 100.19 Relative to local datum with an assigned elevation of 100.00 m. Reported survey measurement by GHD (Table 1, 2020). Survey date unknown. Ground surface elevations calculated using SNC-Lavalin April 2005 survey (100.19 Relative to local benchmark (arrowhead on top of fire hydrant on the east side of Prince of Wales Dr.) with an assigned elevation of 100.00 m)

[2] Organic vapour meter readings measured in ppmv or % LEL using RKI Eagle II (or equivalent) operated in methane elimination mode and calibrated to hexane standards.

btr = below top of riser pipe
bgs = below ground surface
rld = relative to local datum
nd = not detected
nm = not monitored
dry = groundwater not detected in PVC pipe
ppmv = parts per million by volume
% LEL = percentage of the lower expolosive limit of hexane
** = LNAPL drawn into well while manually purging

TABLE 2: Soil Analytical Results for General Chemistry, Total Metals
1440 Prince of Wales Dr., Ottawa, ON

Sample Location			Table 3[2]	BH23-01	BH23-01	BH23-01	BH23-01	BH23-01	BH23-01	BH23-01	BH23-01	BH23-02	BH23-02
Laboratory Sample ID				WRD345	WRD346	WRD347	WRD348	WRD349	WRD350	WRD351	WRD352	WRD360	WRD361
SNC-Lavalin Sample ID			Standard I/C/C FG	BH23-01-01	BH23-01-011	BH23-01-03	BH23-01-04	BH23-01-05	BH23-01-06	BH23-01-08	BH23-01-11	BH23-02-01	BH23-02-02
Sampling Date (yyyy/mm/dd)				2023/08/10	2023/08/10	2023/08/10	2023/08/10	2023/08/10	2023/08/10	2023/08/10	2023/08/10	2023/08/11	2023/08/11
Depth Interval (mbgs)				0.0 - 0.8	0.0 - 0.8	1.5 - 1.8	1.8 - 2.4	2.4 - 3.0	3.0 - 3.7	4.4 - 5.2	6.7 - 7.5	0.0 - 0.8	0.8 - 1.5
Field Screen (ppmv)				<5	<5	<5	<5	175	2,650	5	-	<5	<5
Parameter	**RDL**	**Units**			Duplicate of BH23-01								
General Chemistry													
Free Cyanide	0.01	µg/g	0.051	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Electrical Conductivity	0.002	mS/cm	1.4	***2.3***	***2.5***	***2.6***	***2.0***	***2.3***	***2.0***	***2.2***	0.69	0.84	0.57
pH[2]	-	pH	9 (5-9)	***9.44***	***9.51***	7.73	7.18	7.64	7.36	7.66	7.59	7.75	7.72
Sodium Adsorption Ratio	-	None	12	***31***	***32***	***21***	7.0	5.6	4.0	7.5	1.1	***16***	10
Total Metals													
Antimony	0.20	µg/g	50	< 0.20	0.24	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	0.24	0.22
Arsenic	1.0	µg/g	18	1.5	1.5	1.7	1.5	1.1	< 1.0	1.7	< 1.0	1.8	1.8
Barium	0.50	µg/g	670	200	230	310	310	300	200	95	79	230	210
Beryllium	0.20	µg/g	10	0.75	0.79	0.91	0.87	0.82	0.47	0.33	0.30	0.76	0.68
Boron	5.0	µg/g	120	5.7	6.0	6.4	6.4	5.9	< 5.0	< 5.0	< 5.0	5.4	5.1
Boron (Hot Water Soluble)	0.050	µg/g	2	0.59	0.47	0.21	0.21	0.19	0.19	0.080	0.082	0.19	0.16
Cadmium	0.10	µg/g	1.9	0.12	0.18	0.15	0.13	0.13	< 0.10	< 0.10	< 0.10	0.26	0.25
Chromium (total)	1.0	µg/g	160	99	100	140	140	110	70	25	22	100	88
Chromium (VI)	0.18	µg/g	10	< 0.18	< 0.18	< 0.18	< 0.18	0.25	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18
Cobalt	0.10	µg/g	100	17	17	25	27	20	13	7.3	6.7	19	18
Copper	0.50	µg/g	300	29	37	59	53	49	33	16	17	48	37
Lead	1.0	µg/g	120	17	18	11	8.9	8.0	5.9	3.8	3.5	44	40
Mercury	0.050	µg/g	20	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	0.055	0.079
Molybdenum	0.50	µg/g	40	0.68	0.55	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.73	1.0	0.58
Nickel	0.50	µg/g	340	46	51	72	73	56	37	15	12	53	47
Selenium	0.50	µg/g	5.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Silver	0.20	µg/g	50	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Thallium	0.050	µg/g	3.3	0.36	0.35	0.44	0.43	0.39	0.24	0.14	0.15	0.30	0.31
Uranium	0.050	µg/g	33	0.95	0.98	0.97	0.90	0.92	0.74	0.49	0.98	0.73	0.79
Vanadium	5.0	µg/g	86	83	***87***	***110***	***120***	***100***	71	39	43	85	77
Zinc	5.0	µg/g	340	110	110	130	130	110	71	40	31	130	120

Footnotes:

Laboratory analysis by Bureau Veritas Canada (2019) Inc., ,
Additional terms may be defined within the body of SNC-Lavalin's report.
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
mbgs - metres below ground surface
Field Screen - organic vapour meter reading
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)
µg/g - micrograms per gram, dry weight basis

BOLD Concentration greater than Table 3 Standard

[1] Table 3 full depth generic site condition standards in a non-potable groundwater condition for industrial/commercial/community property use, medium and fine textured soils (MOE, 2011)

[2] Acceptable pH range for applying generic standards (O. Reg. 153/04, as amended): 5 to 9 for surface soil (0-1.5 mbg); 5 to 11 for subsurface soil (>1.5 mbg)

TABLE 2: Soil Analytical Results for General Chemistry, Total Metal
1440 Prince of Wales Dr., Ottawa, ON

Sample Location			Table 3[2]	BH23-02	BH23-02	BH23-02	BH23-03	BH23-03	BH23-03	BH23-03	BH23-03	BH23-03	BH23-03
Laboratory Sample ID				WRD362	WRD363	WRD364	WRD353	WRD354	WRD355	WRD356	WRD357	WRD358	WRD359
SNC-Lavalin Sample ID			Standard I/C/C FG	BH23-02-04	BH23-02-07	BH23-02-09	BH23-03-01	BH23-03-03	BH23-03-05	BH23-03-06	BH23-03-07	BH23-03-10	BH23-03-100
Sampling Date (yyyy/mm/dd)				2023/08/11	2023/08/11	2023/08/11	2023/08/11	2023/08/11	2023/08/11	2023/08/11	2023/08/11	2023/08/11	2023/08/11
Depth Interval (mbgs)				1.8 - 2.4	3.7 - 4.4	5.2 - 5.9	0.0 - 0.8	1.5 - 1.8	2.4 - 3.0	3.0 - 3.7	3.7 - 4.4	5.9 - 6.7	5.9 - 6.7
Field Screen (ppmv)				<5	<5	<5	<5	<5	<5	<5	<5	<5	<5 Duplicate of BH23-03
Parameter	**RDL**	**Units**											
General Chemistry													
Free Cyanide	0.01	µg/g	0.051	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Electrical Conductivity	0.002	mS/cm	1.4	***1.6***	0.86	0.61	0.98	***1.8***	***2.2***	***2.0***	***2.0***	1.2	1.1
pH[2]	-	pH	9 (5-9)	7.06	7.04	7.53	7.63	7.22	7.14	7.25	7.28	7.63	7.50
Sodium Adsorption Ratio	-	None	12	3.0	0.97	0.56	***17***	6.6	3.4	4.2	4.1	2.2	2.0
Total Metals													
Antimony	0.20	µg/g	50	< 0.20	< 0.20	< 0.20	0.56	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Arsenic	1.0	µg/g	18	1.6	< 1.0	1.6	1.5	1.2	1.4	1.4	< 1.0	1.3	1.6
Barium	0.50	µg/g	670	310	150	88	180	310	310	280	250	120	110
Beryllium	0.20	µg/g	10	0.90	0.41	0.34	0.54	0.94	0.86	0.72	0.59	0.36	0.34
Boron	5.0	µg/g	120	6.2	< 5.0	< 5.0	5.7	7.4	8.4	6.3	5.4	< 5.0	< 5.0
Boron (Hot Water Soluble)	0.050	µg/g	2	0.14	< 0.050	< 0.050	0.69	0.81	1.1	0.80	0.85	0.51	0.34
Cadmium	0.10	µg/g	1.9	0.11	< 0.10	< 0.10	0.22	0.11	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chromium (total)	1.0	µg/g	160	140	58	24	74	140	110	93	85	31	28
Chromium (VI)	0.18	µg/g	10	0.36	< 0.36	< 0.18	< 0.18	0.37	0.30	0.23	< 0.18	< 0.18	< 0.18
Cobalt	0.10	µg/g	100	24	9.5	7.3	14	29	23	21	16	8.1	7.7
Copper	0.50	µg/g	300	53	26	14	26	55	51	43	41	17	16
Lead	1.0	µg/g	120	9.9	4.2	3.7	***180***	14	8.3	6.8	5.6	3.7	3.9
Mercury	0.050	µg/g	20	< 0.050	< 0.050	< 0.050	0.080	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Molybdenum	0.50	µg/g	40	< 0.50	< 0.50	0.75	0.75	< 0.50	< 0.50	< 0.50	< 0.50	0.84	0.98
Nickel	0.50	µg/g	340	71	28	14	36	76	61	54	45	18	16
Selenium	0.50	µg/g	5.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Silver	0.20	µg/g	50	< 0.20	< 0.20	< 0.20	0.40	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Thallium	0.050	µg/g	3.3	0.41	0.18	0.13	0.24	0.40	0.43	0.35	0.30	0.15	0.15
Uranium	0.050	µg/g	33	0.98	0.65	4.3	0.62	0.98	0.87	0.77	0.83	1.5	3.3
Vanadium	5.0	µg/g	86	***110***	58	42	63	***110***	***100***	***94***	84	46	42
Zinc	5.0	µg/g	340	120	57	37	140	120	110	100	88	44	40

Footnotes:
Laboratory analysis by Bureau Veritas Canada (2019) Inc., ,
Additional terms may be defined within the body of SNC-Lavalin's report.
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
mbgs - metres below ground surface
Field Screen - organic vapour meter reading
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)
µg/g - micrograms per gram, dry weight basis

BOLD Concentration greater than Table 3 Standard

[1] Table 3 full depth generic site condition standards in a non-potable groundwater condition for industrial/commercial/community property use, medium and fine textured soils (MOE, 2011)

[2] Acceptable pH range for applying generic standards (O. Reg. 153/04, as amended): 5 to 9 for surface soil (0-1.5 mbg); 5 to 11 for subsurface soil (>1.5 mbg)

TABLE 3: Soil Analytical Results for BTEX and PHCs
1440 Prince of Wales Dr., Ottawa, ON

Sample Location			Table 3[1]	BH23-01	BH23-01	BH23-01	BH23-01	BH23-01	BH23-01	BH23-01
Laboratory Sample ID			Standard	WRD345	WRD346	WRD347	WRD348	WRD349	WRD350	WRD351
SNC-Lavalin Sample ID			I/C/C FG	BH23-01-01	BH23-01-011	BH23-01-03	BH23-01-04	BH23-01-05	BH23-01-06	BH23-01-08
Sampling Date (yyyy/mm/dd)				2023/08/10	2023/08/10	2023/08/10	2023/08/10	2023/08/10	2023/08/10	2023/08/10
Depth Interval (mbgs)				0.0 - 0.8	0.0 - 0.8	1.5 - 1.8	1.8 - 2.4	2.4 - 3.0	3.0 - 3.7	4.4 - 5.2
Field Screen (ppmv)				<5	<5	<5	<5	175	2,650	5
					Duplicate of BH23-01					
Parameter	**RDL**	**Units**								
Volatiles										
Benzene	0.0060	µg/g	0.4	***1.0***	***0.44***	0.11	***1.1***	***4.1***	***5.8***	***1.1***
Toluene	0.020	µg/g	78	0.18	0.092	< 0.020	0.14	24	43	0.21
Ethylbenzene	0.010	µg/g	19	0.66	0.77	0.14	1.9	13	***20***	1.6
Xylenes	0.020	µg/g	30	0.14	0.12	< 0.020	7.4	***72***	***110***	1.5
m+p-Xylenes	0.020	µg/g	na	0.057	0.043	< 0.020	5.6	53	83	1.1
o-Xylenes	0.020	µg/g	na	0.086	0.081	< 0.020	1.8	19	29	0.45
Petroleum Hydrocarbons (PHC)										
PHC F1 - BTEX	10	µg/g	65	27	31	< 10	27	***260***	***430***	< 10
PHC F2	10	µg/g	250	< 10	< 10	< 10	51	110	***810***	< 10
PHC F3	50	µg/g	2,500	56	< 50	55	< 50	< 50	120	< 50
PHC F4	50	µg/g	6,600	51	< 50	< 50	< 50	< 50	< 50	< 50

Footnotes:
Laboratory analysis by Bureau Veritas Canada (2019) Inc.
Additional terms may be defined within the body of SNC-Lavalin's report.
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
mbgs - metres below ground surface
Field Screen - organic vapour meter reading
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)
µg/g - micrograms per gram, dry weight basis

BOLD Concentration greater than Table 3 Standard

[1] Table 3 full depth generic site condition standards in a non-potable groundwater condition for industrial/commercial/community property use, medium and fine textured soils (MOE, 2011)

TABLE 3: Soil Analytical Results for BTEX and PHCs
1440 Prince of Wales Dr., Ottawa, ON

Sample Location			Table 3[1]	BH23-01	BH23-02	BH23-02	BH23-02	BH23-02	BH23-02	BH23-03	BH23-03
Laboratory Sample ID			Standard	WRD352	WRD360	WRD361	WRD362	WRD363	WRD364	WRD353	WRD354
SNC-Lavalin Sample ID			I/C/C FG	BH23-01-11	BH23-02-01	BH23-02-02	BH23-02-04	BH23-02-07	BH23-02-09	BH23-03-01	BH23-03-03
Sampling Date (yyyy/mm/dd)				2023/08/10	2023/08/11	2023/08/11	2023/08/11	2023/08/11	2023/08/11	2023/08/11	2023/08/11
Depth Interval (mbgs)				6.7 - 7.5	0.0 - 0.8	0.8 - 1.5	1.8 - 2.4	3.7 - 4.4	5.2 - 5.9	0.0 - 0.8	1.5 - 1.8
Field Screen (ppmv)				-	<5	<5	<5	<5	<5	<5	<5
Parameter	**RDL**	**Units**									
Volatiles											
Benzene	0.0060	µg/g	0.4	***1.3***	< 0.0060	< 0.0060	< 0.0060	< 0.0060	< 0.0060	< 0.0060	< 0.0060
Toluene	0.020	µg/g	78	0.028	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Ethylbenzene	0.010	µg/g	19	0.037	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Xylenes	0.020	µg/g	30	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
m+p-Xylenes	0.020	µg/g	na	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
o-Xylenes	0.020	µg/g	na	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Petroleum Hydrocarbons (PHC)											
PHC F1 - BTEX	10	µg/g	65	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
PHC F2	10	µg/g	250	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
PHC F3	50	µg/g	2,500	< 50	< 50	< 50	< 50	< 50	< 50	100	< 50
PHC F4	50	µg/g	6,600	< 50	82	51	< 50	< 50	< 50	< 50	< 50

Footnotes:
Laboratory analysis by Bureau Veritas Canada (2019) Inc.
Additional terms may be defined within the body of SNC-Lavalin's report.
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
mbgs - metres below ground surface
Field Screen - organic vapour meter reading
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)
µg/g - micrograms per gram, dry weight basis

BOLD Concentration greater than Table 3 Standard

[1] Table 3 full depth generic site condition standards in a non-potable groundwater condition for industrial/commercial/community property use, medium and fine textured soils (MOE, 2011)

TABLE 3: Soil Analytical Results for BTEX and PHCs
1440 Prince of Wales Dr., Ottawa, ON

Sample Location			Table 3[1]	BH23-03	BH23-03	BH23-03	BH23-03	BH23-03
Laboratory Sample ID			Standard	WRD355	WRD356	WRD357	WRD358	WRD359
SNC-Lavalin Sample ID			I/C/C FG	BH23-03-05	BH23-03-06	BH23-03-07	BH23-03-10	BH23-03-100
Sampling Date (yyyy/mm/dd)				2023/08/11	2023/08/11	2023/08/11	2023/08/11	2023/08/11
Depth Interval (mbgs)				2.4 - 3.0	3.0 - 3.7	3.7 - 4.4	5.9 - 6.7	5.9 - 6.7
Field Screen (ppmv)				<5	<5	<5	<5	<5
Parameter	**RDL**	**Units**						Duplicate of BH23-03
Volatiles								
Benzene	0.0060	µg/g	0.4	< 0.0060	< 0.0060	< 0.0060	< 0.0060	< 0.0060
Toluene	0.020	µg/g	78	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Ethylbenzene	0.010	µg/g	19	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Xylenes	0.020	µg/g	30	< 0.020	< 0.020	< 0.020	0.025	< 0.020
m+p-Xylenes	0.020	µg/g	na	< 0.020	< 0.020	< 0.020	0.025	< 0.020
o-Xylenes	0.020	µg/g	na	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Petroleum Hydrocarbons (PHC)								
PHC F1 - BTEX	10	µg/g	65	< 10	< 10	< 10	< 10	< 10
PHC F2	10	µg/g	250	< 10	< 10	< 10	< 10	< 10
PHC F3	50	µg/g	2,500	< 50	< 50	< 50	< 50	< 50
PHC F4	50	µg/g	6,600	< 50	< 50	< 50	< 50	< 50

Footnotes:
Laboratory analysis by Bureau Veritas Canada (2019) Inc.
Additional terms may be defined within the body of SNC-Lavalin's report.
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
mbgs - metres below ground surface
Field Screen - organic vapour meter reading
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)
µg/g - micrograms per gram, dry weight basis

BOLD Concentration greater than Table 3 Standard

[1] Table 3 full depth generic site condition standards in a non-potable groundwater condition for industrial/commercial/community property use, medium and fine textured soils (MOE, 2011)

Table 3a: Soil Analytical Results - Petroleum Parameters (Extracted from Aqua Terre Soils Investigation report dated Aug. 28, 2000)

Table 1 — **Soil Analytical Results - Petroleum Compounds**
1440 Prince of Wales Drive, Ottawa, Ontario
Project No. 00-642

Date / Parameter	Sample ID		Sample Identification							MOE Soil Remediation Criteria+ Table B
			BH-1-5	BH-2-4	BH-3-6	BH-4-6	BH-5-6		BH-6-5	
			31/07/00	31/07/00	31/07/00	31/07/00	31/07/00	Duplicate 31/07/00	31/07/00	
	LOQ	Units								
Sample Depth	na	m bgs	3.8 - 4.4	3.0 - 3.6	4.5 - 5.1	4.5 - 5.1	4.5 - 5.1	4.5 - 5.1	3.8 - 4.4	**na**
OVM Reading	na	ppmv	40	8% LEL	50	100% LEL	100% LEL	100% LEL	300	**na**
Benzene	0.02	µg/g	nd	nd	nd	10.3	**29**	10.8	nd	**25**
Toluene	0.02	µg/g	nd	TR	nd	47.2	125	77.6	0.09	**150**
Ethylbenzene	0.02	µg/g	nd	TR	nd	10.5	30.1	24.2	0.38	**1000**
m,p-Xylenes	0.04	µg/g	nd	TR	nd	39.7	116	102	0.07	**nv**
o-Xylene	0.02	µg/g	nd	TR	nd	15	53.8	52.8	0.16	**nv**
Total Xylenes	na	µg/g	nd	TR	nd	54.7	169.8	154.8	0.23	**210**
Total Purgeable Hydrocarbons	10	µg/g	nd	nd	nd	698	2040	1520	25	**nv**
Total Extractable Hydrocarbons	10.0	µg/g	nd	nd	nd	86.2	328	191	nd	**nv**
TPH - Gas/Diesel	na	µg/g	nd	nd	nd	784.2	**2368**	1711	25	**2000**
TPH - Heavy Oils	100	µg/g	nd	nd	nd	nd	nd	nd	nd	**5000**
Resemblance	na	na	na	na	na	EGD?	EGD?	EGD?	na	**na**

LOQ	Limit of Quantitation=lowest level of the parameter that can be quantified with confidence
m bgs	metres below ground surface
nd	parameter not detected
TR	trace level below LOQ
na	not applicable
nv	no guideline criteria for this parameter
Total Xylenes	sum of o-xylene and m,p-xylene
TPH Gas-Diesel	sum of purgeable and extractable hydrocarbons
+ MOE Surface Soil Remediation Criteria	Table B: Remediation Criteria for medium/fine textured soils, industrial/commercial land use in a non-potable groundwater situation. Guideline for Use at Contaminated Sites in Ontario, Ontario Ministry of Environment and Energy (February, 1997)
2368	Exceeds MOE Table B soil remediation criteria

All analyses by Philip Analytical Services Corporation, Mississauga, Ontario

Table 3b: Soil Analytical Results - Petroleum Parameters
(Extracted from 2001 Remedial Activities report dated March 26, 2002)

Table 1	Soil Analytical Results - Petroleum Compounds 1440 Prince of Wales Drive, Ottawa, Ontario Project No. 00-642						
	Sample ID		Sample Identification				MOE Soil Remediation Criteria+ Table B
			BH-20-5	BH-20-7	BH-21-6	BH-22-5	
Date			12/07/01	12/07/01	12/07/01	12/07/01	
Parameter	EQL	Units					
Sample Depth	na	m bgs	*3.81-4.42*	5.33-5.94	4.57-5.18	*3.81-4.42*	**na**
OVM Reading	na	ppmv	60% LEL	5% LEL	80% LEL	>100% LEL	**na**
Benzene	0.02	µg/g	2.53	nd	5.36	4.27	**25**
Toluene	0.02	µg/g	10.1	0.80	22.4	12.3	**150**
Ethylbenzene	0.02	µg/g	5.05	0.84	9.08	3.47	**1000**
m,p-Xylenes	0.04	µg/g	17.4	2.15	28.4	11.6	**nv**
o-Xylene	0.02	µg/g	6.96	0.96	11.1	5.35	**nv**
Total Xylenes	na	µg/g	24.36	3.11	39.5	16.95	**210**
Total Purgeable Hydrocarbons	10	µg/g	187	59	308	121	**nv**
Total Extractable Hydrocarbons	10.0	µg/g	528	100	148	116	**nv**
TPH - Gas/Diesel	na	µg/g	715	159	456	237	**2000**
TPH - Heavy Oils	100	µg/g	-	-	-	-	**5000**

EQL	Estimated Quantitation Limit = lowest level of the parameter that can be quantified with confidence
m bgs	metres below ground surface
nd	parameter not detected
TR	trace level below EQL
na	not applicable
nv	no guideline criteria for this parameter
-	not analysed
Total Xylenes	sum of o-xylene and m,p-xylene
TPH Gas-Diesel	sum of purgeable and extractable hydrocarbons
+ MOE Surface Soil Remediation Criteria	Table B: Remediation Criteria for medium/fine textured soils, industrial/commercial land use in a non-potable groundwater condition. Guideline for Use at Contaminated Sites in Ontario, Ontario Ministry of Environment and Energy (September, 1998)
2368	Exceeds MOE Table B soil remediation criteria

All analyses by Philip Analytical Services Corporation, Mississauga, Ontario

TABLE 4: **Soil Analytical Results for VOCs.**
1440 Prince of Wales Dr., Ottawa, ON

Sample Location			Table 3[1] Standard I/C/C FG	BH23-01	BH23-01	BH23-01	BH23-01	BH23-01	BH23-01	BH23-01	BH23-01	BH23-02	BH23-02	BH23-02	BH23-02	BH23-02	BH23-03	BH23-03	BH23-03	BH23-03
Laboratory Sample ID				WRD345	WRD346	WRD347	WRD348	WRD349	WRD350	WRD351	WRD352	WRD360	WRD361	WRD362	WRD363	WRD364	WRD353	WRD354	WRD355	WRD356
SNC-Lavalin Sample ID				BH23-01-01	BH23-01-011	BH23-01-03	BH23-01-04	BH23-01-05	BH23-01-06	BH23-01-08	BH23-01-11	BH23-02-01	BH23-02-02	BH23-02-04	BH23-02-07	BH23-02-09	BH23-03-01	BH23-03-03	BH23-03-05	BH23-03-06
Sampling Date (yyyy/mm/dd)				2023/08/10	2023/08/10	2023/08/10	2023/08/10	2023/08/10	2023/08/10	2023/08/10	2023/08/10	2023/08/11	2023/08/11	2023/08/11	2023/08/11	2023/08/11	2023/08/11	2023/08/11	2023/08/11	2023/08/11
Depth Interval (mbgs)				0.0 - 0.8	0.0 - 0.8	1.5 - 1.8	1.8 - 2.4	2.4 - 3.0	3.0 - 3.7	4.4 - 5.2	6.7 - 7.5	0.0 - 0.8	0.8 - 1.5	1.8 - 2.4	3.7 - 4.4	5.2 - 5.9	0.0 - 0.8	1.5 - 1.8	2.4 - 3.0	3.0 - 3.7
Field Screen (ppmv)				<5	<5	<5	<5	175	2,650	5	-	<5	<5	<5	<5	<5	<5	<5	<5	<5
					Duplicate of BH23-01															
Parameter	**RDL**	**Units**																		
Volatile Organic Compounds																				
Acetone	0.49	µg/g	28	< 1.4	< 1.5	< 0.49	< 0.49	< 6.3	< 8.8	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49
Bromodichloromethane	0.040	µg/g	18	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Bromoform	0.040	µg/g	1.7	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Bromomethane	0.040	µg/g	0.05	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Carbon Tetrachloride	0.040	µg/g	1.5	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Chlorobenzene	0.040	µg/g	2.7	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Chloroform	0.040	µg/g	0.18	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Dichloropropene, trans-1,3-	0.040	µg/g	na	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Dibromochloromethane (Chlorodibromomethane)	0.040	µg/g	13	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Dichloropropene, cis-1,3-	0.030	µg/g	na	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030
Dichlorobenzene, 1,2- (o-DCB)	0.040	µg/g	8.5	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Dichlorobenzene, 1,3- (m-DCB)	0.040	µg/g	12	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Dichlorobenzene, 1,4- (p-DCB)	0.040	µg/g	0.84	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Dichlorodifluoromethane	0.040	µg/g	25	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Dichloroethane, 1,1-	0.040	µg/g	21	< 0.040	< 0.040	< 0.040	< 0.040	< 0.050	< 0.070	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Dichloroethane, 1,2-	0.049	µg/g	0.05	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.040	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049
Dichloroethylene, 1,1-	0.040	µg/g	0.48	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Dichloroethylene, cis-1,2-	0.040	µg/g	37	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Dichloroethylene, trans-1,2-	0.040	µg/g	9.3	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Dichloropropane, 1,2-	0.040	µg/g	0.68	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Dichloropropene, 1,3-	0.050	µg/g	0.21	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Ethylene Dibromide (Dibromoethane, 1,2-)	0.040	µg/g	0.05	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Hexane(n)	0.040	µg/g	88	0.28	0.13	< 0.040	0.33	9.4	19	0.45	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Methyl Ethyl Ketone	0.40	µg/g	88	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
Methyl Isobutyl Ketone	0.40	µg/g	210	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
Methyl tert butyl ether (MTBE)	0.040	µg/g	3.2	< 0.040	< 0.040	< 0.040	< 0.040	< 0.060	0.055	< 0.040	0.12	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Methylene Chloride (Dichloromethane)	0.049	µg/g	2	< 0.20	< 0.30[1]	< 0.049	< 0.050	< 0.060	< 0.070	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049
Styrene	0.040	µg/g	43	< 0.040	< 0.040	< 0.040	< 0.080	< 0.80	< 1.2	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Tetrachloroethane, 1,1,1,2-	0.040	µg/g	0.11	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Tetrachloroethane, 1,1,2,2-	0.040	µg/g	0.094	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Trichloroethane, 1,1,1-	0.040	µg/g	12	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Trichloroethane, 1,1,2-	0.040	µg/g	0.11	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Trichloroethylene	0.010	µg/g	0.61	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Tetrachloroethylene	0.040	µg/g	21	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Trichlorofluoromethane	0.040	µg/g	5.8	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Vinyl Chloride	0.019	µg/g	0.25	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019

Footnotes:

Laboratory analysis by Bureau Veritas Canada (2019) Inc.
Additional terms may be defined within the body of SNC-Lavalin's report.
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
mbgs - metres below ground surface
Field Screen - organic vapour meter reading
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)
µg/g - micrograms per gram, dry weight basis

BOLD Concentration greater than Table 3 Standard

[1] Table 3 full depth generic site condition standards in a non-potable groundwater condition for industrial/commercial/community property use, medium and fine textured soils (MOE, 2011)

TABLE 4: **Soil Analytical Results for VOCs.**
1440 Prince of Wales Dr., Ottawa, ON

Sample Location			Table 3[1]	BH23-03	BH23-03	BH23-03
Laboratory Sample ID			Standard	WRD357	WRD358	WRD359
SNC-Lavalin Sample ID			I/C/C FG	BH23-03-07	BH23-03-10	BH23-03-100
Sampling Date (yyyy/mm/dd)				2023/08/11	2023/08/11	2023/08/11
Depth Interval (mbgs)				3.7 - 4.4	5.9 - 6.7	5.9 - 6.7
Field Screen (ppmv)				<5	<5	<5
						Duplicate of
Parameter	**RDL**	**Units**				BH23-03
Volatile Organic Compounds						
Acetone	0.49	µg/g	28	< 0.49	< 0.49	< 0.49
Bromodichloromethane	0.040	µg/g	18	< 0.040	< 0.040	< 0.040
Bromoform	0.040	µg/g	1.7	< 0.040	< 0.040	< 0.040
Bromomethane	0.040	µg/g	0.05	< 0.040	< 0.040	< 0.040
Carbon Tetrachloride	0.040	µg/g	1.5	< 0.040	< 0.040	< 0.040
Chlorobenzene	0.040	µg/g	2.7	< 0.040	< 0.040	< 0.040
Chloroform	0.040	µg/g	0.18	< 0.040	< 0.040	< 0.040
Dichloropropene, trans-1,3-	0.040	µg/g	na	< 0.040	< 0.040	< 0.040
Dibromochloromethane (Chlorodibromomethane)	0.040	µg/g	13	< 0.040	< 0.040	< 0.040
Dichloropropene, cis-1,3-	0.030	µg/g	na	< 0.030	< 0.030	< 0.030
Dichlorobenzene, 1,2- (o-DCB)	0.040	µg/g	8.5	< 0.040	< 0.040	< 0.040
Dichlorobenzene, 1,3- (m-DCB)	0.040	µg/g	12	< 0.040	< 0.040	< 0.040
Dichlorobenzene, 1,4- (p-DCB)	0.040	µg/g	0.84	< 0.040	< 0.040	< 0.040
Dichlorodifluoromethane	0.040	µg/g	25	< 0.040	< 0.040	< 0.040
Dichloroethane, 1,1-	0.040	µg/g	21	< 0.040	< 0.040	< 0.040
Dichloroethane, 1,2-	0.049	µg/g	0.05	< 0.049	< 0.049	< 0.049
Dichloroethylene, 1,1-	0.040	µg/g	0.48	< 0.040	< 0.040	< 0.040
Dichloroethylene, cis-1,2-	0.040	µg/g	37	< 0.040	< 0.040	< 0.040
Dichloroethylene, trans-1,2-	0.040	µg/g	9.3	< 0.040	< 0.040	< 0.040
Dichloropropane, 1,2-	0.040	µg/g	0.68	< 0.040	< 0.040	< 0.040
Dichloropropene, 1,3-	0.050	µg/g	0.21	< 0.050	< 0.050	< 0.050
Ethylene Dibromide (Dibromoethane, 1,2-)	0.040	µg/g	0.05	< 0.040	< 0.040	< 0.040
Hexane(n)	0.040	µg/g	88	< 0.040	< 0.040	< 0.040
Methyl Ethyl Ketone	0.40	µg/g	88	< 0.40	< 0.40	< 0.40
Methyl Isobutyl Ketone	0.40	µg/g	210	< 0.40	< 0.40	< 0.40
Methyl tert butyl ether (MTBE)	0.040	µg/g	3.2	< 0.040	< 0.040	< 0.040
Methylene Chloride (Dichloromethane)	0.049	µg/g	2	< 0.049	< 0.049	< 0.049
Styrene	0.040	µg/g	43	< 0.040	< 0.040	< 0.040
Tetrachloroethane, 1,1,1,2-	0.040	µg/g	0.11	< 0.040	< 0.040	< 0.040
Tetrachloroethane, 1,1,2,2-	0.040	µg/g	0.094	< 0.040	< 0.040	< 0.040
Trichloroethane, 1,1,1-	0.040	µg/g	12	< 0.040	< 0.040	< 0.040
Trichloroethane, 1,1,2-	0.040	µg/g	0.11	< 0.040	< 0.040	< 0.040
Trichloroethylene	0.010	µg/g	0.61	< 0.010	< 0.010	< 0.010
Tetrachloroethylene	0.040	µg/g	21	< 0.040	< 0.040	< 0.040
Trichlorofluoromethane	0.040	µg/g	5.8	< 0.040	< 0.040	< 0.040
Vinyl Chloride	0.019	µg/g	0.25	< 0.019	< 0.019	< 0.019

Footnotes:
Laboratory analysis by Bureau Veritas Canada (2019) Inc.
Additional terms may be defined within the body of SNC-Lavalin's report.
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
mbgs - metres below ground surface
Field Screen - organic vapour meter reading
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)
µg/g - micrograms per gram, dry weight basis

BOLD Concentration greater than Table 3 Standard

[1] Table 3 full depth generic site condition standards in a non-potable groundwater condition for industrial/commercial/community property use, medium and fine textured soils (MOE, 2011)

TABLE 5: **Groundwater Analytical Results for General Chemistry, Metals, VOCs, PAHs.**
1440 Prince of Wales Dr., Ottawa, ON

Sample Location			Leachate Quality Criteria[1]	BH23-01
Laboratory Sample ID				WRD316
SNC-Lavalin Sample ID				BH23-01-TCLP
Sampling Date (yyyy/mm/dd)				2023/08/11
Parameter	**RDL**	**Units**		
Leachable General Chemistry				
Cyanide	0.010	mg/L	20	< 0.010
Fluoride	0.10	mg/L	150	0.34
Nitrite	0.10	mg/L	na	< 0.10
Nitrate+Nitrite as N	1.0	mg/L	1,000	< 1.0
Final pH	-	pH	na	5.58
Initial pH	-	pH	na	8.96
Nitrate	1.0	mg/L	na	< 1.0
Leachable Metals				
Arsenic	200	µg/L	2,500	< 200
Barium	200	µg/L	100,000	400
Boron	100	µg/L	500,000	200
Cadmium	50	µg/L	500	< 50
Chromium (total)	100	µg/L	5,000	< 100
Lead	100	µg/L	5,000	< 100
Mercury	1	µg/L	100	< 1
Selenium	100	µg/L	1,000	< 100
Silver	10	µg/L	5,000	< 10
Uranium	10	µg/L	10,000	< 10
Leachable Volatiles				
Benzene	0.020	mg/L	0.5	< 0.020
Carbon Tetrachloride	0.020	mg/L	0.5	< 0.020
Chlorobenzene	0.020	mg/L	8	< 0.020
Chloroform	0.020	mg/L	10	< 0.020
Dichlorobenzene, 1,2- (o-DCB)	0.050	mg/L	20	< 0.050
Dichlorobenzene, 1,4- (p-DCB)	0.050	mg/L	0.5	< 0.050
Dichloroethane, 1,2-	0.050	mg/L	0.5	< 0.050
Dichloroethylene, 1,1-	0.020	mg/L	1.4	< 0.020
Methyl Ethyl Ketone	1.0	mg/L	200	< 1.0
Methylene Chloride (Dichloromethane)	0.20	mg/L	5	< 0.20
Tetrachloroethylene	0.020	mg/L	3	< 0.020
Trichloroethylene	0.020	mg/L	5	< 0.020
Vinyl Chloride	0.020	mg/L	0.2	< 0.020
Leachable PAHs				
Benzo(a)pyrene	0.10	µg/L	1	< 0.10
Perylene	0.20	µg/L	na	< 0.20

Footnotes:
Laboratory analysis by Bureau Veritas Canada (2019) Inc., ,
Additional terms may be defined within the body of SNC-Lavalin's report.
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
mbgs - metres below ground surface
Field Screen - organic vapour meter reading
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)
µg/L - micrograms per litre
mg/L - milligrams per litre

BOLD Concentration greater than Leachate Quality Criteria

[1] Ontario Regulation 347 as amended. "Waste Management". Schedule 4 Leachate Quality Criteria.

Table 5a: Soil Waste Characterization
(Extracted from Aqua Terre, 2000 Soils Investigation report dated August 28, 2000)

TABLE 2	REG. 347 LEACHATE ANALYTICAL RESULTS 1440 Prince of Wales Drive, Ottawa, Ontario Project No. 00-642			
	Sample ID		BH-6-5	Hazardous Waste Criteria[1]
	MDL	Units		
Depth	na	m bgs	*3.8 - 4.4*	**na**
OVM Concentration	na	ppmv	*300*	**na**
Leachate Parameters				
Nitrate (as N)	0.2	mg/L	nd	**100**
Nitrite (as N)	0.2	mg/L	nd	**1000**
Cyanide free	0.001	mg/L	nd	**20**
Fluoride	0.1	mg/L	0.1	**240**
Mercury	0.0005	mg/L	nd	**0.1**
Arsenic	0.005	mg/L	nd	**5**
Barium	0.005	mg/L	0.050	**100**
Boron	0.01	mg/L	0.02	**500**
Cadmium	0.001	mg/L	nd	**0.5**
Chromium	0.010	mg/L	nd	**5**
Lead	0.005	mg/L	nd	**5**
Selenium	0.005	mg/L	nd	**1**
Silver	0.005	mg/L	nd	**5**
Uranium	0.001	mg/L	nd	**2**
PCB	0.05	ug/g	nd	**300**
Soil Parameters				
Ignitability	1.0	°C	non-flammable solid	**61**

MDL	Method Detection Limit lowest level of the parameter that can be quantified with confidence
m bgs	metres below ground surface
<	less than MDL
nd	parameter not detected
na	not applicable
nc	no criteria
[1]	Ontario EPA, 1993-95 "Ontario Regulation 347 - Waste Management - Definitions" Schedule 4: Leachate Quality Criteria
	Exceeds criterion

All analyses by Philip Analytical Services Corporation, Mississauga, Ontario

Table 5b: Soil Waste Characterization
(Extracted from Aqua Terre, 2001 Remedial Activities report dated March 26, 2002)

TABLE 2	SOIL DISPOSAL ANALYTICAL RESULTS 1440 Prince of Wales Drive, Ottawa, Ontario Project No. 00-642			
Date	Sample ID		BH-21-5 12/07/01	Non-Hazardous Waste Criteria[1]
	MDL	Units		
Depth	na	m bgs	*3.81-4.42*	**na**
Location	na	na		**na**
OVM Concentration	na	na	*15% LEL*	**na**
Leachate Parameters				
Nitrate and Nitrite (as N)	0.2	mg/L	nd	**1000**
Cyanide free	0.01	mg/L	nd	**20**
Fluoride	0.1	mg/L	0.1	**150**
Mercury	0.01	mg/L	nd	**0.1**
Arsenic	0.200	mg/L	nd	**2.5**
Barium	0.200	mg/L	nd	**100**
Boron	0.100	mg/L	nd	**500**
Cadmium	0.050	mg/L	nd	**0.5**
Chromium	0.100	mg/L	nd	**5**
Lead	0.100	mg/L	nd	**5**
Selenium	0.100	mg/L	nd	**1**
Silver	0.010	mg/L	nd	**5**
Uranium	0.01	mg/L	nd	**10**
Total PCB	0.05	ug/L	nd	**0.3**
Benzene	0.01	mg/L	nd	**0.5**
Soil Parameters				
Ignitability	1	°C	nfs	**non-ignitable**

MDL	Method Detection Limit lowest level of the parameter that can be quantified with confidence
m bgs	metres below ground surface
nd	less than MDL
na	not applicable
nc	no criteria
nfs	Nonflamable solid
[1]	Schedule 4: Leachate Quality Criteria and Ignitibility Criterion from Ontario Regulation 347 (amended March 21, 2001)
10	Exceeds criterion

All analyses by PSC Analytical Services Corporation, Mississauga, Ontario

TABLE 6: Groundwater Analytical Results for Petroleum Hydrocarbon Parameters
1440 Prince of Wales Dr., Ottawa, ON

Sample Location			Table 3 NPG FG[1] Standard	98-1	98-1	98-1	98-2	98-2	98-3
Laboratory Sample ID				WEK284	XSK595	XSK596	WEK340	XSK605	WEK339
SNC-Lavalin Sample ID				98-1-230621	Jan-98	Nov-98	98-2-230621	98-2-231127	98-3-230621
Sampling Date (yyyy/mm/dd)				2023/06/21	2023/11/27	2023/11/27	2023/06/21	2023/11/27	2023/06/21
Parameter	**RDL**	**Units**				Duplicate of 98-1			
Volatiles									
Benzene	0.20	µg/L	430	< 0.20	<0.20	<0.20	**1,500**	**1,800**	**740**
Toluene	0.20	µg/L	18,000	< 0.20	<0.20	<0.20	330	450	7.6
Ethylbenzene	0.20	µg/L	2,300	< 0.20	<0.20	<0.20	1,000	1,200	450
Xylenes	0.40	µg/L	4,200	< 0.40	<0.20	<0.20	4,000	**4,700**	110
Petroleum Hydrocarbon (PHC) Fractions									
PHC F1	25	µg/L	750	< 25	-	-	**5,000**	**-**	**1,500**
PHC F2	100	µg/L	150	< 100	-	-	**3,200**	**-**	**720**
PHC F3	200	µg/L	500	< 200	-	-	< 200	-	250
PHC F4	200	µg/L	500	< 200	-	-	< 200	-	< 200

Laboratory analysis by Bureau Veritas Canada (2019) Inc., ,
Additional terms may be defined within the body of SNC-Lavalin's report.
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
µg/L - micrograms per litre

BOLD Concentration greater than Table 3 NPG FG Standard

[1] Table 3 full depth generic site condition standards in a non-potable groundwater condition for all types of property use, medium and fine textured soils (MOE, 2011)

TABLE 6: Groundwater Analytical Results for Petroleum Hydrocarbon Parameters
1440 Prince of Wales Dr., Ottawa, ON

Sample Location Laboratory Sample ID SNC-Lavalin Sample ID Sampling Date (yyyy/mm/dd)			Table 3 NPG FG[1] Standard	MW-20 WEK336 MW-20-230621 2023/06/21	MW-20 XSK594 MW-20 2023/11/27	MW-21 WEK337 MW-21-230621 2023/06/21	MW-22 WEK338 MW-22-230621 2023/06/21
Parameter	**RDL**	**Units**					
Volatiles							
Benzene	0.20	µg/L	430	2.0	**540**	**490**	**5,100**
Toluene	0.20	µg/L	18,000	< 0.20	8.6	27	1,600
Ethylbenzene	0.20	µg/L	2,300	< 0.20	410	360	1,500
Xylenes	0.40	µg/L	4,200	< 0.40	78	350	**7,700**
Petroleum Hydrocarbon (PHC) Fractions							
PHC F1	25	µg/L	750	30	-'	630	**6,700**
PHC F2	100	µg/L	150	< 100	-	**520**	**3,800**
PHC F3	200	µg/L	500	< 200	-	300	220
PHC F4	200	µg/L	500	< 200	-	< 200	< 200

Laboratory analysis by Bureau Veritas Canada (2019) Inc., ,
Additional terms may be defined within the body of SNC-Lavalin's report.
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
µg/L - micrograms per litre

BOLD Concentration greater than Table 3 NPG FG Standard

[1] Table 3 full depth generic site condition standards in a non-potable groundwater condition for all types of property use, medium and fine textured soils (MOE, 2011)

TABLE 7: Groundwater Analytical Results for VOCS
1440 Prince of Wales Dr., Ottawa, ON

Sample Location			Table 3 NPG FG[1] Standard	98-1	98-1	98-2	MW-20
Laboratory Sample ID				XSK595	XSK596	XSK605	XSK594
SNC-Lavalin Sample ID				Jan-98	Nov-98	98-2-231127	MW-20
Sampling Date (yyyy/mm/dd)				2023/11/27	2023/11/27	2023/11/27	2023/11/27
					Duplicate of 98-1		
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	130,000	< 10	< 10	< 71	< 10
Bromodichloromethane	0.50	µg/L	85,000	< 0.50	< 0.50	< 0.50	< 0.50
Bromoform	1.0	µg/L	770	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	0.50	µg/L	56	< 0.50	< 0.50	< 0.50	< 0.50
Carbon Tetrachloride	0.19	µg/L	8.4	< 0.19	< 0.19	< 0.19	< 0.19
Chlorobenzene	0.20	µg/L	630	< 0.20	< 0.20	< 0.20	< 0.20
Chloroform	0.20	µg/L	22	< 0.20	< 0.20	< 0.20	< 0.20
Dibromochloromethane	0.50	µg/L	82,000	< 0.50	< 0.50	< 0.50	< 0.50
Dichlorobenzene, 1,2- (o-DCB)	0.40	µg/L	9,600	< 0.40	< 0.40	< 0.40	< 0.40
Dichlorobenzene, 1,3- (m-DCB)	0.40	µg/L	9,600	< 0.40	< 0.40	< 0.40	< 0.40
Dichlorobenzene, 1,4- (p-DCB)	0.40	µg/L	67	< 0.40	< 0.40	< 0.40	< 0.40
Dichlorodifluoromethane	1.0	µg/L	4,400	< 1.0	< 1.0	< 1.0	< 1.0
Dichloroethane, 1,1-	0.20	µg/L	3,100	< 0.20	< 0.20	< 2.3	< 0.50
Dichloroethane, 1,2-	0.49	µg/L	12	< 0.49	< 0.49	< 0.49	< 0.49
Dichloroethylene, 1,1-	0.20	µg/L	17	< 0.20	< 0.20	< 0.20	< 0.20
Dichloroethylene, cis-1,2-	0.50	µg/L	17	< 0.50	< 0.50	< 0.50	< 0.50
Dichloroethylene, trans-1,2-	0.50	µg/L	17	< 0.50	< 0.50	< 0.50	< 0.50
Dichloropropane, 1,2-	0.20	µg/L	140	< 0.20	< 0.20	< 0.50	< 0.20
Dichloropropene, 1,3-	0.50	µg/L	45	< 0.50	< 0.50	< 0.50	< 0.50
Dichloropropene, cis-1,3-	0.30	µg/L	na	< 0.30	< 0.30	< 0.30	< 0.30
Dichloropropene, trans-1,3-	0.40	µg/L	na	< 0.40	< 0.40	< 0.40	< 0.40
Ethylene Dibromide (Dibromoethane, 1,2-)	0.19	µg/L	0.83	< 0.19	< 0.19	< 0.19	< 0.19
Hexane (n)	1.0	µg/L	520	< 1.0	< 1.0	120	8.2
Methyl Ethyl Ketone	10	µg/L	1,500,000	< 10	< 10	< 10	< 10
Methyl Isobutyl Ketone	5.0	µg/L	580,000	< 5.0	< 5.0	13	< 5.0
Methyl t-butyl ether (MTBE)	0.50	µg/L	1,400	< 0.50	< 0.50	65	8.5
Methylene Chloride (Dichloromethane)	2.0	µg/L	5,500	< 2.0	< 2.0	< 2.0	< 2.0
Styrene	0.40	µg/L	9,100	< 0.40	< 0.40	< 33	< 0.40
Tetrachloroethane, 1,1,1,2-	0.50	µg/L	28	< 0.50	< 0.50	< 0.50	< 0.50
Tetrachloroethane, 1,1,2,2-	0.40	µg/L	15	< 0.40	< 0.40	< 0.40	< 0.40
Tetrachloroethylene	0.20	µg/L	17	< 0.20	< 0.20	< 0.20	< 0.20
Trichloroethane, 1,1,1-	0.20	µg/L	6,700	< 0.20	< 0.20	< 0.20	< 0.20
Trichloroethane, 1,1,2-	0.40	µg/L	30	< 0.40	< 0.40	< 0.40	< 0.40
Trichloroethylene	0.20	µg/L	17	< 0.20	< 0.20	< 0.20	< 0.20
Trichlorofluoromethane	0.50	µg/L	2,500	< 0.50	< 0.50	< 0.50	< 0.50
Vinyl Chloride	0.20	µg/L	1.7	< 0.20	< 0.20	< 0.20	< 0.20

Footnotes:

Laboratory analysis by Bureau Veritas Canada (2019) Inc.
Additional terms may be defined within the body of SNC-Lavalin's report.
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
µg/L - micrograms per litre

BOLD Concentration greater than Table 3 NPG FG Standard

[1] Table 3 full depth generic site condition standards in a non-potable groundwater condition for all types of property use, medium and fine textured soils (MOE, 2011)

APPENDIX A

Borehole Logs

SNC·LAVALIN

Client
Shell

Location
1440 Prince of Wales Dr., Ottawa, ON

Borehole No. : BH23-01

PAGE 1 OF 1

Drilling Contractor		Date Monitored	n/a
Drilling Method	Solid Stem Auger	Ground Surface Elev. (m)	82.585
Borehole Dia. (m)	0.16	Top of Casing Elev. (m)	n/a
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5024140.792	Easting: 445046.998

Project Number:	676801_694129
Borehole Logged By:	JP
Date Drilled:	2023 08 10
Log Typed By:	MD

Drilling Legend
Sample Interval
Split Spoon

Water/ Levels
Water Level 1
Water Level 2

Reading within indicated scale
Reading outside indicated scale

Depth in Feet	Soil Description	Stratigraphy Plot	Core Run Sample Interval	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm)
0	CLAY (FILL), silty, trace medium gravel, dark brown, medium stiff, moist, odours.			**01-01** **01-011***			5
1				01-02			5
2	CLAY, silty, trace fine grained sand, brown/grey, medium dense, moist.			**01-03**			5
				01-04		100	175
	Between 2.4 and 3.0 m - odours.			**01-05**		100	2650
3	SILT, clayey, some sand, trace medium gravel, light grey, stiff, moist-wet, odours.			**01-06**		100	
4				01-07		100	200
				01-08		100	5
5				01-09		100	5
6				01-10		100	5
7	SILT (TILL), some sand, trace medium gravel, trace clay, light grey, stiff, moist.			**01-11**			
8				01-12			
9				01-13			
10				01-14			
	Bottom of hole at 9.8 m.						

NOTES
*denotes blind field duplicate.

SNC·LAVALIN

Client
Shell

Location
1440 Prince of Wales Dr., Ottawa, ON

Borehole No. : BH23-02

PAGE 1 OF 2

Drilling Contractor
Drilling Method Solid Stem Auger
Borehole Dia. (m) 0.16
Pipe/Slotted Pipe Dia. (m) none/none

Date Monitored n/a
Ground Surface Elev. (m) 82.462
Top of Casing Elev. (m) n/a
Northing: 5024109.329 Easting: 445938.978

Project Number: 676801_694129
Borehole Logged By: JP
Date Drilled: 2023 08 11
Log Typed By: MD

Drilling Legend
Sample Interval
Split Spoon

Water/ Levels
Water Level 1
Water Level 2

Depth in Feet	Soil Description	Stratigraphy Plot	Core Run Sample Interval	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm)
0	CLAY (FILL), silty, some medium gravel, some medium grained sand, light brown, very loose, moist.			02-01		100	5
1				02-02		100	5
	CLAY, silty, trace fine grained sand, light brown/grey, medium dense, moist.			02-03		100	5
2				02-04		100	5
				02-05		100	5
3				02-06		100	5
4				02-07		100	5
	SILT, clayey, some fine grained sand, stiff, moist-wet.			02-08		100	5
5				02-09		100	5
6	Between 5.9 and 8.9 m - light grey, wet.			02-10		100	5
7				02-11		100	5
8				02-12		100	5
				02-13			
9	SILT (TILL), sandy, trace medium gravel, trace clay, light grey, stiff, moist.			02-14			
10				02-15			

Reading within indicated scale
Reading outside indicated scale

Soil Vapour (ppm)
10^1 10^2 10^3 10^4

NOTES

SNC·LAVALIN	Client **Shell**	**Borehole No. : BH23-02**
	Location **1440 Prince of Wales Dr., Ottawa, ON**	PAGE 2 OF 2

Drilling Contractor		Date Monitored	n/a	Project Number:	676801_694129
Drilling Method	Solid Stem Auger	Ground Surface Elev. (m)	82.462	Borehole Logged By:	JP
Borehole Dia. (m)	0.16	Top of Casing Elev. (m)	n/a	Date Drilled:	2023 08 11
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5024109.329	Easting: 445038.978	Log Typed By:	MD

Drilling Legend
- Sample Interval
- Split Spoon

Water/ Levels
- Water Level 1
- Water Level 2

Depth in Feet	Soil Description	Stratigraphy Plot	Core Run Sample Interval	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm)
10				02-15			
	Bottom of hole at 10.4 m.						
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Soil Vapour (ppm): ○ Reading within indicated scale; ● Reading outside indicated scale; 10^1 10^2 10^3 10^4

NOTES

SNC·LAVALIN

Client
Shell

Location
1440 Prince of Wales Dr., Ottawa, ON

Borehole No. : BH23-03

Drilling Contractor		Date Monitored	n/a
Drilling Method	Solid Stem Auger	Ground Surface Elev. (m)	82.686
Borehole Dia. (m)	0.16	Top of Casing Elev. (m)	n/a
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5024115.901	Easting: 445060.466

Project Number:	676801_694129
Borehole Logged By:	JP
Date Drilled:	2023 08 11
Log Typed By:	MD

Drilling Legend
Sample Interval
Split Spoon

Water/ Levels
Water Level 1
Water Level 2

Depth in Feet	Soil Description	Stratigraphy Plot	Core Run Sample Interval	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm)
0	CLAY (FILL), silty, trace medium gravel, trace medium grained sand, dark brown, medium stiff, moist.			03-01			5
1				03-02			5
2	CLAY, silty, trace medium grained sand, light grey, medium dense, moist.			03-03		100	5
				03-04			
	Between 2.4 and 3.0 m - light brown, moist.			03-05		100	5
3	Between 3.0 and 4.4 m - light brown, moist-wet.			03-06		100	5
4				03-07		100	5
	CLAY, silty, trace medium gravel, trace medium grained sand, light brown/grey, stiff, moist-wet.			03-08		100	
5	SILT, clayey, trace medium grained sand, light grey, medium stiff, wet.			03-09		100	5
6				03-10 03-100*		100	5
7				03-11		100	5
	SILT (TILL), sandy, trace medium gravel, trace clay, light grey, stiff, moist.			03-12		100	5
8				03-13		100	5
9				03-14		100	5
10				03-15		100	5

Reading within indicated scale
Reading outside indicated scale
Soil Vapour (ppm)
10^1 10^2 10^3 10^4

NOTES
*denotes blind field duplicate.

SNC·LAVALIN

Client
Shell

Borehole No. : BH23-03

Location
1440 Prince of Wales Dr., Ottawa, ON

Drilling Contractor		Date Monitored	n/a	Project Number:	676801_694129
Drilling Method	Solid Stem Auger	Ground Surface Elev. (m)	82.686	Borehole Logged By:	JP
Borehole Dia. (m)	0.16	Top of Casing Elev. (m)	n/a	Date Drilled:	2023 08 11
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5024115.901	Easting: 445060.466	Log Typed By:	MD

Drilling Legend
- Sample Interval
- Split Spoon

Water/ Levels
- Water Level 1
- Water Level 2

Soil Description

Stratigraphy Plot | Core Run Sample Interval | Sample Number | Blow Count | % Recovery

Soil Vapour (ppm)
- ○ Reading within indicated scale
- ● Reading outside indicated scale

10^1 10^2 10^3 10^4

Depth in Feet	Soil Description	Sample Number	Blow Count	% Recovery
10		03-15		
	Bottom of hole at 10.4 m.			
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

NOTES
*denotes blind field duplicate.

JACQUES WHITFORD ENVIRONMENT LIMITED

MONITORING WELL RECORD

MW98-1

CLIENT Shell Canada Products Limited

LOCATION 1440 Prince of Wales Drive

DATES BORING: 98-03-16

WATER LEVEL 98-03-21

PROJECT No. 31088

DATUM Local

TPC ELEV. 100.69

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION
0	100.85	
	100.8	40mm TOPSOIL and fine roots
1		Brown, sand and gravel, trace debris: FILL
2	98.8	
		Grey, silty sand to silty clay, trace organics: FILL
3		
4	96.4	
		Grey, silty CLAY
5	96.0	
		Grey to light brown, silty SAND
6	94.8	
		End of Monitoring Well
7		
8		
9		
10		

STRATA PLOT

WATER LEVEL

DEPTH (ft): 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32

VAPOUR CONCENTRATIONS

OVM ◆ ppm

GASTECHTOR ● %LEL ▲ ppm

● 20 40 60 80

▲ ◆ 100 200 300 400

SAMPLES TYPE	N-VALUE OR RQD
SS1	10
SS2	11
SS3	17
SS4	10
SS5	7
SS6	3
SS7	2

WELL CONSTRUCTION

Protective Casing

Bentonite Seal

51mm #10 slot PVC Screen with Silica Sandpack

▼ Groundwater Level

JACQUES WHITFORD
ENVIRONMENT LIMITED

MONITORING WELL RECORD

MW98-2

CLIENT Shell Canada Products Limited
LOCATION 1440 Prince of Wales Drive
DATES BORING: 98-03-16 WATER LEVEL 98-03-21

PROJECT No. 31088
DATUM Local
TPC ELEV. 100.09

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION
0	100.17	
	100.1	40mm ASPHALT
	99.6	Dark brown, sand and gravel: FILL
1		Grey, silty sand, trace cobbles: FILL
2	97.9	
		Grey, silty CLAY
3		
	96.4	
4		Grey, silty SAND
5		
6	94.1	
		End of Monitoring Well
7		
8		
9		
10		

VAPOUR CONCENTRATIONS
OVM ◆ ppm
GASTECHTOR ● %LEL ▲ ppm
● 20 40 60 80
▲ ◆ 100 200 300 400

DEPTH (ft): 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32

SAMPLES TYPE	N-VALUE OR RQD
SS1	14
SS2	15
SS3	8
SS4	7
SS5	5
SS6	3
SS7	2

WELL CONSTRUCTION
Protective Casing
Bentonite Seal
51mm #10 slot PVC Screen with Silica Sandpack

Groundwater Level

JACQUES WHITFORD ENVIRONMENT LIMITED

MONITORING WELL RECORD

MW98-3

CLIENT Shell Canada Products Limited

LOCATION 1440 Prince of Wales Drive

DATES BORING: 98-03-16 WATER LEVEL 98-03-21

PROJECT No. 31088

DATUM Local

TPC ELEV. 100.26

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION
0	100.34	
	100.2	40mm ASPHALT
		Dark brown, sand and gravel: FILL
		Apparent concrete slab .60m - .76m
1	99.0	
		Grey, silty CLAY
2		
3		
4	95.5	
		Grey, silty SAND
5		
6	94.2	
		End of Monitoring Well
7		
8		
9		
10		

STRATA PLOT

WATER LEVEL

Groundwater Level

VAPOUR CONCENTRATIONS

OVM ◆ ppm

GASTECHTOR ● %LEL ▲ ppm

DEPTH (ft)	20 ● 100 ◆ 100 ▲	40 200	60 300	80 400
2				
4		◆		
6			▲	
8	●			
10				
12		●		
14				●
16				
18				●
20				
22				
24				
26				
28				
30				
32				

SAMPLES TYPE	N-VALUE OR RQD
SS1	8
SS2	15
SS3	16
SS4	6
SS5	4
SS6	3
SS7	2

WELL CONSTRUCTION

Protective Casing

Bentonite Seal

51mm #10 slot PVC Screen with Silica Sandpack

Borehole Logs - Extracted from 2000 Soil Investigation (Aqua Terre, 2000)

AQUA TERRE

Borehole ID: BH-1

Project Name and Number: 00-642
Client: Shell Canada Products Ltd
Location: 1440 Prince of Wales, Ottawa, ON
Date Completed: July 31, 2000
Site Datum:

Drill Supervisor: TLH
Drilling Method: Hollow Stem Auger
Borehole Diameter: 20.0 cm
Well Diameter:

Depth (meters)	Depth (feet)	BLOW COUNT (1)	SAMPLE ID	LOCATION	OVM (2)	GRAPHIC LOG	DESCRIPTION
							CLAYEY SAND FILL – dry, brown, loose, fine to coarse
.5	2	2					
1		3	BH-1-1		10		
	4	3					
1.5		4					
		2					SAND FILL – moist, brown, fine to coarse
	6	1	BH-1-2		22		
2		1					
		1					
2.5	8	2					CLAY – moist, brown, fine, firm, fractured
		4	BH-1-3		20		
3		6					
	10	7					
		2					
		2					
3.5		3	BH-1-4		40		
	12	4					
		1					
4		1					SILTY CLAY – wet, brown to grey, soft, very fractured
		2	BH-1-5		40		
	14	4					
4.5		1					
		1					
	16	1	BH-1-6		38		
5		2					
		1					
5.5	18	1	BH-1-7		24		
		1					
6	20						
		1	BH-1-8		18		SILT – wet, grey, soft, compact
6.5	22						
							End of hole @ 6.7 m bgs.
7							
	24						
7.5							

(1) Measured every 15 cm using SPT for overburden split spoon sample
(2) Sample headspace reading using Tracetechtor

The data presented in this borehole log requires interpretation by AQUA TERRE personnel.

All elevations and locations are approximate.

Borehole Logs - Extracted from 2000 Soil Investigation (Aqua Terre, 2000)

AQUA TERRE

Borehole ID: BH-2

Project Name and Number: 00-642
Client: Shell Canada Products Ltd.
Location: 1440 Prince of Wales, Ottawa, ON
Date Completed: July 31, 2000
Site Datum:

Drill Supervisor: TLH
Drilling Method: Hollow Stem Auger
Borehole Diameter: 20.0 cm
Well Diameter:

Depth (meters)	Depth (feet)	BLOW COUNT (1)	SAMPLE ID	LOCATION	OVM (2)	GRAPHIC LOG	DESCRIPTION
0.5	2	1 2 3 3	BH-2-1		12		SAND AND GRAVEL FILL - moist, brown, medium to coarse, loose
1	4						
1.5	6	1 1 1 1	BH-2-2		10		
2							
2.5	8	3 4 1 1	BH-2-3		126		SAND FILL - wet, brown, loose - medium to coarse - black staining at 2.8 m
3	10	1 1 1 2	BH-2-4		8% LEL		CLAY - wet, brown, fine, soft
3.5	12						
4		1 2 2 3	BH-2-5		80		SILTY CLAY - wet, brown, fine soft, fractured
	14						
4.5		1 1 2 3	BH-2-6		60		
5	16						
5.5	18	1 1 1	BH-2-7		30		SILT - wet, mottled brown to grey, fine, soft
6	20	1 1	BH-2-8		30		
6.5	22						End of hole @ 6.7 m bgs.
7							
7.5	24						

(1) Measured every 15 cm using SPT for overburden split spoon sample
(2) Sample headspace reading using Tracetechtor

The data presented in this borehole log requires interpretation by AQUA TERRE personnel.

All elevations and locations are approximate.

Borehole Logs - Extracted from 2000
Soil Investigation (Aqua Terre, 2000)

AQUA TERRE

Borehole ID: BH-3

Project Name and Number: 00-642
Client: Shell Canada products Ltd.
Location: 1440 Prince of Wales, Ottawa, ON
Date Completed: July 31, 2000
Site Datum:

Drill Supervisor: TLH
Drilling Method: Hollow Stem Auger
Borehole Diameter: 20.0 cm
Well Diameter:

Depth (meters)	Depth (feet)	BLOW COUNT (1)	SAMPLE ID	LOCATION	OVM (2)	GRAPHIC LOG	DESCRIPTION
0.5	2	4 6 4 4	BH-3-1		20		SAND AND GRAVEL FILL – dry, brown, coarse, loose
1	4						
1.5	6	2 2 2 2	BH-3-2		30		SILTY CLAY – moist, brown to grey, soft to firm, fractured
2							
2.5	8	6 5 7 9	BH-3-3		36		– minor pockets of fine sand
3	10	2 2 4 4	BH-3-4		34		– silty seams
3.5	12						
4		2 1 2 3	BH-3-5		30		
	14						
4.5		1 1 1 1	BH-3-6		50		SILTY CLAY – wet, grey, fine, compact
5	16						
5.5	18	1 1 1 1	BH-3-7		30		SANDY SILT – wet, mottled brown to grey, fine, compact
6	20						
6.5		1	BH-3-8		30		
	22						End of hole @ 6.7 m bgs.
7							
	24						
7.5							

(1) Measured every 15 cm using SPT for overburden split spoon sample
(2) Sample headspace reading using Tracetechtor

The data presented in this borehole log requires interpretation by AQUA TERRE personnel.

All elevations and locations are approximate.

Borehole Logs - Extracted from 2000 Soil Investigation (Aqua Terre , 2000)

AQUA TERRE

Borehole ID: BH-4

Project Name and Number: 00-642
Client: Shell Canada Products Ltd.
Location: 1440 Prince of Wales, Ottawa, ON
Date Completed: July 31, 2000
Site Datum:

Drill Supervisor: TLH
Drilling Method: Hollow Stem Auger
Borehole Diameter: 20.0 cm
Well Diameter:

Depth (meters)	Depth (feet)	BLOW COUNT (1)	SAMPLE ID	LOCATION	OVM (2)	GRAPHIC LOG	DESCRIPTION
							SAND AND GRAVEL FILL - brown, dry, coarse, loose
.5	2	2 3 3 2	BH-4-1		18		
1	4						
1.5		2 1 2 3	BH-4-2		20		
2	6						
2.5	8	3 1 1 3	BH-4-3		140		SILTY CLAY - moist to wet, mottled brown to grey - compact to dense, fractured
3	10	2 2 4 4	BH-4-4		50%LEL		
3.5	12						
4		1 2 3 4	BH-4-5		50%LEL		
	14						
4.5		1 1 1 2	BH-4-6		100%LEL		SANDY SILT - grey, wet, firm, compact - hydrocarbon sheen
5	16						
5.5	18	1 2	BH-4-7		80%LEL		CLAYEY SILT - brown to grey, wet, fine to medium, compact - hydrocarbon sheen
6	20	1					
6.5			BH-4-8		80		
	22						End of hole @ 6.7 m bgs.
7							
	24						
7.5							

(1) Measured every 15 cm using SPT for overburden split spoon sample
(2) Sample headspace reading using Tracethector

The data presented in this borehole log requires interpretation by AQUA TERRE personnel.

All elevations and locations are approximate.

Borehole Logs - Extracted from 2000 Soil Investigation (Aqua Terre, 2000)

AQUA TERRE

Borehole ID: BH-5

Project Name and Number: 00-642
Client: Shell Canada Products Ltd
Location: 1440 Prince of Wales, Ottawa, ON
Date Completed: July 31, 2000
Site Datum:

Drill Supervisor: TLH
Drilling Method: Hollow Stem Auger
Borehole Diameter: 20.0 cm
Well Diameter:

Depth (meters)	Depth (feet)	BLOW COUNT (1)	SAMPLE ID	LOCATION	OVM (2)	GRAPHIC LOG	DESCRIPTION
0	0						SILTY CLAY
0.5	2	1 2 4 4	BH-5-1		t8		– moist to wet, brown to grey, fractured – dry, brown to grey, compact, fractured
1	4						
1.5	6	2 4 7 8	BH-5-2		60		– dry, brown to grey, compact, fractured
2	8	5 6 8 9	BH-5-3		70% LEL		– dry, brown to grey, dense, fractured
2.5	10	2 3 5 7	BH-5-4		100% LEL		– moist, brown to grey, dense, fractured
3	12	1 2 3 4	BH-5-5		100% LEL		– moist, brown to grey, dense, fractured
3.5	14	1 2 2 3	BH-5-6		100% LEL		– moist, brown to grey, dense, fractured – hydrocarbon sheen
4	16	1 1 1 1	BH-5-7		80% LEL		SILT – wet, brown, dense
4.5	18	1	BH-5-8		100		– wet, grey. compact
5	20						End of hole @ 6.7 m bgs.
5.5	22						
6	24						
6.5							
7							
7.5							

(1) Measured every 15 cm using SPT for overburden split spoon sample
(2) Sample headspace reading using Tracetechtor

The data presented in this borehole log requires interpretation by AQUA TERRE personnel.

All elevations and locations are approximate.

Borehole Logs - Extracted from 2000 Soil Investigation (Aqua Terre, 2000)

AQUA TERRE

Borehole ID: BH-6

Project Name and Number: 00-642
Client: Shell Canada Products Ltd
Location: 1440 Prince of Wales, Ottawa, ON
Date Completed: July 31, 2000
Site Datum:

Drill Supervisor: TLH
Drilling Method: Hollow Stem Auger
Borehole Diameter: 20.0 cm
Well Diameter:

Depth (meters)	Depth (feet)	BLOW COUNT (1)	SAMPLE ID	LOCATION	OVM (2)	GRAPHIC LOG	DESCRIPTION
							SAND AND SANDY CLAY FILL – dry, brown to grey, medium, loose
.5	2	1					
		2					
1		2	BH-6-1		38		
	4	4					
1.5		2					SILTY CLAY – dry, brown, dense, compact, fractured
	6	5	BH-6-2		38		
2		7					
		8					
2.5	8	2	BH-6-3		72		
		4					
3	10	6					
		8					
		2					
3.5		4	BH-6-4		118		
	12	5					
		6					
4		1					– moist, grey, compact
		2	BH-6-5		300		
	14	2					
		4					
4.5		1					
		2					
	16	2	BH-6-6		60		
5		3					
		1					SANDY SILT – wet, brown to grey, fine, compact
5.5	18	1	BH-6-7		24		
		1					
		1					
6	20	1					
		1					
6.5		1	BH-6-8		14		– wet, mottled brown to grey, compact
	22	1					
							End of hole @ 6.7 m bgs.
7							
	24						
7.5							

(1) Measured every 15 cm using SPT for overburden split spoon sample
(2) Sample headspace reading using Tracethector

The data presented in this borehole log requires interpretation by AQUA TERRE personnel.

All elevations and locations are approximate.

Borehole Logs - Extracted from 2001 Remedial Activities (Aqua Terre, 2001)

AQUA TERRE

Borehole ID: BH-20 (MW-20)

Project Name and Number: 00-642
Client: Shell Canada Products Ltd
Location: 1440 Prince of Wales, Ottawa, ON
Date Completed: July 12, 2001
Site Datum: Fire hydrant on east side of Prince of Wales.

Drill Supervisor: LS
Drilling Method: Hollow Stem Auger
Borehole Diameter: 20.0 cm
Well Diameter: 5.1 cm

Depth (meters)	Depth (feet)	BLOW COUNT (1)	SAMPLE ID	LOCATION	OVM (2)	GRAPHIC LOG	DESCRIPTION (G.S.= 98.67)
							ASPHALT
							GRAVELLY SAND FILL
-.5	2						– dry to moist, fine to medium, brown
-1	4	3 4 14 10	BH-20-1		15 ppm		SANDY SILT
-1.5	6	1 2 4 8	BH-20-2		5% LEL		– dry to moist, brownish grey, soft
-2	8	4 5 8 10	BH-20-3		10%LEL		– trace clay
-2.5	10	3 3 5 6	BH-20-4		40%LEL		
-3	12	3 3 2 5	BH-20-5		60%LEL		
-3.5	14	1 1 2 2	BH-20-6		>100%LEL		– wet at 4.57 m – strong odour – weathered brown product
-4	16	1 2 1 2	BH-20-7		5% LEL		
-4.5	18	0 1 1 1	BH-20-8		100 ppm		
-5	20						End of hole @ 6.71 m
-5.5	22						
-6	24						
-6.5							
-7							
-7.5							

TOP of PVC 98.52

98 — 97.45 — 97 — 97.15 — 96 — 95 — 94 — 93 — 92.58 — 92 — 91

07/17/01 ▼ 96.26 m

(1) Measured every 15 cm using SPT for overburden split spoon sample
(2) Sample headspace reading using Tracetechtor

The data presented in this borehole log requires interpretation by AQUA TERRE personnel.

All elevations and locations are approximate.

Borehole Logs - Extracted from 2001 Remedial Activities (Aqua Terre, 2001)

AQUA TERRE

Borehole ID: BH-21 (MW-21)

Project Name and Number: 00-642
Client: Shell Canada Products Ltd
Location: 1440 Prince of Wales, Ottawa, ON
Date Completed: July 12, 2001
Site Datum: Fire hydrant on east side of Prince of Wales.

Drill Supervisor: LS
Drilling Method: Hollow Stem Auger
Borehole Diameter: 20.0 cm
Well Diameter: 5.1 cm

Depth (meters)	Depth (feet)	BLOW COUNT (1)	SAMPLE ID	LOCATION	OVM (2)	GRAPHIC LOG	DESCRIPTION	G.S.= 98.71	TOP of PVC 98.57
							ASPHALT		
							SAND AND GRAVEL FILL		
0.5	2	7					- dry to moist, fine to medium	98	
1	4	6	BH-21-1		200 ppm				
1.5		5							97.49
	6	8							97.19
2		1						97	
		2							
2.5	8	3	BH-21-2		90 ppm				
		3							
3	10	2	BH-21-3		50 ppm			96	
		2							
3.5	12	2							
		1							
4		3					SANDY SILT		
	14	5	BH-21-4		450 ppm		- dry to moist, brownish grey, soft	95	
4.5		5					- trace sand		
		9					- trace clay		
5	16	3	BH-21-5		15% LEL				
		3							
5.5	18	4					- wet at 4.57 m	94	
		5	BH-21-6		80% LEL				
6	20	2							
		2							
6.5	22	2	BH-21-7		80 ppm			93	
		3							
7	24	1							92.61
		2							
7.5		2						92	
		2							
		0	BH-21-8		100 ppm				
		1							
		1							
		1							
							End of hole @ 6.71 m	91	

07/17/01
95.77 m

(1) Measured every 15 cm using SPT for overburden split spoon sample
(2) Sample headspace reading using Tracetechtor

The data presented in this borehole log requires interpretation by AQUA TERRE personnel.

All elevations and locations are approximate.

Borehole Logs - Extracted from 2001 Remedial Activities (Aqua Terre, 2001)

AQUA TERRE

Borehole ID: BH-22 (MW-22)

Project Name and Number: 00-642
Client: Shell Canada Products Ltd
Location: 1440 Prince of Wales, Ottawa, ON
Date Completed: July 12, 2001
Site Datum: Fire hydrant on east side of Prince of Wales.

Drill Supervisor: LS
Drilling Method: Hollow Stem Auger
Borehole Diameter: 20.0 cm
Well Diameter: 5.1 cm

Depth (meters)	Depth (feet)	BLOW COUNT (1)	SAMPLE ID	LOCATION	OVM (2)	GRAPHIC LOG	DESCRIPTION	G.S.= 98.63	TOP of PVC 98.55
							ASPHALT		
-.5	2						GRAVELLY SAND FILL - dry to moist, fine to medium, brown	98	
-1		3 4							
	4	4 6	BH-22-1		25 ppm		SANDY SILT		
-1.5		4					- dry to moist, brownish grey, soft	97.41	
	6	8 9	BH-22-2		100 ppm		- trace clay	97.11	
-2		9						97	
-2.5	8	4 6	BH-22-3		10% LEL			96	
		6 6							
-3	10	4							
		5 5	BH-22-4		65% LEL			95	
-3.5	12	6							
-4		3 3							
	14	5 5	BH-22-5		>100%LEL				
-4.5		2					- wet at 4.57 m	94	
	16	2 2	BH-22-6		>100%LEL		- strong odour		
-5		3					- weathered black product		
-5.5	18	1						93	
		2 2	BH-22-7		>100%LEL				
-6		2							92.54
	20	1							
-6.5		0 1	BH-22-8		10% LEL			92	
	22	1							
-7		1							
		0	BH-22-9		200 ppm				
-7.5	24	1					End of hole @ 7.46 m	91	

07/13/01
95.56 m

(1) Measured every 15 cm using SPT for overburden split spoon sample
(2) Sample headspace reading using Tracetechtor

The data presented in this borehole log requires interpretation by AQUA TERRE personnel.

All elevations and locations are approximate.

APPENDIX B

Certificates of Analysis (Soil)

TABLE B.1: Soil Analytical Results for BTEX, General Chemistry, PHCs, Total Metals, Volatile Organic Compounds.
1440 Prince of Wales Dr., Ottawa, ON

Sample Location			RPD[1]	BH23-01	BH23-01	RPD	BH23-03	BH23-03	RPD
Laboratory Sample ID			Limit	WRD345	WRD346		WRD358	WRD359	
SNC-Lavalin Sample ID				BH23-01-01	BH23-01-011		BH23-03-10	BH23-03-100	
Sampling Date (yyyy/mm/dd)				2023/08/10	2023/08/10		2023/08/11	2023/08/11	
Depth Interval (mbgs)				0.0 - 0.8	0.0 - 0.8		5.9 - 6.7	5.9 - 6.7	
Field Screen (ppmv)				<5	<5		<5	<5	
					Duplicate of			Duplicate of	
Parameter	**RDL**	**Units**			BH23-01			BH23-03	
General Chemistry									
Free Cyanide	0.01	µg/g	70%	< 0.01	< 0.01	*	< 0.01	< 0.01	*
Electrical Conductivity	0.002	mS/cm	40%	2.3	2.5	8%	1.2	1.1	9%
pH	-	pH	60% [2]	9.44	9.51	*	7.63	7.50	*
Sodium Adsorption Ratio	-	None	n/a	31	32	*	2.2	2.0	*
Total Metals									
Antimony	0.20	µg/g	60%	< 0.20	0.24	*	< 0.20	< 0.20	*
Arsenic	1.0	µg/g	60%	1.5	1.5	*	1.3	1.6	*
Barium	0.50	µg/g	80%	200	230	14%	120	110	9%
Beryllium	0.20	µg/g	60%	0.75	0.79	*	0.36	0.34	*
Boron	5.0	µg/g	60%	5.7	6.0	*	< 5.0	< 5.0	*
Boron (Hot Water Soluble)	0.050	µg/g	80%	0.59	0.47	23%	0.51	0.34	40%
Cadmium	0.10	µg/g	60%	0.12	0.18	*	< 0.10	< 0.10	*
Chromium (total)	1.0	µg/g	70%	99	100	1%	31	28	10%
Chromium (VI)	0.18	µg/g	70%	< 0.18	< 0.18	*	< 0.18	< 0.18	*
Cobalt	0.10	µg/g	60%	17	17	0%	8.1	7.7	5%
Copper	0.50	µg/g	60%	29	37	24%	17	16	6%
Lead	1.0	µg/g	80%	17	18	6%	3.7	3.9	*
Mercury	0.050	µg/g	80%	< 0.050	< 0.050	*	< 0.050	< 0.050	*
Molybdenum	0.50	µg/g	80%	0.68	0.55	*	0.84	0.98	*
Nickel	0.50	µg/g	60%	46	51	10%	18	16	12%
Selenium	0.50	µg/g	60%	< 0.50	< 0.50	*	< 0.50	< 0.50	*
Silver	0.20	µg/g	80%	< 0.20	< 0.20	*	< 0.20	< 0.20	*
Thallium	0.050	µg/g	60%	0.36	0.35	3%	0.15	0.15	*
Uranium	0.050	µg/g	60%	0.95	0.98	3%	1.5	3.3	***75%***
Vanadium	5.0	µg/g	60%	83	87	5%	46	42	9%
Zinc	5.0	µg/g	60%	110	110	0%	44	40	10%
Volatiles									
Benzene	0.0060	µg/g	100%	1.0	0.44	78%	< 0.0060	< 0.0060	*
Toluene	0.020	µg/g	100%	0.18	0.092	*	< 0.020	< 0.020	*
Ethylbenzene	0.010	µg/g	100%	0.66	0.77	15%	< 0.010	< 0.010	*
Xylenes	0.020	µg/g	100%	0.14	0.12	15%	0.025	< 0.020	*
m+p-Xylenes	0.020	µg/g	100%	0.057	0.043	*	0.025	< 0.020	*
o-Xylenes	0.020	µg/g	100%	0.086	0.081	*	< 0.020	< 0.020	*
Petroleum Hydrocarbons (PHC)									
PHC F1 (C6-C10)	10	µg/g	60%	29	33	*	< 10	< 10	*
PHC F1 - BTEX	10	µg/g	60%	27	31	*	< 10	< 10	*
PHC F2	10	µg/g	60%	< 10	< 10	*	< 10	< 10	*
PHC F3	50	µg/g	60%	56	< 50	*	< 50	< 50	*
PHC F4	50	µg/g	60%	51	< 50	*	< 50	< 50	*
Volatile Organic Compounds									
Acetone	0.49	µg/g	100%	< 1.4	< 1.5	*	< 0.49	< 0.49	*
Bromodichloromethane	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Bromoform	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Bromomethane	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Carbon Tetrachloride	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Chlorobenzene	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Chloroform	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Dichloropropene, trans-1,3-	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Dibromochloromethane (Chlorodibromomethane)	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Dichloropropene, cis-1,3-	0.030	µg/g	100%	< 0.030	< 0.030	*	< 0.030	< 0.030	*
Dichlorobenzene, 1,2- (o-DCB)	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Dichlorobenzene, 1,3- (m-DCB)	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Dichlorobenzene, 1,4- (p-DCB)	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Dichlorodifluoromethane	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Dichloroethane, 1,1-	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Dichloroethane, 1,2-	0.049	µg/g	100%	< 0.049	< 0.049	*	< 0.049	< 0.049	*
Dichloroethylene, 1,1-	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Dichloroethylene, cis-1,2-	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Dichloroethylene, trans-1,2-	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Dichloropropane, 1,2-	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Dichloropropene, 1,3-	0.050	µg/g	100%	< 0.050	< 0.050	*	< 0.050	< 0.050	*
Ethylene Dibromide (Dibromoethane, 1,2-)	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Hexane(n)	0.040	µg/g	100%	0.28	0.13	*	< 0.040	< 0.040	*
Methyl Ethyl Ketone	0.40	µg/g	100%	< 0.40	< 0.40	*	< 0.40	< 0.40	*
Methyl Isobutyl Ketone	0.40	µg/g	100%	< 0.40	< 0.40	*	< 0.40	< 0.40	*
Methyl tert butyl ether (MTBE)	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Methylene Chloride (Dichloromethane)	0.049	µg/g	100%	< 0.20	< 0.30	*	< 0.049	< 0.049	*
Styrene	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Tetrachloroethane, 1,1,1,2-	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Tetrachloroethane, 1,1,2,2-	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Trichloroethane, 1,1,1-	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Trichloroethane, 1,1,2-	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Trichloroethylene	0.010	µg/g	100%	< 0.010	< 0.010	*	< 0.010	< 0.010	*
Tetrachloroethylene	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Trichlorofluoromethane	0.040	µg/g	100%	< 0.040	< 0.040	*	< 0.040	< 0.040	*
Vinyl Chloride	0.019	µg/g	100%	< 0.019	< 0.019	*	< 0.019	< 0.019	*

Footnotes:
Laboratory analysis by Bureau Veritas Canada (2019) Inc., ,
Additional terms may be defined within the body of SNC-Lavalin's report.
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
mbgs - metres below ground surface
Field Screen - organic vapour meter reading
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)
µg/g - micrograms per gram, dry weight basis
mS/cm - milliSiemens per centimetre

BOLD Exceeds RPD Limit

[1] RPD limits calculated as 2x laboratory performance criteria (CCME, 2016) using limits provided in the CCME guidance.
[2] CCME performance criteria for pH is for lab duplicates to be within 0.3 units, therefore,
a performance criteria of 0.6 pH units has been applied to field duplicates following CCME (2016) guidance.

TABLE B.2: Soil Analytical Results for BTEX and PHCs
1440 Prince of Wales Dr., Ottawa, ON

Sample Location Laboratory Sample ID SNC-Lavalin Sample ID Sampling Date (yyyy/mm/dd)			Table 3[1] Standard I/C/C FG	TRIP BLANK WRD444 TRIP BLANK 2023/08/11
Parameter	**RDL**	**Units**		
Volatiles				
Benzene	0.0060	µg/g	0.4	< 0.0060
Toluene	0.020	µg/g	78	< 0.020
Ethylbenzene	0.010	µg/g	19	< 0.010
Xylenes	0.020	µg/g	30	< 0.020
m+p-Xylenes	0.020	µg/g	na	< 0.020
o-Xylenes	0.020	µg/g	na	< 0.020
Hexane (n)	0.040	µg/g	88	< 0.040
Petroleum Hydrocarbons (PHC)				
PHC F1 (C6-C10)	10	µg/g	65	< 10
PHC F1 - BTEX	10	µg/g	65	< 10

Footnotes:
Laboratory analysis by Bureau Veritas Canada (2019) Inc.
Additional terms may be defined within the body of SNC-Lavalin's report.
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
mbgs - metres below ground surface
Field Screen - organic vapour meter reading
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)
µg/g - micrograms per gram, dry weight basis

BOLD Concentration greater than Table 3 Standard

[1] Table 3 full depth generic site condition standards in a non-potable groundwater condition for industrial/commercial/community property use, medium and fine textured soils (MOE, 2011)

APPENDIX C

Certificates of Analysis
(Groundwater)

TABLE C.1 : **Field Duplicate QAQC Results for Groundwater - Petroleum Parameters**
1440 Prince of Wales Dr., Ottawa, ON

	Sample Location		RPD[1]	98-1	98-1	RPD
	Laboratory Sample ID		Limit	XSK595	XSK596	
	SNC-Lavalin Sample ID			98-1	98-11	
	Sampling Date (yyyy/mm/dd)			2023/11/27	2023/11/27 Duplicate of 98-1	
Parameter	**RDL**	**Units**				
Volatiles						
Benzene	4.0	µg/L	60%	<0.20	<0.20	*
Toluene	4.0	µg/L	60%	<0.20	<0.20	*
Ethylbenzene	4.0	µg/L	60%	<0.20	<0.20	*
Xylenes	8.0	µg/L	60%	<0.20	<0.20	*
Petroleum Hydrocarbons (PHC) Fractions						
PHC F1	500	µg/L	60%	-	-	-
PHC F2	100	µg/L	60%	-	-	-
PHC F3	200	µg/L	60%	-	-	
PHC F4	200	µg/L	60%	-	-	-

Laboratory analysis by Bureau Veritas Canada (2019) Inc., ,
Additional terms may be defined within the body of SNC-Lavalin's report.
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
µg/L - micrograms per litre

BOLD RPD Exceeds RPD Limit

[1] RPD limits calculated as 2x laboratory performance criteria (CCME, 2016) using limits provided in the CCME guidance.

TABLE C.2: Blank QA/QC Analytical Results for Groundwater - Petroleum Parameters
1440 Prince of Wales Dr., Ottawa, ON

Sample Location Laboratory Sample ID SNC-Lavalin Sample ID Sampling Date (yyyy/mm/dd)			Table 3 NPG FG[1] Standard	FIELD BLANK WEK252 FIELD BLANK 2023/06/21	FIELD BLANK XSK614 FIELD-BLANK 2023/11/27	TRIP BLANK WEK253 TRIP BLANK 2023/06/21	TRIP BLANK XSK615 TRIP-BLANK 2023/11/27
Parameter	**RDL**	**Units**					
Volatiles							
Benzene	0.20	µg/L	430	< 0.20	<0.20	< 0.20	< 0.20
Toluene	0.20	µg/L	18,000	< 0.20	<0.20	< 0.20	< 0.20
Ethylbenzene	0.20	µg/L	2,300	< 0.20	<0.20	< 0.20	< 0.20
Xylenes	0.20	µg/L	4,200	< 0.40	<0.20	< 0.20	< 0.20
Petroleum Hydrocarbon (PHC) Fractions							
PHC F1	25	µg/L	750	< 25	-	-	-
PHC F2	100	µg/L	150	< 100	-	-	-
PHC F3	200	µg/L	500	< 200	-	-	-
PHC F4	200	µg/L	500	< 200	-	-	-

Laboratory analysis by Bureau Veritas Canada (2019) Inc., ,
Additional terms may be defined within the body of SNC-Lavalin's report.
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
µg/L - micrograms per litre

BOLD Concentration greater than Table 3 NPG FG Standard

[1] Table 3 full depth generic site condition standards in a non-potable groundwater condition for all types of property use, medium and fine textured soils (MOE, 2011)

TABLE C.3: Field Duplicate QAQC Results for Groundwater - VOCs
1440 Prince of Wales Dr., Ottawa, ON

Sample Location			RPD[1]	98-1	98-1	RPD
Laboratory Sample ID			Limit	XSK595	XSK596	
SNC-Lavalin Sample ID				98-1	98-11	
Sampling Date (yyyy/mm/dd)				2023/11/27	2023/11/27	
					Duplicate of	
Parameter	RDL	Units			98-1	
Volatile Organic Compounds						
Acetone	10	µg/L	60%	< 10	< 10	*
Benzene	0.20	µg/L	60%	< 0.20	< 0.20	*
Bromodichloromethane	0.50	µg/L	60%	< 0.50	< 0.50	*
Bromoform	1.0	µg/L	60%	< 1.0	< 1.0	*
Bromomethane	0.50	µg/L	60%	< 0.50	< 0.50	*
Carbon Tetrachloride	0.19	µg/L	60%	< 0.19	< 0.19	*
Chlorobenzene	0.20	µg/L	60%	< 0.20	< 0.20	*
Chloroform	0.20	µg/L	60%	< 0.20	< 0.20	*
Dibromochloromethane	0.50	µg/L	60%	< 0.50	< 0.50	*
Dichlorobenzene, 1,2- (o-DCB)	0.40	µg/L	60%	< 0.40	< 0.40	*
Dichlorobenzene, 1,3- (m-DCB)	0.40	µg/L	60%	< 0.40	< 0.40	*
Dichlorobenzene, 1,4- (p-DCB)	0.40	µg/L	60%	< 0.40	< 0.40	*
Dichlorodifluoromethane	1.0	µg/L	60%	< 1.0	< 1.0	*
Dichloroethane, 1,1-	0.20	µg/L	60%	< 0.20	< 0.20	*
Dichloroethane, 1,2-	0.49	µg/L	60%	< 0.49	< 0.49	*
Dichloroethylene, 1,1-	0.20	µg/L	60%	< 0.20	< 0.20	*
Dichloroethylene, cis-1,2-	0.50	µg/L	60%	< 0.50	< 0.50	*
Dichloroethylene, trans-1,2-	0.50	µg/L	60%	< 0.50	< 0.50	*
Dichloropropane, 1,2-	0.20	µg/L	60%	< 0.20	< 0.20	*
Dichloropropene, 1,3-	0.50	µg/L	60%	< 0.50	< 0.50	*
Dichloropropene, cis-1,3-	0.30	µg/L	60%	< 0.30	< 0.30	*
Dichloropropene, trans-1,3-	0.40	µg/L	60%	< 0.40	< 0.40	*
Ethylbenzene	0.20	µg/L	60%	< 0.20	< 0.20	*
Ethylene Dibromide (Dibromoethane, 1,2-)	0.19	µg/L	60%	< 0.19	< 0.19	*
Hexane (n)	1.0	µg/L	60%	< 1.0	< 1.0	*
Methyl Ethyl Ketone	10	µg/L	60%	< 10	< 10	*
Methyl Isobutyl Ketone	5.0	µg/L	60%	< 5.0	< 5.0	*
Methyl t-butyl ether (MTBE)	0.50	µg/L	60%	< 0.50	< 0.50	*
Methylene Chloride (Dichloromethane)	2.0	µg/L	60%	< 2.0	< 2.0	*
Styrene	0.40	µg/L	60%	< 0.40	< 0.40	*
Tetrachloroethane, 1,1,1,2-	0.50	µg/L	60%	< 0.50	< 0.50	*
Tetrachloroethane, 1,1,2,2-	0.40	µg/L	60%	< 0.40	< 0.40	*
Tetrachloroethylene	0.20	µg/L	60%	< 0.20	< 0.20	*
Toluene	0.20	µg/L	60%	< 0.20	< 0.20	*
Trichloroethane, 1,1,1-	0.20	µg/L	60%	< 0.20	< 0.20	*
Trichloroethane, 1,1,2-	0.40	µg/L	60%	< 0.40	< 0.40	*
Trichloroethylene	0.20	µg/L	60%	< 0.20	< 0.20	*
Trichlorofluoromethane	0.50	µg/L	60%	< 0.50	< 0.50	*
Vinyl Chloride	0.20	µg/L	60%	< 0.20	< 0.20	*
Xylenes	0.20	µg/L	60%	< 0.20	< 0.20	*
Xylenes, m+p-	0.20	µg/L	60%	< 0.20	< 0.20	*
Xylenes, o-	0.20	µg/L	60%	< 0.20	< 0.20	*

Footnotes:
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Additional terms may be defined within the body of SNC-Lavalin's report.
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
µg/L - micrograms per litre

BOLD Exceeds RPD Limit

[1] RPD limits calculated as 2x laboratory performance criteria (CCME, 2016) using limits provided in the CCME guidance.

TABLE C.4: Groundwater Analytical Results for VOCS
1440 Prince of Wales Dr., Ottawa, ON

Sample Location			Table 3 NPG FG[1] Standard	FIELD BLANK	TRIP BLANK
Laboratory Sample ID				XSK614	XSK615
SNC-Lavalin Sample ID				FIELD-BLANK	TRIP-BLANK
Sampling Date (yyyy/mm/dd)				2023/11/27	2023/11/27
Parameter	**RDL**	**Units**			
Volatile Organic Compounds					
Acetone	10	µg/L	130,000	< 10	< 10
Bromodichloromethane	0.50	µg/L	85,000	< 0.50	< 0.50
Bromoform	1.0	µg/L	770	< 1.0	< 1.0
Bromomethane	0.50	µg/L	56	< 0.50	< 0.50
Carbon Tetrachloride	0.19	µg/L	8.4	< 0.19	< 0.19
Chlorobenzene	0.20	µg/L	630	< 0.20	< 0.20
Chloroform	0.20	µg/L	22	< 0.20	< 0.20
Dibromochloromethane	0.50	µg/L	82,000	< 0.50	< 0.50
Dichlorobenzene, 1,2- (o-DCB)	0.40	µg/L	9,600	< 0.40	< 0.40
Dichlorobenzene, 1,3- (m-DCB)	0.40	µg/L	9,600	< 0.40	< 0.40
Dichlorobenzene, 1,4- (p-DCB)	0.40	µg/L	67	< 0.40	< 0.40
Dichlorodifluoromethane	1.0	µg/L	4,400	< 1.0	< 1.0
Dichloroethane, 1,1-	0.20	µg/L	3,100	< 0.20	< 0.20
Dichloroethane, 1,2-	0.49	µg/L	12	< 0.49	< 0.49
Dichloroethylene, 1,1-	0.20	µg/L	17	< 0.20	< 0.20
Dichloroethylene, cis-1,2-	0.50	µg/L	17	< 0.50	< 0.50
Dichloroethylene, trans-1,2-	0.50	µg/L	17	< 0.50	< 0.50
Dichloropropane, 1,2-	0.20	µg/L	140	< 0.20	< 0.20
Dichloropropene, 1,3-	0.50	µg/L	45	< 0.50	< 0.50
Dichloropropene, cis-1,3-	0.30	µg/L	na	< 0.30	< 0.30
Dichloropropene, trans-1,3-	0.40	µg/L	na	< 0.40	< 0.40
Ethylene Dibromide (Dibromoethane, 1,2-)	0.19	µg/L	0.83	< 0.19	< 0.19
Hexane (n)	1.0	µg/L	520	< 1.0	< 1.0
Methyl Ethyl Ketone	10	µg/L	1,500,000	< 10	< 10
Methyl Isobutyl Ketone	5.0	µg/L	580,000	< 5.0	< 5.0
Methyl t-butyl ether (MTBE)	0.50	µg/L	1,400	< 0.50	< 0.50
Methylene Chloride (Dichloromethane)	2.0	µg/L	5,500	< 2.0	< 2.0
Styrene	0.40	µg/L	9,100	< 0.40	< 0.40
Tetrachloroethane, 1,1,1,2-	0.50	µg/L	28	< 0.50	< 0.50
Tetrachloroethane, 1,1,2,2-	0.40	µg/L	15	< 0.40	< 0.40
Tetrachloroethylene	0.20	µg/L	17	< 0.20	< 0.20
Trichloroethane, 1,1,1-	0.20	µg/L	6,700	< 0.20	< 0.20
Trichloroethane, 1,1,2-	0.40	µg/L	30	< 0.40	< 0.40
Trichloroethylene	0.20	µg/L	17	< 0.20	< 0.20
Trichlorofluoromethane	0.50	µg/L	2,500	< 0.50	< 0.50
Vinyl Chloride	0.20	µg/L	1.7	< 0.20	< 0.20

Footnotes:
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BOLD Concentration greater than Table 3 NPG FG Standard

[1] Table 3 full depth generic site condition standards in a non-potable groundwater condition for all types of property use, medium and fine textured soils (MOE, 2011)

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