University of Ottawa

Phase One Environmental Site Assessment

Proposed Site Redevelopment – 200 Lees Avenue, Ottawa, Ontario

A001049

CIMA+ file number: A001049
11 September 2020 – Review 01

University of Ottawa

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Proposed Site Redevelopment – 200 Lees Avenue, Ottawa, Ontario

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Prepared by:

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Confidentiality and ownership

1. Executive Summary

Executive Summary

Phase One Environmental Site Assessment (ESA)

Site identification:

Location:	University of Ottawa - 200 Lees Ave. Ottawa, ON
PIN:	Part of 042030732 and 042030731
Activity:	Phase One ESA for proposed site redevelopment

Inspector Name:	Jamieson-Lee Scott, Technologist
Qualified Person:	**Karen Greer, Senior Hydrogeologist**
Client Contact:	Sylviane Charette, Senior Project Manager – Major Projects, University of Ottawa

Findings and Recommendations Summary

Potential Source of Impacts	PCA	Comments	Recommended Intervention
Historic Land Use	Yes	The site was formerly an ash and cinder landfill of incinerator waste. The site has been in its current configuration as a college / university campus since 1965.	Phase Two ESA
Adjoining Properties	Yes	North: North of the overflow parking and Highway 417 is an Enbridge substation. To the north, northeast is a City of Ottawa work yard (Road Division) (not a concern) South: Rideau River (not a concern. East: East of the open-air stadium is the Rideau River. Northeast is the City work yard (not a concern) West: Former coal gasification plant as well as asphalt and bitumen manufacturing (concern)	Phase Two ESA
Building	No	Most of the site is occupied by three (3) buildings (Building B, C, and D). Adjacent to the buildings are a storage yard (south of Building B), parking lots to the north and west, and landscaping in much of the remaining open space.	N/A
Fill	Yes	Fill materials referred to as a "cinder and ash" layer to varying depths and materials (ie. Industrial and landfill).	Phase Two ESA
Heating Systems	No	Buildings are equipped with boilers and chillers. There are also exterior air conditioning units adjacent to buildings.	N/A
Drains and Wells	No	There are no drinking water wells on-site or within the study area. There is a sewer line running under the property.	N/A
Sanitary Conditions	No	No signs of unsanitary conditions were observed.	N/A
Exterior Surfaces and Stressed Vegetation	No	The site consisted of landscaped grass, trees, and brick walking paths. There was no sign of stressed vegetation.	N/A

Executive Summary			
Storage Tank	No	No storage tanks are present on the property. Historically, a UST was present adjacent to the site in association with Building A. The UST was removed in 2012.	N/A
Infrastructure	No	The site is serviced by municipal water and sewer. Electrical and telecommunications services also run underneath the property.	N/A
Operation at the Property	No	A full-service university campus is operated on the property. Various services include cafeteria, simulated clinics, laboratories, and sporting facilities.	N/A
Hazardous Material	No	Paint cans, solvents, and other commercial and household products. In addition, asbestos and lead based paint have been identified on the property.	N/A
Products manufactured at the property, By-product and Waste Management	No	No products manufactured at the property. Wastes generated at the property are associated with laboratories, simulated clinics, detergents, and alkaline batteries, etc. Municipal waste collection by the City of Ottawa.	N/A
Raw Material handling and Storage Locations	No	No raw material handling and storage location were observed.	N/A
Location and Contents of Drums, Totes and Bins	No	On the property, drums, totes, and bins are in secured mechanical rooms.	N/A
Equipment Maintenance Areas	No	No equipment maintenance areas were observed.	N/A
Spills and Stains	No	Spills and stains were minimal in mechanical rooms of all buildings.	N/A
Liquid Discharge Point such as Water and French Drains	No	Floor drains located in mechanical rooms. No obstructions were observed.	N/A
Hydraulic Lift Equipment	No	No hydraulic lift equipment was observed.	N/A

Executive Summary

CIMA+ was retained by the University of Ottawa (uOttawa) to complete a Phase One Environmental Site Assessment (ESA) on a portion of the Property at 200 Lees Avenue in Ottawa, Ontario. The "Site" encompasses a portion of the Property being proposed for redevelopment that will include the location of a new "C" shaped building, which would require the demolition of Buildings B, C, and D. The new multi-storey building (with no basement) will be located within the approximate footprints of existing Buildings C and D. This Phase One ESA report is being prepared in general accordance with Ontario Regulation O.Reg. 153/04, as amended in order to meet the requirements as per the City of Ottawa Site Plan Control application.

The Site has been in its current configuration since 1965 and primarily consists of three (3) buildings (Building B, C, and D). Adjacent to the buildings are a storage yard (south of Building B), parking lots to the north and west, and treed landscaping in much of the remaining open space.

On the adjacent property parcel, there are two (2) additional buildings, Building A and Building E as well as an open-air stadium to the east. The grounds of the Site are primarily cement and asphalt walkways, as well as parking lots with the balance of the Site being landscaped.

A Site visit was conducted by Karen Greer, Qualified Person as defined by O.Reg. 153/04, as amended; and Jamieson-Lee Scott, technologist, on July 8, 2020. Pertinent accessible areas of all buildings on the surrounding property were inspected and observations were made of properties within the Study Area.

The Site was formerly an ash and cinder landfill of incinerator waste. Adjacent to the site was a former industrial area to the north that consisted of a former coal gasification plant as well as asphalt and bitumen manufacturing. Extensive soil and groundwater investigations have taken place on the Site and on the adjacent properties within the Study Area.

Past investigations have reported soil impacts being confirmed on-Site for COC of PAH, PHC and metals within the fill and the native alluvium deposits. Groundwater impacts have also been confirmed for COC of PAH and PHC for wells completed within the fill and deep alluvium units. Soil vapour investigations concluded no concerns with respect to the volatile compounds (BTEX, PHC, naphthalene) or methane.

A Phase Two ESA is recommended in order to further investigate the above noted APEC on the Phase One Property.

PCA is identified from the former on-Site landfill and off-Site as a results of coal gasification plant operations as well as asphalt and bitumen manufacturing.

APEC for the Site include the following:

A. Historical Landfill (cinder and ash fill layer) over the entire Site from former on-Site operations.

B. Historical coal tar impacts over the northwest portion of the Site from former operations at a site within the Phase One Study Area.

From past report analysis COC known to be present on-Site include PAH, PHC and metals in soil and PAH and PHC in groundwater.

A Phase Two ESA is recommended to further investigate the above noted APEC for the identified COC.

Executive Summary

Glossary: Site: Phase One Property
Study Area: Phase One Study Area (250 m)
ESA: Environmental Site Assessment
PCA: Potential Contaminating Activity
APEC: Areas of Potential Environmental Concerns
COC: Contaminant of Concern
PAH: Polycyclic Aromatic Hydrocarbons
PHC: Petroleum Hydrocarbons
EPA: Environmental Protection Act
O.Reg 153/04: Ontario Regulation 153/04, as amended under the EPA
UST: Underground Storage Tank

Note: This summary is a part of a detailed evaluation report that contains information essential to its interpretation.

Table of contents

List of Tables

List of Appendices

2. Introduction

2.1 Phase One Property Information

Municipal Address, Property Identifier Number (PIN), and Property Description:

The Phase One Property is comprised of the following:

Table 1: Phase One Property Information

Legal Description	PIN	Legal Municipal Address
CON D RF PT LOT G RP4R 299; PARTS 6, 9 &10 LESS 5R 5009; PARTS 1 to 8 LESS 5R 5015; PARTS 1&2	042030732 and 042030731	200 Lees Avenue, Ottawa ON

Name, Address, and Other Contact Information for the Property Owner:

The Phase One Property is currently owned and managed by;

University of Ottawa

75 Laurier Avenue East,

Ottawa Ontario, K1N6N5

Name, Status, and Other Contact Information for Any Other Person Who Engaged the Qualified Person to Conduct the Phase One ESA;

In June 2020, CIMA Canada Inc. (**CIMA+**) with technical subcontractor support from Geosyntec Consultants International, Inc. (Geosyntec) was retained by the University of Ottawa (uOttawa) to complete a Phase One Environmental Site Assessment (ESA) on a portion of the 200 Lees Avenue property planned for re-development. The principal client contact is as follows:

Sylviane Charette, P. Eng., PMP

Senior Project Manager, Major Projects - Facilities

University of Ottawa

scharet4@uOttawa.ca

613-302-7696

3. Scope of Investigation

The scope for this Phase One ESA was developed in general accordance with Ontario Regulation 153/04, as amended. The overall objective of a Phase One ESA is to asses if the Phase One Property is subject to actual or potential contamination. The tasks completed as part of a typical scope of investigation include but are not limited to;

+ Obtaining and reviewing sources of information pertaining to the Phase One Property and key properties within the Phase One Study Area, as required;
+ Interviewing owners, tenants and/or neighbours of the Phase One Property, if possible;
+ Inspection of the Phase One Property for evidence of current or past Potentially Contaminating Activities (PCA) that could contribute to Areas of Potential Environmental Concern (APEC);
+ Identifying PCA in the Phase One Study Area that could contribute to APEC on the Phase One Property;
+ Preparation of a report including a summary of relevant documentation, detailing investigation findings as well as conclusions and recommendations inclusive of:
    - Identification of on and off Phase One Property PCA(s)
    - Identification of APEC(s) on the Phase One Property
    - Assessment of Contaminants of Potential Concern (COPC) or if know Contaminants of Concern (COC)
    - Phase One Conceptual Site Model (CSM)

The purpose of the Phase One ESA is to determine if evidence of actual and/or potential contamination exists at, or adjacent to, the Phase One Property. The Phase One ESA works to identify PCA that could contribute to APEC on the Phase One Property. A Phase One ESA does not include the surface and subsurface testing of media (soil, sediment and/or groundwater) for COPC or known COC and therefore the conclusions of the report are limited to the identification of the PCA that may contribute to APEC on the Phase One Property. The investigation of the APEC, if required based on the conclusions of the Phase One ESA are done by way of a recommendation to complete a Phase Two ESA. A Phase Two ESA works to gather qualitative and quantitative information to confirm or refute APEC on the Phase One Property.

This report must be read and interpreted in accordance with the limitations and constraints outlined in Section 8.3.

3.1 Terms of Reference

CIMA+ understands that the Phase One Property from herein referred to as the “Site” is being re-developed by the University of Ottawa (uOttawa) and this Phase One Environmental Site Assessment (ESA) report is being prepared to meet City of Ottawa’s Site Plan Control application requirements.

A portion of the Property parcel which consists of 200 Lees Avenue is being proposed as the location of a new “C” shaped building, which would require the demolition of Buildings B, C, and D. The new multi-storey building, with no basement, is proposed to be located within the approximate footprints of existing Buildings C and D.

Per City of Ottawa requirements, the work was completed in general accordance with the requirements of Ontario Regulation 153/04, as amended (O.Reg.153/04). A Record of Site Condition (RSC) is not required under O.Reg.153/04 as the land use of the property is not changing and therefore an RSC not required for the proposed redevelopment of the Phase One Property.

3.2 General Description of the Phase One Property

The Site is a portion of the 200 Lees Avenue property and has an approximate area of 22,000 m^2. The Site is bounded by the Rideau River to the south, Highway 417 to the north, the Transitway to the west, and the remainder of the 200 Lees Avenue property to the east (Building A, Building E, and the sports field). Most of the Site is occupied by three (3) buildings (Building B, C, and D). Adjacent to the buildings are a storage yard (south of Building B), parking lots to the north and west, and landscaping in much of the remaining open space.

The 200 Lees Avenue property currently facilitates both administrative and academic services for the uOttawa. Current occupants include the Faculty of Health Sciences (FHS), a library, the Faculty of Engineering, the Faculty of Arts, and Sports Services.

A layout of the Site and nearby features is shown in Figure 1 **(Appendix B)**. A plan of survey is also provided within **Appendix A**.

4. Records Review

4.1 General

4.1.1 Phase One Study Area Determination

The Phase One Study Area, hereinafter referred to as the “Study Area”, has been assessed and determined to be inclusive of the area within 250 m radius of the Phase One Property boundary. For the purpose of this Phase One ESA, the Study Area is inclusive of properties in whole or in part within 250 m of the Phase One Property except for those located beyond the Rideau River (to the south of the site). The area within the 250 m radius but south of the Rideau River were not included within the Study Area due to the lack of pathways for PCA to impact the Site. The boundaries of the Site and Study Area are shown in Figure 1 **(Appendix B)**.

4.1.2 First Developed Use Determination

The property, including the Site, was originally developed in the early 1960’s for Algonquin College, and was subsequently acquired by the uOttawa in 2007. Most of the main campus construction was completed in 1964, and included Buildings A to D, inclusive. The construction of Building E began and ceased with its completion in 1979; a second level was later added to Building C in 1993. Details are provided within the Franz Phase I for the property completed in 2011 (Franz, 2011).

The Site was formerly a municipal landfill (UR-12) from 1906 to 1947, including a railway yard and an incinerator. The site was described as an ash and cinder landfill due to contributing incinerator waste. Adjacent to the site was a former industrial area to the north that consisted of a former coal gasification plant. This information is provided in various sources (see reference list) including the Franz, 2011 and Geofirma, 2013 reports.

A review of available air photo imagery from GeoOttawa (2020) web mapping application indicates that the Site has been in its current configuration since 1965. The football field and associated facility at the east side of the property was constructed between 2011 and 2014.

According to the City of Ottawa, much of the Site is zoned as a High Transit Oriented Development Density Zone (TD3) (2029). The remaining portion along the Rideau River is zoned as a Parks and Open Space Zone (01H) (2088) with a subzone permitting marine facility (limited to a boating club) and recreational and athletic facility uses. (GeoOttawa, 2020)

4.1.3 Fire Insurance Plans

A record search for Fire Insurance Plans (FIP) pertaining to the area surrounding the Site was conducted in 2011 through ERIS by Franz Environmental Inc. (Franz, 2011). Relevant transactions to the subject property and adjacent properties were summarized in the 2011 records review. A detailed review of the information was completed as part of this investigation and the findings were noted to be consistent with those reported in 2011.

4.1.4 Chain of Title

The Site is currently owned by the uOttawa. Chain of title records were provided by previous assessment reports (Franz, 2011) and ownership of the property has not changed since uOttawa acquired the property in 2007. Previous owners have included Consumer's Gas Company, The Corporation of the City of Ottawa and Board of Governors of the Algonquin College of Applied Arts and Technologies. A summary of the Title search and associated records are presented in Franz (2011) report.

4.1.5 Environmental Reports

Historical environmental reports were provided for review as part of the preparation of this Phase One ESA by the uOttawa for the Site and properties within the Study Area. A full list of reports provided can be found in **Section 10**, Bibliography**.** A comprehensive review of historical records (pre 2011) was completed and reported as part of the Franz, 2011 report. The following section identifies and summarizes the relevant information presented in each of the key documents provided that added additional relevant information pertaining to the Site.

Final Report for MOE Submittal – Human-Health and Ecological Site-Specific Risk Assessment Algonquin College, Rideau Campus. CH2M Hill, July 2002

CH2MHill Canada Limited (CH2M Hill) was commissioned by Algonquin College in 2002 to complete a Human Health and Ecological Site-Specific Risk Assessment (SSRA) for the property located at 200 Lees Avenue.

The SSRA was completed to assess the risks to human health and ecological receptors on the site based on known COC (PAH and metals) in soil and groundwater as a result of historical coal gasification and landfilling operations in the area.

As part of the SSRA, CH2MHill completed a detailed review of historical reports and various rounds of sub-surface investigations to fill in identified data gaps in order to better asses site specific human health exposure pathways. This included but was not limited to soil and groundwater sampling for COC (PAH, metals, sulphate, ammonia, free cyanide etc.) as well as methane and organic vapour monitoring for VOC.

SSRA results concluded that COC within the soil for the site were select metals; arsenic, copper, and lead as well as PAH specifically benzo(a)pyrene. No methane or organic vapours were detected and concluded not to be a concern. Sulphate, ammonia and cyanide were also removed for the list of COC for the site based on the conclusions of the SSRA.

Results of the SSRA concluded that no significant remedial action or rehabilitation is required at the time for the property and risk management measures were to be put in place to limit the potential exposure to the soil, sediment and groundwater contaminants. Additional landscaping and institutional controls were also suggested to minimize the acceptable risks to daily users of the property.

Phase One Environmental Site Assessment University of Ottawa 200 Lees Avenue Ottawa, Ontario. Franz Environmental Inc. September 2, 2011

Franz was retained by the uOttawa to complete a Phase One ESA on the eastern portion of the 200 Lees Avenue property, which included Building A and what was then a parking lot to the east. Franz presented findings in general accordance with O. Reg. 153/04, as amended, including a review of readily available historical records, site reconnaissance, interviews, reviews of previous environmental reports, an evaluation of information, and reporting. The report provides a comprehensive summary of historical Site operations and conditions up to 2011 the date of the report completed.

The Phase One ESA conducted identified the following PCA and associated APEC:

- Asphalt and bitumen manufacturing associated with a tar distillation plant that was located west of the Site near 170 Lees. This PCA was combined with Coal Gasification from the plant previously located in the northwest to form a single APEC (off-site coal tar impacts) due to the similarity of impacts. Franz identified the western boundary of the Site as the APEC location (off-site coal tar impacts) with COC of Polycyclic Aromatic Hydrocarbons (PAH) and metals above the applicable Site Condition Standard (SCS);
- Gasoline and associated products stored in fixed tanks associated with two (2) off-site locations (tanks associated with Building A and a private service outlet to the north). Franz identified the northwest corner of the site as the APEC location (fuel storage) with identified COC of PAH and BTEX (benzene, toluene, ethylbenzene and xylene);
- Rail yards, tracks, and spurs associated with an on-site location for which there were no removal or decommission records. Franz identified the central portion of the site as the associated APEC location (Rail spur), with identified COPC of PAH and metals; and
- Waste disposal associated with the former landfill located on-Site in the early 1900s. Franz considered the cinder and ash layer an APEC across the entire site (cinder and ash fill layer) with identified COC of PAH.

The Phase One ESA also identified the following PCA, but determined there were no associated APEC:

- A commercial autobody shop at 23 Hurdman Avenue (off-Site), north of Highway 417. Franz determined that due to the distance from the Site, it was not identified as an APEC; and
- Treatment of sewage associated with a treatment certificate for an off-Site location to the north circa 1990. Franz determined that previous reports did not identify associated impacts with the sewage treatment, therefore, it was not identified as an APEC.

Franz recommended a Phase Two ESA to address the environmental concerns summarized above.

Phase Two Environmental Site Assessment University of Ottawa 200 Lees Avenue Ottawa, Ontario. Franz Environmental Inc. December 9, 2011

Based on the findings of the Phase One ESA (Franz, 2011), a Phase Two ESA was also completed by Franz for the previous Phase One Property. The Phase Two ESA consisted of drilling sixteen (16) boreholes, installing three (3) monitoring wells, drilling three (3) shallow boreholes along the rail spur alignment, installation of four vapour probes, and associated sampling. Soil samples collected from the fill material in most of the boreholes exhibited results above the applicable SCS for metals and PAH. At these same locations, groundwater impacts were minimal, which led Franz to conclude that there was little to no risk of off-site migration of the identified on-site contamination.

Vapour and indoor air results did not demonstrate exceedances for any of the applicable volatile contaminants (BTEX, PHC and naphthalene).

Based on the results of the assessment, Franz made the following determinations based on the previously identified APEC:

+ The cinder and ash fill layer APEC were confirmed as a result of analysis of soil impacts;
+ Soil vapour and indoor air results were reported below the applicable and adopted guidelines for volatile contaminants of concern at the site;
+ The fuel storage APEC was not confirmed or unconfirmed due to the lack of PHC exceedances from soil samples collected at boreholes adjacent to the storage tank (that was later removed) and water samples collected at the adjacent monitoring well;
+ Franz was unable to differentiate between the rail spur and the cinder and ash fill layer. It was recommended that the rail spur APEC be considered a part of the confirmed cinder and ash fill layer APEC; and
+ The off-Site coal tar impacts APEC associated COC of PAH was not found in groundwater samples in on-site monitoring wells. As such, Franz found no evidence for potential migration of contaminants onto the site.

Franz Environmental concluded that a human health risk assessment was warranted to manage the on-Site impacts in soil and groundwater.

Risk Management Health and Safety Plan 200 Lees Ave. University of Ottawa. February 2012

The Risk Management Health and Safety Plan (HASP) was developed by the uOttawa as a supplemental plan in support of non-construction related activities to occur at the 200 Lees Avenue campus. The plan is based on a Human Health and Ecological Site-Specific Risk Assessment (RA) that was completed for the site which found that the site does not pose material human health or ecological risks. Requirements for the RA and subsequent HASP comes from the historical landfilling operations on-Site and from a historical coal gasification plant located off-Site (191 Lees Ave.).

This HASP established protocols pertaining to personal protective equipment (PPE), associated safety procedures, and provided contingencies as a result of activities that would create a potential encounter with impacted subsurface soils and groundwater.

The HASP also provided critical safety advisories for minimizing risks with regards to third-party contractor activities. The HASP also outlines measures for reducing soil erosion along the riverbank, maintenance of soil cover, and fence maintenance.

Supplementary Environmental Site Assessment Coal Tar Impacts 200 Lees Avenue Ottawa, Ontario. Franz Environmental Inc. April 5, 2013

Franz was retained by the uOttawa to complete a supplementary ESA on the western portion of the 200 Lees Avenue property, which included Building A, B, C, D, and E, and what was then a parking lot to the east. Franz presented a review of readily available historical records regarding coal tar impacts at the site and on adjacent properties, summaries of related reports, and a two-stage Site investigation that involved groundwater monitoring (Stage I) and an intrusive drilling and sampling program (Stage II). The scope of work was based on the findings of a Phase Two ESA previously completed by Franz in 2011 (Franz, 2011).

A summary of the historical records and previous reports pertaining to coal tar impacts gleaned that sampling investigations on the former coal gasification plant property showed areas of coal tar impacts. Additionally, the Lees Avenue Transitway station was developed on that property. A groundwater treatment system facility would later be constructed to treat coal tar contaminated groundwater at the station due to evidence of tarry substances in the station and associated outfall.

In Stage I, eight (8) groundwater samples and one (1) duplicate were collected and analysed. Samples were analysed for PAH. Results of the analysis indicated that the samples exceeded the then applicable Table 3 SCS for PAH at BH00-1 and OW-120B-86.

In Stage II, twelve (12) soil samples and two (2) duplicates were collected from five (5) newly advanced boreholes and analysed for PAH, metals, Petroleum Hydrocarbons (PHC), and Polychlorinated biphenyls (PCB). Results of the analysis indicated that six (6) soil samples demonstrated exceedances of the applicable Table 3 SCS for PAH and metals. Concentrations of PCB or PHC were found not reported above the applicable SCS in the soil samples.

Also, in Stage II, fourteen (14) groundwater samples and one (1) duplicate were collected and analysed for PAH, metals, PHC, and PCB. Results of the analysis indicated that one (1) sample exceeded the applicable Table 3 SCS for PAH (acenaphthylene) and PHC (F2) at MW12-11.

Based upon the results Franz concluded the following:

+ Groundwater sampling indicates the presence of free phase product in the westernmost portion of the Site;
+ Total area estimated to be impacted by coal tar at the Site is 3,200m^2; and
+ Mobility of impacted groundwater appears to be low as both free phase and dissolved impacts appear to be stable.

Underground Storage Tank Removal, Building "A", University of Ottawa Campus, 200 Lees Avenue, Ottawa, Ontario. May 23, 2012

Franz was retained by the uOttawa to provide environmental support during the removal of a 27,252-litre underground storage tank (UST) located next to Building A at the 200 Lees Avenue campus. This inactive UST was removed on February 14, 2012 as part of the Open-Air Stadium construction project.

Before the UST was removed, approximately 10,600 litres of fuel oil were siphoned. Following the removal of the UST, sixteen (16) soil samples were obtained from the Site of the removal. Samples were subjected to vapour analysis and later analysed for BTEX and PHC. Results of the analysis indicated that the samples satisfied the applicable Table 3 SCS. Visual impacts of PHC were not identified in soil during the excavation.

Supplementary Phase 2 Environmental Site Assessment and Remedial Options Assessment 191 and 193 Lees Ave Ottawa, Ontario. Geofirma Engineering Ltd. February 4, 2013

Geofirma Engineering Ltd. (Geofirma) was retained by the City of Ottawa to complete a Supplementary Phase 2 ESA and Remedial Options Assessment (ROA) for 191 and 193 Lees Avenue, Ottawa, Ontario. 191 Lees Avenue is the Lees Avenue Transitway Station property and 193 Lees Avenue is vacant and located immediately north of the uOttawa property. The Lees Lees Avenue Transitway Station property is a former coal and oil manufacturing gas plant that was in operation from the early 1920s to 1957. Coal tar was discovered on the property and in the adjacent Rideau River in April 1986. Since that time significant subsurface investigations have been completed to characterize the coal tar as well as resulting impacts to soil and groundwater on and off the property. A groundwater collection system was installed at the Transitway Station to pump and treat the coal tar.

The work plan was based on the recommendations of a Phase 2 ESA (Geofirma, 2012). The Phase 2 ESA recommended that additional work be completed to better delineate the nature and extent of soil and groundwater contamination identified and complete a formal assessment of remedial options for the site. Report presents a details Conceptual Site Model (CSM) for the property and the general area (extending onto the 200 Lees Avenue property).

Historical occurrences of soil and groundwater quality that exceed the then applicable SCS; PAH in soil and groundwater; PHC-F1/BTEX in soil and groundwater; and metals in soil. Intrusive investigations were completed on the site, City of Ottawa property, within the MTO right-of-way of Highway 417 and on uOttawa property (200 Lees Avenue). Seven (7) boreholes (BH12-13 to BH12-19) were drilled in various locations on the site. The boreholes were advanced to the top of till to delineate the known coal tar plume in the overlying permeable alluvial soils.

Groundwater monitoring wells were installed within the permeable deep alluvium unit in all seven (7) boreholes drilled during the program described above. One round of groundwater sampling was performed. Groundwater samples were collected from 19 of the 2012 wells (7 installed in September and 12 installed in February 2012) and from 15 wells of the existing monitoring well network. Results of the drilling noted stratigraphic conditions consistent with those previously reported for the Site and detailed in the Site CSM.

The patterns of groundwater flow in the deep alluvium showed the continued significant drawdown effect of the Transitway Station groundwater collection system on groundwater flow in the area of 191 and 193 Lees Avenue and extended impacts onto the 200 Lees Avenue property with groundwater flow in the north western portion of the site towards northwest and the Transitway Station groundwater collection system. It was concluded in the report that the system provides hydraulic control over groundwater in the deep alluvium across the 191 and 193 Lees Avenue site, and beyond.

The results of the drilling confirmed areas previously reported to have coal tar present (i.e., BH/MW12- 09, BH/MW12-10, BH/MW12-11 (located on the Phase One Property), BH/MW12-13, BH/MW12-15) below the Lees Avenue Transitway parking lot with less reported south of Lees Avenue on uOttawa property.

A review of the soil analytical results indicated the following:

- Metals impacts within the fill are low and not widespread. Only one impact was reported within the native soils (deep alluvium unit);
- PAH impacts within the fill and in the underlying native alluvium, predominately on the eastern side of the Transitway in the vicinity of the former gas plant structures. The highest PAH concentrations correspond to observed coal tar in recovered soil samples made in the field. Elevated PAH concentrations were found in boreholes BH12-09, BH12-10 and BH12-11 in the fill and below depths of 3 m within the deep alluvium; and,
- PHC-F1/BTEX impacts were from samples collected below a depth of 3 m in the fill and alluvium.

Notable product was not reported below the water table in several monitoring wells and visual coal tar was reported in the collected purge water from wells OW112B, MW12-09, MW12-10, MW12-11, MW12-13 and MW12-15.

Groundwater analytical results indicated the following:

- Metals and cyanide impacts in groundwater are not a concern at the site;
- PAH impacts of groundwater exceeding applicable Table 3 SCS were mainly in areas of identified coal tar impacts of soil. Concentrations above Table 3 SCS for several light to heavy molecular weight PAH were found in fill or deep alluvium groundwater at OW112B, MW12-09, MW12-10, MW12-11, MW12-13 and MW12-14;
- PHC-F1 and BTEX above of Table 3 SCS non-potable groundwater standards are limited to those boreholes with evidence of coal tar presence and/or PAH concentrations above Table 3 SCS. PHC-F1, benzene impacts were found at OW112B, MW12-09, MW12-10, MW12-11 (spring 2012 only), MW12-13 and MW12-14; and
- Bedrock groundwater quality was not investigated.

Overall soil and groundwater quality above the applicable SCS indicate that PAH and PHC-F1/BTEX remain the COC at the site.

The distribution of coal tar contamination was determined from both visual/olfactory observation and laboratory chemical testing observed in 2012 is consistent with the distribution described in 1986 and 1987. Coal tar is present within the deep alluvium and to a lesser extent the shallow alluvium and fill units primarily on the east side of the Transitway below the parking lot. The highest concentrations of coal tar chemicals (i.e., PAH) were most often found in the fill and in the deep alluvium to the top of the low permeability basal till unit over the eastern half of the parking lot. Typically, coal tar is found in this part of the site at elevations of 53 to 50 meters (m) above sea level (asl) at depths of 7 to 10 m below ground surface (bgs) (e.g., BH12-09, BH12-10 and BH12-15). This coal tar appears to be pooled on top of the basal till unit. The occurrence of coal tar at BH12-11 (and historically at OW120B) is consistent with historical movement of coal tar within the fill and deep alluvium and down the sloping till surface to the southeast of the parking lot. Coal tar is also shown to be present at shallow depths of 1.9 to 3.0 m bgs (elevations of 57.9 to 56.8 m asl) within fill in the former relief gas holder (BH12-13) and in BH12-15.

An initial assessment of potential remedial technologies and strategies to address the coal tar impacts at the site was completed. Four (4) strategies combining multiple remediation activities were recommended for further consideration; Excavation and Off-site Combustion; Partial Excavation and In-situ Combustion; Partial Excavation and In-situ Stabilization; and Risk Management and Risk Assessment. Class 5 cost estimates were provided for each strategy for comparison and evaluation purposes and it was recommended that a Class 4 cost estimates be prepared as part of a more detailed remedial feasibility study.

Groundwater Monitoring Report 200 Lees Ave Groundwater Monitoring Program. University of Ottawa. November 2019

The groundwater monitoring report was prepared by the uOttawa as a supplement to the annual groundwater monitoring program intended to oversee sampling at monitoring wells MW05-12, MW04-12, MW03-12, MW12-11, OW-506A, and OW-506B at 200 Lees Avenue.

Six (6) groundwater samples and one (1) duplicate were collected and analysed. Samples were analysed for BTEX, PHC and PAH. Results of the analysis indicated that the samples satisfied the applicable Table 3 SCS for all parameters at MW05-12, MW04-12, MW03-12, OW-506A and OW-506B. Samples taken at MW12-11 were reported above the Table 3 SCS for PAH (Acenaphthylene). According to the report, MW12-11 has had impacts in the past.

The report concludes that no action beyond a continuation of the monitoring plan is recommended.

4.2 Environmental Source Information

4.2.1 Technical Standards and Safety Authority (TSSA)

The Technical Standards & Safety Authority (“SSA) Fuels Safety Division maintains records related to registered fuel storage tanks and other petroleum-related infrastructure. The Technical Standards and Safety Act and its relevant documents and regulations (*e.g., Liquid Fuels Handling Code; Ontario Regulation 213/01 – Fuel Oil; Ontario Regulation 217/01 – Liquid Fuels*) require that all fuel storage devices such as aboveground storage tanks (AST) and Underground Storage Tanks (UST) to be registered with the TSSA.

An information request was submitted to TSSA on July 3, 2020 regarding records relating to the Site and the whole of the 200 Lees Avenue property. The TSSA responded on August 6, 2020, stating that a search of fuels safety and boiler/pressure vessel documents pertaining to the Site produced no results.

A record of the correspondence is provided in **Appendix C**.

4.2.2 Ministry of the Environment, Conservation and Parks

A Freedom of Information (FOI) request was submitted to the Ministry of the Environment Conservation and Parks (MECP) on June 25, 2020 regarding records relating to the Site and the whole of the 200 Lees Avenue property. A response had not been received at the time this report was issued. A record of the request correspondence is provided in **Appendix C**. **CIMA+** will forward the MECP correspondence with the applicable recommendations upon receipt.

4.2.3 City of Ottawa

The City of Ottawa information office was contacted, and a Historical Land Use Inventory (HLUI) search was initiated for records relating to the Site and the whole of the 200 Lees Avenue property on July 2, 2020. The City of Ottawa responded on August 28, 2020. The City of Ottawa indicated that there are two (2) activities associated with the 200 Lees Avenue property and thirty-nine (39) activities associated with properties within a 250 m radius.

The former activities listed for the 200 Lees Avenue property are as follows:

Table 2: HLUI Subject Property Activities

Business Name	Facility Type	Years of Operation
Algonquin College	Post-Secondary Non-University Education	2000, 2001, 2003, 2005
Unnamed Waste Disposal Site	Other Utility Industries	1920-1948, 1950, 1953, 1958, 1962-1991

A record of the correspondence is provided in **Appendix C**.

4.2.4 ERIS Data Bases

A records and regulatory agency databases review was completed by Environmental Risk Information Services (ERIS). This report includes a search of federal, provincial, and private database records for the Site and the surrounding properties within the Study Area. A summary of the results is provided in **Table 3**.

A comprehensive review of historical records (pre 2011) was completed and reported as part of the Franz, 2011 report (See section 4.1.5). As part of this report, the historical records (before 2011) were reviewed and records from 2011 to present and historical records that were deemed pertinent to this report are provided below.

Table 3: ERIS Search Results

Data Base	Name	On-Site	Within 250 m
ANDR	Anderson's Waste Disposal Sites	0	1
BORE	Borehole	0	18
CA	Certificates of Approval	0	11
COAL	Inventory of Coal Gasification Plans and Coal Tar Sites	0	2
EBR	Environmental Registry	0	1
ECA	Environmental Compliance Approval	0	7
EHS	ERIS Historical Searches	1	12
FSTH	Fuel Storage Tanks - Historic	0	1
GEN	Ontario Regulation 347 Waste Generators Summary	1	31
PRT	Private and Retail Fuel Storage Tanks	0	1

Data Base	Name	On-Site	Within 250 m
RSC	Record of Site Condition	0	1
SPL	Ontario Spills	0	17
WDSH	Waste Disposal Sites – MOE 1991 Historical Approval Inventory	0	1
WWIS	Water Well Information System	0	30

A copy of the ERIS Custom Report is included in **Appendix C**. It should be noted that the ERIS search was for a 250 m radius for a point at the center of the Site. Since the ERIS search considers the site as a single central point at the center of the Site, it does not include all records with the municipal address of 200 Lees Avenue. Accordingly, whether an entry is considered on/off Site should be considered on a case by case basis.

Most of the records appear to pertain to activities that occurred on adjacent properties. Additionally, site locations of database entries presented in the report do not necessarily relate to the exact location of the event/item identified in the entry. As such, drawing conclusions based on the direction and distance from the Site should be taken with due consideration.

Site

The information provided by the ERIS search for waste disposal sites was limited to two (2) entries. The entries were found in both the Anderson's Waste Disposal Sites (ANDR) database and the MOE 1991 Historical Approval Inventory. Each entry refers to disposal sites that closed in 1947 and fall adjacent to one another on or near the south boundary of the Site (on ERIS site map 16 and 23, respectively). Based on the known site history, it has been assumed that the records refer to the same disposal site.

Since 2011, one (1) ERIS historical search has been completed for a site on the 200 Lees Avenue property associated with Franz 2011 report. This includes most other areas within the Study Area.

A single waste generators license, related to the Ontario Ministry of Transportation (MTO), is reported associated with the 200 Lees Avenue property with an approval year of 2011. The entry relates to a location at the northwestern edge of the property, however there is no structure at the reported location. There is no additional information provided for the entry.

One (1) borehole record was identified for the Site in the south, southwest and dates from between 1956 to 1972. New boreholes have not been recorded on the Site from 2011 to the present.

Four (4) water well records were identified for locations throughout the Site. The records appear to relate to a drilling program for the fall of 2012 and were classified as test holes.

Study Area

There are two (2) entries for coal gasification (170 and 175 Lees Avenue) to the west-southwest of the Site. Both pertain to coal processing facilities that operated from the 1920s to the 1960s (on ERIS site map, 25 and 57). While no new information was presented since the 2011 report, it is so noted for the continued PCA from coal tar wastes that are currently under remediation (Geofirma, 2013).

Only two (2) environmental compliance approvals were issued since 2011 within the Study Area. One (1) approval pertains to stormwater disposal at the 200 Lees Avenue property to the east of the Site. The other is an air approval at 191 Lees Avenue (west of Site) for a passive coal tar vapour mitigation system related to construction for the Ottawa Light Rail Transit (LRT).

Since 2011, four (4) ERIS historical searches (EHS) have been conducted for properties within 250 m of the Site boundary. Three (3) of the four (4) corresponded to standard reports produced in 2012, 2015, and 2019 for 190 Lees Avenue (Order #s 20120613028, 20150506076, and 20190212036), which is presently a multi-storey residential tower west-southwest of the Site. The other search was conducted in 2011 (Order # 20110720056) for the property at 180 Lees Avenue, which is also a multi-storey residential tower west of the Site.

Since 2011, There were six (6) Ontario Regulation 347 Waste Generators Summary entries within 250 m of the Site. Four (4) of these listings represent licenses re-issued annually to the uOttawa from 2011 to 2019 and cover a broad range of potential waste materials at the 200 Lees Avenue property. One (1) is provided for the Ministry of Transportation (MTO), dated 2011 with no additional information provided. A single entry is also provided for Enbridge at the 200 Lees Avenue property for waste oil skimmings.

Four (4) additional entries are listed for properties east and northeast of the Site. Three (3) of the four (4) entries pertain to Light Rail Transit construction activities at or near 191 Lees Avenue, which is presently a multi-storey residential tower, for 2016 (2) and 2018. Waste classes include waste oil skimmings, sludge, and lubricants. The fourth relates to construction activities at 180 Lees Avenue, covering other specified inorganic wastes.

Since 2011, Five (5) water well records were identified for locations at 200 Lees Avenue. Four (4) of the records appear to relate to a drilling program for the fall of 2012 and were classified as test holes. One additional record from 2013 relates to an abandoned test hole.

Twenty-two (22) well records were identified with dates falling on or after 2011. A majority of these were from two (2) properties: 191 Lees Avenue and 1 Robinson Avenue. All of these relate to monitoring and test hole uses.

From 2011 to the present, nine (9) reported spills have occurred within the Study Area. Seven (7) of these have occurred at the transit station west of the Site (191 Lees Avenue) and primarily relate to accidental releases of hydraulic oils, engine oils, and fuel onto land and sewer drains. Only one (1) incident pertains to the 200 Lees Avenue property; a 5-litre hydraulic oil spill that was contained on land in 2018.

4.3 Physical Setting Sources

4.3.1 Aerial Photographs

Aerial photographs obtained from geoOttawa (GeoOttawa, 2020) and Google Earth (Google Earth Pro, 2020) were used to identify the development history of the site[1]. Photographs analysed in this report were limited to dates between 2011 and the present. Historical Site conditions were described and reported within the Franz 2011 report.

[1] Due to limitations as a result of the COVID-19 pandemic, photographs from the National Air Photo Library could not be obtained.

A description of the Site and the Study Area including their features are described in **Table 4** for each aerial photograph which are included in **Appendix D**.

Table 4: Aerial Photograph Interpretation

PHOTOGRAPH	SCALE	DATE	DESCRIPTION
geoOttawa **200 Lees Ave., Ottawa, ON and Surrounding Area**	-	2011	The Site has been fully developed since 1979 with the addition of Building E. At this point, there had been no significant changes to the site since a 1993 expansion of Building C through the addition of a second storey.
geoOttawa **200 Lees Ave., Ottawa, ON and Surrounding Area**	-	2012	No significant difference to the Site from 2011. To the east of the site, construction appears to have begun on the outdoor stadium.
Google Earth **200 Lees Ave., Ottawa, ON and Surrounding Area**	-	04/08/2013	No significant difference to the Site from 2012. To the east of the site, construction appears to have ended for the outdoor stadium.
Google Earth **200 Lees Ave., Ottawa, ON and Surrounding Area**	-	28/10/2013	The parking lot at the north end of the site has been expanded to well beyond the Site boundary. There are also additions of paved concrete walkways, and painted lot lines in the parking lot. At 1 Robinson Avenue, a staging area has been developed.
geoOttawa **200 Lees Ave., Ottawa, ON and Surrounding Area**	-	2014	No significant difference to the site from 2013. At 1 Robinson Avenue there are additional assets on what continues to be a staging area.
geoOttawa **200 Lees Ave., Ottawa, ON and Surrounding Area**	-	2015	No significant difference to the site from 2014.
geoOttawa **200 Lees Ave., Ottawa, ON and Surrounding Area**	-	2017	No significant difference to the site from 2015. To the northwest of the site, construction is taking place at the OC Transpo Lees Avenue station.
Google Earth **200 Lees Ave., Ottawa, ON and Surrounding Area**	-	2018	No significant difference to the site from 2017. A serpentine walking and biking path had since been developed at the southwest corner of the Site. To the northwest of the site, a new OC Transpo transit station has been erected.
Google Earth **200 Lees Ave., Ottawa, ON and Surrounding Area**	-	2020	No significant difference to the site from 2018.

4.3.2 Topography, Hydrogeology, Geology

4.3.2.1 Topography

Topographically, the site is shown on Natural Resources Canada Topographic Map 031G05 (NRC, 2020), see map provided in **Appendix A**. This shows that the Site is relatively flat with an elevation of approximately 61 meters above sea level (masl).

4.3.2.2 Hydrogeology

The previous Phase One ESA by Franz (2011) points to a historically multidirectional groundwater flow direction due to the operation of Transitway Station groundwater collection system that was installed by the City of Ottawa to control the migration of contaminants from the former coal gasification plant property onto the Site. The result is that the groundwater from the north half of the Site flows towards the north. The nearest surface water body is the Rideau River, less than 100 m to the south, therefore, the inferred groundwater flow direction for the southern portion of the Site is towards the south and southeast.

4.3.2.3 Overburden and Geology

The overburden consists of a combination of soil and pavement over a layer of multicomponent fill (approximately 6 mbgs), underlain by silty clay to alluvium. This in turn overlays fine-textured glaciomarine deposits (glacial or basal till) – silt and clay, minor sand and gravel extending to the bedrock surface at or near 10 to 13 mbgs (Ontario Geological Survey, 2020). Physiographically, the Site lies within the Ottawa Valley Clay Plains region (Ontario Geological Survey, 2020).

Underlying bedrock geology for the area consists of dark grey to black, fine-grained fissile, thinly bedded shale of the Billings Formation (Williams, 1984). Based on previous reports, depth to bedrock ranged from 10 to 13 mbgs.

Bedrock and surficial geology mapping are provided in Figures 2 and 3 **(Appendix B)**.

4.3.3 Fill Materials

As previously summarized, the Site is covered by fill materials referred to as a “cinder and ash” layer to varying depths and materials (ie. Industrial, construction, and landfill use). Previous studies (Franz, 2011 and Geofirma, 2013) have reported that the encountered material consists of ash, sand, brick, wood, coal, and glass (Franz, 2011).

4.3.4 Water Bodies, Areas of Natural Significance

As stated previously, the Rideau River abuts the southern boundary of the Site. No other areas of natural significance are present in the Phase One Study Area.

Surface drainage is managed by a system of storm drains located throughout the property parcel that is connected to an outfall located on the western limit of the property.

4.3.5 Well Records

According to the ERIS Report and the online Water Well Information System (WWIS), since 2011, four (4) water well records were identified for locations at the Site. The records appear to relate to a drilling program for the fall of 2012 and were classified as test holes.

The remainder of the well records pertain to locations within the 250 m Study Area. Well records (22) were identified to have been completed since 2011. A majority of these were from two (2) properties: 191 Lees Avenue and 1 Robinson Avenue. A majority of these relate to monitoring and test hole uses.

A summary of pertinent information obtained with respect to the wells is provided in **Table 5**.

Table 5: Well Records

MECP Well ID (EcoLog ERIS ID)	Location	Stratigraphy	Approximate depth to bedrock	Approximate depth to water table
7191035 **(WWIS-1)**	Phase One Property	Layer 4: Sand, Silt, Gravel (7.93 ~ 9.14 m) Layer 3: Silt, Clay (7.57 ~ 7.93 m) Layer 2: Fill (0.91 ~ 7.57 m) Layer 1: Sand, Gravel (0 ~ 0.91 m)	Not specified	Not specified
7188804 **(WWIS-2)**	Phase One Property	Not Specified	Not specified	Not Specified
7191042 **(WWIS-3)**	Phase One Property	Layer 4: Clay, Silty, Gravel (7.62 ~ 8.84 m) Layer 3: Silt, Clay (4.57 ~ 7.62 m) Layer 2: Fill, Clay (0.91 ~ 4.57 m) Layer 1: Sand, Gravel (0 ~ 0.91 m)	Not Specified	Not Specified
7191062 **(WWIS-6)**	Phase One Property	Layer 4: Silt, Till, Sand (7.32 ~ 10.06 m) Layer 3: Clay, Silty (4.57 ~ 7.32 m) Layer 2: Fill (0.91 ~ 4.57 m) Layer 1: Sand (0 ~ 0.91 m)	Not Specified	Not Specified

MECP Well ID (EcoLog ERIS ID)	Location	Stratigraphy	Approximate depth to bedrock	Approximate depth to water table
7211119 **(WWIS-7)**	Approximately 1 m north of Phase One Property	Not Specified	Not Specified	Not Specified
7191060 **(WWIS-8)**	Approximately 2 m north of Phase One Property	Layer 4: Silt, Clay (6.1 ~ 9.14 m) Layer 3: Clay, Till (4.57 ~ 6.1 m) Layer 2: Fill (0.61 ~ 4.57 m) Layer 1: Topsoil, Fill (0 ~ 0.61 m)	Not Specified	Not Specified
7191092 **(WWIS-10)**	Approximately 63 m north northwest of Phase One Property	Layer 5: Clay, Silt, Gravel (8.35 ~ 9.14 m) Layer 4: Sand, Silt (6.1 ~ 8.35 m) Layer 3: Sand, Silt (3.1 ~ 6.1 m) Layer 2: Sand, Gravel (0.31 ~ 3.1 m) Layer 1: Gravel (0 ~ 0.31 m)	Not Specified	Not Specified
7191061 **(WWIS-11)**	Approximately 81 m south southeast of Phase One Property	Layer 4: Not specified (7.32 ~ 10.06 m) Layer 3: Clay, Silty (4.57 ~ 7.32 m) Layer 2: Fill (0.31 ~ 4.57 m) Layer 1: Gravel (0 ~ 0.31 m)	Not Specified	Not Specified
7251493 **(WWIS-12)**	Approximately 82 m northeast of Phase One Property	Not Specified	Not Specified	Not Specified
7190979 **(WWIS-17)**	Approximately 63 m north northeast of Phase One Property	Layer 4: Sand, Silt, Clay (6.1 ~ 9.14 m) Layer 3: Sand, Gravel (3.1 ~ 6.1 m) Layer 2: Sand, Gravel (0.61 ~ 3.1 m) Layer 1: Gravel (0 ~ 0.61 m)	Not Specified	Not Specified

MECP Well ID (EcoLog ERIS ID)	Location	Stratigraphy	Approximate depth to bedrock	Approximate depth to water table
7231849 **(WWIS-26)**	Approximately 64 m north of Phase One Property	Not Specified	Not Specified	Not Specified
7191091 **(WWIS-27)**	Approximately 125 m north northwest of Phase One Property	Layer 3: Sand, Silt (2.44 ~ 4.88 m) Layer 2: Sand, Fill (0.31 ~ 2.44 m) Layer 1: Gravel (0 ~ 0.31 m)	Not Specified	Not Specified
7191094 **(WWIS-32)**	Approximately 139 m west northwest of Phase One Property	Layer 5: Till (8.53 ~ 8.84 m) Layer 4: Clay, Silt (7.62 ~ 8.53 m) Layer 3: Silt, Clay (6.1 ~ 7.62 m) Layer 2: Sand, Gravel (0.61 ~ 6.1 m) Layer 1: Topsoil Sand (0 ~ 0.61 m)	Not Specified	Not Specified
7191096 **(WWIS-34)**	Approximately 146 m west northwest of Phase One Property	Layer 4: Clay, Sand (6.1 ~ 8.84 m) Layer 3: Sand, Silty (3.66 ~ 6.1 m) Layer 2: Sand, Gravel (0.61 ~ 6.1 m) Layer 1: Topsoil Sand (0 ~ 0.61 m)	Not Specified	Not Specified
7191093 **WWIS-37)**	Approximately 152 m northwest of Phase One Property	Layer 4: Sand, Silt (6.1 ~ 8.99 m) Layer 3: (7.16 ~ 6.1 m) Layer 2: (0.31 ~ 7.16 m) Layer 1: Topsoil Sand (0 ~ 0.31 m)	Not Specified	Not Specified
7201658 **(WWIS-48)**	Approximately 152 m northwest of Site	Layer 5: Till (6.71 ~ 7.62 m) Layer 4: Fine Sand (3.66 ~ 6.71 m) Layer 3: Fine Sand (3.1 ~ 3.66 m) Layer 2: Coarse Sand (1.22 ~ 3.1 m) Layer 1: Sand (0 ~ 1.22 m)	Not Specified	Not Specified

MECP Well ID (EcoLog ERIS ID)	Location	Stratigraphy	Approximate depth to bedrock	Approximate depth to water table
7191095 **(WWIS-50)**	Approximately 190 m west of Site	Layer 3: Clay, Silt (4.57 ~ 7.62 m) Layer 2: Sand, Gravel (0.61 ~ 4.57 m) Layer 1: Topsoil, Sand (0 ~ 0.61 m)	Not Specified	Not Specified
7211118 **(WWIS-51)** ***Abandoned***	Approximately 191 m north northwest of Site	Not Specified	Not Specified	Not Specified
7180700 **(WWIS-52)** ***Abandoned***	Approximately 198 m east northeast of Site	Not Specified	Not Specified	Not Specified
7201656 **(WWIS-55)**	Approximately 216 m east northeast of Site	Layer 3: Till (6.71 ~ 7.62 m) Layer 2: Fine Sand (3.1 ~ 6.71 m) Layer 1: Coarse Sand (0 ~ 3.1 m)	Not Specified	Not Specified
7201657 **(WWIS-56)**	Approximately 220 m north northwest of Site	Layer 3: Till (6.71 ~ 8.53 m) Layer 2: Fine Sand (3.1 ~ 6.71 m) Layer 1: Coarse Sand (0 ~ 3.1 m)	Not Specified	Not Specified
7293327 **(WWIS-60)**	Approximately 226 m north of Site	Layer 4: Sand, Silt, Gravel (3.1 ~ 4.57 m) Layer 3: Gravel, Silt, Sandy (1.83 ~ 3.1 m) Layer 2: Fill (0.61 ~ 1.83 m) Layer 1: Gravel (0 ~ 0.61 m)	Not Specified	Not Specified
7201661 **(WWIS-66)** ***Abandoned***	Approximately 234 m north northwest of Site	Not Specified	Not Specified	Not Specified
7180693 **(WWIS-67)** ***Abandoned***	Approximately 50 m east of Site	Not Specified	Not Specified	Not Specified

MECP Well ID (EcoLog ERIS ID)	Location	Stratigraphy	Approximate depth to bedrock	Approximate depth to water table
7188805 **(WWIS-68)**	Approximately 238 m west northwest of Site	Not Specified	Not Specified	Not Specified
7201660 **(WWIS-70)** ***Abandoned***	Approximately 239 m north northwest of Site	Not Specified	Not Specified	Not Specified

The Site and other properties within the Study Area are supplied by a municipal drinking water system from the City of Ottawa.

The WWIS database search are provided in the ERIS report in **Appendix C**.

4.4 Site Operating Records

A request was made to the client for copies of operating records pertaining to the environmental conditions at the Site. Records obtained included: inventories of chemicals, chemical usage, and chemical storage areas; environmental monitoring data; waste management records; emergency response and contingency plans, including spill prevention and contingency plans; and site plans of the buildings.

CIMA+ reviewed the available information listed above, which included the chemical inventory, a hazardous materials survey (McIntosh Perry, 2020), and the Risk Management Health and Safety Plan (uOttawa, 2012).

Based on the review of the chemical inventory, no COC are located on the Site at volumes that cause a concern.

5. Interviews

Interviews were conducted by CIMA+ staff with the individuals identified to be the most knowledgeable with respect to both the current and historical Site uses. As per the interview record provided in **Table 6**, individuals provided information regarding the history of the Site and the surrounding properties within the Study Area to the best of their knowledge:

Table 6: Interview Record

Person Interviewed	Relationship to Phase One Property	Date and Place of Interview	Interview Method
Sylviane Charette	Senior Project Manager, Facilities	July 8th, 2020, 200 Lees Avenue	In-person
Pascal Simard	Assistant Director, Environmental Management	July 8th, 2020, 200 Lees Avenue	In-person

Ms. Charette and Mr. Simard were both chosen to be interviewed given that each individual is familiar with the recent operational history of the Site. Ms. Charette and Mr. Simard are referred to herein as the "Site Representative(s)".

CIMA+ compared the information obtained from the interviews with information obtained from the historical records. The information provided by the Site Representatives was corroborated by the available historical records. As such, **CIMA+** has no concerns regarding the validity of the information provided by the individuals interviewed for this Phase One ESA.

With respect to PCA and APEC, the Site representatives confirmed that no AST or UST remain on the Site or 200 Lees Avenue proper. The last UST was associated with Building A and was removed in 2012. Prior to the tank's removal an investigation was completed by Franz (see Section 4.1.5 for a summary).

The site representatives also indicated that they would provide an inventory of chemicals currently stored on the property (see Section 4.4).

6. Site Reconnaissance

6.1 General Requirements

The Site visit was conducted by Ms. Karen Greer, M.Sc., P.Geo. and Qualified Person as defined by O.Reg. 153/04, as amended; and Jamieson-Lee Scott, technologist, on July 8, 2020. The duration of this visit was approximately one (1) hour, and the weather conditions were partly cloudy and 24°C.

All accessible areas of the site were examined. The crawl space under the buildings was not accessed as it is considered a confined space and therefore not accessible. No invasive/destructive investigations were performed. Visual inspections of neighboring properties were also conducted from the site.

See **Appendix D** for Site photographs.

6.2 Specific Observations at Phase One Property

6.2.1 Site Description and Buildings

Building B was built in 1964 and is approximately 1,250 m^2 in size. Building B is a rectangular shaped building located in the centre of the 200 Lees building complex. This is a two-storey building with classrooms, laboratories, a crawlspace, and mechanical rooms. At the time of the Site reconnaissance, none of the classrooms or laboratories were in use[2]. Mechanical room B151 contained a DC inverter air-cooled chiller, insulated water return piping, electrical shutoffs, and dry transformer. Mechanical room B150 contained the air conditioning cabinet, insulated water return piping, and electrical shutoffs. On the south side of Building B there are two (2) entrances into the building. The two (2) other entrances into the building are via stairways from Building D and Building C.

[2] Due to limitations as a result of the COVID-19 pandemic, UofO had suspended most on-site classes at the time of the Site reconnaissance.

Building C was built in 1964 and is approximately 3,000 m^2 in size. Building C is a rectangular shaped building located on the west side of the 200 Lees building complex. This is a two-storey building with classrooms, laboratories, storage rooms, offices, a crawlspace, and mechanical rooms. At the time of the Site reconnaissance, none of the classrooms or laboratories were in use. On the north side of the building are the main entrances with an additional entrance to the west. The two (2) other entrances into the building are connected hallways from Building B and Building D.

Building D was built in 1964 and is approximately 1,100 m^2 in size. Building D is a rectangular shaped building located on the southwest side of the 200 Lees building complex. This is a two-storey building with a gymnasium, storage rooms, offices, and mechanical rooms. At the time of the Site reconnaissance, none of the rooms were in use. On the east and west side of the building are the entrances. An additional entrance into the building is a connected hallway from Building C.

Immediately to the west of the Site is occupied by the Riverview Place Apartments, which consists of several residential apartment towers, beyond which is an open greenspace. To the northwest is the Ottawa-Carleton Transportation light rail station for Lees Avenue. Immediately north of the Site is overflow parking for the 200 Lees Avenue campus, beyond which is Highway 417. Immediately to the east of the Site is both Building A and E, beyond which is the open-air stadium. Lastly, immediately to the south of the Site is the Rideau River.

Investigation of the properties neighbouring 200 Lees Avenue was limited to the visual identification of elements which represent environmental liabilities, as viewed from publicly accessible locations. Those are as follows:

- North: North of the overflow parking and Highway 417 is an Enbridge gas-line monitoring substation. Northeast is the City work yard (City of Ottawa Roadway Division)
- South : Rideau River
- East: East of the open-air stadium is the Rideau River
- West : Residential Apartments

6.2.2 Chemical and Product Storage

Building B has a small contingent of stored chemicals that include household cleaners and sanitizers. Chemicals were appropriately stored in sealed containers and secured shelving. One (1) flammable liquid locker was located to the south of Building D and was appropriately secured.

6.2.3 Solid and Liquid Wastes

There are wastes generated at the buildings that reside in-part on the site and buildings on the surrounding property. The ERIS database search did identify records pertaining to waste generators licenses and the variety of associated wastes (see Section 4.2.4).

6.2.4 Oil / Water Separators and Hydraulic Lifts

There were currently no oil/water separators or hydraulic lifts observed on the Site.

6.2.5 Drains, Pits, Sumps and Staining

Neither drains, pits, sumps, nor staining were observed on the exterior surfaces of the Site. Building B, Building C and Building D had floor drains that were observed in the mechanical rooms.

In Building B some minor staining and pools of condensate were noted on the floors of the mechanical rooms. In Building D, drains in the mechanical room had minor staining on the surrounding floor. Lastly, piping for the chilled water return in the mechanical rooms of Building B and C were well insulated and there was only minor evidence of staining.

Stormwater from the parking lot was observed to be directed to an outfall to the west.

6.2.6 Hazardous Materials

Polychlorinated Biphenyls (PCB)

No fluid filled transformers or other potential sources of PCB were observed on the Site at the time of the reconnaissance.

6.2.7 Heating Systems

The buildings on the Site and those on the surrounding property are heated via natural gas boilers to pre-heat water and chillers for cooling.

6.2.8 Sanitary Conditions

The general condition and appearance of the Site during the visit did not indicate any sign of unsanitary conditions.

6.2.9 Exterior Surfaces

The construction of the buildings consists mainly of concrete block mortar, steel beams, and trusses. The exterior façade of the buildings consists mainly of stucco and mortar.

The Site is covered with grass, trees and shrubs with asphalt, cement, and brick walkways.

6.2.10 Stressed Vegetation

Grass, trees, and shrubs were predominantly well maintained and showed no obvious signs of stress.

6.2.11 Storage Tanks

Evidence of UST, ventilation, or fill pipe were not observed during the Site reconnaissance.

6.2.12 Pesticides and Herbicides

Evidence of the excessive use or storage of pesticides or herbicides was not observed at the time of the Site visit.

7. Review and Evaluation of Information

The detailed investigations both on and off Site has resulted in an overall understanding of the sub-surface conditions and the extent of impacts for known COC within the soil and groundwater on-Site. The analysis of the available records, interview information and on-Site reconnaissance has identified PCA on-Site and within the Study Area. A discussion and analysis of these PCAs and the resulting APEC on-Site are provided in Section 7.0.

7.1 Enhanced Investigation Property

O. Reg. 153/04 defines an “enhanced investigation property” as a property that is being used or has been used, in whole or in part, in the following manner:

+ For an industrial use or;
+ For any of the following commercial uses:
    - As a garage;
    - As a bulk liquid dispensing facility, including a gasoline outlet; or
    - For the operation of dry-cleaning equipment.

At the time of the Site visit, the Phase One Property was a university campus; however, it was an active landfill for domestic and commercial waste burned in a nearby incinerator from at least 1912 till 1921. Based on previous studies, it is also evident that the landfill imported waste materials from the nearby coal gasification plant (industrial use) from at least 1922 to 1939 (Franz, 2011). As such, based on the former industrial land use of the Phase One Property, the Site is an Enhanced Investigation Property according section 32(1)b of O.Reg. 153/04.

7.2 Current and Past Uses

The 200 Lees Avenue property currently facilitates both administrative and academic services for the uOttawa. The Site was developed for its current use in the early 1960’s for Algonquin College, and was subsequently transferred to the uOttawa. Most of the main campus construction was completed in 1964, and included Buildings A to D, inclusive. The construction of Building E began and ceased with its completion in 1979; a second level was later added to Building C in 1993 (Franz, 2011).

The Site was formerly a municipal landfill (UR-12) from 1906 to 1947, including a railway yard and an incinerator. Adjacent to the site was a former industrial area to the north that consisted of a former coal gasification plant (Franz, 2011). The Ottawa-Carleton Transit Rail Station and a groundwater treatment system facility are now located on the former coal gasification plant property.

Extensive soil and groundwater investigations have taken place on the Site with the most recent ones in 2011 and 2013 by Franz (Franz, 2011 and 2012) and on the adjacent property by Geofirma in 2013 (Geofirma, 2013).

7.3 Potentially Contaminating Activities

O. Reg. 153/04 as amended of the Environmental Protection Act provides a list of PCA which could have occurred on, in or under a Phase One property or within a Phase One Study Area. This list was reviewed, and all applicable potentially contaminating activities listed in **Table 7** below. The locations of the PCA on and off-Site are depicted in Figure 4 **(Appendix B)**.

Table 7: Potentially Contaminating Activities (PCA)

POTENTIALLY CONTAMINATING ACTIVITIES AS LISTED IN TABLE 2, SCHEDULE D OF O. REG. 153/04 (AS AMENDED)
Phase One Property/Site
58. Waste Disposal and Waste Management
Phase One Study Area/Study Area
5. Asphalt and Bitumen Manufacturing
9. Coal Gasification

7.4 Areas of Potential Environmental Concern (APEC)

Based on a review of the available information and the exercise of professional judgment several APEC have been identified in **Table 8** for the Site.

Table 8: Areas of Potential Environmental Concern (APEC)

APEC	Location of APEC	PCA	Location of PCA	Contaminants of Potential Concern	Media Potentially Impacted
A: Historic Landfill (cinder and ash fill layer)	Entire Site	58	On-Site	PAHs, PHCs and metals	Soil, Groundwater
B: Historic coal tar impacts	Northwest portion	5, 9	Off-site	PAHs, PHCs, and metals	Soil, Groundwater

The general areas of the Site pertaining to each APEC are depicted in Figure 4 **(Appendix B)**.

<u>APEC A – Historic Landfill (cinder and ash fill layer)</u>

The Site was formerly a municipal landfill from 1906 to 1947 that included both a railway yard and an incinerator. Historic records and previous reports indicate that the site received wastes primarily from the incinerator, which consisted of private and commercial waste, and wastes from the coal gasification plant. Evidence from previous reports suggest that the waste consists primarily of incinerator ash and to a lesser degree, various charred wastes (glass, brick, scattered metals, etc.). The evidence of the former Site operation is evident across the Site with a layer of fill containing cinders and ash being laterally extensive.

Historical investigations have reported soil impacts being confirmed on-site for PAH, PHC and metals within the fill and the native alluvium deposits. Groundwater impacts have also been confirmed for PAH and PHC for wells completed within the fill and deep alluvium units.

COC associated with the cinder and ash fill include PAH, PHC and metals in soil and PAH and PHC in groundwater.

APEC B – Historic Coal tar impacts

A former gasification plant located west northwest of the Site operated circa 1920s to the 1950s. Previous reports indicate occurrences of oil and tar contamination below the Lees Avenue Transitway parking lot, and south of Lees Avenue on uOttawa property.

Historical investigations have confirmed the distribution of coal tar impacts, both visual/olfactory observation and laboratory analysis to be present within the deep alluvium and to a lesser extent the shallow alluvium and fill units primarily on the east side of the Transitway below the parking lot. The impacts were also reported to occur on the northwestern portion of the Site. The occurrence of coal tar on the Site is consistent with historical movement of coal tar within the fill and deep alluvium and down the sloping till surface to the southeast of the parking lot. Overall, the mobility of impacted groundwater has reported to be low as both free phase and dissolved impacts have been stable overtime.

Soil impacts have been confirmed on-site for PAH, PHC and metals within the fill and the native alluvium deposits. Groundwater impacts have been confirmed for PAH and PHC for wells completed within the fill and deep alluvium units.

COC associated with the coal tar impacts from the former gasification plant include PAH, PHC and metals in soil and PAH and PHC in groundwater.

7.5 Phase One Conceptual Site Model (CSM)

Based on the information and data contained in this Phase One ESA report, including our understanding of the former property use, **CIMA+** has developed a CSM to understand possible impacts to the subsurface as a result of the APEC identified on-site as required by O.Reg. 153/04.

A CSM has been created to provide a summary of the findings of the Phase One ESA. The Phase One CSM is summarized in Figures 1 through 4 **(Appendix B)**, which illustrate the following features within the Phase One Study Area, where present:

+ Existing buildings and structures;
+ Water bodies located in whole or in part within the Study Area;
+ Areas of natural significance located in whole or in part within the Study Area;
+ Drinking water wells located at the Site;
+ Land use of adjacent properties;
+ Roads within the Study Area;

A summary CSM figure which shows identified PCA on-Site and within the Study Area and APEC at the Site is provided in Figure 4 **(Appendix B)**.

The following describes the Phase One ESA CSM for the Site based on the information obtained and reviewed as part of this Phase One ESA:

- The Phase One Property is an irregular-shaped parcel of land approximately 22,000 m^2 in size, located a portion of the 200 Lees Avenue property and is bound by Rideau River to the south, Highway 417 to the north, the Transitway to the west, and the remainder of the 200 Lees Avenue property to the east (Building A, Building E, and the sports field). Most of the site is occupied by three (3) buildings (Building B, C, and D). Adjacent to the buildings are a storage yard (south of Building B), parking lots to the north and west, and landscaping in much of the remaining open space. The Site has been used for educational purposes since Algonquin College developed the property in 1964. From circa 1906 to 1947, the Site was a former ash and cinder landfill of incinerator waste. As a result, the former industrial nature of the Site requires that the Site be treated as an enhanced investigation property. Adjacent to the Site was a former industrial area to the northwest that consisted of a former coal gasification plant;
- No areas of natural significance were identified within the Study Area;
- No drinking water wells were located on the Site or within the Study Area;
- Three (3) PCA were identified in the Study Area, one (1) of which was on the Site. Based on Site characteristics and the locations of the off-Site PCA, a total of two (2) APEC were identified for the Site;
- Soil at the Site consists primarily of sandy granular fill, cinders and ashes, and construction debris; silty and fine sand alluvium with silty clays, coarse sand, and gravels; glacial till deposits with some clay and gravel; and fractured black shale of the Billings Formation. The physiography of the soils is clay plains.
- Borehole records for the Site and Study Area from previous environmental studies indicate the presence of wide-spread cinders and ash fill material 0 to 5 m bgs underlain by fine sand alluvium with silty clays and coarse sand and gravels at 3 to 10 m bgs, compacted glacial or basal till from 7 to 11 m bgs and black shale bedrock at a depth of approximately 10 to 13 m bgs (the quality of which is largely unknown due to the inconsistencies between previous reports).
- Past investigations have reported soil impacts being confirmed on-site for PAH, PHC and metals within the fill and the native alluvium deposits. Past COC for the Site including cyanide, ammonia and sulphate have been adequately investigated and are no longer a concern (CH2M Hill, 2002).
- Soil vapour investigations reports concluded no concerns with respect to the volatile compounds (BTEX, PHC, naphthalene) or methane (CH2M Hill, 2002; Franz, 2011).
- Groundwater impacts have also been confirmed for PAH and PHC for wells completed within the fill and native alluvium units. Limited groundwater investigations have been completed within the bedrock on-Site.
- The Site is relatively flat with little relief. Local groundwater flow is multidirectional because of the groundwater collection system to the northwest of the Site based on the results of previous subsurface investigative work completed in the area of the Site (Franz 2012, 2013, Geofirma, 2013).

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

8. Conclusion

8.1 Whether Phase Two Environmental Site Assessment Required Before RSC Submitted

A Phase Two ESA is recommended in order to further investigate the above noted APEC on the Phase One Property.

PCA is identified from the former on-Site landfill and off-Site as a results of coal gasification plant operations as well as asphalt and bitumen manufacturing.

APEC for the Site include the following:

A. Historical Landfill (cinder and ash fill layer) over the entire Site from former on-Site operations.

B. Historical coal tar impacts over the northwest portion of the Site from former operations at a site within the Phase One Study Area.

From past report analysis COC known to be present on-Site include PAH, PHC and metals in soil and PAH and PHC in groundwater.

A Phase Two ESA is recommended to further investigate the above noted APEC for the identified COC.

8.2 RSC Based on phase One ESA Alone

Phase One Environmental Site Assessment (ESA) report is being prepared to meet City of Ottawa's Site Plan Control application requirements and therefore has been prepared in accordance with City of Ottawa requirements and in generally accordance with the requirements of Ontario Regulation 153/04, as amended (O.Reg.153/04). An RSC is not being sought under O.Reg.153/04 as the land use of the property is not changing and therefore an RSC not required for the proposed redevelopment of the Phase One Property.

8.3 Limiting Conditions, QP Statement and QP Signature

8.3.1 Limiting Conditions

CIMA+ completed diligent and reasonable research in the conduct of this evaluation, with respect to the recognized laws and standards of practice.

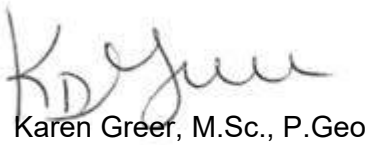
The facts presented in this report are strictly limited to the period of investigation. The conclusions presented in this report are based on the available information and documents, the observations made during the Site visit and the information obtained from communications with various contacts. The interpretation presented in this report is limited to this data.

CIMA+ is not responsible for erroneous conclusions due to voluntary abstention or the non-availability of pertinent information. Any opinion expressed in relation to legal or regulatory conformity is technical and should not be, in any case, considered as legal advice.

8.3.2 Statement and Signature of the Qualified Person

The Phase One ESA for the Phase One Property as detailed in this report has been conducted by or under the supervisions of a Qualified Person as defined in O.Reg 153/04, as amended. Assessor Qualifications are provided in **Appendix E**.

CIMA+



Karen Greer, M.Sc., P.Geo., QP_{ESA}

Senior Hydrogeologist

9. References

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A

Appendix A
Plan of Survey and Topographic Map

TOPOGRAPHICAL PLAN OF

PART OF LOT G
CONCESSION D (RIDEAU FRONT)
GEOGRAPHIC TOWNSHIP OF NEPEAN
CITY OF OTTAWA

Prepared by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 400

16 12 8 4 0 8 16 Metres

Metric

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

Surveyor's Certificate

I CERTIFY THAT :

1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the Land Titles Act and the regulations made under them.
2. The survey was completed on the 14th day of July, 2020.

July 21, 2020
Date

Richard R. Gauthier
Ontario Land Surveyor

Notes & Legend

	Denotes	
—□—	"	Survey Monument Planted
—■—	"	Survey Monument Found
SIB	"	Standard Iron Bar
SSIB	"	Short Standard Iron Bar
IB	"	Iron Bar
CC	"	Cut Cross
CP	"	Concrete Pin
IBø	"	Round Iron Bar
S&W	"	Spike & Washer
SSIB*	"	Short Standard Iron Bar (0.3m Long)
IB*	"	Iron Bar (0.3m Long)
(WIT)	"	Witness
Meas.	"	Measured
(AOG)	"	Annis, O'Sullivan, Vollebekk Ltd.
(P1)	"	Plan (1287) Sept. 19, 2002 (Ref. No. 258-02)
(P2)	"	Plan 4R-31189
(P3)	"	Plan 5R-8860
(P4)	"	Plan 5R-5009
(P5)	"	Plan 4R-1162
(P6)	"	Plan 4R-299
(P7)	"	Plan 4R-26892
CRW	"	Concrete Retaining Wall
HR	"	Hand Rail
	"	Deciduous Tree
	"	Coniferous Tree
FH	"	Fire Hydrant
WV	"	Water Valve
SP	"	Water Stand Post
MH-ST	"	Maintenance Hole (Storm Sewer)
MH-S	"	Maintenance Hole (Sanitary)
MH-B	"	Maintenance Hole (Bell Telephone)
MH-T	"	Maintenance Hole (Traffic)
MH-H	"	Maintenance Hole (Hydro)
MH-G	"	Maintenance Hole (Gas)
MH	"	Maintenance Hole (Unidentified)
VC	"	Valve Chamber (Watermain)
—— ST ——	"	Underground Storm Sewer
—— W ——	"	Underground Water
—— P ——	"	Underground Power
—— OHW ——	"	Overhead Wires
CB	"	Catch Basin
CBI	"	Catch Basin Inlet
CSP	"	Corrugated Steel Pipe
CGR	"	Guard Rail on Curb
CLF	"	Chain Link Fence
V	"	Vent
PO-M	"	Metal Pole
GM	"	Gas Meter
HM	"	Hydro Meter
HH	"	Handhole
TB-B	"	Bell Terminal Box
TB-C	"	Cable Terminal Box
TB-T	"	Traffic Terminal Box
TB	"	Unidentified Terminal Box
B	"	Bollard
S	"	Sign
V	"	Vent
ACC	"	Air Conditioner on Concrete Pad
BOS	"	Bottom of Slope
TOS	"	Top of Slope
EOG	"	Edge of Gravel
EOA	"	Edge of Asphalt
Elev	"	Elevation
BF	"	Board Fence
P&W	"	Post and Wire
GR	"	Guardrail
	"	Gate
UP	"	Utility Pole
AN	"	Anchor
LS	"	Light Standard
FP	"	Flag Pole
TB-B	"	Bell Terminal Box
TB-C	"	Cable Terminal Box
W	"	Well Cap
AC	"	Air Conditioner
WRW	"	Wood Retaining Wall
Ø	"	Diameter
+ 65.00	"	Location of Elevations
+ 65.00	"	Top of Concrete Curb Elevation
C/L	"	Centreline
——	"	Property Line

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2127768

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

Bearings are grid, derived from Can-Net 2016 Real Time Network GPS observations, MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

ELEVATION NOTES

1. Elevations shown are geodetic and are referred to the CGVD28 geodetic datum.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

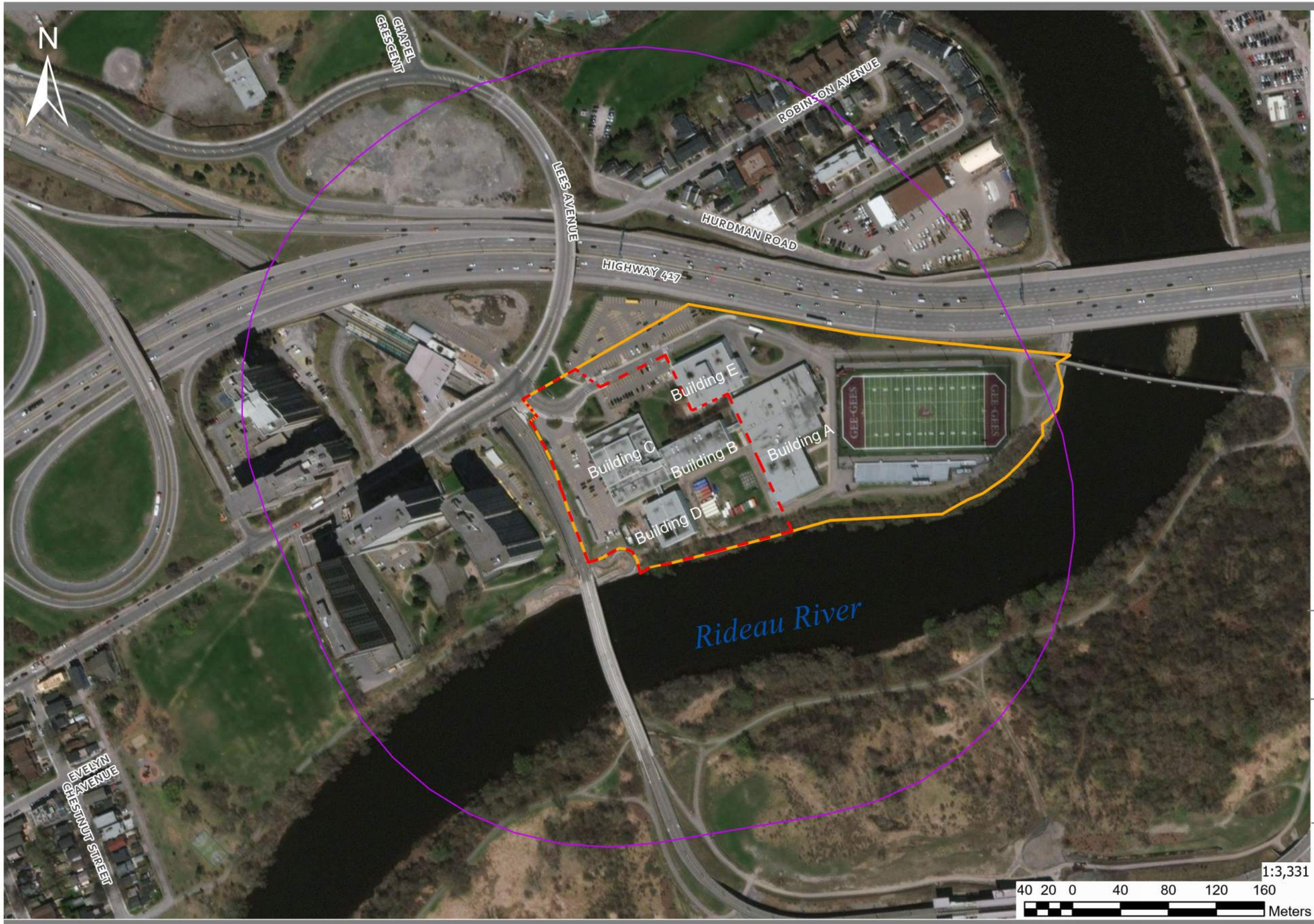
1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nepean@aovltd.com
Ontario Land Surveyors

Job No. 20610-20 IBIGrp 200LeesAvePrtLtGConD T FI | DG

B

Appendix B
Figures



Phase One Property
250 m - Phase One Study Area
Property Parcel

Spatial Reference
Name: WGS 1984 UTM Zone 18N
PCS: WGS 1984 UTM Zone 18N
GCS: GCS WGS 1984
Datum: WGS 1984

Sources:
- Terrestrial Survey, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : Esri, HERE, Garmin, INCREMENT P, NGA, USGS, NRCan, GeoEye, Maxar

General Notes:
Dimensions on the plan should be read and not measured. Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 1 - Phase One Property and Phase One Study Area

Phase One Environmental Site Assessment
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Survey by : J. Scott
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer
Revision 00 - - Issued for report - 31 July 2020

Ref # : C10-A001049-080-111

Phase One Property

Surficial Geology Type

- 10a: Massive-well laminated
- 12: Older alluvial deposits
- 19: Modern alluvial deposits

Spatial Reference
Name: WGS 1984 UTM Zone 18N
PCS: WGS 1984 UTM Zone 18N
GCS: GCS WGS 1984
Datum: WGS 1984

Sources:
- Terrestrial Survey, 2020
- Ontario Geological Survey 2010. Surficial geology of southern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 128 – Revised.
- Basemap : Esri, HERE, Garmin, INCREMENT P,

General Notes:

Dimensions on the plan should be read and not measured. Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 2 - Surficial Geology

Phase One Environmental Site Assessment
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Ref # : C10-A001049-080-111

Survey by : J. Scott
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer
Revision 00 - - Issued for report - 31 July 2020

Phase One Property

Bedrock Geology

55b,Shale, limestone, dolostone, siltstone

Spatial Reference
Name: WGS 1984 UTM Zone 18N
PCS: WGS 1984 UTM Zone 18N
GCS: GCS WGS 1984
Datum: WGS 1984

Sources:
- Terrestrial Survey, 2020
- Ontario Geological Survey 2011. 1:250 000 scale bedrock geology of Ontario; Ontario Geological Survey, Miscellaneous Release–Data 126 Rev 1
- Basemap : Esri, HERE, Garmin, INCREMENT P,

General Notes:

Dimensions on the plan should be read and not measured. Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

1:3,228

40 20 0 40 80 120 160 Meters

Figure 3 - Bedrock Geology

Phase One Environmental Site Assessment
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Survey by : J. Scott
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer

Revision 00 - - Issued for report - 31 July 2020

Ref # : C10-A001049-080-111

Site Boundary
Estimated Extent of Coal Tar Impacts on uOttawa property (from off-site sources)

Areas of Potential Environmental Concern (APEC)

APEC A: Historic Landfill
APEC B: Historic coal tar impacts

Potentially Contaminating Activity (PCA)

Waste Disposal and Waste Management (58) PCA
Asphalt and Bitumen Manufacturing (5) and Coal Gasification (9) PCA

Spatial Reference
Name: WGS 1984 UTM Zone 18N
PCS: WGS 1984 UTM Zone 18N
GCS: GCS WGS 1984
Datum: WGS 1984

Sources:
- Terrestrial Survey, 2020
- Coal Tar Plume, Suppl. ESA, Franz Environmental Ltd., 2011
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : Esri, HERE, Garmin, NGA, USGS, NPS, NRCan, USDA FSA, GeoEye, Maxar, CNES/Airbus

General Notes:

Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 4 - Phase One Conceptual Site Model

Phase One Environmental Site Assessment
200 Lees Avenue Ottawa, Ontario
University of Ottawa

Survey by : J. Scott
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer

Revision 00 - - Issued for report - 18 August 2020

Ref # : C10-A001049-080-111

C

Appendix C
Environmental Source Information

Ontario

Ministry of the Environment and Climate Change

Freedom of Information and
Protection of Privacy Office
40 St. Clair Avenue West, 12th Floor
Toronto ON M4V 1M2
Telephone 416 314-4075

Freedom of Information Request

Instructions

Use this form to request records that are in the Ministry's files on environmental concerns related to properties. Our fax number is 416 314-4285.

For Ministry Use Only

FOI Request Number	Date Request Received (yyyy/mm/dd)
Fee Paid	☐ Cheque ☐ VISA/MC ☐ Cash/Money Order

☐ CNR ☐ ER ☐ NOR ☐ SWR ☐ WCR ☐ IEB ☐ EAA ☐ EMR ☐ SCB ☐ SDW

1. Requester Data

Last Name	First Name	Middle Initial
Scott	Jamieson-Lee	

Title	Company Name
Technologist	CIMA+

Mailing Address

Unit Number	Street Number	Street Name	PO Box
	240	Catherine Street	

City/Town	Province	Postal Code
Ottawa	ON	K2P 2G8

Email Address	Telephone Number	Fax Number
jamieson-lee.scott@cima.ca	613 860-2462 ext. 6662	613 860-1870

Project/Reference Number	Signature of Requester
A001049-111	Jamieson Scott

2. Request Parameters

Municipal Address (Municipal address mandatory for cities, towns or regions)

Unit Number	Street Number	Street Name	PO Box
	200	Lees Avenue	

Lot Number	Concession	Geographic Township
		Ottawa

City/Town/Village	Province	Postal Code
Ottawa	Ontario	K1N 6N5

Present Property

1. Owner: University of Ottawa — Date of Ownership (yyyy/mm/dd): 1963/01/01

Tenant (if applicable)

Previous Property

1. Owner — Date of Ownership (yyyy/mm/dd)

Tenant (if applicable)

  Disponible en français

3. Search Parameters

Search Parameters	Specify Year(s) Requested
Environmental concerns (General correspondence, occurrence reports, abatement)	2011-2020
Orders	2011-2020
Spills	2011-2020
Investigations/prosecutions ► Owner and tenant information must be provided	2011-2020
Waste Generator number/classes	2011-2020

Files older than 2 years may require $60.00 retrieval cost. There is no guarantee that records responsive to your request will be located.

4. Environmental Compliance Approvals/Certificates of Approval

Environmental Compliance Approvals/Certificates of Approval	SD	Specify Year(s) Requested
air - emissions	☑	2011-2020
renewable energy	☐	
water - mains, treatment, ground level, standpipes & elevated storage, pumping stations (local & booster)	☑	2011-2020
sewage - sanitary, storm, treatment, stormwater, leachate & leachate treatment & sewage pump stations	☑	2011-2020
waste water - industrial discharge	☑	2011-2020
waste sites - disposal, landfill sites, transfer stations, processing sites, incinerator sites	☑	2011-2020
waste systems - haulers: sewage, non-hazardous & hazardous waste, mobile waste processing units, PCB destruction	☑	2011-2020

Proponent information must be provided and Environmental Compliance Approval/Certificate of Approval number(s) (if known). 1985 and prior records are searched manually. Search fees in excess of $300.00 may be incurred, depending on the types and years to be searched. Specify Approval number(s) (if known). If supporting documents are also required, mark SD box and specify type e.g. maps, plans, reports, etc.

uOttawa

Université d'Ottawa
Immeubles

University of Ottawa
Facilities

June 26, 2020

Manager
Business Support Services, Planning Infrastructure and Economic Development Department
City of Ottawa
110 Laurier Avenue West
Ottawa, ON, K1P 1J1

RE: Release Relevant Historic Land Use Inventory Information about the property at 200 Lees Avenue, Ottawa, ON K1N 6N5

I, Sylviane Charette of the University of Ottawa—Facilities at 141 Louis-Pasteur Ottawa, ON K1N 6N5, hereby direct the City of Ottawa to release any and all records, reports, and any other documentation related to the above noted property as part of a Historic Land Use Inventory information request to the firm of CIMA+ ("the Requester") at 110–240 Catherine Street, Ottawa, ON K2P 2G8.

Dated at Ottawa, Ontario, this 26 day of June 2020.

Sylviane Charette

141 Louis Pasteur
Ottawa ON KlN 6N5 Canada

www.uOttawa.ca

Office Use Only			
Application Number:	Ward Number:	Application Received: (dd/mm/yyyy):	
Client Service Centre Staff:		Fee Received:	$

Historic Land Use Inventory

Application Form

Notice of Public Record

All information and materials required in support of your application shall be made available to the public, as indicated by Section 1.0.1 of *The Planning Act*, R.S.O. 1990, C.P.13.

Municipal Freedom of Information and Protection Act

Personal information on this form is collected under the authority the *Planning Act*, RSO 1990, c. P. 13 and will be used to process this application. Questions about this collection may be directed by mail to Manager, Business Support Services, Planning Infrastructure and Economic Development Department, 110 Laurier Avenue West, Ottawa, K1P 1J1, or by phone at (613) 580-2424, ext. 24075

Background Information

***Site Address or Location:** *200 Lees Avenue, Ottawa, ON K1N 6N5*

** Mandatory Field*

Applicant/Agent Information:

Name:	*Jamieson-Lee Scott (CIMA+)*		
Mailing Address:	*110-240 Catherine Street, Ottawa, ON K2P 2G8*		
Telephone:	*343-961-3309*	Email Address:	*jamieson-lee.scott@cima.ca*

Registered Property Owner Information: ☐ Same as above

Name:	*University of Ottawa, Sylviane Charette*		
Mailing Address:	*141 Louis-Pasteur, Ottawa, ON K1N 6N5*		
Telephone:	*613-302-7696*	Email Address:	*scharet4@uottawa.ca*

Site Details

Legal Description and PIN:	*CON D RF PT LOT G RP4R 299; PARTS 6, 9 &10 LESS 5R 5009; PARTS 1 to 8 LESS 5R 5015; PARTS 1&2. PIN 042030732 and 042030731*
What is the land currently used for?	*University campus*

Lot frontage: _____ m Lot depth: _____ m Lot area: _____ m²

OR Lot area: (irregular lot) 66,131.76 m²

Does the site have Full Municipal Services: (•) Yes ( ) No

Required Fees

Please don't hesitate to visit the Historic Land Use Inventory website more information. Fees must be paid in full at the time of application submission.

Planning Fee	$125.00

Submittal Requirements

The following are required to be submitted with this application:

1. **Consent to Disclose Information:** Consultants and other third parties may make requests for information on behalf of an individual or corporation. However, if the requester is not the owner of the property, **the requester must provide the City of Ottawa with a 'consent to disclose information' letter, signed by the property owner.** This will authorize the City of Ottawa to release any relevant information about the property or its owner(s) to the requester. Consent for disclosure is required in the event that personal information or proprietary company information is found concerning the property and its owner. All consents must clearly indicate the name of the property owner as well as the name of the requester, and must be signed and dated.
2. **Disclaimer:** Requesters must read and understand the conditions included in the attached disclaimer and submit a signed disclaimer to the City of Ottawa's Planning, Infrastructure and Economic Development Department. This disclaimer is related to the Historic Land Use Inventory and must be received by the City of Ottawa, signed and dated by the requestor, before the process can begin.
3. **A site plan or key plan of the property, its location and particular features.**
4. **Any significant dates or time frames that you would like researched.**

Disclaimer
For use with HLUI Database

CITY OF OTTAWA ("the City") is the owner of the Historical Land Use Inventory ("HLUI"), a database of information on the type and location of land uses within the geographic area of Ottawa, which had or have the potential to cause contamination in soil, groundwater or surface water.

The City, in providing information from the HLUI, to CIMA+ ("the Requester") does so only under the following conditions and understanding:

1. The HLUI may contain erroneous information given that such records and sources of information may be flawed. Changes in municipal addresses over time may have introduced error in such records and sources of information. The City is not responsible for any errors or omissions in the HLUI and reserves the right to change and update the HLUI without further notice. The City does not, however, make any commitment to update the HLUI. Accordingly, all information from the HLUI is provided on an "as is" basis with no representation or warranty by the City with respect to the information's accuracy or exhaustiveness in responding to the request.

2. City staff will perform a search of the HLUI based on the information given by the Requester. City staff will make every effort to be accurate, however, the City does not provide an assurance, guarantee, warranty, representation (express or implied), as to the availability, accuracy, completeness or currency of information which will be provided to the Requester. The HLUI in no way confirms the presence or absence of contamination or pollution of any kind. The information provided by the City to the Requester is provided on the assumption that it will not be relied upon by any person whatsoever. The City denies all liability to any such persons attempting to rely on any information provided from the HLUI database.

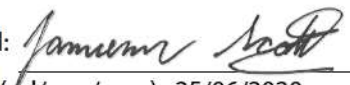
3. The City, its employees, servants, agents, boards, officials or contractors take no responsibility for any actions, claims, losses, liability, judgments, demands, expenses, costs, damages or harm suffered by any person whatsoever including negligence in compiling or disseminating information in the HLUI.

4. Copyright is reserved to the City.

5. Any use of the information provided from the HLUI which a third party makes, or any reliance on or decisions to be based on it, are the responsibilities of such third parties. The City, its employees, servants, agents, boards, officials or contractors accept no responsibility for any damages, if any, suffered by a third party as a result of decisions made as a result of an information search of the HLUI.

6. Any use of this service by the Requestor indicates an acknowledgement, acceptance and limits of this disclaimer.

7. All information collected under this request and all records provided in response to this request are subject to the provisions of the Municipal Freedom of Information and Protection of Privacy Act, R.S.O. 1990, c. M.56, as amended.

Signed: 

Dated (dd/mm/yyyy): 25/06/2020

Per: Jamieson-Lee Scott

(Please print name)

Title: Technologist

Company: CIMA+

File Number: D06-03-20-0122

August 28, 2020

Scott Jameison-Lee
CIMA+
240 Catherine Street, Suite 110, Ottawa

*Sent via email [*Jamieson-Lee.Scott@cima.ca]

Dear Mr. Jamieson-Lee,

Re: Information Request
200 Lees Avenue**, Ottawa, Ontario ("Subject Property")**

Internal Department Circulation

The Planning, Infrastructure and Economic Development Department has the following information in response to your request for information regarding the Subject Property:

- **Disposals and Environmental Remediation Unit:** The City's Environmental Remediation Unit has environmental records on file pertaining to the subject property noted above either directly on or adjacent to the subject property. The parcel is within a landfill footprint UR-12. To submit requests for information under the Municipal Freedom of Information and Protection of Privacy Act, please visit https://ottawa.ca/en/city-hall/accountabilityand-transparency/accountability-framework/freedom-information-and-protectionprivacy/access-information

Search of Historical Land Use Inventory

This acknowledges receipt of the signed Disclaimer regarding your request for information from the City's Historical Land Use Inventory (HLUI 2005) database for the Subject Property.

A search of the HLUI database revealed the following information:

- There are two activities associated with the Subject Property.

The HLUI database was also searched for activity associated with properties located within 250m of the Subject Property. The search revealed the following:

City of Ottawa
Planning, Infrastructure and Economic Development Department

110 Laurier Avenue West, 4th Floor
Ottawa, ON K1P 1J1
Tel: (613) 580-2424 ext. 21690
Fax: (613) 560-6006
www.ottawa.ca

Ville d'Ottawa
Services de la planification, de l'infrastructure et du développement économique

110, avenue Laurier Ouest, 4e étage
Ottawa (Ontario) K1P 1J1
Tél.: (613) 580-2424 ext. 21690
Téléc: (613) 560-6006
www.ottawa.ca

- There are 39 activities associated with 42 properties located within 250m of the Subject Property.

Please note that certain activities have been identified to have a PIN Certainty of “2”. This identifier acknowledges that there is some uncertainty about the exact location of the land use activity and that the activity may or may not have been located on the property. All database entries with a PIN Certainty of “2” require independent verification as to their precise location.

A **site map** and **table** have been included to show the location of the Subject Property as well as the location of all the activities noted above, including the HLUI database’s location of the Activity Numbers with a PIN Certainty of “2”.

Additional information may be obtained by contacting:

Ontario’s Environmental Registry

The Environmental Registry found at http://www.ebr.gov.on.ca/ERS-WEB-External/ contains "public notices" about environmental matters being proposed by all government ministries covered by the Environmental Bill of Rights. The public notices may contain information about proposed new laws, regulations, policies and programs or about proposals to change or eliminate existing ones. By using keys words i.e. name of proponent/owner and the address one can ascertain if there is any information on the proponent and address under the following categories: Ministry, keywords, notice types, Notice Status, Acts, Instruments and published date (all years).

The Ontario Land Registry Office

Registration of real property is recorded in the Ontario Land Registry Office through the Land Titles Act or the Registry Act. Documents relating to title and other agreements that may affect your property are available to the public for a fee. It is recommended that a property search at the Land Registry Office be included in any investigation as to the historic use of your property. The City of Ottawa cannot comment on any documents to which it is not a party.

Court House
161 Elgin Street 4th Floor
Ottawa ON K2P 2K1
Tel: (613) 239-1230
Fax: (613) 239-1422

Please note, as per the HLUI Disclaimer, that the information contained in the HLUI database has been compiled from publicly available records and other sources of information. The HLUI may contain erroneous information given that the records used as sources of information may be flawed. For instance, changes in municipal addresses over time may introduce error. Accordingly, all information from the HLUI database is provided on an “as is” basis with no representation or warranty

by the City with respect to the information's accuracy or exhaustiveness in responding to the request.

Furthermore, the HLUI database and the results of this search in no way confirm the presence or absence of contamination or pollution of any kind. This information is provided on the assumption that it will not be relied upon by any person for any purpose whatsoever. The City of Ottawa denies all liability to any persons attempting to rely on any information provided from the HLUI database.

Please note that in responding to your request, the City of Ottawa does not guarantee or comment on the environmental condition of the Subject Property. You may wish to contact the Ontario Ministry of Environment and Climate Change for additional information.

If you have any further questions or comments, please contact Insert Your Name at 613-580-2424 ext. 23493 or HLUI@ottawa.ca

Sincerely,

Sarah Ezzio

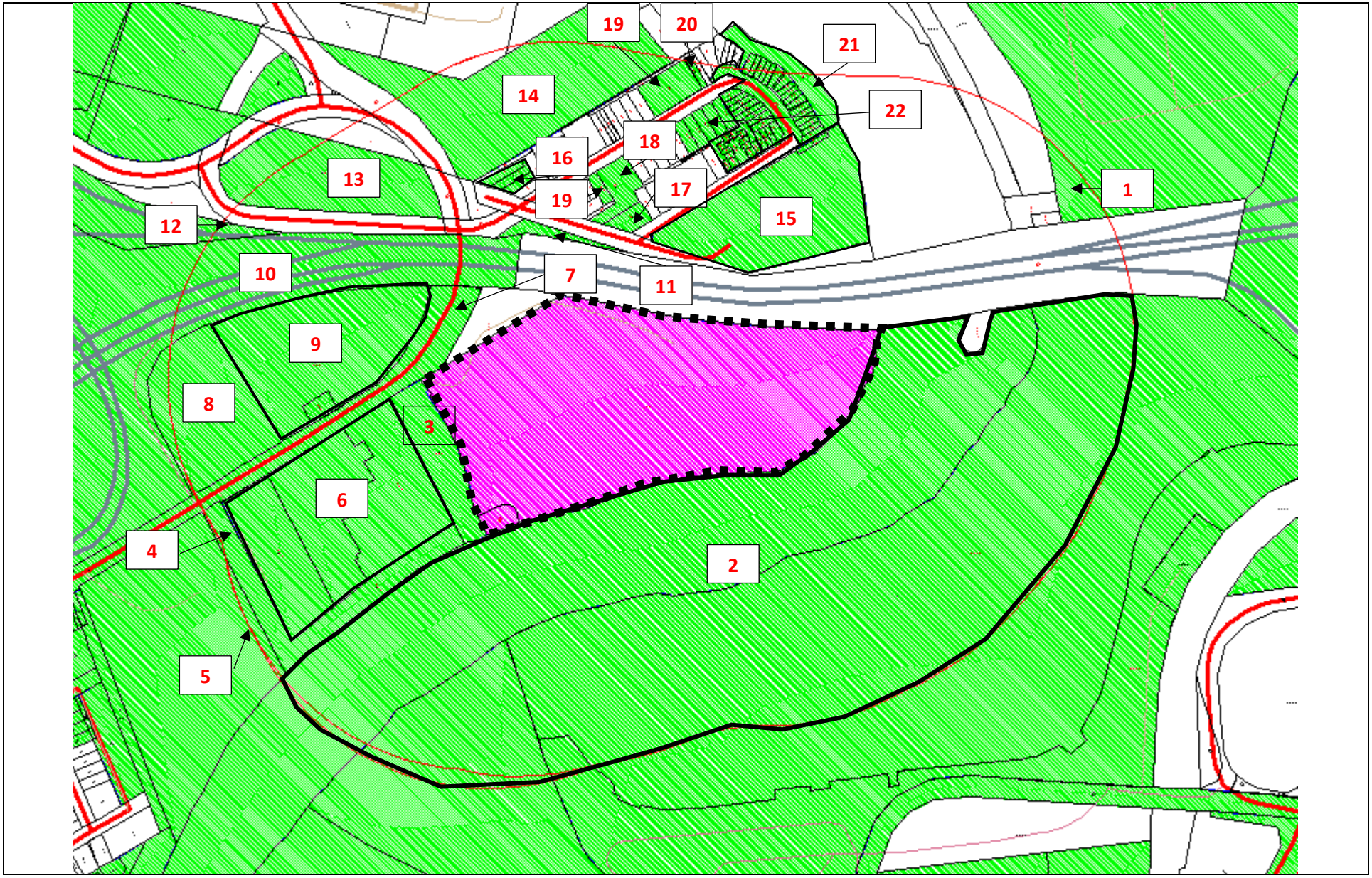
Per:

Michael Boughton, MCIP, RPP
Senior Planner
Development Review East
Planning Services
Planning, Infrastructure and Economic Development Department

MB / SE

Enclosures.

cc: File no. D06-03-20-0122



Address: 200 Lees Avenue
Ottawa, ON

File No.: D06-03-20-0122

Prepared By: Sarah Ezzio

Legend:
- 00 — Area Number
- Subject Site
- 250 m Buffer

Scale: 1 : N/A

Area	Associated HLUI Activities	Associated HLUI Activities with a PIN Certainty of “2” *
Subject Property	1070, 14515	
1	10684, 5342	
2	14515	
3	1070, 14515	
4	4040, 9928	
5	10180, 14515, 4040, 6190	11879
6	12185, 1676, 4040	
7	14515	
8		10591, 740
9	11973, 3631	10591
10	14538	740, 9785
11		2704, 9785
12		8664
13		10589
14		8227
15	9070, 9931	12686, 13774, 6608, 9034
16		11669, 7030, 8227
17	7489	6607
18	9977	6405

19		6405
20		5959
21		10470
22	5803	

*This identifier acknowledges that there is some uncertainty about the exact location of the land use activity and that the activity may or may not have been located on the property. All database entries with a PIN Certainty of “2” require independent verification as to their precise location.

Historical Land Use Inventory
Subject Property
Activity Numbers

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City of Ottawa
Planning, Infrastructure and Economic Development Department

Ville d'Ottawa
Services de la planification, de l'infrastructure et du développement économique

CITY OF OTTAWA

HLUI ID: __679BJM

AREA (Square Metres): 66961.915

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030630	Y	N
2005	042030731	N	N

Activity ID: 1070 **Multiple PINS:** Y

PIN Certainty: 1 **Previous Activity ID(s) :**

Related PINS: 042030731

Name: ALGONQUIN COLLEGE

Address: 200 LEES AVENUE, OTTAWA

Facility Type: Post-Secondary Non-University Education

Comments 1:

Comments 2:

Generator Number: ON0213601

Storage Tanks:

HL References 1:

HL References 2:

HL References 3: 2000 PID

NAICS	SIC
611610	0
611510	0
611210	0
611310	0

Company Name	Year of Operation
ALGONQUIN COLLEGE	c. 2005
ALGONQUIN COLLEGE	c. 2000
ALGONQUIN COLLEGE	c. 2003
ALGONQUIN COLLEGE	c. 2001

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030630	Y	N
2005	042030731	N	N

Activity ID: 14515

Multiple PINS: Y

PIN Certainty: 1

Previous Activity ID(s) : 6190, 6060, 6064, 6082, 6077, 6084, 6094, 6095, 6098, 6099, 6102, 6103, 6105, 6108, 6109, 6110, 6111, 6112, 6115, 6117, 6121, 6122, 6124, 6125, 6127, 6129, 6130, 6190, 6191, 6192, 6193, 6198, 6200, 6202, 6203, 6238, 6240, 6243, 6245, 6280, 6282, 6284, 62

Related PINS: 041330051

Name: UNNAMED WASTE DISPOSAL SITE

Address: , OTTAWA

Facility Type: Other Utility Industries n.e.c.

Comments 1: UTM = 445870E, 5028130N, map 31G/5. Site #X1102 of closed sites in the MOE inventory (pg134).

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: 1991-WDSI/WMB/MOE; RBE 1992; MC Staff, 19/02/99; 1922DMD-TM-Ottawa-Sheet #14, 1948DND-ASE-NTS-31G/5, 1967-EMR-SMB-NTS-31G/5-7th ed., 1985-EMR-SMB-NTS-31G/5-11th ed., City of Gloucester-File #8-400-Box 130;

HL References 2: City of Gloucester File # 6-79A: Subject-Health/Dumping -Box 75 -28/12/64; 1938-39-DND-ASE-NTS-31B/13W-2nd ed., 1964-DND-MCE-NTS-31B/13-3rd ed., 1976-EMR-SMB-NTS-31B/13-4th ed., 1979-EMR-SMB-NTS-31B/13-5th ed.

HL References 3:

NAICS	SIC
562210	499
221330	499
221320	499
562920	499
562990	499

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030630	Y	N
2005	042030731	N	N

Company Name	Year of Operation
Unnamed Waste Disposal Site	c. <1991
Unnamed Waste Disposal Site	c. 1953
Unnamed Waste Disposal Site	c. 1946
Unnamed Waste Disposal Site	c. 1924
Unnamed Waste Disposal Site	c. 1958
Unnamed Waste Disposal Site	c. 1979
Unnamed Waste Disposal Site	c. 1965
Unnamed Waste Disposal Site	c. 1974
Unnamed Waste Disposal Site	c. 1920-1931
Unnamed Waste Disposal Site	c. 1973
Unnamed Waste Disposal Site	c. 1927
Unamed Waste Disposal Site	c. 1966-1991
Unnamed Waste Dispoal Site	c. 1947
Unnamed Waste Disposal Site	c. 1976
Unnamed Waste Disposal Site	c. 1940
Unnamed Waste Disposal Site	c. 1962
Unnamed Waste Disposal Site	c. 1926
Unnamed Waste Disposal Site	c. 1944
Unnamed Waste Disposal Site	c. 1972
Unnamed Waste Disposal Site	c. 1935
Unnamed Waste Disposal Site	c. 1921-1945
Unnamed Waste Disposal Site	c. 1977
Unnamed Waste Disposal Site	c. 1947
Unnamed Waste Disposal Site	c. 1950
Unnamed Waste Disposal Site	c. 1981
Unnamed Waste Disposal Site	c. 1971
Unnamed Waste Disposal Site	c. 1963
Unnamed Waste Disposal Site	c. <1990
Unnamed Waste Disposal Site	c. 1964
Unnamed Waste Disposal Site	c. 1920
Unnamed Waste Disposal Site	c. 1938

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030630	Y	N
2005	042030731	N	N

Unnamed Waste Disposal Site	c. 1929
Unnamed Waste Disposal Site	c. 1966

Historical Land Use Inventory
Adjacent Properties within 250m
Area & Activity Numbers

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City of Ottawa
Planning, Infrastructure and Economic
Development Department

Ville d'Ottawa
Services de la planification, de l'infrastructure
et du développement économique

Historical Land Use Inventory
Area 1 Activity Numbers

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City of Ottawa
Planning, Infrastructure and Economic Development Department

Ville d'Ottawa
Services de la planification, de l'infrastructure et du développement économique

CITY OF OTTAWA

HLUI ID: __679BK5

AREA (Square Metres): 149719.168

Study Year	PIN	Multi-NAIC	Multiple Activities
2005	042070400	Y	Y

Activity ID: 10684 **Multiple PINS:** N

PIN Certainty: 1 **Previous Activity ID(s) :**

Related PINS: 042070400

Name: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

Address: 1200 VANIER PARKWAY, OTTAWA

Facility Type: General Administrative Services

Comments 1:

Comments 2: FEDERAL STUDY CENTRE

Generator Number: ON0554836

Storage Tanks:

HL References 1:

HL References 2:

HL References 3: 2003 PID

NAICS	SIC
911910	0

Company Name	Year of Operation
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA	c. 2003

Study Year	PIN	Multi-NAIC	Multiple Activities
2005	042070400	Y	Y

Activity ID: 5342 **Multiple PINS:** N

PIN Certainty: 1 **Previous Activity ID(s) :**

Related PINS: 042070400

Name: FED-RCMP

Address: 1200 VANIER PARKWAY, OTTAWA

Facility Type: Protective Services

Comments 1:

Comments 2:

Generator Number: ON0283104

Storage Tanks:

HL References 1:

HL References 2:

HL References 3: 2000 PID

NAICS	SIC
911230	0
913130	0

Company Name	Year of Operation
FORENSIC LABORATORY SERVICES	c. 2003
FED-RCMP	c. 2005
FED-RCMP	c. 2001
FED-RCMP	c. 2003
FED-RCMP	c. 2000

Historical Land Use Inventory
Area 2 Activity Numbers

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City of Ottawa
Planning, Infrastructure and Economic Development Department

Ville d'Ottawa
Services de la planification, de l'infrastructure et du développement économique

CITY OF OTTAWA

HLUI ID: __670IUE

AREA (Square Metres): 240138.586

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030633	Y	N

Activity ID: 14515

Multiple PINS: Y

PIN Certainty: 1

Previous Activity ID(s) : 6190, 6060, 6064, 6082, 6077, 6084, 6094, 6095, 6098, 6099, 6102, 6103, 6105, 6108, 6109, 6110, 6111, 6112, 6115, 6117, 6121, 6122, 6124, 6125, 6127, 6129, 6130, 6190, 6191, 6192, 6193, 6198, 6200, 6202, 6203, 6238, 6240, 6243, 6245, 6280, 6282, 6284, 62

Related PINS: 041330051

Name: UNNAMED WASTE DISPOSAL SITE

Address: , OTTAWA

Facility Type: Other Utility Industries n.e.c.

Comments 1: UTM = 445870E, 5028130N, map 31G/5. Site #X1102 of closed sites in the MOE inventory (pg134).

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: 1991-WDSI/WMB/MOE; RBE 1992; MC Staff, 19/02/99; 1922DMD-TM-Ottawa-Sheet #14, 1948DND-ASE-NTS-31G/5, 1967-EMR-SMB-NTS-31G/5-7th ed., 1985-EMR-SMB-NTS-31G/5-11th ed., City of Gloucester-File #8-400-Box 130;

HL References 2: City of Gloucester File # 6-79A: Subject-Health/Dumping -Box 75 -28/12/64; 1938-39-DND-ASE-NTS-31B/13W-2nd ed., 1964-DND-MCE-NTS-31B/13-3rd ed., 1976-EMR-SMB-NTS-31B/13-4th ed., 1979-EMR-SMB-NTS-31B/13-5th ed.

HL References 3:

NAICS	SIC
562210	499
221330	499
221320	499
562920	499
562990	499

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030633	Y	N

Company Name	Year of Operation
Unnamed Waste Disposal Site	c. <1991
Unnamed Waste Disposal Site	c. 1953
Unnamed Waste Disposal Site	c. 1946
Unnamed Waste Disposal Site	c. 1924
Unnamed Waste Disposal Site	c. 1958
Unnamed Waste Disposal Site	c. 1979
Unnamed Waste Disposal Site	c. 1965
Unnamed Waste Disposal Site	c. 1974
Unnamed Waste Disposal Site	c. 1920-1931
Unnamed Waste Disposal Site	c. 1973
Unnamed Waste Disposal Site	c. 1927
Unamed Waste Disposal Site	c. 1966-1991
Unnamed Waste Dispoal Site	c. 1947
Unnamed Waste Disposal Site	c. 1976
Unnamed Waste Disposal Site	c. 1940
Unnamed Waste Disposal Site	c. 1962
Unnamed Waste Disposal Site	c. 1926
Unnamed Waste Disposal Site	c. 1944
Unnamed Waste Disposal Site	c. 1972
Unnamed Waste Disposal Site	c. 1935
Unnamed Waste Disposal Site	c. 1921-1945
Unnamed Waste Disposal Site	c. 1977
Unnamed Waste Disposal Site	c. 1947
Unnamed Waste Disposal Site	c. 1950
Unnamed Waste Disposal Site	c. 1981
Unnamed Waste Disposal Site	c. 1971
Unnamed Waste Disposal Site	c. 1963
Unnamed Waste Disposal Site	c. <1990
Unnamed Waste Disposal Site	c. 1964
Unnamed Waste Disposal Site	c. 1920
Unnamed Waste Disposal Site	c. 1938
Unnamed Waste Disposal Site	c. 1929

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030633	Y	N

Unnamed Waste Disposal Site c. 1966

CITY OF OTTAWA

HLUI ID: __670ITP

AREA (Square Metres): 101558.163

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030707	Y	N

Activity ID: 14515

Multiple PINS: Y

PIN Certainty: 1

Previous Activity ID(s) : 6190, 6060, 6064, 6082, 6077, 6084, 6094, 6095, 6098, 6099, 6102, 6103, 6105, 6108, 6109, 6110, 6111, 6112, 6115, 6117, 6121, 6122, 6124, 6125, 6127, 6129, 6130, 6190, 6191, 6192, 6193, 6198, 6200, 6202, 6203, 6238, 6240, 6243, 6245, 6280, 6282, 6284, 62

Related PINS: 041330051

Name: UNNAMED WASTE DISPOSAL SITE

Address: , OTTAWA

Facility Type: Other Utility Industries n.e.c.

Comments 1: UTM = 445870E, 5028130N, map 31G/5. Site #X1102 of closed sites in the MOE inventory (pg134).

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: 1991-WDSI/WMB/MOE; RBE 1992; MC Staff, 19/02/99; 1922DMD-TM-Ottawa-Sheet #14, 1948DND-ASE-NTS-31G/5, 1967-EMR-SMB-NTS-31G/5-7th ed., 1985-EMR-SMB-NTS-31G/5-11th ed., City of Gloucester-File #8-400-Box 130;

HL References 2: City of Gloucester File # 6-79A: Subject-Health/Dumping -Box 75 -28/12/64; 1938-39-DND-ASE-NTS-31B/13W-2nd ed., 1964-DND-MCE-NTS-31B/13-3rd ed., 1976-EMR-SMB-NTS-31B/13-4th ed., 1979-EMR-SMB-NTS-31B/13-5th ed.

HL References 3:

NAICS	SIC
562210	499
221330	499
221320	499
562920	499
562990	499

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030707	Y	N

Company Name	Year of Operation
Unnamed Waste Disposal Site	c. <1991
Unnamed Waste Disposal Site	c. 1953
Unnamed Waste Disposal Site	c. 1946
Unnamed Waste Disposal Site	c. 1924
Unnamed Waste Disposal Site	c. 1958
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Unnamed Waste Disposal Site	c. 1927
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Unnamed Waste Dispoal Site	c. 1947
Unnamed Waste Disposal Site	c. 1976
Unnamed Waste Disposal Site	c. 1940
Unnamed Waste Disposal Site	c. 1962
Unnamed Waste Disposal Site	c. 1926
Unnamed Waste Disposal Site	c. 1944
Unnamed Waste Disposal Site	c. 1972
Unnamed Waste Disposal Site	c. 1935
Unnamed Waste Disposal Site	c. 1921-1945
Unnamed Waste Disposal Site	c. 1977
Unnamed Waste Disposal Site	c. 1947
Unnamed Waste Disposal Site	c. 1950
Unnamed Waste Disposal Site	c. 1981
Unnamed Waste Disposal Site	c. 1971
Unnamed Waste Disposal Site	c. 1963
Unnamed Waste Disposal Site	c. <1990
Unnamed Waste Disposal Site	c. 1964
Unnamed Waste Disposal Site	c. 1920
Unnamed Waste Disposal Site	c. 1938
Unnamed Waste Disposal Site	c. 1929

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030707	Y	N

Unnamed Waste Disposal Site	c. 1966

CITY OF OTTAWA

HLUI ID: __679B35

AREA (Square Metres): 267270.336

Study Year	PIN	Multi-NAIC	Multiple Activities
2005	042030632	Y	N

Activity ID: 14515

Multiple PINS: Y

PIN Certainty: 1

Previous Activity ID(s) : 6190, 6060, 6064, 6082, 6077, 6084, 6094, 6095, 6098, 6099, 6102, 6103, 6105, 6108, 6109, 6110, 6111, 6112, 6115, 6117, 6121, 6122, 6124, 6125, 6127, 6129, 6130, 6190, 6191, 6192, 6193, 6198, 6200, 6202, 6203, 6238, 6240, 6243, 6245, 6280, 6282, 6284, 62

Related PINS: 041330051

Name: UNNAMED WASTE DISPOSAL SITE

Address: , OTTAWA

Facility Type: Other Utility Industries n.e.c.

Comments 1: UTM = 445870E, 5028130N, map 31G/5. Site #X1102 of closed sites in the MOE inventory (pg134).

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: 1991-WDSI/WMB/MOE; RBE 1992; MC Staff, 19/02/99; 1922DMD-TM-Ottawa-Sheet #14, 1948DND-ASE-NTS-31G/5, 1967-EMR-SMB-NTS-31G/5-7th ed., 1985-EMR-SMB-NTS-31G/5-11th ed., City of Gloucester-File #8-400-Box 130;

HL References 2: City of Gloucester File # 6-79A: Subject-Health/Dumping -Box 75 -28/12/64; 1938-39-DND-ASE-NTS-31B/13W-2nd ed., 1964-DND-MCE-NTS-31B/13-3rd ed., 1976-EMR-SMB-NTS-31B/13-4th ed., 1979-EMR-SMB-NTS-31B/13-5th ed.

HL References 3:

NAICS	SIC
562210	499
221330	499
221320	499
562920	499
562990	499

Study Year	PIN	Multi-NAIC	Multiple Activities
2005	042030632	Y	N

Company Name	Year of Operation
Unnamed Waste Disposal Site	c. <1991
Unnamed Waste Disposal Site	c. 1953
Unnamed Waste Disposal Site	c. 1946
Unnamed Waste Disposal Site	c. 1924
Unnamed Waste Disposal Site	c. 1958
Unnamed Waste Disposal Site	c. 1979
Unnamed Waste Disposal Site	c. 1965
Unnamed Waste Disposal Site	c. 1974
Unnamed Waste Disposal Site	c. 1920-1931
Unnamed Waste Disposal Site	c. 1973
Unnamed Waste Disposal Site	c. 1927
Unamed Waste Disposal Site	c. 1966-1991
Unnamed Waste Dispoal Site	c. 1947
Unnamed Waste Disposal Site	c. 1976
Unnamed Waste Disposal Site	c. 1940
Unnamed Waste Disposal Site	c. 1962
Unnamed Waste Disposal Site	c. 1926
Unnamed Waste Disposal Site	c. 1944
Unnamed Waste Disposal Site	c. 1972
Unnamed Waste Disposal Site	c. 1935
Unnamed Waste Disposal Site	c. 1921-1945
Unnamed Waste Disposal Site	c. 1977
Unnamed Waste Disposal Site	c. 1947
Unnamed Waste Disposal Site	c. 1950
Unnamed Waste Disposal Site	c. 1981
Unnamed Waste Disposal Site	c. 1971
Unnamed Waste Disposal Site	c. 1963
Unnamed Waste Disposal Site	c. <1990
Unnamed Waste Disposal Site	c. 1964
Unnamed Waste Disposal Site	c. 1920
Unnamed Waste Disposal Site	c. 1938
Unnamed Waste Disposal Site	c. 1929

Study Year	PIN	Multi-NAIC	Multiple Activities
2005	042030632	Y	N

Unnamed Waste Disposal Site c. 1966

Historical Land Use Inventory
Area 3 Activity Numbers

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Ville d'Ottawa
Services de la planification, de l'infrastructure et du développement économique

CITY OF OTTAWA

HLUI ID: __679ACC

AREA (Square Metres): 5353.462

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030630	Y	N
2005	042030731	Y	N

Activity ID: 1070 **Multiple PINS:** Y

PIN Certainty: 1 **Previous Activity ID(s) :**

Related PINS: 042030731

Name: ALGONQUIN COLLEGE

Address: 200 LEES AVENUE, OTTAWA

Facility Type: Post-Secondary Non-University Education

Comments 1:

Comments 2:

Generator Number: ON0213601

Storage Tanks:

HL References 1:

HL References 2:

HL References 3: 2000 PID

NAICS	SIC
611610	0
611510	0
611210	0
611310	0

Company Name	Year of Operation
ALGONQUIN COLLEGE	c. 2005
ALGONQUIN COLLEGE	c. 2000
ALGONQUIN COLLEGE	c. 2003
ALGONQUIN COLLEGE	c. 2001

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030630	Y	N
2005	042030731	Y	N

Activity ID: 14515

Multiple PINS: Y

PIN Certainty: 1

Previous Activity ID(s) : 6190, 6060, 6064, 6082, 6077, 6084, 6094, 6095, 6098, 6099, 6102, 6103, 6105, 6108, 6109, 6110, 6111, 6112, 6115, 6117, 6121, 6122, 6124, 6125, 6127, 6129, 6130, 6190, 6191, 6192, 6193, 6198, 6200, 6202, 6203, 6238, 6240, 6243, 6245, 6280, 6282, 6284, 62

Related PINS: 041330051

Name: UNNAMED WASTE DISPOSAL SITE

Address: , OTTAWA

Facility Type: Other Utility Industries n.e.c.

Comments 1: UTM = 445870E, 5028130N, map 31G/5. Site #X1102 of closed sites in the MOE inventory (pg134).

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: 1991-WDSI/WMB/MOE; RBE 1992; MC Staff, 19/02/99; 1922DMD-TM-Ottawa-Sheet #14, 1948DND-ASE-NTS-31G/5, 1967-EMR-SMB-NTS-31G/5-7th ed., 1985-EMR-SMB-NTS-31G/5-11th ed., City of Gloucester-File #8-400-Box 130;

HL References 2: City of Gloucester File # 6-79A: Subject-Health/Dumping -Box 75 -28/12/64; 1938-39-DND-ASE-NTS-31B/13W-2nd ed., 1964-DND-MCE-NTS-31B/13-3rd ed., 1976-EMR-SMB-NTS-31B/13-4th ed., 1979-EMR-SMB-NTS-31B/13-5th ed.

HL References 3:

NAICS	SIC
562210	499
221330	499
221320	499
562920	499
562990	499

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030630	Y	N
2005	042030731	Y	N

Company Name	Year of Operation
Unnamed Waste Disposal Site	c. <1991
Unnamed Waste Disposal Site	c. 1953
Unnamed Waste Disposal Site	c. 1946
Unnamed Waste Disposal Site	c. 1924
Unnamed Waste Disposal Site	c. 1958
Unnamed Waste Disposal Site	c. 1979
Unnamed Waste Disposal Site	c. 1965
Unnamed Waste Disposal Site	c. 1974
Unnamed Waste Disposal Site	c. 1920-1931
Unnamed Waste Disposal Site	c. 1973
Unnamed Waste Disposal Site	c. 1927
Unamed Waste Disposal Site	c. 1966-1991
Unnamed Waste Dispoal Site	c. 1947
Unnamed Waste Disposal Site	c. 1976
Unnamed Waste Disposal Site	c. 1940
Unnamed Waste Disposal Site	c. 1962
Unnamed Waste Disposal Site	c. 1926
Unnamed Waste Disposal Site	c. 1944
Unnamed Waste Disposal Site	c. 1972
Unnamed Waste Disposal Site	c. 1935
Unnamed Waste Disposal Site	c. 1921-1945
Unnamed Waste Disposal Site	c. 1977
Unnamed Waste Disposal Site	c. 1947
Unnamed Waste Disposal Site	c. 1950
Unnamed Waste Disposal Site	c. 1981
Unnamed Waste Disposal Site	c. 1971
Unnamed Waste Disposal Site	c. 1963
Unnamed Waste Disposal Site	c. <1990
Unnamed Waste Disposal Site	c. 1964
Unnamed Waste Disposal Site	c. 1920
Unnamed Waste Disposal Site	c. 1938

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030630	Y	N
2005	042030731	Y	N

Unnamed Waste Disposal Site	c. 1929
Unnamed Waste Disposal Site	c. 1966

Historical Land Use Inventory
Area 4 Activity Numbers

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Planning, Infrastructure and Economic Development Department

Ville d'Ottawa
Services de la planification, de l'infrastructure et du développement économique

CITY OF OTTAWA

HLUI ID: __670IHW

AREA (Square Metres): 7758.471

Report: RPTC_OT_DEV0122

Run On: 28 Aug 2020 at: 10:53:15

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030627	Y	Y

Activity ID: 4040 **Multiple PINS:** N

PIN Certainty: 1 **Previous Activity ID(s) :** 5668

Related PINS: 042030628

Name: HAMA INVESTMENTS LIMITED

Address: 170 LEES AVENUE, OTTAWA

Facility Type: Other Petroleum and Coal Products Industries

Comments 1:

Comments 2:

Generator Number: ON1161300

Storage Tanks: 1 verrtical above ground , and 6 underground tanks which contain tar

HL References 1: M.1900 - M.1980; S.1958, S.1961, S.1964, S.1965; FIP1901,vol2; FIP1912,vol2; FIP1922,vol2; FIP1948-234-1249; FIP1956-234-4-1249; PID1994, Intera-1988b

HL References 2:

HL References 3: 2000 PID

NAICS	SIC
324121	0
324121	369

Company Name	Year of Operation
Ontario Inc.	c. 1994
HAMA INVESTMENTS LIMITED	c. 2000
Hamilton Tar Products Co. Ltd	c. 1930
Currie Products Ltd.	c. 1940-1950

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030627	Y	Y

Activity ID: 9928
Multiple PINS: N
PIN Certainty: 1
Previous Activity ID(s) :
Related PINS: 042030627
Name: OTTAWA, CORPORATION OF THE CITY OF
Address: 168 LEES AVENUE, OTTAWA
Facility Type: General Administrative Services
Comments 1:
Comments 2:
Generator Number: ON0136221
Storage Tanks:
HL References 1:
HL References 2:
HL References 3: 2003 PID

NAICS	SIC
913910	0

Company Name	Year of Operation
OTTAWA, CORPORATION OF THE CITY OF	c. 2003

Historical Land Use Inventory
Area 5 Activity Numbers

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Planning, Infrastructure and Economic Development Department

Ville d'Ottawa
Services de la planification, de l'infrastructure et du développement économique

CITY OF OTTAWA

HLUI ID: __670IQR

AREA (Square Metres): 33363.298

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030626	Y	Y

Activity ID: 10180 **Multiple PINS:** N

PIN Certainty: 1 **Previous Activity ID(s) :**

Related PINS: 042030626

Name: OTTAWA-CARLTON, REGIONAL MUNICIPALITY OF

Address: 160 LEES AVENUE, OTTAWA

Facility Type: General Administrative Services

Comments 1:

Comments 2:

Generator Number: ON0303128

Storage Tanks:

HL References 1:

HL References 2:

HL References 3: 2003 PID

NAICS	SIC
913910	0

Company Name	Year of Operation
OTTAWA-CARLTON, REGIONAL MUNICIPALITY OF	c. 2003

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030626	Y	Y

Activity ID: 11879 **Multiple PINS:** N

PIN Certainty: 2 **Previous Activity ID(s) :** 5078

Related PINS: 042030626

Name: ROYAL CANADIAN ENGINEERS

Address: BRUNSWICK STREET, OTTAWA

Facility Type: Machine Shop Industry

Comments 1:

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: FIP1901,vol2; FIP1912,vol2; FIP1922,vol2; FIP1948-234-1249, M.1948, M.1955; FIP1956-234-4-1249

HL References 2:

HL References 3:

NAICS	SIC
333619	308
336310	308
332710	308
336350	308

Company Name	Year of Operation
Royal Canadian Engineers	c. 1948-1956

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030626	Y	Y

Activity ID: 14515

Multiple PINS: Y

PIN Certainty: 1

Previous Activity ID(s) : 6190, 6060, 6064, 6082, 6077, 6084, 6094, 6095, 6098, 6099, 6102, 6103, 6105, 6108, 6109, 6110, 6111, 6112, 6115, 6117, 6121, 6122, 6124, 6125, 6127, 6129, 6130, 6190, 6191, 6192, 6193, 6198, 6200, 6202, 6203, 6238, 6240, 6243, 6245, 6280, 6282, 6284, 62

Related PINS: 041330051

Name: UNNAMED WASTE DISPOSAL SITE

Address: , OTTAWA

Facility Type: Other Utility Industries n.e.c.

Comments 1: UTM = 445870E, 5028130N, map 31G/5. Site #X1102 of closed sites in the MOE inventory (pg134).

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: 1991-WDSI/WMB/MOE; RBE 1992; MC Staff, 19/02/99; 1922DMD-TM-Ottawa-Sheet #14, 1948DND-ASE-NTS-31G/5, 1967-EMR-SMB-NTS-31G/5-7th ed., 1985-EMR-SMB-NTS-31G/5-11th ed., City of Gloucester-File #8-400-Box 130;

HL References 2: City of Gloucester File # 6-79A: Subject-Health/Dumping -Box 75 -28/12/64; 1938-39-DND-ASE-NTS-31B/13W-2nd ed., 1964-DND-MCE-NTS-31B/13-3rd ed., 1976-EMR-SMB-NTS-31B/13-4th ed., 1979-EMR-SMB-NTS-31B/13-5th ed.

HL References 3:

NAICS	SIC
562210	499
221330	499
221320	499
562920	499
562990	499

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030626	Y	Y

Company Name	Year of Operation
Unnamed Waste Disposal Site	c. <1991
Unnamed Waste Disposal Site	c. 1953
Unnamed Waste Disposal Site	c. 1946
Unnamed Waste Disposal Site	c. 1924
Unnamed Waste Disposal Site	c. 1958
Unnamed Waste Disposal Site	c. 1979
Unnamed Waste Disposal Site	c. 1965
Unnamed Waste Disposal Site	c. 1974
Unnamed Waste Disposal Site	c. 1920-1931
Unnamed Waste Disposal Site	c. 1973
Unnamed Waste Disposal Site	c. 1927
Unamed Waste Disposal Site	c. 1966-1991
Unnamed Waste Dispoal Site	c. 1947
Unnamed Waste Disposal Site	c. 1976
Unnamed Waste Disposal Site	c. 1940
Unnamed Waste Disposal Site	c. 1962
Unnamed Waste Disposal Site	c. 1926
Unnamed Waste Disposal Site	c. 1944
Unnamed Waste Disposal Site	c. 1972
Unnamed Waste Disposal Site	c. 1935
Unnamed Waste Disposal Site	c. 1921-1945
Unnamed Waste Disposal Site	c. 1977
Unnamed Waste Disposal Site	c. 1947
Unnamed Waste Disposal Site	c. 1950
Unnamed Waste Disposal Site	c. 1981
Unnamed Waste Disposal Site	c. 1971
Unnamed Waste Disposal Site	c. 1963
Unnamed Waste Disposal Site	c. <1990
Unnamed Waste Disposal Site	c. 1964
Unnamed Waste Disposal Site	c. 1920
Unnamed Waste Disposal Site	c. 1938
Unnamed Waste Disposal Site	c. 1929

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030626	Y	Y

Unnamed Waste Disposal Site	c. 1966

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030626	Y	Y

Activity ID: 4040 **Multiple PINS:** N

PIN Certainty: 1 **Previous Activity ID(s) :** 5668

Related PINS: 042030628

Name: HAMA INVESTMENTS LIMITED

Address: 170 LEES AVENUE, OTTAWA

Facility Type: Other Petroleum and Coal Products Industries

Comments 1:

Comments 2:

Generator Number: ON1161300

Storage Tanks: 1 verrtical above ground , and 6 underground tanks which contain tar

HL References 1: M.1900 - M.1980; S.1958, S.1961, S.1964, S.1965; FIP1901,vol2; FIP1912,vol2; FIP1922,vol2; FIP1948-234-1249; FIP1956-234-4-1249; PID1994, Intera-1988b

HL References 2:

HL References 3: 2000 PID

NAICS	SIC
324121	0
324121	369

Company Name	Year of Operation
Ontario Inc.	c. 1994
HAMA INVESTMENTS LIMITED	c. 2000
Hamilton Tar Products Co. Ltd	c. 1930
Currie Products Ltd.	c. 1940-1950

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030626	Y	Y

Activity ID: 6190 **Multiple PINS:** N

PIN Certainty: 1 **Previous Activity ID(s) :** 6884

Related PINS: 042030626

Name: GOVERNMENT OF CANADA

Address: LEES AVENUE, OTTAWA

Facility Type: Motor Vehicles, Wholesale

Comments 1: Generator #ON0046555

Comments 2: 158 to 160

Generator Number:

Storage Tanks:

HL References 1: M.1960, M.1970, M.1980; PID1994

HL References 2:

HL References 3:

NAICS	SIC
415110	551
415120	551
911110	811
415190	551
811111	551
811310	551

Company Name	Year of Operation
Department of National Defence	c. 1960
Government of Canada	c. 1994

Historical Land Use Inventory
Area 6 Activity Numbers

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CITY OF OTTAWA

HLUI ID: __679BEE

AREA (Square Metres): 19844.602

Study Year	PIN	Multi-NAIC	Multiple Activities
	042030628	N	N

Activity ID: 12185 **Multiple PINS:** N

PIN Certainty: 1 **Previous Activity ID(s) :**

Related PINS: 042030628

Name: SAIKALEY PHIL CONTRACTOR

Address: 170 LEES AVENUE, OTTAWA

Facility Type: Residential Building and Development

Comments 1:

Comments 2:

Generator Number:

Storage Tanks:

HL References 1:

HL References 2:

HL References 3: 2001 Employment Survey

NAICS	SIC
236110	0

Company Name	Year of Operation
SAIKALEY PHIL CONTRACTOR	c. 2001

Study Year	PIN	Multi-NAIC	Multiple Activities
	042030628	N	N

Activity ID: 1676 **Multiple PINS:** N

PIN Certainty: 1 **Previous Activity ID(s) :**

Related PINS: 042030628

Name: BITS 'N BYTES

Address: 170 LEES AVENUE, OTTAWA

Facility Type: Electrical and Electronic Machinery, Equipment and Supplies, Wholesale

Comments 1:

Comments 2:

Generator Number:

Storage Tanks:

HL References 1:

HL References 2:

HL References 3: 2001 Employment Survey

NAICS	SIC
443120	0

Company Name	Year of Operation
BITS 'N BYTES	c. 2001

Study Year	PIN	Multi-NAIC	Multiple Activities
	042030628	N	N

Activity ID: 4040 **Multiple PINS:** N

PIN Certainty: 1 **Previous Activity ID(s) :** 5668

Related PINS: 042030628

Name: HAMA INVESTMENTS LIMITED

Address: 170 LEES AVENUE, OTTAWA

Facility Type: Other Petroleum and Coal Products Industries

Comments 1:

Comments 2:

Generator Number: ON1161300

Storage Tanks: 1 verrtical above ground , and 6 underground tanks which contain tar

HL References 1: M.1900 - M.1980; S.1958, S.1961, S.1964, S.1965; FIP1901,vol2; FIP1912,vol2; FIP1922,vol2; FIP1948-234-1249; FIP1956-234-4-1249; PID1994, Intera-1988b

HL References 2:

HL References 3: 2000 PID

NAICS	SIC
324121	0
324121	369

Company Name	Year of Operation
Ontario Inc.	c. 1994
HAMA INVESTMENTS LIMITED	c. 2000
Hamilton Tar Products Co. Ltd	c. 1930
Currie Products Ltd.	c. 1940-1950

CITY OF OTTAWA

HLUI ID: __679GSJ

AREA (Square Metres): 7978.765

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030628	Y	Y

Activity ID: 12185 **Multiple PINS:** N

PIN Certainty: 1 **Previous Activity ID(s) :**

Related PINS: 042030628

Name: SAIKALEY PHIL CONTRACTOR

Address: 170 LEES AVENUE, OTTAWA

Facility Type: Residential Building and Development

Comments 1:

Comments 2:

Generator Number:

Storage Tanks:

HL References 1:

HL References 2:

HL References 3: 2001 Employment Survey

NAICS	SIC
236110	0

Company Name	Year of Operation
SAIKALEY PHIL CONTRACTOR	c. 2001

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030628	Y	Y

Activity ID: 1676 **Multiple PINS:** N

PIN Certainty: 1 **Previous Activity ID(s) :**

Related PINS: 042030628

Name: BITS 'N BYTES

Address: 170 LEES AVENUE, OTTAWA

Facility Type: Electrical and Electronic Machinery, Equipment and Supplies, Wholesale

Comments 1:

Comments 2:

Generator Number:

Storage Tanks:

HL References 1:

HL References 2:

HL References 3: 2001 Employment Survey

NAICS	SIC
443120	0

Company Name	Year of Operation
BITS 'N BYTES	c. 2001

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042030628	Y	Y

Activity ID: 4040 **Multiple PINS:** N

PIN Certainty: 1 **Previous Activity ID(s) :** 5668

Related PINS: 042030628

Name: HAMA INVESTMENTS LIMITED

Address: 170 LEES AVENUE, OTTAWA

Facility Type: Other Petroleum and Coal Products Industries

Comments 1:

Comments 2:

Generator Number: ON1161300

Storage Tanks: 1 verrtical above ground , and 6 underground tanks which contain tar

HL References 1: M.1900 - M.1980; S.1958, S.1961, S.1964, S.1965; FIP1901,vol2; FIP1912,vol2; FIP1922,vol2; FIP1948-234-1249; FIP1956-234-4-1249; PID1994, Intera-1988b

HL References 2:

HL References 3: 2000 PID

NAICS	SIC
324121	0
324121	369

Company Name	Year of Operation
Ontario Inc.	c. 1994
HAMA INVESTMENTS LIMITED	c. 2000
Hamilton Tar Products Co. Ltd	c. 1930
Currie Products Ltd.	c. 1940-1950

Historical Land Use Inventory
Area 7 Activity Numbers

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HLUI ID: __670IOR

AREA (Square Metres): 19997.739

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042040227	Y	N

Activity ID: 14515

Multiple PINS: Y

PIN Certainty: 1

Previous Activity ID(s) : 6190, 6060, 6064, 6082, 6077, 6084, 6094, 6095, 6098, 6099, 6102, 6103, 6105, 6108, 6109, 6110, 6111, 6112, 6115, 6117, 6121, 6122, 6124, 6125, 6127, 6129, 6130, 6190, 6191, 6192, 6193, 6198, 6200, 6202, 6203, 6238, 6240, 6243, 6245, 6280, 6282, 6284, 62

Related PINS: 041330051

Name: UNNAMED WASTE DISPOSAL SITE

Address: , OTTAWA

Facility Type: Other Utility Industries n.e.c.

Comments 1: UTM = 445870E, 5028130N, map 31G/5. Site #X1102 of closed sites in the MOE inventory (pg134).

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: 1991-WDSI/WMB/MOE; RBE 1992; MC Staff, 19/02/99; 1922DMD-TM-Ottawa-Sheet #14, 1948DND-ASE-NTS-31G/5, 1967-EMR-SMB-NTS-31G/5-7th ed., 1985-EMR-SMB-NTS-31G/5-11th ed., City of Gloucester-File #8-400-Box 130;

HL References 2: City of Gloucester File # 6-79A: Subject-Health/Dumping -Box 75 -28/12/64; 1938-39-DND-ASE-NTS-31B/13W-2nd ed., 1964-DND-MCE-NTS-31B/13-3rd ed., 1976-EMR-SMB-NTS-31B/13-4th ed., 1979-EMR-SMB-NTS-31B/13-5th ed.

HL References 3:

NAICS	SIC
562210	499
221330	499
221320	499
562920	499
562990	499

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042040227	Y	N

Company Name	Year of Operation
Unnamed Waste Disposal Site	c. <1991
Unnamed Waste Disposal Site	c. 1953
Unnamed Waste Disposal Site	c. 1946
Unnamed Waste Disposal Site	c. 1924
Unnamed Waste Disposal Site	c. 1958
Unnamed Waste Disposal Site	c. 1979
Unnamed Waste Disposal Site	c. 1965
Unnamed Waste Disposal Site	c. 1974
Unnamed Waste Disposal Site	c. 1920-1931
Unnamed Waste Disposal Site	c. 1973
Unnamed Waste Disposal Site	c. 1927
Unamed Waste Disposal Site	c. 1966-1991
Unnamed Waste Dispoal Site	c. 1947
Unnamed Waste Disposal Site	c. 1976
Unnamed Waste Disposal Site	c. 1940
Unnamed Waste Disposal Site	c. 1962
Unnamed Waste Disposal Site	c. 1926
Unnamed Waste Disposal Site	c. 1944
Unnamed Waste Disposal Site	c. 1972
Unnamed Waste Disposal Site	c. 1935
Unnamed Waste Disposal Site	c. 1921-1945
Unnamed Waste Disposal Site	c. 1977
Unnamed Waste Disposal Site	c. 1947
Unnamed Waste Disposal Site	c. 1950
Unnamed Waste Disposal Site	c. 1981
Unnamed Waste Disposal Site	c. 1971
Unnamed Waste Disposal Site	c. 1963
Unnamed Waste Disposal Site	c. <1990
Unnamed Waste Disposal Site	c. 1964
Unnamed Waste Disposal Site	c. 1920
Unnamed Waste Disposal Site	c. 1938
Unnamed Waste Disposal Site	c. 1929

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042040227	Y	N

Unnamed Waste Disposal Site c. 1966

Historical Land Use Inventory
Area 8 Activity Numbers

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Services de la planification, de l'infrastructure
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CITY OF OTTAWA

HLUI ID: __679G5A

AREA (Square Metres): 12987.045

Report: RPTC_OT_DEV0122

Run On: 28 Aug 2020 at: 11:11:18

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042040235	Y	Y

Activity ID: 10591 **Multiple PINS:** Y

PIN Certainty: 2 **Previous Activity ID(s) :** 2928

Related PINS: 042040233

Name: OTTAWA GAS LIMITED

Address: 175 LEES AVENUE, OTTAWA

Facility Type: Refined Petroleum Products Industries

Comments 1: Formerly a coal gas plant. The site is known to have coal tar contamination. There wasan underground ammonia well sparator,ammonia liquor well, underground tar separator, and a tar well.

Comments 2: Exhaust house: purifying/condenser/boiler/water/gas,coal shed & piles,machine shop,lab,steel storage, and transformer room.This site is bounded by the train tracks to the east.

Generator Number:

Storage Tanks: 1 AST- 9.35 m gal., 1 AST- 511,000 gal., 2 AST - gas (not there in 1922, 1948), 2 UST - oil, 1 UST - lime

HL References 1: M.1948, M.1960, M.1963, M.1970, M.1980; FIP1901,vol2; FIP1912,vol2; FIP1922-259-1247; FIP1948-234-1247, Gloucester Roots -1991, Intera-1988b

HL References 2:

HL References 3:

NAICS	SIC
454310	511
324110	361
324190	361
419120	511
221210	492
412110	511

Company Name	Year of Operation
Ottawa Gas Ltd.	c. 1912-1960

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042040235	Y	Y

Activity ID: 740 **Multiple PINS:** Y

PIN Certainty: 2 **Previous Activity ID(s) :** 2748, 2750, 4253

Related PINS: 042040232

Name: D. & D. GARAGE REG'D

Address: 230 HAWTHORNE AVENUE, OTTAWA

Facility Type: Motor Vehicle Repair Shops

Comments 1:

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1900, M.1910, M.1920, M.1930, M.1940, M.1950, M.1960, M.1970, M.1980

HL References 2:

HL References 3:

NAICS	SIC
811121	635
811112	635
811119	635

Company Name	Year of Operation
Ben's Auto Service	c. 1950
Rick's Garage	c. 1960
D. & D. Garage Reg'd	c. 1960

Historical Land Use Inventory
Area 9 Activity Numbers

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CITY OF OTTAWA

HLUI ID: __679BDO

AREA (Square Metres): 552.328

Study Year	PIN	Multi-NAIC	Multiple Activities
	042040233	N	N

Activity ID:	10591	**Multiple PINS:**	Y
PIN Certainty:	2	**Previous Activity ID(s) :**	2928
Related PINS:	042040233		
Name:	OTTAWA GAS LIMITED		
Address:	175 LEES AVENUE, OTTAWA		
Facility Type:	Refined Petroleum Products Industries		
Comments 1:	Formerly a coal gas plant. The site is known to have coal tar contamination. There wasan underground ammonia well sparator,ammonia liquor well, underground tar separator, and a tar well.		
Comments 2:	Exhaust house: purifying/condenser/boiler/water/gas,coal shed & piles,machine shop,lab,steel storage, and transformer room.This site is bounded by the train tracks to the east.		
Generator Number:			
Storage Tanks:	1 AST- 9.35 m gal., 1 AST- 511,000 gal., 2 AST - gas (not there in 1922, 1948), 2 UST - oil, 1 UST - lime		
HL References 1:	M.1948, M.1960, M.1963, M.1970, M.1980; FIP1901,vol2; FIP1912,vol2; FIP1922-259-1247; FIP1948-234-1247, Gloucester Roots -1991, Intera-1988b		
HL References 2:			
HL References 3:			

NAICS	SIC
454310	511
324110	361
324190	361
419120	511
221210	492
412110	511

Company Name	Year of Operation
Ottawa Gas Ltd.	c. 1912-1960

Study Year	PIN	Multi-NAIC	Multiple Activities
	042040233	N	N

Activity ID: 11973 **Multiple PINS:** N

PIN Certainty: 1 **Previous Activity ID(s) :** 6855

Related PINS: 042040233

Name: REGIONAL MUNICIPALITY OF OTTAWA-CARLETON

Address: LEES AVENUE, OTTAWA

Facility Type: Other Petroleum and Coal Products Industries

Comments 1: Groundwater contaminated with coal tar. Generator #ON0303104 (waste generator)

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: PID1994

HL References 2:

HL References 3:

NAICS	SIC
221310	493
913910	835
324121	369

Company Name	Year of Operation
Regional Municipality of Ottawa-Carleton	c. 1994

Study Year	PIN	Multi-NAIC	Multiple Activities
	042040233	N	N

Activity ID: 3631
Multiple PINS: N
PIN Certainty: 1
Previous Activity ID(s) :
Related PINS: 042040233
Name: CITY OF OTTAWA
Address: 191 LEES AVENUE, OTTAWA
Facility Type: Other Utility Industries n.e.c.
Comments 1: LEES AVENUE TRANSIT STATION
Comments 2:
Generator Number: ON0303104
Storage Tanks:
HL References 1:
HL References 2:
HL References 3: 2003 PID

NAICS	SIC
221320	0

Company Name	Year of Operation
CITY OF OTTAWA	c. 2003

CITY OF OTTAWA

HLUI ID: __679G96

AREA (Square Metres): 18602.177

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042040233	Y	Y

Activity ID: 10591 **Multiple PINS:** Y

PIN Certainty: 2 **Previous Activity ID(s) :** 2928

Related PINS: 042040233

Name: OTTAWA GAS LIMITED

Address: 175 LEES AVENUE, OTTAWA

Facility Type: Refined Petroleum Products Industries

Comments 1: Formerly a coal gas plant. The site is known to have coal tar contamination. There wasan underground ammonia well sparator,ammonia liquor well, underground tar separator, and a tar well.

Comments 2: Exhaust house: purifying/condenser/boiler/water/gas,coal shed & piles,machine shop,lab,steel storage, and transformer room.This site is bounded by the train tracks to the east.

Generator Number:

Storage Tanks: 1 AST- 9.35 m gal., 1 AST- 511,000 gal., 2 AST - gas (not there in 1922, 1948), 2 UST - oil, 1 UST - lime

HL References 1: M.1948, M.1960, M.1963, M.1970, M.1980; FIP1901,vol2; FIP1912,vol2; FIP1922-259-1247; FIP1948-234-1247, Gloucester Roots -1991, Intera-1988b

HL References 2:

HL References 3:

NAICS	SIC
454310	511
324110	361
324190	361
419120	511
221210	492
412110	511

Company Name	Year of Operation
Ottawa Gas Ltd.	c. 1912-1960

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042040233	Y	Y

Activity ID: 11973 **Multiple PINS:** N

PIN Certainty: 1 **Previous Activity ID(s) :** 6855

Related PINS: 042040233

Name: REGIONAL MUNICIPALITY OF OTTAWA-CARLETON

Address: LEES AVENUE, OTTAWA

Facility Type: Other Petroleum and Coal Products Industries

Comments 1: Groundwater contaminated with coal tar. Generator #ON0303104 (waste generator)

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: PID1994

HL References 2:

HL References 3:

NAICS	SIC
221310	493
913910	835
324121	369

Company Name	Year of Operation
Regional Municipality of Ottawa-Carleton	c. 1994

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042040233	Y	Y

Activity ID: 3631 **Multiple PINS:** N

PIN Certainty: 1 **Previous Activity ID(s) :**

Related PINS: 042040233

Name: CITY OF OTTAWA

Address: 191 LEES AVENUE, OTTAWA

Facility Type: Other Utility Industries n.e.c.

Comments 1: LEES AVENUE TRANSIT STATION

Comments 2:

Generator Number: ON0303104

Storage Tanks:

HL References 1:

HL References 2:

HL References 3: 2003 PID

NAICS	SIC
221320	0

Company Name	Year of Operation
CITY OF OTTAWA	c. 2003

Historical Land Use Inventory
Area 10 Activity Numbers

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HLUI ID: __670IU3

AREA (Square Metres): 192814.843

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042040232	Y	Y

Activity ID: 14538 **Multiple PINS:** Y

PIN Certainty: 1 **Previous Activity ID(s) :** 7070

Related PINS: 152300000

Name: UNNAMED WASTE DISPOSAL SITE

Address: LEES AVENUE, OTTAWA

Facility Type: Other Utility Industries n.e.c.

Comments 1: Listed as a former landfill site, the years of operation and closure are unknown. Lot 6, Consession D

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: Intera-1988a

HL References 2:

HL References 3:

NAICS	SIC
221320	499
562920	499
562210	499
221330	499
562990	499

Company Name	Year of Operation
Unnamed Waste Disposal Site	c. 1988

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042040232	Y	Y

Activity ID: 740

Multiple PINS: Y

PIN Certainty: 2

Previous Activity ID(s) : 2748, 2750, 4253

Related PINS: 042040232

Name: D. & D. GARAGE REG'D

Address: 230 HAWTHORNE AVENUE, OTTAWA

Facility Type: Motor Vehicle Repair Shops

Comments 1:

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1900, M.1910, M.1920, M.1930, M.1940, M.1950, M.1960, M.1970, M.1980

HL References 2:

HL References 3:

NAICS	SIC
811121	635
811112	635
811119	635

Company Name	Year of Operation
Ben's Auto Service	c. 1950
Rick's Garage	c. 1960
D. & D. Garage Reg'd	c. 1960

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042040232	Y	Y

Activity ID: 9785 **Multiple PINS:** Y

PIN Certainty: 2 **Previous Activity ID(s) :** 3454

Related PINS: 041250012

Name: NEW YORK CENTRAL RAILWAY

Address: MANN AVENUE, OTTAWA

Facility Type: Machine Shop Industry

Comments 1: Round House and workshops, machine shop, oil house. Coal Pocket and Sand Blast east of Round house -800-900 feet

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1900, M.1910, M.1912, M.1920, M.1922, M.1930, M.1940, M.1949, M.1950, M.1954, M.1957; FIP1901-key, Vol1; FIP1912-158-1121,Vol2;

HL References 2: FIP1912-158-1122,Vol2; FIP1922-158-1122,Vol2,FIP1922-158-1121,Vol2; FIP1948-234-1121; FIP1956-234-2-1121,Vol2

HL References 3:

NAICS	SIC
332710	308
482113	453
482112	453
333619	308
336350	308
454310	511
488210	453
336310	308
412110	511
483116	453
419120	511
482114	453

Company Name	Year of Operation
New York Central Railway	c. 1910-1956
Canadian National Railway	c. 1912-1956

Historical Land Use Inventory

Area 11 Activity Numbers

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CITY OF OTTAWA

HLUI ID: __679GCN

AREA (Square Metres): 24022.668

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042040268	Y	Y

Activity ID: 2704 **Multiple PINS:** Y

PIN Certainty: 2 **Previous Activity ID(s) :** 1672

Related PINS: 042040242

Name: CITIES SERVICE OIL CO. LIMITED

Address: MANN AVENUE, OTTAWA

Facility Type: Railway Transport and Related Service Industries

Comments 1: Two (2) electric pump houses. FIP1948-located at 20 Mann ave.

Comments 2:

Generator Number:

Storage Tanks: Six (6) gasoline USTs, three (3) of which are noted as 15 000 Gallons each. Three (3) fuel oil tanks, an oil warehouse, and garage-FIP1949, FIP1956

HL References 1: M.1900, M.1910, M.1920, M.1930, M.1940, M.1950, M.1960, M.1970, M.1980; FIP1901-key, Vol1; FIP1912-158-1121,Vol2; FIP1922-158-1121,Vol2; FIP1948-234-1121; FIP1956-234-2-1121,Vol2

HL References 2:

HL References 3:

NAICS	SIC
419120	511
811310	551
415190	551
454310	511
493190	479
415110	551
412110	511
415120	551
493130	479
493120	479
482114	453
483116	453
482113	453
488210	453
482112	453
811111	551

Company Name	Year of Operation
Cities Service Oil Co. Ltd.	c. 1930-1960

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042040268	Y	Y

Activity ID: 9785 **Multiple PINS:** Y

PIN Certainty: 2 **Previous Activity ID(s) :** 3454

Related PINS: 041250012

Name: NEW YORK CENTRAL RAILWAY

Address: MANN AVENUE, OTTAWA

Facility Type: Machine Shop Industry

Comments 1: Round House and workshops, machine shop, oil house. Coal Pocket and Sand Blast east of Round house -800-900 feet

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1900, M.1910, M.1912, M.1920, M.1922, M.1930, M.1940, M.1949, M.1950, M.1954, M.1957; FIP1901-key, Vol1; FIP1912-158-1121,Vol2;

HL References 2: FIP1912-158-1122,Vol2; FIP1922-158-1122,Vol2,FIP1922-158-1121,Vol2; FIP1948-234-1121; FIP1956-234-2-1121,Vol2

HL References 3:

NAICS	SIC
332710	308
482113	453
482112	453
333619	308
336350	308
454310	511
488210	453
336310	308
412110	511
483116	453
419120	511
482114	453

Company Name	Year of Operation
New York Central Railway	c. 1910-1956
Canadian National Railway	c. 1912-1956

Historical Land Use Inventory
Area 12 Activity Numbers

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CITY OF OTTAWA

HLUI ID: __679EEX

AREA (Square Metres): 945.079

Report: RPTC_OT_DEV0122

Run On: 28 Aug 2020 at: 11:26:35

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070406	Y	N

Activity ID: 8664 **Multiple PINS:** N

PIN Certainty: 2 **Previous Activity ID(s) :** 6863

Related PINS: 042070406

Name: NATIONAL CAPITAL COMMISSION

Address: 2 ROBINSON AVENUE, OTTAWA

Facility Type: Motor Vehicles, Wholesale

Comments 1: Generator #ON0128804 (waste generator)

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: PID1994

HL References 2:

HL References 3:

NAICS	SIC
811310	551
447110	633
415120	551
415190	551
447190	633
415110	551
811199	633
811111	551

Company Name	Year of Operation
National Capital Commission	c. 1994

Historical Land Use Inventory
Area 13 Activity Numbers

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CITY OF OTTAWA

HLUI ID: __679G6I

AREA (Square Metres): 13246.110

Report: RPTC_OT_DEV0122

Run On: 28 Aug 2020 at: 11:28:27

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042040249	Y	N

Activity ID: 10589 **Multiple PINS:** N

PIN Certainty: 2 **Previous Activity ID(s) :** 5722

Related PINS: 042040249

Name: OTTAWA GAS CO.

Address: LEES AVENUE, OTTAWA

Facility Type: Other Petroleum and Coal Products Industries

Comments 1:

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1900, M.1910, M.1920, M.1930, M.1940, M.1950, Intera-1988b

HL References 2:

HL References 3:

NAICS	SIC
221210	492
324121	369

Company Name	Year of Operation
Ottawa Light, Heat and Power Co. Ltd.	
Ottawa Gas Co.	c. 1940

Historical Land Use Inventory
Area 14 Activity Numbers

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CITY OF OTTAWA

HLUI ID: __679GCV

AREA (Square Metres): 24654.022

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070134	Y	N

Activity ID: 8227 **Multiple PINS:** Y

PIN Certainty: 2 **Previous Activity ID(s) :** 5129

Related PINS: 042070134

Name: MANUFACTURERS PRODUCTS LIMITED

Address: HURDMAN ROAD, OTTAWA

Facility Type: Other Storage and Warehousing Industries

Comments 1:

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1955; FIP1901,vol2; FIP1912-163-1153,vol2; FIP1922-163-1153,vol2; FIP1948-234-1153,vol2; FIP1956-234-4-1153,vol2.

HL References 2:

HL References 3:

NAICS	SIC
444190	563
493120	479
493190	479
416310	563
416340	563
416320	563
444120	563
493130	479
444110	563

Company Name	Year of Operation
Manufacturers Products Ltd.	c. 1956

Historical Land Use Inventory
Area 15 Activity Numbers

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CITY OF OTTAWA

HLUI ID: __679ACY

AREA (Square Metres): 194.826

Report: RPTC_OT_DEV0122

Run On: 28 Aug 2020 at: 11:53:58

Study Year	PIN	Multi-NAIC	Multiple Activities
2005	042070629	Y	Y
1998	042070516	Y	Y

Activity ID: 12686 **Multiple PINS:** N

PIN Certainty: 2 **Previous Activity ID(s) :** 1110

Related PINS: 042070516

Name: SPHINX MANUFACTURING COMPANY

Address: HURDMAN ROAD, OTTAWA

Facility Type: Heating Equipment Industry

Comments 1:

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1900, M.1910, M.1920, M.1930, M.1940, M.1950

HL References 2:

HL References 3:

NAICS	SIC
333413	307
333310	307
333416	307

Company Name	Year of Operation
Sphinx Manufacturing Company	c. 1950

Study Year	PIN	Multi-NAIC	Multiple Activities
2005	042070629	Y	Y
1998	042070516	Y	Y

Activity ID: 13774 **Multiple PINS:** N

PIN Certainty: 2 **Previous Activity ID(s) :** 4333

Related PINS: 042070516

Name: UNNAMED GASOLINE SERVICE STATION

Address: 33 HURDMAN ROAD, OTTAWA

Facility Type: Gasoline Service Stations

Comments 1: FIP1912, FIP1922 - vacant lot Mights has no listing at all for this business

Comments 2:

Generator Number:

Storage Tanks: 2 UST - property NE corner of Hurdman & Lees - tanks right angle to street

HL References 1: M.1922, M.1948, M.1956, M.1957, M.1963; FIP1912-163-1154,vol2; FIP1922-163-1155,vol2; FIP1948-235-1155; FIP1956-235-2-1155

HL References 2:

HL References 3:

NAICS	SIC
811199	633
811119	635
447190	633
447110	633
811112	635
811121	635

Company Name	Year of Operation
Unnamed Gasoline Service Station	c. 1948-1956

Study Year	PIN	Multi-NAIC	Multiple Activities
2005	042070629	Y	Y
1998	042070516	Y	Y

Activity ID: 6608 **Multiple PINS:** N

PIN Certainty: 2 **Previous Activity ID(s) :** 1610

Related PINS: 042070516

Name: HARRY HAYLEY AND SONS LIMITED

Address: HURDMAN ROAD, OTTAWA

Facility Type: Concrete Products Industries

Comments 1: Concrete products, blocks, bricks, artificial stone, sewer pipe, manholes, valve chambers, catch basins. Artificial stone/concrete block, machine shop/lab

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1958, M.1961, M.1964, S.1958, S.1961, S.1964, S.1965; M.1922, M.1948, M.1956; FIP1912-163- 1155,vol2; FIP1922-163-1155,vol2; FIP1948-235-1155; FIP1956-235-2-1155

HL References 2:

HL References 3:

NAICS	SIC
332710	308
336350	308
336310	308
327990	354
327330	354
327390	354
333619	308

Company Name	Year of Operation
Harry Hayley and Sons Ltd	c. 1948-1965

Study Year	PIN	Multi-NAIC	Multiple Activities
2005	042070629	Y	Y
1998	042070516	Y	Y

Activity ID: 9034 **Multiple PINS:** N

PIN Certainty: 2 **Previous Activity ID(s) :** 4335

Related PINS: 042070516

Name: MCCAULIFFE & DAVIS LUMBER CO.

Address: HURDMAN ROAD, OTTAWA

Facility Type: Lumber and Building Materials, Wholesale

Comments 1: FIP1912, FIP1922 - planing mill - large exterior cinder pile in rear of building (Harry Hayley & Sons Ltd., 1948 - 1956, artificial stone & concrete blocks)

Comments 2: - triangulated property Lees on the west & Rideau River on east - Shavings Carrier from Mill to Rideau River.

Generator Number:

Storage Tanks:

HL References 1: M.1900, M.1910, M.1920, M.1922, M.1930, M.1940, M.1948, M.1950, M.1956; FIP1901-Key Plan,vol2; FIP1912-163-1155,vol2; FIP1922-163-1155,l vol2; FIP1948-235-1155; FIP1956-235-2-1155

HL References 2:

HL References 3:

NAICS	SIC
416310	563
444120	563
416340	563
321111	251
321920	251
416320	563
321112	251
444190	563
321919	251
444110	563

Company Name	Year of Operation
McCauliffe & Davis Lumber Co.	c. 1910-1922

Study Year	PIN	Multi-NAIC	Multiple Activities
2005	042070629	Y	Y
1998	042070516	Y	Y

Activity ID: 9070 **Multiple PINS:** Y

PIN Certainty: 1 **Previous Activity ID(s) :**

Related PINS: 042070629

Name: MUN-WORKS

Address: 29 HURDMAN ROAD,

Facility Type: General Administrative Services

Comments 1:

Comments 2:

Generator Number:

Storage Tanks:

HL References 1:

HL References 2:

HL References 3: 2001 Employment Survey

NAICS	SIC
913910	0

Company Name	Year of Operation
MUN-WORKS	c. 2001

Study Year	PIN	Multi-NAIC	Multiple Activities
2005	042070629	Y	Y
1998	042070516	Y	Y

Activity ID: 9931 **Multiple PINS:** Y

PIN Certainty: 1 **Previous Activity ID(s) :**

Related PINS: 042070629

Name: OTTAWA, CORPORATION OF THE CITY OF
Address: 29 HURDMAN ROAD, OTTAWA
Facility Type: General Administrative Services
Comments 1:
Comments 2:
Generator Number: ON0136222
Storage Tanks:
HL References 1:
HL References 2:
HL References 3: 2003 PID

NAICS	SIC
811112	0
913910	0
811111	0
811119	0
811121	0
811199	0

Company Name	Year of Operation
OTTAWA, CORPORATION OF THE CITY OF	c. 2003
OTTAWA, CORPORATION OF THE CITY OF	c. 2005

CITY OF OTTAWA

HLUI ID: __679BJP

AREA (Square Metres): 16829.531

Report: RPTC_OT_DEV0122

Run On: 28 Aug 2020 at: 11:30:51

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070516	Y	Y
2005	042070629	N	N

Activity ID: 12686 **Multiple PINS:** N

PIN Certainty: 2 **Previous Activity ID(s) :** 1110

Related PINS: 042070516

Name: SPHINX MANUFACTURING COMPANY

Address: HURDMAN ROAD, OTTAWA

Facility Type: Heating Equipment Industry

Comments 1:

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1900, M.1910, M.1920, M.1930, M.1940, M.1950

HL References 2:

HL References 3:

NAICS	SIC
333413	307
333310	307
333416	307

Company Name	Year of Operation
Sphinx Manufacturing Company	c. 1950

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070516	Y	Y
2005	042070629	N	N

Activity ID: 13774 **Multiple PINS:** N

PIN Certainty: 2 **Previous Activity ID(s) :** 4333

Related PINS: 042070516

Name: UNNAMED GASOLINE SERVICE STATION

Address: 33 HURDMAN ROAD, OTTAWA

Facility Type: Gasoline Service Stations

Comments 1: FIP1912, FIP1922 - vacant lot Mights has no listing at all for this business

Comments 2:

Generator Number:

Storage Tanks: 2 UST - property NE corner of Hurdman & Lees - tanks right angle to street

HL References 1: M.1922, M.1948, M.1956, M.1957, M.1963; FIP1912-163-1154,vol2; FIP1922-163-1155,vol2; FIP1948-235-1155; FIP1956-235-2-1155

HL References 2:

HL References 3:

NAICS	SIC
811199	633
811119	635
447190	633
447110	633
811112	635
811121	635

Company Name	Year of Operation
Unnamed Gasoline Service Station	c. 1948-1956

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070516	Y	Y
2005	042070629	N	N

Activity ID: 6608 **Multiple PINS:** N

PIN Certainty: 2 **Previous Activity ID(s) :** 1610

Related PINS: 042070516

Name: HARRY HAYLEY AND SONS LIMITED

Address: HURDMAN ROAD, OTTAWA

Facility Type: Concrete Products Industries

Comments 1: Concrete products, blocks, bricks, artificial stone, sewer pipe, manholes, valve chambers, catch basins. Artificial stone/concrete block, machine shop/lab

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1958, M.1961, M.1964, S.1958, S.1961, S.1964, S.1965; M.1922, M.1948, M.1956; FIP1912-163- 1155,vol2; FIP1922-163-1155,vol2; FIP1948-235-1155; FIP1956-235-2-1155

HL References 2:

HL References 3:

NAICS	SIC
332710	308
336350	308
336310	308
327990	354
327330	354
327390	354
333619	308

Company Name	Year of Operation
Harry Hayley and Sons Ltd	c. 1948-1965

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070516	Y	Y
2005	042070629	N	N

Activity ID: 9034 **Multiple PINS:** N

PIN Certainty: 2 **Previous Activity ID(s) :** 4335

Related PINS: 042070516

Name: MCCAULIFFE & DAVIS LUMBER CO.

Address: HURDMAN ROAD, OTTAWA

Facility Type: Lumber and Building Materials, Wholesale

Comments 1: FIP1912, FIP1922 - planing mill - large exterior cinder pile in rear of building (Harry Hayley & Sons Ltd., 1948 - 1956, artificial stone & concrete blocks)

Comments 2: - triangulated property Lees on the west & Rideau River on east - Shavings Carrier from Mill to Rideau River.

Generator Number:

Storage Tanks:

HL References 1: M.1900, M.1910, M.1920, M.1922, M.1930, M.1940, M.1948, M.1950, M.1956; FIP1901-Key Plan,vol2; FIP1912-163-1155,vol2; FIP1922-163-1155,l vol2; FIP1948-235-1155; FIP1956-235-2-1155

HL References 2:

HL References 3:

NAICS	SIC
416310	563
444120	563
416340	563
321111	251
321920	251
416320	563
321112	251
444190	563
321919	251
444110	563

Company Name	Year of Operation
McCauliffe & Davis Lumber Co.	c. 1910-1922

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070516	Y	Y
2005	042070629	N	N

Activity ID: 9070 **Multiple PINS:** Y

PIN Certainty: 1 **Previous Activity ID(s) :**

Related PINS: 042070629

Name: MUN-WORKS

Address: 29 HURDMAN ROAD,

Facility Type: General Administrative Services

Comments 1:

Comments 2:

Generator Number:

Storage Tanks:

HL References 1:

HL References 2:

HL References 3: 2001 Employment Survey

NAICS	SIC
913910	0

Company Name	Year of Operation
MUN-WORKS	c. 2001

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070516	Y	Y
2005	042070629	N	N

Activity ID: 9931 **Multiple PINS:** Y

PIN Certainty: 1 **Previous Activity ID(s) :**

Related PINS: 042070629

Name: OTTAWA, CORPORATION OF THE CITY OF

Address: 29 HURDMAN ROAD, OTTAWA

Facility Type: General Administrative Services

Comments 1:

Comments 2:

Generator Number: ON0136222

Storage Tanks:

HL References 1:

HL References 2:

HL References 3: 2003 PID

NAICS	SIC
811112	0
913910	0
811111	0
811119	0
811121	0
811199	0

Company Name	Year of Operation
OTTAWA, CORPORATION OF THE CITY OF	c. 2003
OTTAWA, CORPORATION OF THE CITY OF	c. 2005

Historical Land Use Inventory
Area 16 Activity Numbers

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Ville d'Ottawa
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CITY OF OTTAWA

HLUI ID: __679EGA

AREA (Square Metres): 1046.854

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070351	Y	Y

Activity ID: 11669 **Multiple PINS:** N

PIN Certainty: 2 **Previous Activity ID(s) :** 5572

Related PINS: 042070351

Name: RIDEAU SUPPLY CO.

Address: HURDMAN ROAD, OTTAWA

Facility Type: Lumber and Building Materials, Wholesale

Comments 1:

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1900, M.1910, M.1920, M.1930, M.1940, M.1950

HL References 2:

HL References 3:

NAICS	SIC
444110	563
321112	251
416320	563
321111	251
321920	251
416340	563
444120	563
416310	563
321919	251
444190	563

Company Name	Year of Operation
Rideau Supply Co.	c. 1930

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070351	Y	Y

Activity ID: 7030 **Multiple PINS:** N

PIN Certainty: 2 **Previous Activity ID(s) :** 5082

Related PINS: 042070351

Name: IDEAL ROOFING CO.

Address: 3 HURDMAN ROAD, OTTAWA

Facility Type: Exterior Close In Work

Comments 1: M. 1948 - also lists as sheet metal roofers

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1900, M.1910, M.1920, M.1930, M.1940, M.1950; FIP1901,vol2; FIP1912-163- 1153,vol2; FIP1922-163-1153,vol2; FIP1948-234-1153

HL References 2:

HL References 3:

NAICS	SIC
238140	423
238310	423
238220	424
238150	423
238160	423

Company Name	Year of Operation
Ideal Roofing Co.	c. 1940-1956

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070351	Y	Y

Activity ID: 8227 **Multiple PINS:** Y

PIN Certainty: 2 **Previous Activity ID(s) :** 5129

Related PINS: 042070134

Name: MANUFACTURERS PRODUCTS LIMITED

Address: HURDMAN ROAD, OTTAWA

Facility Type: Other Storage and Warehousing Industries

Comments 1:

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1955; FIP1901,vol2; FIP1912-163-1153,vol2; FIP1922-163-1153,vol2; FIP1948-234-1153,vol2; FIP1956-234-4-1153,vol2.

HL References 2:

HL References 3:

NAICS	SIC
444190	563
493120	479
493190	479
416310	563
416340	563
416320	563
444120	563
493130	479
444110	563

Company Name	Year of Operation
Manufacturers Products Ltd.	c. 1956

Historical Land Use Inventory
Area 17 Activity Numbers

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Planning, Infrastructure and Economic Development Department

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CITY OF OTTAWA

HLUI ID: __679E9P

AREA (Square Metres): 762.061

Report: RPTC_OT_DEV0122

Run On: 28 Aug 2020 at: 11:35:56

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070388	Y	Y

Activity ID: 6607 **Multiple PINS:** N

PIN Certainty: 2 **Previous Activity ID(s) :** 4331

Related PINS: 042070388

Name: HARRY HAYLEY & SONS

Address: LEES AVENUE, OTTAWA

Facility Type: Motor Vehicles, Wholesale

Comments 1: FIP1912, FIP1922 - vacant lot M. 1948 - NE corner of Lees & Hurdman Rd., shows front door on Hurdman & side door on Lees

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1900, M.1910, M.1920, M.1922, M.1930, M.1940, M.1948, M.1950, M.1956, M.1960, M.1970, M.1980; FIP1922-163-1154,vol2; FIP1948-235-1154; FIP1956-235-2-1154

HL References 2:

HL References 3:

NAICS	SIC
493120	479
415190	551
811121	635
811119	635
493190	479
811310	551
493130	479
811112	635
415110	551
415120	551
811111	551

Company Name	Year of Operation
Harry Hayley & Sons	c. 1948-1960

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070388	Y	Y

Activity ID: 7489 **Multiple PINS:** N

PIN Certainty: 1 **Previous Activity ID(s) :** 2247

Related PINS: 042070388

Name: KELLY'S AUTO BODY (1984) LIMITED

Address: 23 HURDMAN ROAD, OTTAWA

Facility Type: Motor Vehicle Repair Shops

Comments 1:

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1960, M.1970, M.1980; SC98

HL References 2:

HL References 3: 2005 Property Assessment

NAICS	SIC
811112	635
811121	0
811112	0
811121	635
811119	635
811111	0
811119	0
811199	0

Company Name	Year of Operation
KELLY'S AUTO BODY (1984) LIMITED	c. 2001
Kelley's Auto Body (1984) Ltd.	c. 1980-1998
KELLY'S AUTO BODY (1984) LIMITED	c. 2005

Historical Land Use Inventory
Area 18 Activity Numbers

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HLUI ID: __679FUI

AREA (Square Metres): 1751.420

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070375	Y	Y

Activity ID: 6405 **Multiple PINS:** Y

PIN Certainty: 2 **Previous Activity ID(s) :** 1248

Related PINS: 042070375

Name: HARE W. A

Address: 18 ROBINSON AVENUE, OTTAWA

Facility Type: Machine Shop Industry

Comments 1: M. 1922 - lists as Ottawa Suburban Roads Commission - repair shop

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1900, M.1910, M.1920, M.1922, M.1930, M.1940, M.1948, M.1950, M.1956; FIP1912-163- 1154,vol2; FIP1922-163-1154,vol2; FIP1948-235-1154; FIP1956-235-2-1154

HL References 2:

HL References 3:

NAICS	SIC
493190	479
336310	308
493130	479
332710	308
336350	308
333619	308
493120	479

Company Name	Year of Operation
Hare W. A	c. 1930-1956

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070375	Y	Y

Activity ID: 9977 **Multiple PINS:** N

PIN Certainty: 1 **Previous Activity ID(s) :** 4330

Related PINS: 042070375

Name: OTTAWA SUBURBAN ROADS COMMISSION

Address: 18 ROBINSON AVENUE, OTTAWA

Facility Type: Machine Shop Industry

Comments 1: M. 1956 - also lists William A. Hare (machine shop)

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1922, M.1948, M.1956; FIP1912-163-1154,vol2; FIP1922-163-1154,vol2; FIP1948-235-1154; FIP1956-235-2-1154

HL References 2:

HL References 3:

NAICS	SIC
493190	479
913910	835
336350	308
336310	308
493130	479
333619	308
332710	308
238910	412
493120	479

Company Name	Year of Operation
Ottawa Suburban Roads Commission	c. 1922

Historical Land Use Inventory
Area 19 Activity Numbers

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CITY OF OTTAWA

HLUI ID: __679DVL

AREA (Square Metres): 371.085

Report: RPTC_OT_DEV0122

Run On: 28 Aug 2020 at: 11:38:59

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070376	Y	N

Activity ID: 6405 **Multiple PINS:** Y

PIN Certainty: 2 **Previous Activity ID(s) :** 1248

Related PINS: 042070375

Name: HARE W. A

Address: 18 ROBINSON AVENUE, OTTAWA

Facility Type: Machine Shop Industry

Comments 1: M. 1922 - lists as Ottawa Suburban Roads Commission - repair shop

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1900, M.1910, M.1920, M.1922, M.1930, M.1940, M.1948, M.1950, M.1956; FIP1912-163- 1154,vol2; FIP1922-163-1154,vol2; FIP1948-235-1154; FIP1956-235-2-1154

HL References 2:

HL References 3:

NAICS	SIC
493190	479
336310	308
493130	479
332710	308
336350	308
333619	308
493120	479

Company Name	Year of Operation
Hare W. A	c. 1930-1956

Historical Land Use Inventory
Area 20 Activity Numbers

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CITY OF OTTAWA

HLUI ID: __679CX8

AREA (Square Metres): 208.736

Report: RPTC_OT_DEV0122

Run On: 28 Aug 2020 at: 11:52:13

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070365	Y	N

Activity ID: 5959 **Multiple PINS:** Y

PIN Certainty: 2 **Previous Activity ID(s) :** 1242

Related PINS: 152990000

Name: FOURNIER VAN AND STORAGE LIMITED

Address: ROBINSON AVENUE, OTTAWA

Facility Type: Service Industries Incidental to Air Transport

Comments 1:

Comments 2: 37 to 39

Generator Number:

Storage Tanks:

HL References 1: M.1900, M.1910, M.1920, M.1930, M.1940, M.1950

HL References 2:

HL References 3:

NAICS	SIC
493120	479
811119	635
488190	452
532410	452
811112	635
488111	452
493190	479
488119	452
493130	479
561722	452
811121	635

Company Name	Year of Operation
Fournier Van and Storage Ltd.	c. 1940-1950
Fournier L.G.	c. 1930

Historical Land Use Inventory
Area 21 Activity Numbers

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CITY OF OTTAWA

HLUI ID: __670HCJ

AREA (Square Metres): 3965.699

Report: RPTC_OT_DEV0122

Run On: 28 Aug 2020 at: 11:57:49

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070527	Y	N

Activity ID: 10470 **Multiple PINS:** Y

PIN Certainty: 2 **Previous Activity ID(s) :** 4332

Related PINS: 042070522

Name: OTTAWA BEEF CO. LIMITED

Address: 231 LEES AVENUE, OTTAWA

Facility Type: Meat and Poultry Products Industries

Comments 1: FIP1912 - 61 Lees, Slaughter House M. 1922 - lists as residence FIP1948, FIP1956 - building doubles in size - bounded by Rideau River to east

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1922, M.1948, M.1956, M.1960, M.1970, M.1980; S.1970/71; FIP1912-163-1154,vol2; FIP1922-163-1154,vol2; FIP1948-235-1154; FIP1956-235-2-1154

HL References 2:

HL References 3:

NAICS	SIC
311614	101
311611	101
311615	101

Company Name	Year of Operation
Ottawa Beef Co. Ltd.	c. 1922-1980

CITY OF OTTAWA

HLUI ID: __679FP8

AREA (Square Metres): 1462.651

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070554	Y	N

Activity ID: 10470 **Multiple PINS:** Y

PIN Certainty: 2 **Previous Activity ID(s) :** 4332

Related PINS: 042070522

Name: OTTAWA BEEF CO. LIMITED

Address: 231 LEES AVENUE, OTTAWA

Facility Type: Meat and Poultry Products Industries

Comments 1: FIP1912 - 61 Lees, Slaughter House M. 1922 - lists as residence FIP1948, FIP1956 - building doubles in size - bounded by Rideau River to east

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1922, M.1948, M.1956, M.1960, M.1970, M.1980; S.1970/71; FIP1912-163-1154,vol2; FIP1922-163-1154,vol2; FIP1948-235-1154; FIP1956-235-2-1154

HL References 2:

HL References 3:

NAICS	SIC
311614	101
311611	101
311615	101

Company Name	Year of Operation
Ottawa Beef Co. Ltd.	c. 1922-1980

CITY OF OTTAWA

HLUI ID: __679CKZ

AREA (Square Metres): 110.749

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070552	Y	N

Activity ID: 10470 **Multiple PINS:** Y

PIN Certainty: 2 **Previous Activity ID(s) :** 4332

Related PINS: 042070522

Name: OTTAWA BEEF CO. LIMITED

Address: 231 LEES AVENUE, OTTAWA

Facility Type: Meat and Poultry Products Industries

Comments 1: FIP1912 - 61 Lees, Slaughter House M. 1922 - lists as residence FIP1948, FIP1956 - building doubles in size - bounded by Rideau River to east

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1922, M.1948, M.1956, M.1960, M.1970, M.1980; S.1970/71; FIP1912-163-1154,vol2; FIP1922-163-1154,vol2; FIP1948-235-1154; FIP1956-235-2-1154

HL References 2:

HL References 3:

NAICS	SIC
311614	101
311611	101
311615	101

Company Name	Year of Operation
Ottawa Beef Co. Ltd.	c. 1922-1980

CITY OF OTTAWA

HLUI ID: __679CP0

AREA (Square Metres): 153.138

Report: RPTC_OT_DEV0122

Run On: 28 Aug 2020 at: 12:02:08

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070551	Y	N

Activity ID: 10470 **Multiple PINS:** Y

PIN Certainty: 2 **Previous Activity ID(s) :** 4332

Related PINS: 042070522

Name: OTTAWA BEEF CO. LIMITED

Address: 231 LEES AVENUE, OTTAWA

Facility Type: Meat and Poultry Products Industries

Comments 1: FIP1912 - 61 Lees, Slaughter House M. 1922 - lists as residence FIP1948, FIP1956 - building doubles in size - bounded by Rideau River to east

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1922, M.1948, M.1956, M.1960, M.1970, M.1980; S.1970/71; FIP1912-163-1154,vol2; FIP1922-163-1154,vol2; FIP1948-235-1154; FIP1956-235-2-1154

HL References 2:

HL References 3:

NAICS	SIC
311614	101
311611	101
311615	101

Company Name	Year of Operation
Ottawa Beef Co. Ltd.	c. 1922-1980

CITY OF OTTAWA

HLUI ID: __679CR6

AREA (Square Metres): 168.493

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070544	Y	N

Activity ID: 10470 **Multiple PINS:** Y

PIN Certainty: 2 **Previous Activity ID(s) :** 4332

Related PINS: 042070522

Name: OTTAWA BEEF CO. LIMITED

Address: 231 LEES AVENUE, OTTAWA

Facility Type: Meat and Poultry Products Industries

Comments 1: FIP1912 - 61 Lees, Slaughter House M. 1922 - lists as residence FIP1948, FIP1956 - building doubles in size - bounded by Rideau River to east

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1922, M.1948, M.1956, M.1960, M.1970, M.1980; S.1970/71; FIP1912-163-1154,vol2; FIP1922-163-1154,vol2; FIP1948-235-1154; FIP1956-235-2-1154

HL References 2:

HL References 3:

NAICS	SIC
311614	101
311611	101
311615	101

Company Name	Year of Operation
Ottawa Beef Co. Ltd.	c. 1922-1980

CITY OF OTTAWA

HLUI ID: __679CPX

AREA (Square Metres): 150.218

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070541	Y	N

Activity ID: 10470 **Multiple PINS:** Y

PIN Certainty: 2 **Previous Activity ID(s) :** 4332

Related PINS: 042070522

Name: OTTAWA BEEF CO. LIMITED

Address: 231 LEES AVENUE, OTTAWA

Facility Type: Meat and Poultry Products Industries

Comments 1: FIP1912 - 61 Lees, Slaughter House M. 1922 - lists as residence FIP1948, FIP1956 - building doubles in size - bounded by Rideau River to east

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1922, M.1948, M.1956, M.1960, M.1970, M.1980; S.1970/71; FIP1912-163-1154,vol2; FIP1922-163-1154,vol2; FIP1948-235-1154; FIP1956-235-2-1154

HL References 2:

HL References 3:

NAICS	SIC
311614	101
311611	101
311615	101

Company Name	Year of Operation
Ottawa Beef Co. Ltd.	c. 1922-1980

CITY OF OTTAWA

HLUI ID: __670H0Y

AREA (Square Metres): 2651.180

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070524	Y	N

Activity ID: 10470 **Multiple PINS:** Y

PIN Certainty: 2 **Previous Activity ID(s) :** 4332

Related PINS: 042070522

Name: OTTAWA BEEF CO. LIMITED

Address: 231 LEES AVENUE, OTTAWA

Facility Type: Meat and Poultry Products Industries

Comments 1: FIP1912 - 61 Lees, Slaughter House M. 1922 - lists as residence FIP1948, FIP1956 - building doubles in size - bounded by Rideau River to east

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: M.1922, M.1948, M.1956, M.1960, M.1970, M.1980; S.1970/71; FIP1912-163-1154,vol2; FIP1922-163-1154,vol2; FIP1948-235-1154; FIP1956-235-2-1154

HL References 2:

HL References 3:

NAICS	SIC
311614	101
311611	101
311615	101

Company Name	Year of Operation
Ottawa Beef Co. Ltd.	c. 1922-1980

Historical Land Use Inventory
Area 22 Activity Numbers

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HLUI ID: __679FV7

AREA (Square Metres): 1842.457

Report: RPTC_OT_DEV0122

Run On: 28 Aug 2020 at: 12:06:14

Study Year	PIN	Multi-NAIC	Multiple Activities
1998	042070369	Y	N

Activity ID: 5803 **Multiple PINS:** N

PIN Certainty: 1 **Previous Activity ID(s) :** 5780

Related PINS: 042070369

Name: GARY'S CUSTOM CYCLE

Address: 36 ROBINSON AVENUE, OTTAWA

Facility Type: Motor Vehicle Repair Shops

Comments 1:

Comments 2:

Generator Number:

Storage Tanks:

HL References 1: SC98

HL References 2:

HL References 3: 2001 Employment Survey

NAICS	SIC
811119	635
811119	0
811490	632
811112	635
811121	635

Company Name	Year of Operation
GARY'S CUSTOM CYCLE	c. 2001
Gary's Custom Cycle	c. 1998

345 Carlingview Drive
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Tel: (416) 734-3383
Fax: (416) 231-6183
Email: publicinformationservices@tssa.org

06 August 2020

Jamieson-Lee Scott
CIMA+
240 Catherine Street
Ottawa, ON K2P 2G8

Subject: **200 Lees Avenue, Ottawa, Ontario**
Your File No.: **A001049-111**
SR No.: **2880936**

Dear Madam/Sir:

We are in receipt of your correspondence wherein you requested information regarding the above noted subject.

A search of our records did not produce any Fuels Safety or Boiler/Pressure Vessel documents.

TSSA does not make any representations or warranties with respect to the accuracy or completeness of any records released. The requestor assumes all risk in using or relying on the information provided.

Should you have any questions, please contact Public Information at publicinformationservices@tssa.org.

Yours truly,

C. Hill

Connie Hill
Public Information Agent

ENVIRONMENTAL RISK INFORMATION SERVICES

DATABASE REPORT

Project Property:	*UOttawa Environmental Consultation* *200 Lees Avenue* *Ottawa ON K1S*
Project No:	*A001049-111*
Report Type:	*Quote - Custom-Build Your Own Report*
Order No:	*20200624071*
Requested by:	*CIMA+*
Date Completed:	*July 2, 2020*

Environmental Risk Information Services
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Table of Contents

Executive Summary

Property Information:

Project Property:	*UOttawa Environmental Consultation* *200 Lees Avenue Ottawa ON K1S*
Project No:	*A001049-111*

Coordinates:

Latitude:	*45.4157363*
Longitude:	*-75.6685054*
UTM Northing:	*5,029,369.54*
UTM Easting:	*447,639.53*
UTM Zone:	*18T*

Elevation: *205 FT*
62.56 M

Order Information:

Order No:	*20200624071*
Date Requested:	*June 24, 2020*
Requested by:	*CIMA+*
Report Type:	*Quote - Custom-Build Your Own Report*

Historical/Products:

Executive Summary: Report Summary

Database	Name	Searched	Project Property	Within 0.25 km	Total
AAGR	Abandoned Aggregate Inventory	Y	0	0	0
AGR	Aggregate Inventory	Y	0	0	0
AMIS	Abandoned Mine Information System	Y	0	0	0
ANDR	Anderson's Waste Disposal Sites	Y	0	1	1
AST	Aboveground Storage Tanks	Y	0	0	0
AUWR	Automobile Wrecking & Supplies	Y	0	0	0
BORE	Borehole	Y	0	18	18
CA	Certificates of Approval	Y	0	11	11
CDRY	Dry Cleaning Facilities	Y	0	0	0
CFOT	Commercial Fuel Oil Tanks	Y	0	0	0
CHEM	Chemical Register	Y	0	0	0
CNG	Compressed Natural Gas Stations	Y	0	0	0
COAL	Inventory of Coal Gasification Plants and Coal Tar Sites	Y	0	2	2
CONV	Compliance and Convictions	Y	0	0	0
CPU	Certificates of Property Use	Y	0	0	0
DRL	Drill Hole Database	Y	0	0	0
EASR	Environmental Activity and Sector Registry	Y	0	0	0
EBR	Environmental Registry	Y	0	1	1
ECA	Environmental Compliance Approval	Y	0	7	7
EEM	Environmental Effects Monitoring	Y	0	0	0
EHS	ERIS Historical Searches	Y	1	12	13
EIIS	Environmental Issues Inventory System	Y	0	0	0
EMHE	Emergency Management Historical Event	Y	0	0	0
EPAR	Environmental Penalty Annual Report	Y	0	0	0
EXP	List of Expired Fuels Safety Facilities	Y	0	0	0
FCON	Federal Convictions	Y	0	0	0
FCS	Contaminated Sites on Federal Land	Y	0	0	0
FOFT	Fisheries & Oceans Fuel Tanks	Y	0	0	0
FRST	Federal Identification Registry for Storage Tank Systems (FIRSTS)	Y	0	0	0
FST	Fuel Storage Tank	Y	0	0	0
FSTH	Fuel Storage Tank - Historic	Y	0	1	1
GEN	Ontario Regulation 347 Waste Generators Summary	Y	1	31	32
GHG	Greenhouse Gas Emissions from Large Facilities	Y	0	0	0
HINC	TSSA Historic Incidents	Y	0	0	0
IAFT	Indian & Northern Affairs Fuel Tanks	Y	0	0	0
INC	Fuel Oil Spills and Leaks	Y	0	0	0

Database	Name	Searched	Project Property	Within 0.25 km	Total
LIMO	Landfill Inventory Management Ontario	Y	0	0	0
MINE	Canadian Mine Locations	Y	0	0	0
MNR	Mineral Occurrences	Y	0	0	0
NATE	National Analysis of Trends in Emergencies System (NATES)	Y	0	0	0
NCPL	Non-Compliance Reports	Y	0	0	0
NDFT	National Defense & Canadian Forces Fuel Tanks	Y	0	0	0
NDSP	National Defense & Canadian Forces Spills	Y	0	0	0
NDWD	National Defence & Canadian Forces Waste Disposal Sites	Y	0	0	0
NEBI	National Energy Board Pipeline Incidents	Y	0	0	0
NEBP	National Energy Board Wells	Y	0	0	0
NEES	National Environmental Emergencies System (NEES)	Y	0	0	0
NPCB	National PCB Inventory	Y	0	0	0
NPRI	National Pollutant Release Inventory	Y	0	0	0
OGWE	Oil and Gas Wells	Y	0	0	0
OOGW	Ontario Oil and Gas Wells	Y	0	0	0
OPCB	Inventory of PCB Storage Sites	Y	0	0	0
ORD	Orders	Y	0	0	0
PAP	Canadian Pulp and Paper	Y	0	0	0
PCFT	Parks Canada Fuel Storage Tanks	Y	0	0	0
PES	Pesticide Register	Y	0	0	0
PINC	Pipeline Incidents	Y	0	0	0
PRT	Private and Retail Fuel Storage Tanks	Y	0	1	1
PTTW	Permit to Take Water	Y	0	0	0
REC	Ontario Regulation 347 Waste Receivers Summary	Y	0	0	0
RSC	Record of Site Condition	Y	0	1	1
RST	Retail Fuel Storage Tanks	Y	0	0	0
SCT	Scott's Manufacturing Directory	Y	0	0	0
SPL	Ontario Spills	Y	0	17	17
SRDS	Wastewater Discharger Registration Database	Y	0	0	0
TANK	Anderson's Storage Tanks	Y	0	0	0
TCFT	Transport Canada Fuel Storage Tanks	Y	0	0	0
VAR	Variances for Abandonment of Underground Storage Tanks	Y	0	0	0
WDS	Waste Disposal Sites - MOE CA Inventory	Y	0	0	0
WDSH	Waste Disposal Sites - MOE 1991 Historical Approval Inventory	Y	0	1	1
WWIS	Water Well Information System	Y	0	30	30
	Total:	2	134	136	

Executive Summary: Site Report Summary - Project Property

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev diff (m)	Page Number
4	GEN	MTO	200 Lees Ave. Ottawa ON K1N 6N5	NW/56.1	1.01	35
13	EHS		200 Lees Ave Ottawa ON K1N 6N5	N/86.7	0.62	35

Executive Summary: Site Report Summary - Surrounding Properties

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
1	WWIS		Ottawa ON **Well ID:** 7191035	SE/40.4	-0.63	35
2	WWIS		ON **Well ID:** 7188804	NNW/40.5	0.28	38
3	WWIS		Ottawa ON **Well ID:** 7191042	SE/48.1	-1.44	39
5	BORE		ON	SE/56.7	-1.69	42
6	WWIS		Ottawa ON **Well ID:** 7191062	ENE/58.8	-0.65	43
7	WWIS		OTTAWA ON **Well ID:** 7211119	ENE/63.8	-0.38	46
8	WWIS		Ottawa ON **Well ID:** 7191060	NE/66.6	0.34	48
9	BORE		ON	SW/68.0	-1.69	51
10	WWIS		Ottawa ON **Well ID:** 7191092	NNW/77.2	1.28	53
11	WWIS		Ottawa ON **Well ID:** 7191061	SSE/81.5	-2.72	56
12	WWIS		ON **Well ID:** 7251493	NE/82.0	0.42	59
14	EHS		190 Lees Avenue Ottawa ON K1S 5L5	SW/94.4	-1.99	60

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
15	SPL	UNKNOWN	AT 190 LEE'S AVENUE OTTAWA CITY ON K1S 5L5	SW/94.4	-1.99	60
15	EHS		190 Lees Avenue Ottawa ON K1S 5L5	SW/94.4	-1.99	61
15	EHS		190 Lees Avenue Ottawa ON K1S 5L5	SW/94.4	-1.99	61
15	EHS		190 Lees Avenue Ottawa ON K1S 5L5	SW/94.4	-1.99	61
15	EHS		190 Lees Avenue Ottawa ON K1S 5L5	SW/94.4	-1.99	61
16	WDSH		Lees Ave. (Algonquin College) OTTAWA ON	SE/95.0	-2.95	62
17	WWIS		Ottawa ON ***Well ID:*** 7190979	NNE/97.4	1.26	62
18	CA	REGIONAL MUNICIPAITY OF OTTAWA CARLETON	195 LEES AVE. OTTAWA CITY ON	NNE/104.4	1.26	65
18	CA	City of Ottawa	195 Lees Avenue Ottawa ON	NNE/104.4	1.26	65
19	ECA	City of Ottawa	195 Lees Avenue Ottawa ON K1P 1J1	NNE/104.4	1.26	65
20	EHS		190 Lees Ave Ottawa ON K1S5L5	SW/104.4	-1.99	66
21	BORE		ON	N/107.2	1.34	66
22	BORE		ON	N/107.6	1.46	67

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
23	ANDR	Algonquin College Dump	Ottawa ON K1S 0C5	ESE/109.0	-2.69	68
24	BORE		ON	SSW/111.1	-2.61	69
25	COAL	Ottawa Lees Avenue Gas Works	175 Lees Avenue Ottawa ON	W/113.5	0.26	71
26	WWIS		ON ***Well ID:*** 7231849	N/113.6	1.46	72
27	WWIS		Ottawa ON ***Well ID:*** 7191091	NNW/125.2	2.34	73
28	BORE		ON	N/127.2	1.31	75
29	BORE		ON	N/128.4	2.40	77
30	SPL		179 Lees Avenue Ottawa ON	W/129.1	0.26	77
31	PRT	CAPITAL BEEF ATTN:FRANK VELLENERUVE	229 LEES AV OTTAWA ON K1N 8P1	N/137.7	1.31	78
31	FSTH	CAPITAL BEEF ATTN:FRANK VELLENERUVE	229 LEES AVE OTTAWA ON K1N 8P1	N/137.7	1.31	78
32	WWIS		Ottawa ON ***Well ID:*** 7191094	WNW/139.2	1.31	78
33	CA	ALGONQUIN COLLEGE OF APPLIED ARTS & TECH	LEES AVE/HIGHWAY 417 OTTAWA CITY ON	N/141.7	1.31	82
34	WWIS		Ottawa ON	WNW/146.6	1.62	82

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
			Well ID: 7191096			
35	BORE		ON	N/146.9	1.31	85
36	EHS		180 Lees Ave Ottawa ON K1S 5J6	WSW/151.6	-0.69	86
37	WWIS		Ottawa ON ***Well ID:*** 7191093	NW/152.8	2.34	86
38	BORE		ON	N/154.2	2.40	89
39	GEN	Rideau Transit Group	180 Lees Avenue Ottawa ON K1S5J6	WSW/160.5	-1.53	90
40	BORE		ON	N/161.6	2.40	90
41	BORE		ON	N/162.6	2.40	92
42	SPL	City of Ottawa	191 Lees Ave Ottawa ON	WNW/166.5	1.31	93
42	SPL	Marathon Drilling Company<UNOFFICIAL>	191 Lees Ave Ottawa ON K1S 0B8	WNW/166.5	1.31	94
42	SPL	O.C. Transport <UNOFFICIAL>	191 Lee's Ave. Ottawa ON	WNW/166.5	1.31	94
42	SPL	City of Ottawa	191 Lee's Station, on transit way Ottawa ON	WNW/166.5	1.31	95
42	ECA	Dragados Canada Inc., EllisDon Corporation, and SNC-Lavalin Constructors	(Pacific) Inc. 191 Lees Ave Ottawa ON K1Z 1G3	WNW/166.5	1.31	95
42	SPL		191 Lees Rd Ottawa ON	WNW/166.5	1.31	95

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
42	SPL		191 Lees Avenue Ottawa ON	WNW/166.5	1.31	96
42	GEN	OLRT Constructors/Dragados/EllisDon Corp	191 Lees Avenue - Lees Station Ottawa ON K1S5L5	WNW/166.5	1.31	96
42	GEN	City of Ottawa - OC TRANSPO	191 Lees Avenue Ottawa ON K1S 5L5	WNW/166.5	1.31	97
42	GEN	OLRT Constructors/Dragados/EllisDon Corp	191 Lees Avenue - Lees Station Ottawa ON K1S5L5	WNW/166.5	1.31	97
42	SPL		191 Lees Ave Ottawa ON NA	WNW/166.5	1.31	97
42	SPL	City of Ottawa	191 Lees Avenue Ottawa ON	WNW/166.5	1.31	98
42	SPL		191 Lees Ave Ottawa ON NA	WNW/166.5	1.31	98
43	EHS		200 Lees Avenue Ottawa ON K1S 5S9	E/169.0	-2.38	99
43	GEN	ALGONQUIN COLLEGE	200 LECS AVE. OTTAWA ON K2G 1B8	E/169.0	-2.38	99
43	GEN	ALGONQUIN COLLEGE	200 LEES AVENUE OTTAWA ON K1S 0C5	E/169.0	-2.38	99
43	GEN	ALGONQUIN COLLEGE 02-223	200 LEES AVE. OTTAWA ON K1S 5S9	E/169.0	-2.38	100
43	GEN	ALGONQUIN COLLEGE 02-223	200 LEES AVENUE OTTAWA ON K1S 0C5	E/169.0	-2.38	100
43	EHS		200 Lees Avenue Ottawa ON K1S 5S9	E/169.0	-2.38	101

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
43	GEN	UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E/169.0	-2.38	101
43	CA	University of Ottawa	200 Lees Ave Ottawa ON K1S 5S9	E/169.0	-2.38	101
43	GEN	UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E/169.0	-2.38	102
43	GEN	Statistics Canada	200 Lees Ave rear parking lot Ottawa ON	E/169.0	-2.38	102
43	GEN	UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E/169.0	-2.38	103
43	GEN	UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E/169.0	-2.38	103
43	GEN	UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E/169.0	-2.38	104
43	ECA	University of Ottawa	200 Lees Ave Ottawa ON K1N 7B7	E/169.0	-2.38	104
43	GEN	UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON	E/169.0	-2.38	105
43	ECA	University of Ottawa	200 Lees Ave Ottawa ON K1N 7B7	E/169.0	-2.38	105
43	ECA	University of Ottawa	200 Lees Ave Ottawa ON K1N 6N5	E/169.0	-2.38	106
43	GEN	Enbridge Gas Distribution Inc.	200 Lees Avenue Ottawa ON K1N 6N5	E/169.0	-2.38	106
43	GEN	UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E/169.0	-2.38	106

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
43	GEN	UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E/169.0	-2.38	107
43	GEN	Enbridge Gas Distribution Inc.	200 Lees Avenue Ottawa ON K1N 6N5	E/169.0	-2.38	108
43	GEN	UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E/169.0	-2.38	108
43	GEN	UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E/169.0	-2.38	109
43	SPL		200 Lees Avenue, Ottawa Ottawa ON	E/169.0	-2.38	110
43	GEN	UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E/169.0	-2.38	110
44	EHS		n/a Ottawa ON	SSW/171.3	-10.52	111
45	CA	DANBAR HOLDINGS (OTTAWA) LIMITED	ROBINSON AVE/LEES AVE. OTTAWA CITY ON	N/175.7	2.40	111
45	CA	DANBAR HOLDINGS (OTTAWA) LIMITED	LEES AVE./ROBINSON AVE., CSO OTTAWA CITY ON	N/175.7	2.40	111
46	BORE		ON	N/187.1	2.31	112
47	BORE		ON	N/187.4	2.52	113
48	WWIS		Ottawa ON ***Well ID:*** 7201658	NW/189.2	3.38	114
49	BORE		ON	SW/189.5	-3.08	117

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
50	WWIS		Ottawa ON **Well ID:** 7191095	W/190.1	1.31	119
51	WWIS		OTTAWA ON **Well ID:** 7211118	NNW/191.3	3.40	121
52	WWIS		Ottawa ON **Well ID:** 7180700	ENE/198.2	-0.69	123
53	WWIS		Ottawa ON **Well ID:** 7182966	NW/207.0	3.77	125
54	CA	DANBAR HOLDINGS (OTTAWA) LIMITED	ROBINSON AVE/HURDMAN RD. OTTAWA CITY ON	NNE/212.4	0.31	128
55	WWIS		Ottawa ON **Well ID:** 7201656	NNW/216.3	3.20	128
56	WWIS		Ottawa ON **Well ID:** 7201657	NNW/220.3	3.31	131
57	GEN	773925 ONTARIO INC.	170 LEES AVE., C/O 7-1419 CARLING AVE. OTTAWA ON K1S 5G5	WSW/221.8	-1.69	133
57	GEN	HAMA INVESTMENTS LTD. 43-156	170 LEES AVENUE OTTAWA ON K1S 5G5	WSW/221.8	-1.69	134
57	GEN	773925 ONTARIO INC. 43-156	170 LEES AVE., C/O 7-1419 CARLING AVE. OTTAWA ON K1S 5G5	WSW/221.8	-1.69	134
57	GEN	HAMA INVESTMENTS LIMITED	170 LEES AVENUE OTTAWA ON K1S 5G5	WSW/221.8	-1.69	134
57	COAL	Currie Products Ltd.	170 Lees Avenue Ottawa ON K1S 5G5	WSW/221.8	-1.69	135
57	RSC	HAMA Investments Limited	170 LEES AVE, OTTAWA, ON, K1S 5G5 OTTAWA ON K1S 5G5	WSW/221.8	-1.69	135

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
58	SPL	TRANSPORT TRUCK	AT THE NICHOLAS ST. TRANSITWAY & QUEENSWAY MOTOR VEHICLE (OPERATING FLUID) OTTAWA CITY ON	WNW/224.7	2.11	136
59	WWIS		ON ***Well ID:*** 7251494	NW/226.6	4.01	136
60	WWIS		Ottawa ON ***Well ID:*** 7293327	N/226.9	2.31	138
61	CA		9 Robinson Ave. Ottawa ON K1N 8N8	NNE/227.1	0.31	141
61	ECA	Pegasus Development Corporation	9 Robinson Ave. Ottawa ON K2G 1E8	NNE/227.1	0.31	141
62	BORE		ON	WSW/227.9	-1.69	142
63	EHS		169 Lees Avenue Ottawa ON	W/228.8	0.40	144
64	SPL	PRIVATE OWNER	5-9 HURDMAN STREET MOTOR VEHICLE (OPERATING FLUID) OTTAWA CITY ON K1N 8N6	NNE/230.0	0.31	144
65	BORE		ON	WSW/230.4	-1.61	144
66	WWIS		Ottawa ON ***Well ID:*** 7201661	NNW/234.0	4.31	147
67	WWIS		Ottawa ON ***Well ID:*** 7180693	E/235.7	-2.69	148
68	WWIS		ON ***Well ID:*** 7188805	WNW/238.3	1.63	150

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
69	CA	BONA BUILDING MANAGEMENT	169 LEES AVE. OTTAWA CITY ON K1S 5M2	W/238.9	0.40	150
69	GEN	BONA BUILDING & MANAGEMENT LTD.	169 LEES AVENUE OTTAWA ON K1S 5M2	W/238.9	0.40	151
69	GEN	BONA BUILDING & MANAGEMENT LTD. 05-222	169 LEES AVENUE OTTAWA ON K1S 5M2	W/238.9	0.40	151
69	SPL	City of Ottawa	169 Lees Ave Ottawa ON	W/238.9	0.40	151
70	WWIS		Ottawa ON ***Well ID:*** 7201660	NNW/239.0	4.31	152
70	WWIS		Ottawa ON ***Well ID:*** 7201662	NNW/239.0	4.31	154
71	BORE		ON	N/241.6	3.45	156
72	WWIS		Ottawa ON ***Well ID:*** 7101796	SSE/241.7	-5.69	157
73	BORE		ON	WNW/241.8	2.35	193
74	CA	OTTAWA CITY-LEES AVE.	LEES AVE./HURDMAN RD./ROBINSON OTTAWA CITY ON	ENE/242.4	-0.69	195
75	GEN	R. W. Tomlinson	171 Lees Avenue Ottawa ON K1S 5L5	W/244.3	0.23	195
75	GEN	R. W. Tomlinson Greenbelt Construction	171 Lees Avenue Ottawa ON K1S 5L5	W/244.3	0.23	195
76	SPL		Rideau River Bridge Ottawa ON	SSE/249.0	-7.08	195

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
77	EBR	Kelly's Auto Body (1984) Limited	23 Hurdman Road Ottawa Ontario K1N 8N7 Ottawa ON	NE/249.4	-0.60	196
77	SPL	Hydro Ottawa Limited	23 HURDMAN<UNOFFICIAL> Ottawa ON K1N 8N7	NE/249.4	-0.60	196
77	CA	Kelly's Auto Body (1984) Limited	23 Hurdman Road Ottawa ON K1N 8N7	NE/249.4	-0.60	197
77	ECA	Kelly's Auto Body (1984) Limited	23 Hurdman Road Ottawa ON K1N 8N7	NE/249.4	-0.60	197
78	WWIS		Ottawa ON ***Well ID:*** 7180694	E/250.4	-0.69	197

Executive Summary: Summary By Data Source

ANDR - Anderson's Waste Disposal Sites

A search of the ANDR database, dated 1860s-Present has found that there are 1 ANDR site(s) within approximately 0.25 kilometers of the project property.

Lower Elevation	Address	Direction	Distance (m)	Map Key
Algonquin College Dump	Ottawa ON K1S 0C5	ESE	109.01	23

BORE - Borehole

A search of the BORE database, dated 1875-Jul 2018 has found that there are 18 BORE site(s) within approximately 0.25 kilometers of the project property.

Equal/Higher Elevation	Address	Direction	Distance (m)	Map Key
	ON	N	107.17	21
	ON	N	107.57	22
	ON	N	127.25	28
	ON	N	128.43	29
	ON	N	146.90	35
	ON	N	154.16	38
	ON	N	161.59	40

Equal/Higher Elevation	Address	Direction	Distance (m)	Map Key
	ON	N	162.56	41
	ON	N	187.13	46
	ON	N	187.44	47
	ON	N	241.65	71
	ON	WNW	241.76	73

Lower Elevation	Address	Direction	Distance (m)	Map Key
	ON	SE	56.69	5
	ON	SW	68.03	9
	ON	SSW	111.11	24
	ON	SW	189.49	49
	ON	WSW	227.87	62
	ON	WSW	230.38	65

CA - Certificates of Approval

A search of the CA database, dated 1985-Oct 30, 2011* has found that there are 11 CA site(s) within approximately 0.25 kilometers of the project property.

Equal/Higher Elevation	Address	Direction	Distance (m)	Map Key
City of Ottawa	195 Lees Avenue Ottawa ON	NNE	104.37	18
REGIONAL MUNICIPAITY OF OTTAWA CARLETON	195 LEES AVE. OTTAWA CITY ON	NNE	104.37	18
ALGONQUIN COLLEGE OF APPLIED ARTS & TECH	LEES AVE/HIGHWAY 417 OTTAWA CITY ON	N	141.72	33
DANBAR HOLDINGS (OTTAWA) LIMITED	LEES AVE./ROBINSON AVE., CSO OTTAWA CITY ON	N	175.68	45
DANBAR HOLDINGS (OTTAWA) LIMITED	ROBINSON AVE/LEES AVE. OTTAWA CITY ON	N	175.68	45
DANBAR HOLDINGS (OTTAWA) LIMITED	ROBINSON AVE/HURDMAN RD. OTTAWA CITY ON	NNE	212.42	54
	9 Robinson Ave. Ottawa ON K1N 8N8	NNE	227.11	61
BONA BUILDING MANAGEMENT	169 LEES AVE. OTTAWA CITY ON K1S 5M2	W	238.94	69

Lower Elevation	Address	Direction	Distance (m)	Map Key
University of Ottawa	200 Lees Ave Ottawa ON K1S 5S9	E	168.96	43

OTTAWA CITY-LEES AVE.	LEES AVE./HURDMAN RD. /ROBINSON OTTAWA CITY ON	ENE	242.40	74
Kelly's Auto Body (1984) Limited	23 Hurdman Road Ottawa ON K1N 8N7	NE	249.42	77

COAL - Inventory of Coal Gasification Plants and Coal Tar Sites

A search of the COAL database, dated Apr 1987 and Nov 1988* has found that there are 2 COAL site(s) within approximately 0.25 kilometers of the project property.

Equal/Higher Elevation	Address	Direction	Distance (m)	Map Key
Ottawa Lees Avenue Gas Works	175 Lees Avenue Ottawa ON	W	113.50	25

Lower Elevation	Address	Direction	Distance (m)	Map Key
Currie Products Ltd.	170 Lees Avenue Ottawa ON K1S 5G5	WSW	221.84	57

EBR - Environmental Registry

A search of the EBR database, dated 1994-May 31, 2020 has found that there are 1 EBR site(s) within approximately 0.25 kilometers of the project property.

Lower Elevation	Address	Direction	Distance (m)	Map Key
Kelly's Auto Body (1984) Limited	23 Hurdman Road Ottawa Ontario K1N 8N7 Ottawa ON	NE	249.42	77

ECA - Environmental Compliance Approval

A search of the ECA database, dated Oct 2011-May 31, 2020 has found that there are 7 ECA site(s) within approximately 0.25 kilometers of the project property.

Equal/Higher Elevation	Address	Direction	Distance (m)	Map Key
City of Ottawa	195 Lees Avenue Ottawa ON K1P 1J1	NNE	104.42	19
Dragados Canada Inc., EllisDon Corporation, and SNC-Lavalin Constructors	(Pacific) Inc. 191 Lees Ave Ottawa ON K1Z 1G3	WNW	166.48	42

Equal/Higher Elevation	Address	Direction	Distance (m)	Map Key
Pegasus Development Corporation	9 Robinson Ave. Ottawa ON K2G 1E8	NNE	227.11	61

Lower Elevation	Address	Direction	Distance (m)	Map Key
University of Ottawa	200 Lees Ave Ottawa ON K1N 6N5	E	168.96	43
University of Ottawa	200 Lees Ave Ottawa ON K1N 7B7	E	168.96	43
University of Ottawa	200 Lees Ave Ottawa ON K1N 7B7	E	168.96	43
Kelly's Auto Body (1984) Limited	23 Hurdman Road Ottawa ON K1N 8N7	NE	249.42	77

EHS - ERIS Historical Searches

A search of the EHS database, dated 1999-Apr 30, 2020 has found that there are 12 EHS site(s) within approximately 0.25 kilometers of the project property.

Equal/Higher Elevation	Address	Direction	Distance (m)	Map Key
	200 Lees Ave Ottawa ON K1N 6N5	N	86.69	13
	169 Lees Avenue Ottawa ON	W	228.76	63

Lower Elevation	Address	Direction	Distance (m)	Map Key
	190 Lees Avenue Ottawa ON K1S 5L5	SW	94.41	14

190 Lees Avenue Ottawa ON K1S 5L5	SW	94.41	15
190 Lees Avenue Ottawa ON K1S 5L5	SW	94.41	15
190 Lees Avenue Ottawa ON K1S 5L5	SW	94.41	15
190 Lees Avenue Ottawa ON K1S 5L5	SW	94.41	15
190 Lees Ave Ottawa ON K1S5L5	SW	104.43	20
180 Lees Ave Ottawa ON K1S 5J6	WSW	151.55	36
200 Lees Avenue Ottawa ON K1S 5S9	E	168.96	43
200 Lees Avenue Ottawa ON K1S 5S9	E	168.96	43
n/a Ottawa ON	SSW	171.28	44

FSTH - Fuel Storage Tank - Historic

A search of the FSTH database, dated Pre-Jan 2010* has found that there are 1 FSTH site(s) within approximately 0.25 kilometers of the project property.

Equal/Higher Elevation	Address	Direction	Distance (m)	Map Key
CAPITAL BEEF ATTN:FRANK VELLENERUVE	229 LEES AVE OTTAWA ON K1N 8P1	N	137.71	31

GEN - Ontario Regulation 347 Waste Generators Summary

A search of the GEN database, dated 1986-Jan 31, 2020 has found that there are 31 GEN site(s) within approximately 0.25 kilometers

of the project property.

Equal/Higher Elevation	Address	Direction	Distance (m)	Map Key
MTO	200 Lees Ave. Ottawa ON K1N 6N5	NW	56.14	4
OLRT Constructors/Dragados/EllisDon Corp	191 Lees Avenue - Lees Station Ottawa ON K1S5L5	WNW	166.48	42
City of Ottawa - OC TRANSPO	191 Lees Avenue Ottawa ON K1S 5L5	WNW	166.48	42
OLRT Constructors/Dragados/EllisDon Corp	191 Lees Avenue - Lees Station Ottawa ON K1S5L5	WNW	166.48	42
BONA BUILDING & MANAGEMENT LTD.	169 LEES AVENUE OTTAWA ON K1S 5M2	W	238.94	69
BONA BUILDING & MANAGEMENT LTD. 05-222	169 LEES AVENUE OTTAWA ON K1S 5M2	W	238.94	69
R. W. Tomlinson	171 Lees Avenue Ottawa ON K1S 5L5	W	244.30	75
R. W. Tomlinson Greenbelt Construction	171 Lees Avenue Ottawa ON K1S 5L5	W	244.30	75

Lower Elevation	Address	Direction	Distance (m)	Map Key
Rideau Transit Group	180 Lees Avenue Ottawa ON K1S5J6	WSW	160.53	39
ALGONQUIN COLLEGE	200 LECS AVE. OTTAWA ON K2G 1B8	E	168.96	43

ALGONQUIN COLLEGE	200 LEES AVENUE OTTAWA ON K1S 0C5	E	168.96	43
ALGONQUIN COLLEGE 02-223	200 LEES AVE. OTTAWA ON K1S 5S9	E	168.96	43
ALGONQUIN COLLEGE 02-223	200 LEES AVENUE OTTAWA ON K1S 0C5	E	168.96	43
UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E	168.96	43
UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E	168.96	43
Statistics Canada	200 Lees Ave rear parking lot Ottawa ON	E	168.96	43
UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E	168.96	43
UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E	168.96	43
UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E	168.96	43
UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON	E	168.96	43
Enbridge Gas Distribution Inc.	200 Lees Avenue Ottawa ON K1N 6N5	E	168.96	43
UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E	168.96	43
UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E	168.96	43

Enbridge Gas Distribution Inc.	200 Lees Avenue Ottawa ON K1N 6N5	E	168.96	43
UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E	168.96	43
UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E	168.96	43
UNIVERSITY OF OTTAWA	200 LEES AVENUE OTTAWA ON K1S 5S9	E	168.96	43
773925 ONTARIO INC.	170 LEES AVE., C/O 7-1419 CARLING AVE. OTTAWA ON K1S 5G5	WSW	221.84	57
HAMA INVESTMENTS LTD. 43-156	170 LEES AVENUE OTTAWA ON K1S 5G5	WSW	221.84	57
773925 ONTARIO INC. 43-156	170 LEES AVE., C/O 7-1419 CARLING AVE. OTTAWA ON K1S 5G5	WSW	221.84	57
HAMA INVESTMENTS LIMITED	170 LEES AVENUE OTTAWA ON K1S 5G5	WSW	221.84	57

PRT - Private and Retail Fuel Storage Tanks

A search of the PRT database, dated 1989-1996* has found that there are 1 PRT site(s) within approximately 0.25 kilometers of the project property.

Equal/Higher Elevation	Address	Direction	Distance (m)	Map Key
CAPITAL BEEF ATTN:FRANK VELLENERUVE	229 LEES AV OTTAWA ON K1N 8P1	N	137.71	31

RSC - Record of Site Condition

A search of the RSC database, dated 1997-Sept 2001, Oct 2004-May 2020 has found that there are 1 RSC site(s) within approximately 0.25 kilometers of the project property.

Lower Elevation	Address	Direction	Distance (m)	Map Key
HAMA Investments Limited	170 LEES AVE, OTTAWA, ON, K1S 5G5 OTTAWA ON K1S 5G5	WSW	221.84	57

SPL - Ontario Spills

A search of the SPL database, dated 1988-Nov 2019 has found that there are 17 SPL site(s) within approximately 0.25 kilometers of the project property.

Equal/Higher Elevation	Address	Direction	Distance (m)	Map Key
	179 Lees Avenue Ottawa ON	W	129.07	30
	191 Lees Ave Ottawa ON NA	WNW	166.48	42
	191 Lees Ave Ottawa ON NA	WNW	166.48	42
City of Ottawa	191 Lees Avenue Ottawa ON	WNW	166.48	42
	191 Lees Avenue Ottawa ON	WNW	166.48	42
	191 Lees Rd Ottawa ON	WNW	166.48	42
City of Ottawa	191 Lee's Station, on transit way Ottawa ON	WNW	166.48	42
O.C. Transport <UNOFFICIAL>	191 Lee's Ave. Ottawa ON	WNW	166.48	42
Marathon Drilling Company<UNOFFICIAL>	191 Lees Ave Ottawa ON K1S 0B8	WNW	166.48	42

Equal/Higher Elevation	Address	Direction	Distance (m)	Map Key
City of Ottawa	191 Lees Ave Ottawa ON	WNW	166.48	42
TRANSPORT TRUCK	AT THE NICHOLAS ST. TRANSITWAY & QUEENSWAY MOTOR VEHICLE (OPERATING FLUID) OTTAWA CITY ON	WNW	224.71	58
PRIVATE OWNER	5-9 HURDMAN STREET MOTOR VEHICLE (OPERATING FLUID) OTTAWA CITY ON K1N 8N6	NNE	229.95	64
City of Ottawa	169 Lees Ave Ottawa ON	W	238.94	69

Lower Elevation	Address	Direction	Distance (m)	Map Key
UNKNOWN	AT 190 LEE'S AVENUE OTTAWA CITY ON K1S 5L5	SW	94.41	15
	200 Lees Avenue, Ottawa Ottawa ON	E	168.96	43
	Rideau River Bridge Ottawa ON	SSE	248.99	76
Hydro Ottawa Limited	23 HURDMAN<UNOFFICIAL> Ottawa ON K1N 8N7	NE	249.42	77

WDSH - Waste Disposal Sites - MOE 1991 Historical Approval Inventory

A search of the WDSH database, dated Up to Oct 1990* has found that there are 1 WDSH site(s) within approximately 0.25 kilometers of the project property.

Lower Elevation	Address	Direction	Distance (m)	Map Key
	Lees Ave. (Algonquin College) OTTAWA ON	SE	94.98	16

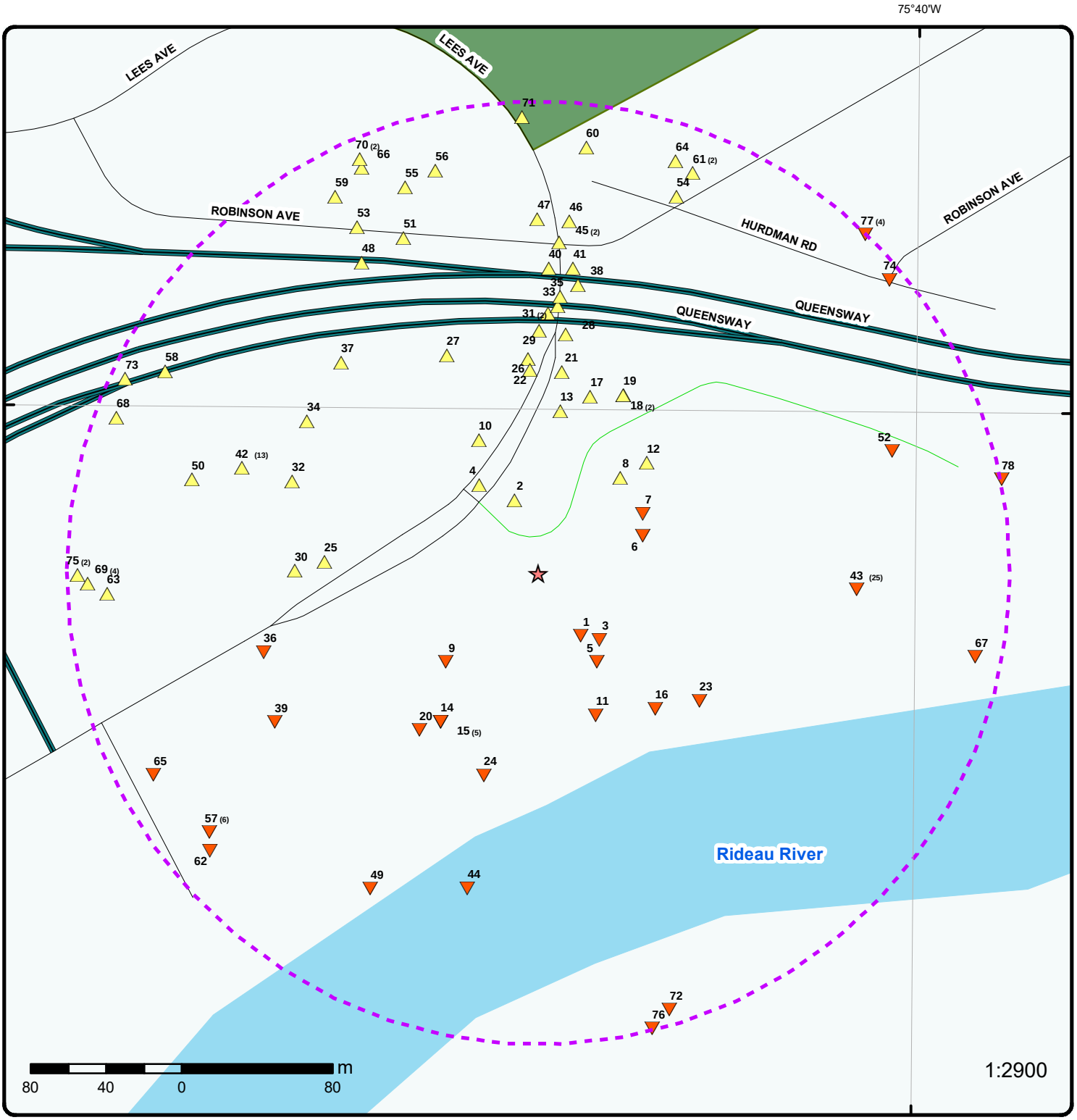
WWIS - Water Well Information System

A search of the WWIS database, dated Feb 28, 2019 has found that there are 31 WWIS site(s) within approximately 0.25 kilometers of the project property.

Equal/Higher Elevation	Address	Direction	Distance (m)	Map Key
	ON ***Well ID:*** 7188804	NNW	40.45	2
	Ottawa ON ***Well ID:*** 7191060	NE	66.60	8
	Ottawa ON ***Well ID:*** 7191092	NNW	77.19	10
	ON ***Well ID:*** 7251493	NE	81.97	12
	Ottawa ON ***Well ID:*** 7190979	NNE	97.41	17
	ON ***Well ID:*** 7231849	N	113.59	26
	Ottawa ON ***Well ID:*** 7191091	NNW	125.25	27
	Ottawa ON ***Well ID:*** 7191094	WNW	139.24	32
	Ottawa ON ***Well ID:*** 7191096	WNW	146.59	34
	Ottawa ON ***Well ID:*** 7191093	NW	152.81	37
	Ottawa ON	NW	189.20	48

Equal/Higher Elevation	Address	Direction	Distance (m)	Map Key
	Well ID: 7201658			
	Ottawa ON	W	190.08	50
	Well ID: 7191095			
	OTTAWA ON	NNW	191.33	51
	Well ID: 7211118			
	Ottawa ON	NW	207.04	53
	Well ID: 7182966			
	Ottawa ON	NNW	216.28	55
	Well ID: 7201656			
	Ottawa ON	NNW	220.32	56
	Well ID: 7201657			
	ON	NW	226.60	59
	Well ID: 7251494			
	Ottawa ON	N	226.89	60
	Well ID: 7293327			
	Ottawa ON	NNW	233.97	66
	Well ID: 7201661			
	ON	WNW	238.26	68
	Well ID: 7188805			
	Ottawa ON	NNW	238.95	70
	Well ID: 7201662			
	Ottawa ON	NNW	238.95	70
	Well ID: 7201660			

Lower Elevation	Address	Direction	Distance (m)	Map Key
	Ottawa ON ***Well ID:*** 7191035	SE	40.37	1
	Ottawa ON ***Well ID:*** 7191042	SE	48.14	3
	Ottawa ON ***Well ID:*** 7191062	ENE	58.78	6
	OTTAWA ON ***Well ID:*** 7211119	ENE	63.77	7
	Ottawa ON ***Well ID:*** 7191061	SSE	81.45	11
	Ottawa ON ***Well ID:*** 7180700	ENE	198.24	52
	Ottawa ON ***Well ID:*** 7180693	E	235.71	67
	Ottawa ON ***Well ID:*** 7101796	SSE	241.74	72
	Ottawa ON ***Well ID:*** 7180694	E	250.40	78



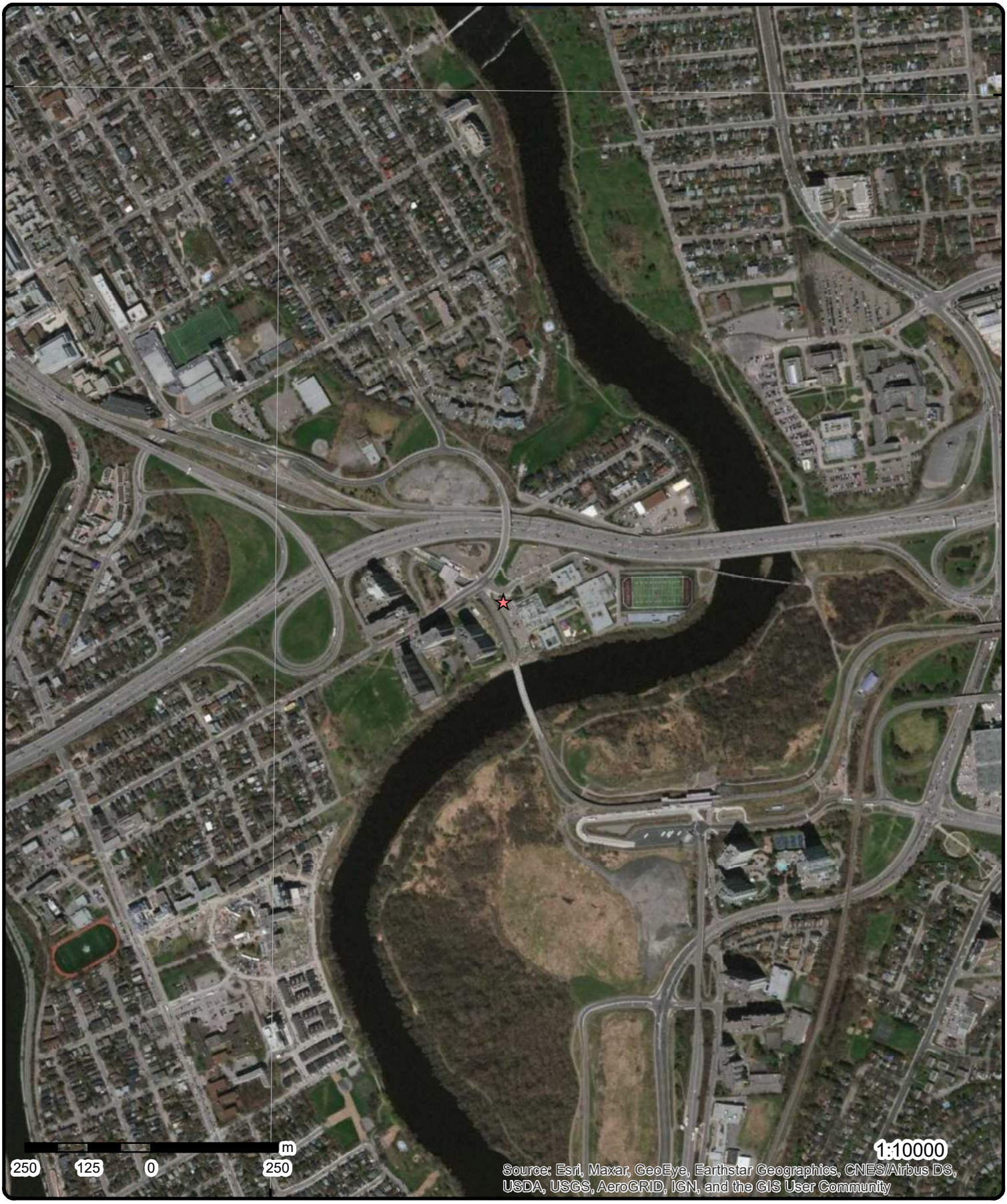
Map : 0.25 Kilometer Radius

Order Number: 20200624071

Address: 200 Lees Avenue, Ottawa, ON

ERIS ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- Expressway
- Principal Highway
- Secondary Highway
- Major Road
- Local road
- Trail
- Proposed Road
- Ferry Route/Ice Road
- Industrial and Resource - Regions
- Main Line
- Sidetrack
- Transit Line
- Abandoned Line
- National Park
- Provincial or Territorial Park
- Other Park
- Golf Course or Driving Range
- Park or Sports Field
- Other Recreation Area



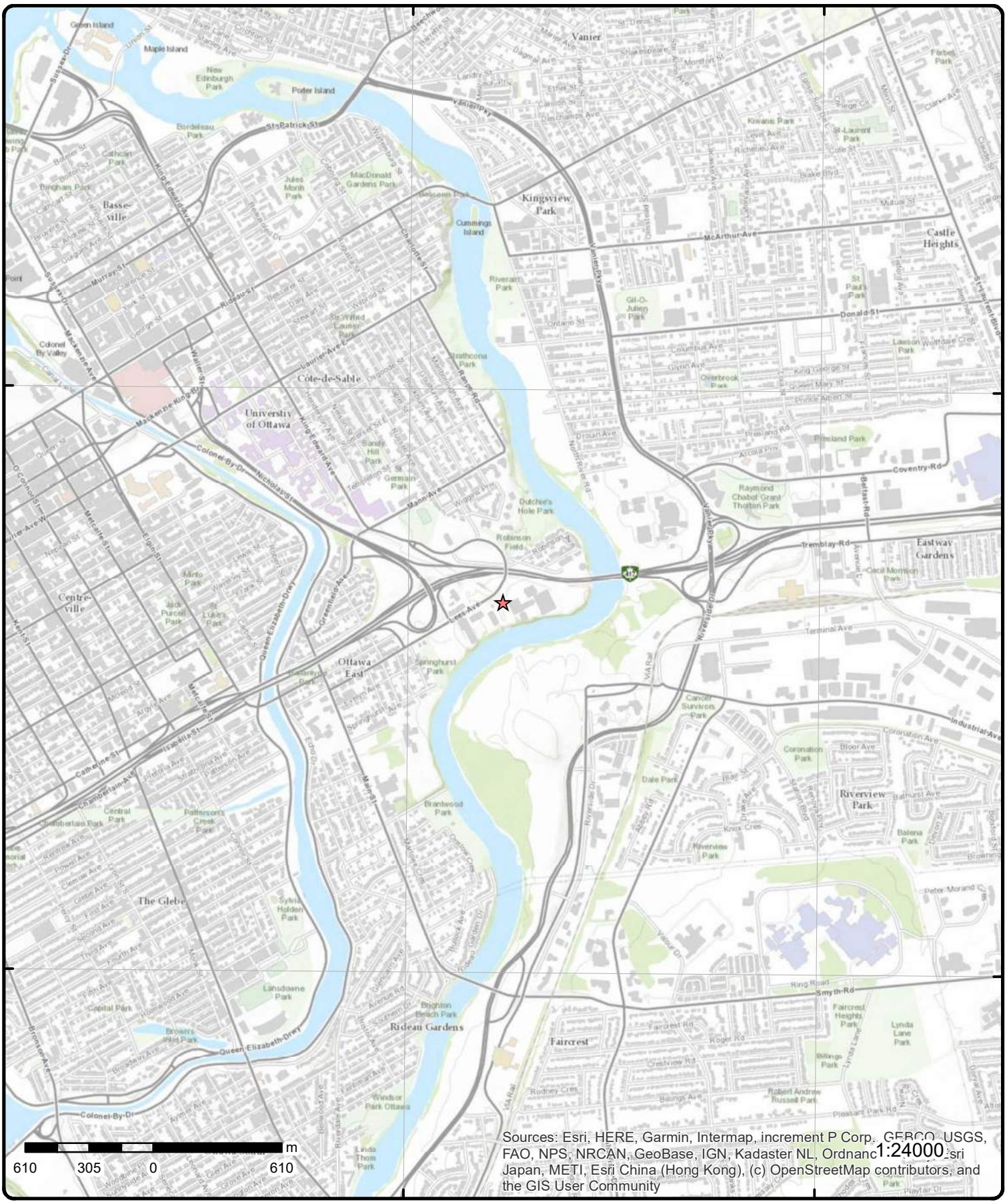
Aerial **Year: 2019**

Address: 200 Lees Avenue, Ottawa, ON

Source: ESRI World Imagery

Order Number: 20200624071

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES



Topographic Map

Address: 200 Lees Avenue, ON

Source: ESRI World Topographic Map

Order Number: 20200624071

ENVIRONMENTAL RISK INFORMATION SERVICES

Detail Report

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
4	1 of 1	NW/56.1	63.6 / 1.01	MTO 200 Lees Ave. Ottawa ON K1N 6N5	GEN

Generator No:	ON4161053	**PO Box No:**	
Status:		**Country:**	
Approval Years:	2011	**Choice of Contact:**	
Contam. Facility:		**Co Admin:**	
MHSW Facility:		**Phone No Admin:**	
SIC Code:	912150		
SIC Description:			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
13	1 of 1	N/86.7	63.2 / 0.62	200 Lees Ave Ottawa ON K1N 6N5	EHS

Order No:	20110615038	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Custom Report	**Client Prov/State:**	ON
Report Date:	6/24/2011	**Search Radius (km):**	0.25
Date Received:	6/15/2011	**X:**	-75.664847
Previous Site Name:		**Y:**	45.416753
Lot/Building Size:			
Additional Info Ordered:			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
1	1 of 1	SE/40.4	61.9 / -0.63	Ottawa ON	WWIS

Well ID:	7191035	**Data Entry Status:**	
Construction Date:		**Data Src:**	
Primary Water Use:	Monitoring and Test Hole	**Date Received:**	11/9/2012
Sec. Water Use:	0	**Selected Flag:**	Yes
Final Well Status:	Test Hole	**Abandonment Rec:**	
Water Type:		**Contractor:**	7241
Casing Material:		**Form Version:**	7
Audit No:	Z156954	**Owner:**	
Tag:	A135009	**Street Name:**	200 LEES AVE
Construction Method:		**County:**	OTTAWA-CARLETON
Elevation (m):		**Municipality:**	NEPEAN TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	
Well Depth:		**Concession:**	
Overburden/Bedrock:		**Concession Name:**	
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004199979	**Elevation:**	61.094074
DP2BR:		**Elevrc:**	

Spatial Status:		***Zone:***	18
Code OB:		***East83:***	447662
Code OB Desc:		***North83:***	5029336
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	9/30/2012	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1004488419
Layer:	4
Color:	2
General Color:	GREY
Mat1:	28
Most Common Material:	SAND
Mat2:	06
Other Materials:	SILT
Mat3:	11
Other Materials:	GRAVEL
Formation Top Depth:	7.93
Formation End Depth:	9.14
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004488417
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	01
Most Common Material:	FILL
Mat2:	85
Other Materials:	SOFT
Mat3:	68
Other Materials:	DRY
Formation Top Depth:	0.91
Formation End Depth:	7.57
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004488418
Layer:	3
Color:	2
General Color:	GREY
Mat1:	06
Most Common Material:	SILT
Mat2:	05
Other Materials:	CLAY
Mat3:	85
Other Materials:	SOFT
Formation Top Depth:	7.57
Formation End Depth:	7.93

Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1004488416
Layer: 1
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2: 11
Other Materials: GRAVEL
Mat3: 85
Other Materials: SOFT
Formation Top Depth: 0
Formation End Depth: 0.91
Formation End Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1004488429
Layer: 3
Plug From: 5.79
Plug To: 9.14
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1004488428
Layer: 2
Plug From: 0.31
Plug To: 5.79
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1004488427
Layer: 1
Plug From: 0
Plug To: 0.31
Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID:
Method Construction Code: 2
Method Construction: Rotary (Convent.)
Other Method Construction:

Pipe Information

Pipe ID: 1004488415
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID:	1004488422
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	0
Depth To:	6.1
Casing Diameter:	5.2
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1004488423
Layer:	1
Slot:	10
Screen Top Depth:	6.1
Screen End Depth:	9.14
Screen Material:	5
Screen Depth UOM:	m
Screen Diameter UOM:	cm
Screen Diameter:	6.03

Hole Diameter

Hole ID:	1004488420
Diameter:	10.92
Depth From:	0
Depth To:	9.14
Hole Depth UOM:	m
Hole Diameter UOM:	cm

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2 ***1 of 1*** ***NNW/40.5*** ***62.8 / 0.28*** ***ON*** ***WWIS***

Well ID:	7188804	***Data Entry Status:***	Yes
Construction Date:		***Data Src:***	
Primary Water Use:		***Date Received:***	7/23/2012
Sec. Water Use:		***Selected Flag:***	Yes
Final Well Status:		***Abandonment Rec:***	
Water Type:		***Contractor:***	1844
Casing Material:		***Form Version:***	8
Audit No:	C15831	***Owner:***	
Tag:	A122887	***Street Name:***	
Construction Method:		***County:***	OTTAWA-CARLETON
Elevation (m):		***Municipality:***	OTTAWA CITY
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	
Well Depth:		***Concession:***	
Overburden/Bedrock:		***Concession Name:***	
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004197764	***Elevation:***	62.099006
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18

Code OB:		**East83:**	447627
Code OB Desc:		**North83:**	5029408
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	2/22/2012	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

3 **1 of 1** **SE/48.1** **61.1 / -1.44** **Ottawa ON** **WWIS**

Well ID:	7191042	**Data Entry Status:**	
Construction Date:		**Data Src:**	
Primary Water Use:	Monitoring and Test Hole	**Date Received:**	11/9/2012
Sec. Water Use:	0	**Selected Flag:**	Yes
Final Well Status:	Test Hole	**Abandonment Rec:**	
Water Type:		**Contractor:**	7241
Casing Material:		**Form Version:**	7
Audit No:	Z156923	**Owner:**	
Tag:	A135010	**Street Name:**	200 LEES AVE
Construction Method:		**County:**	OTTAWA-CARLETON
Elevation (m):		**Municipality:**	NEPEAN TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	
Well Depth:		**Concession:**	
Overburden/Bedrock:		**Concession Name:**	
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004200000	**Elevation:**	61.412872
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	18
Code OB:		**East83:**	447672
Code OB Desc:		**North83:**	5029334
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	9/30/2012	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1004488878
Layer:	4
Color:	2
General Color:	GREY
Mat1:	05

Most Common Material:	CLAY
Mat2:	84
Other Materials:	SILTY
Mat3:	11
Other Materials:	GRAVEL
Formation Top Depth:	7.62
Formation End Depth:	8.84
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004488877
Layer:	3
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	06
Other Materials:	SILT
Mat3:	85
Other Materials:	SOFT
Formation Top Depth:	4.57
Formation End Depth:	7.62
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004488875
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Other Materials:	GRAVEL
Mat3:	85
Other Materials:	SOFT
Formation Top Depth:	0
Formation End Depth:	0.91
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004488876
Layer:	2
Color:	2
General Color:	GREY
Mat1:	01
Most Common Material:	FILL
Mat2:	05
Other Materials:	CLAY
Mat3:	77
Other Materials:	LOOSE
Formation Top Depth:	0.91
Formation End Depth:	4.57
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID: 1004488887
Layer: 2
Plug From: 0.31
Plug To: 5.49
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1004488888
Layer: 3
Plug From: 5.49
Plug To: 8.84
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1004488886
Layer: 1
Plug From: 0
Plug To: 0.31
Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID:
Method Construction Code: 2
Method Construction: Rotary (Convent.)
Other Method Construction:

Pipe Information

Pipe ID: 1004488874
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1004488881
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0
Depth To: 5.79
Casing Diameter: 5.2
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1004488882
Layer: 1
Slot: 10
Screen Top Depth: 5.79
Screen End Depth: 8.84
Screen Material: 5
Screen Depth UOM: m

Screen Diameter UOM: cm
Screen Diameter: 6.03

Hole Diameter

Hole ID: 1004488879
Diameter: 10.92
Depth From: 0
Depth To: 8.84
Hole Depth UOM: m
Hole Diameter UOM: cm

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5 | **1 of 1** | **SE/56.7** | **60.9 / -1.69** | **ON** | **BORE**

Borehole ID: 613284
OGF ID: 215514585
Status:
Type: Borehole
Use:
Completion Date: FEB-1971
Static Water Level:
Primary Water Use:
Sec. Water Use:
Total Depth m: 9.6
Depth Ref: Ground Surface
Depth Elev:
Drill Method:
Orig Ground Elev m: 60.8
Elev Reliabil Note:
DEM Ground Elev m: 61.2
Concession:
Location D:
Survey D:
Comments:

Inclin FLG: No
SP Status: Initial Entry
Surv Elev: No
Piezometer: No
Primary Name:
Municipality:
Lot:
Township:
Latitude DD: 45.415462
Longitude DD: -75.6688
UTM Zone: 18
Easting: 447671
Northing: 5029322
Location Accuracy:
Accuracy: Not Applicable

Borehole Geology Stratum

Geology Stratum ID: 218394495
Top Depth: 1.5
Bottom Depth: 4
Material Color:
Material 1:
Material 2: Sand
Material 3: Till
Material 4: Soil
Gsc Material Description:
Stratum Description: ARTIFICIAL.

Mat Consistency:
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Geology Stratum ID: 218394496
Top Depth: 4
Bottom Depth: 6.1
Material Color: Blue
Material 1: Clay
Material 2:
Material 3:
Material 4:
Gsc Material Description:
Stratum Description: CLAY. BLUE,GREY,STIFF TO VERY STIFF,FISSURED.

Mat Consistency: Stiff
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Geology Stratum ID: 218394497
Top Depth: 6.1
Bottom Depth: 7.6

Mat Consistency: Dense
Material Moisture:
Material Texture:

Material Color:		**Non Geo Mat Type:**	
Material 1:	Silt	**Geologic Formation:**	
Material 2:		**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	SILT. DENSE.		

Geology Stratum ID:	218394498	**Mat Consistency:**	Dense
Top Depth:	7.6	**Material Moisture:**	
Bottom Depth:	9.6	**Material Texture:**	
Material Color:		**Non Geo Mat Type:**	
Material 1:	Unknown	**Geologic Formation:**	
Material 2:	Till	**Geologic Group:**	
Material 3:	Sand	**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	UNSPECIFIED. DENSE. 00000 018 00050 017 00130 038 00200 023 00250 012 0000003 **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Geology Stratum ID:	218394494	**Mat Consistency:**	
Top Depth:	0	**Material Moisture:**	
Bottom Depth:	1.5	**Material Texture:**	
Material Color:		**Non Geo Mat Type:**	
Material 1:		**Geologic Formation:**	
Material 2:	Sand	**Geologic Group:**	
Material 3:	Clay	**Geologic Period:**	
Material 4:	Bedrock	**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	ARTIFICIAL.		

Source

Source Type:	Data Survey	**Source Appl:**	Spatial/Tabular
Source Orig:	Geological Survey of Canada	**Source Iden:**	1
Source Date:	1956-1972	**Scale or Res:**	Varies
Confidence:	H	**Horizontal:**	NAD27
Observatio:		**Verticalda:**	Mean Average Sea Level
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Details:	File: OTTAWA2.txt RecordID: 057920 NTS_Sheet: 31G05G		
Confiden 1:	Logged by professional. Exact and complete description of material and properties.		

Source List

Source Identifier:	1	**Horizontal Datum:**	NAD27
Source Type:	Data Survey	**Vertical Datum:**	Mean Average Sea Level
Source Date:	1956-1972	**Projection Name:**	Universal Transverse Mercator
Scale or Resolution:	Varies		
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Originators:	Geological Survey of Canada		

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6 | ***1 of 1*** | ***ENE/58.8*** | ***61.9 / -0.65*** | ***Ottawa ON*** | ***WWIS***

Well ID:	7191062	**Data Entry Status:**	
Construction Date:		**Data Src:**	
Primary Water Use:	Monitoring and Test Hole	**Date Received:**	11/9/2012
Sec. Water Use:	0	**Selected Flag:**	Yes
Final Well Status:	Test Hole	**Abandonment Rec:**	
Water Type:		**Contractor:**	7241
Casing Material:		**Form Version:**	7
Audit No:	Z156924	**Owner:**	
Tag:	A135011	**Street Name:**	200 LEES AVE

Construction Method:		***County:***	OTTAWA-CARLETON
Elevation (m):		***Municipality:***	NEPEAN TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	
Well Depth:		***Concession:***	
Overburden/Bedrock:		***Concession Name:***	
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004200170	***Elevation:***	62.175006
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	447695
Code OB Desc:		***North83:***	5029389
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	9/30/2012	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1004489423
Layer:	3
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	84
Other Materials:	SILTY
Mat3:	85
Other Materials:	SOFT
Formation Top Depth:	4.57
Formation End Depth:	7.32
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004489424
Layer:	4
Color:	2
General Color:	GREY
Mat1:	06
Most Common Material:	SILT
Mat2:	34
Other Materials:	TILL
Mat3:	81
Other Materials:	SANDY
Formation Top Depth:	7.32
Formation End Depth:	10.06
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004489421
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	77
Other Materials:	LOOSE
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	0.91
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004489422
Layer:	2
Color:	2
General Color:	GREY
Mat1:	01
Most Common Material:	FILL
Mat2:	77
Other Materials:	LOOSE
Mat3:	
Other Materials:	
Formation Top Depth:	0.91
Formation End Depth:	4.57
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004489433
Layer:	2
Plug From:	0.31
Plug To:	6.71
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004489434
Layer:	3
Plug From:	6.71
Plug To:	10.01
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004489432
Layer:	1
Plug From:	0
Plug To:	0.31
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:
Method Construction Code: 2
Method Construction: Rotary (Convent.)
Other Method Construction:

Pipe Information

Pipe ID: 1004489420
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1004489427
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0
Depth To: 7.01
Casing Diameter: 5.2
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1004489428
Layer: 1
Slot: 10
Screen Top Depth: 7.01
Screen End Depth: 10.06
Screen Material: 5
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter: 6.03

Hole Diameter

Hole ID: 1004489425
Diameter: 10.92
Depth From: 0
Depth To: 10.06
Hole Depth UOM: m
Hole Diameter UOM: cm

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7 ***1 of 1*** ***ENE/63.8*** ***62.2 / -0.38*** ***WWIS***

OTTAWA ON

Well ID: 7211119
Construction Date:
Primary Water Use:
Sec. Water Use:
Final Well Status: Abandoned-Quality
Water Type:
Casing Material:
Audit No: Z096864
Tag: A135013
Construction Method:

Data Entry Status:
Data Src:
Date Received: 11/14/2013
Selected Flag: Yes
Abandonment Rec: Yes
Contractor: 6894
Form Version: 7
Owner:
Street Name: 200 LEES AVE
County: OTTAWA-CARLETON

Elevation (m):		***Municipality:***	NEPEAN TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	
Well Depth:		***Concession:***	
Overburden/Bedrock:		***Concession Name:***	
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004633171	***Elevation:***	62.059616
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	447695
Code OB Desc:		***North83:***	5029401
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:		***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Annular Space/Abandonment Sealing Record

Plug ID:	1004895896
Layer:	1
Plug From:	0
Plug To:	30.9
Plug Depth UOM:	ft

Pipe Information

Pipe ID:	1004895889
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1004895893
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	
Depth To:	
Casing Diameter:	2
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Screen

Screen ID:	1004895894
Layer:	
Slot:	

Screen Top Depth:
Screen End Depth:
Screen Material:
Screen Depth UOM: ft
Screen Diameter UOM: inch
Screen Diameter:

Hole Diameter

Hole ID: 1004895891
Diameter:
Depth From:
Depth To:
Hole Depth UOM: ft
Hole Diameter UOM: inch

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8 **1 of 1** **NE/66.6** **62.9 / 0.34** **Ottawa ON** **WWIS**

Well ID:	7191060	**Data Entry Status:**	
Construction Date:		**Data Src:**	
Primary Water Use:	Monitoring and Test Hole	**Date Received:**	11/9/2012
Sec. Water Use:	0	**Selected Flag:**	Yes
Final Well Status:	Test Hole	**Abandonment Rec:**	
Water Type:		**Contractor:**	7241
Casing Material:		**Form Version:**	7
Audit No:	Z156925	**Owner:**	
Tag:	A135013	**Street Name:**	200 LEES AVE
Construction Method:		**County:**	OTTAWA-CARLETON
Elevation (m):		**Municipality:**	OTTAWA CITY
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	
Well Depth:		**Concession:**	
Overburden/Bedrock:		**Concession Name:**	
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004200164	**Elevation:**	61.591522
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	18
Code OB:		**East83:**	447683
Code OB Desc:		**North83:**	5029420
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	10/1/2012	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID: 1004489394

Layer:	4
Color:	2
General Color:	GREY
Mat1:	06
Most Common Material:	SILT
Mat2:	05
Other Materials:	CLAY
Mat3:	77
Other Materials:	LOOSE
Formation Top Depth:	6.1
Formation End Depth:	9.14
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004489391
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	02
Most Common Material:	TOPSOIL
Mat2:	01
Other Materials:	FILL
Mat3:	85
Other Materials:	SOFT
Formation Top Depth:	0
Formation End Depth:	0.61
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004489393
Layer:	3
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	34
Other Materials:	TILL
Mat3:	
Other Materials:	
Formation Top Depth:	4.57
Formation End Depth:	6.1
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004489392
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	01
Most Common Material:	FILL
Mat2:	77
Other Materials:	LOOSE
Mat3:	
Other Materials:	
Formation Top Depth:	0.61
Formation End Depth:	4.57
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004489403
Layer:	2
Plug From:	0.31
Plug To:	5.79
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004489404
Layer:	3
Plug From:	5.79
Plug To:	9.14
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004489402
Layer:	1
Plug From:	0
Plug To:	0.31
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	
Method Construction Code:	2
Method Construction:	Rotary (Convent.)
Other Method Construction:	

Pipe Information

Pipe ID:	1004489390
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1004489397
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	0
Depth To:	6.1
Casing Diameter:	5.2
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1004489398
Layer:	1
Slot:	10

Screen Top Depth:	6.1
Screen End Depth:	9.14
Screen Material:	5
Screen Depth UOM:	m
Screen Diameter UOM:	cm
Screen Diameter:	6.03

Hole Diameter

Hole ID:	1004489395
Diameter:	10.92
Depth From:	0
Depth To:	9.14
Hole Depth UOM:	m
Hole Diameter UOM:	cm

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9 ***1 of 1*** ***SW/68.0*** ***60.9 / -1.69*** ***ON*** ***BORE***

Borehole ID:	613283	**Inclin FLG:**	No
OGF ID:	215514584	**SP Status:**	Initial Entry
Status:		**Surv Elev:**	No
Type:	Borehole	**Piezometer:**	No
Use:		**Primary Name:**	
Completion Date:	FEB-1971	**Municipality:**	
Static Water Level:	5.7	**Lot:**	
Primary Water Use:		**Township:**	
Sec. Water Use:		**Latitude DD:**	45.415456
Total Depth m:	12.8	**Longitude DD:**	-75.669822
Depth Ref:	Ground Surface	**UTM Zone:**	18
Depth Elev:		**Easting:**	447591
Drill Method:		**Northing:**	5029322
Orig Ground Elev m:	59.6	**Location Accuracy:**	
Elev Reliabil Note:		**Accuracy:**	Not Applicable
DEM Ground Elev m:	58.5		
Concession:			
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	218394486	**Mat Consistency:**	
Top Depth:	1.5	**Material Moisture:**	
Bottom Depth:	2.3	**Material Texture:**	
Material Color:		**Non Geo Mat Type:**	
Material 1:		**Geologic Formation:**	
Material 2:	Humus	**Geologic Group:**	
Material 3:	Clay	**Geologic Period:**	
Material 4:	Bedrock	**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	ARTIFICIAL.		

Geology Stratum ID:	218394487	**Mat Consistency:**	Compact
Top Depth:	2.3	**Material Moisture:**	
Bottom Depth:	3	**Material Texture:**	
Material Color:		**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:		**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	SAND. LOOSE TO COMPACT.		

Geology Stratum ID: 218394490
Top Depth: 7.6
Bottom Depth: 8.4
Material Color:
Material 1: Sand
Material 2: Gravel
Material 3: Clay
Material 4:
Gsc Material Description:
Stratum Description: SAND. DENSE TO VERY DENSE.

Mat Consistency: Dense
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Geology Stratum ID: 218394493
Top Depth: 10.3
Bottom Depth: 12.8
Material Color:
Material 1: Bedrock
Material 2: Shale
Material 3:
Material 4:
Gsc Material Description:
Stratum Description: BEDROCK. 00000 012 00050 023 00076 020 00100 040 00215 010 00250 012 00275 **Note: Many records provided by the department have a truncated [Stratum Description] field.

Mat Consistency:
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Geology Stratum ID: 218394489
Top Depth: 6.6
Bottom Depth: 7.6
Material Color:
Material 1: Unknown
Material 2: Till
Material 3: Sand
Material 4:
Gsc Material Description:
Stratum Description: UNSPECIFIED. DENSE TO VERY DENSE, WATER STABLE AT 176.9 FEET.

Mat Consistency: Dense
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Geology Stratum ID: 218394491
Top Depth: 8.4
Bottom Depth: 8.8
Material Color:
Material 1: Silt
Material 2: Shale
Material 3:
Material 4:
Gsc Material Description:
Stratum Description: SILT. VERY DENSE.

Mat Consistency: Dense
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Geology Stratum ID: 218394488
Top Depth: 3
Bottom Depth: 6.6
Material Color: Brown
Material 1: Clay
Material 2: Silt
Material 3: Sand
Material 4:
Gsc Material Description:
Stratum Description: CLAY. BROWN,GREY, STIFF TO VERY STIFF.

Mat Consistency: Stiff
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Geology Stratum ID: 218394485
Top Depth: 0
Bottom Depth: 1.5
Material Color:
Material 1:
Material 2: Sand
Material 3: Bedrock
Material 4: Asphalt
Gsc Material Description:

Mat Consistency:
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Stratum Description: ARTIFICIAL.

Geology Stratum ID: 218394492
Top Depth: 8.8
Bottom Depth: 10.3
Material Color:
Material 1: Boulders
Material 2: Till
Material 3: Silt
Material 4:
Gsc Material Description:
Stratum Description: BOULDERS. VERY DENSE.

Mat Consistency: Dense
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Source

Source Type: Data Survey
Source Orig: Geological Survey of Canada
Source Date: 1956-1972
Confidence: H
Observatio:
Source Name: Urban Geology Automated Information System (UGAIS)
Source Details: File: OTTAWA2.txt RecordID: 057910 NTS_Sheet: 31G05G
Confiden 1: Logged by professional. Exact and complete description of material and properties.

Source Appl: Spatial/Tabular
Source Iden: 1
Scale or Res: Varies
Horizontal: NAD27
Verticalda: Mean Average Sea Level

Source List

Source Identifier: 1
Source Type: Data Survey
Source Date: 1956-1972
Scale or Resolution: Varies
Source Name: Urban Geology Automated Information System (UGAIS)
Source Originators: Geological Survey of Canada

Horizontal Datum: NAD27
Vertical Datum: Mean Average Sea Level
Projection Name: Universal Transverse Mercator

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10 | ***1 of 1*** | ***NNW/77.2*** | ***63.8 / 1.28*** | ***Ottawa ON*** | ***WWIS***

Well ID: 7191092
Construction Date:
Primary Water Use: Monitoring and Test Hole
Sec. Water Use: 0
Final Well Status: Test Hole
Water Type:
Casing Material:
Audit No: Z156922
Tag: A135004
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Data Entry Status:
Data Src:
Date Received: 11/9/2012
Selected Flag: Yes
Abandonment Rec:
Contractor: 7241
Form Version: 7
Owner:
Street Name: 191 LEES AVE
County: OTTAWA-CARLETON
Municipality: NEPEAN TOWNSHIP
Site Info:
Lot:
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 1004200411
DP2BR:
Spatial Status:

Elevation: 61.734176
Elevrc:
Zone: 18

Code OB:		**East83:**	447608
Code OB Desc:		**North83:**	5029440
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	9/25/2012	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1004490087
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Other Materials:	GRAVEL
Mat3:	74
Other Materials:	LAYERED
Formation Top Depth:	0.31
Formation End Depth:	3.1
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004490089
Layer:	4
Color:	2
General Color:	GREY
Mat1:	28
Most Common Material:	SAND
Mat2:	06
Other Materials:	SILT
Mat3:	
Other Materials:	
Formation Top Depth:	6.1
Formation End Depth:	8.35
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004490088
Layer:	3
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	06
Other Materials:	SILT
Mat3:	74
Other Materials:	LAYERED
Formation Top Depth:	3.1
Formation End Depth:	6.1
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004490090
Layer:	5
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	06
Other Materials:	SILT
Mat3:	11
Other Materials:	GRAVEL
Formation Top Depth:	8.35
Formation End Depth:	9.14
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004490086
Layer:	1
Color:	8
General Color:	BLACK
Mat1:	11
Most Common Material:	GRAVEL
Mat2:	
Other Materials:	
Mat3:	73
Other Materials:	HARD
Formation Top Depth:	0
Formation End Depth:	0.31
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004490100
Layer:	3
Plug From:	7.32
Plug To:	9.14
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004490099
Layer:	2
Plug From:	0.31
Plug To:	7.32
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004490098
Layer:	1
Plug From:	0
Plug To:	0.31
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:
Method Construction Code: 2
Method Construction: Rotary (Convent.)
Other Method Construction:

Pipe Information

Pipe ID: 1004490085
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1004490093
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0
Depth To: 7.62
Casing Diameter: 5.2
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1004490094
Layer: 1
Slot: 10
Screen Top Depth: 7.62
Screen End Depth: 9.14
Screen Material: 5
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter: 6.03

Hole Diameter

Hole ID: 1004490091
Diameter: 10.92
Depth From: 0
Depth To: 9.14
Hole Depth UOM: m
Hole Diameter UOM: cm

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11 ***1 of 1*** ***SSE/81.5*** ***59.8 / -2.72*** ***Ottawa ON*** ***WWIS***

Well ID: 7191061
Construction Date:
Primary Water Use: Monitoring and Test Hole
Sec. Water Use: 0
Final Well Status: Test Hole
Water Type:
Casing Material:
Audit No: Z156926
Tag: A135012
Construction Method:

Data Entry Status:
Data Src:
Date Received: 11/9/2012
Selected Flag: Yes
Abandonment Rec:
Contractor: 7241
Form Version: 7
Owner:
Street Name: 200 LEES AVE
County: OTTAWA-CARLETON

Elevation (m):		***Municipality:***	NEPEAN TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	
Well Depth:		***Concession:***	
Overburden/Bedrock:		***Concession Name:***	
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004200167	***Elevation:***	61.010929
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	447670
Code OB Desc:		***North83:***	5029294
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	10/1/2012	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1004489406
Layer:	1
Color:	8
General Color:	BLACK
Mat1:	
Most Common Material:	
Mat2:	11
Other Materials:	GRAVEL
Mat3:	73
Other Materials:	HARD
Formation Top Depth:	0
Formation End Depth:	0.31
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004489409
Layer:	4
Color:	2
General Color:	GREY
Mat1:	
Most Common Material:	
Mat2:	
Other Materials:	
Mat3:	85
Other Materials:	SOFT
Formation Top Depth:	7.32
Formation End Depth:	10.06
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004489408
Layer:	3
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	84
Other Materials:	SILTY
Mat3:	85
Other Materials:	SOFT
Formation Top Depth:	4.57
Formation End Depth:	7.32
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004489407
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	01
Most Common Material:	FILL
Mat2:	
Other Materials:	
Mat3:	77
Other Materials:	LOOSE
Formation Top Depth:	0.31
Formation End Depth:	4.57
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004489417
Layer:	1
Plug From:	0
Plug To:	0.31
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004489419
Layer:	3
Plug From:	6.71
Plug To:	10.01
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004489418
Layer:	2
Plug From:	0.31
Plug To:	6.71
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:
Method Construction Code: 2
Method Construction: Rotary (Convent.)
Other Method Construction:

Pipe Information

Pipe ID: 1004489405
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1004489412
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0
Depth To: 7.01
Casing Diameter: 5.2
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1004489413
Layer: 1
Slot: 10
Screen Top Depth: 7.01
Screen End Depth: 10.06
Screen Material: 5
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter: 6.03

Hole Diameter

Hole ID: 1004489410
Diameter: 10.92
Depth From: 0
Depth To: 10.06
Hole Depth UOM: m
Hole Diameter UOM: cm

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12 ***1 of 1*** ***NE/82.0*** ***63.0 / 0.42*** ***ON*** ***WWIS***

Well ID: 7251493
Construction Date:
Primary Water Use:
Sec. Water Use:
Final Well Status:
Water Type:
Casing Material:
Audit No: C23242
Tag: A135013
Construction Method:
Elevation (m):

Data Entry Status: Yes
Data Src:
Date Received: 11/4/2015
Selected Flag: Yes
Abandonment Rec: Yes
Contractor: 6894
Form Version: 8
Owner:
Street Name:
County: OTTAWA-CARLETON
Municipality: OTTAWA CITY

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Site Info:
Lot:
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID:	1005782114	***Elevation:***	61.565872
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	447697
Code OB Desc:		***North83:***	5029428
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	8/1/2013	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

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14 ***1 of 1*** ***SW/94.4*** ***60.6 / -1.99*** ***190 Lees Avenue Ottawa ON K1S 5L5*** ***EHS***

Order No:	20190212036	***Nearest Intersection:***	
Status:	C	***Municipality:***	
Report Type:	Standard Report	***Client Prov/State:***	ON
Report Date:	19-FEB-19	***Search Radius (km):***	.25
Date Received:	12-FEB-19	***X:***	-75.669855
Previous Site Name:		***Y:***	45.415171
Lot/Building Size:			
Additional Info Ordered:			

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15 ***1 of 5*** ***SW/94.4*** ***60.6 / -1.99*** ***UNKNOWN AT 190 LEE'S AVENUE OTTAWA CITY ON K1S 5L5*** ***SPL***

Ref No:	170189	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	7/13/1999	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	UNKNOWN	***Sector Type:***	
Incident Event:		***Agency Involved:***	
Contaminant Code:		***Nearest Watercourse:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	POSSIBLE	***Site Municipality:***	20101
Nature of Impact:	Multi Media Pollution	***Site Lot:***	
Receiving Medium:	WATER	***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:		***Easting:***	REGION OF OTTAWA/CARLETON
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	7/14/1999	***Site Map Datum:***	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Dt Document Closed:
Incident Reason: UNKNOWN
Site Name:
Site County/District:
Site Geo Ref Meth:
Incident Summary: SOURCE UNKNOWN - OIL SHEEN ON WATER SURFACE IN EXCAVATION HOLE.
Contaminant Qty:
SAC Action Class:
Source Type:

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15 | **2 of 5** | **SW/94.4** | **60.6 / -1.99** | **190 Lees Avenue Ottawa ON K1S 5L5** | **EHS**

Order No: 20050518025
Status: C
Report Type:
Report Date: 5/30/2005
Date Received: 5/18/2005
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:
Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): 0.3
X: -75.670578
Y: 45.414845

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15 | **3 of 5** | **SW/94.4** | **60.6 / -1.99** | **190 Lees Avenue Ottawa ON K1S 5L5** | **EHS**

Order No: 20080312024
Status: C
Report Type: Complete Report
Report Date: 3/24/2008
Date Received: 3/12/2008
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:
Nearest Intersection: Lees Avenue and Main Street
Municipality:
Client Prov/State: ON
Search Radius (km): 0.25
X: -75.669987
Y: 45.415358

---

15 | **4 of 5** | **SW/94.4** | **60.6 / -1.99** | **190 Lees Avenue Ottawa ON K1S 5L5** | **EHS**

Order No: 20090710028
Status: C
Report Type: Standard Report
Report Date: 7/21/2009
Date Received: 7/10/2009
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:
Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): 0.25
X: -75.669868
Y: 45.415235

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15 | **5 of 5** | **SW/94.4** | **60.6 / -1.99** | **190 Lees Avenue Ottawa ON K1S 5L5** | **EHS**

Order No: 20120613028
Status: C
Report Type: Standard Report
Report Date: 22-JUN-12
Date Received: 13-JUN-12
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:
Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): .25
X: -75.669987
Y: 45.415358

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
16	1 of 1	SE/95.0	59.6 / -2.95	Lees Ave. (Algonquin College) OTTAWA ON	WDSH

Site No.: X1017
Region: SOUTHEAST
County: OTTAWA CARLETON
Concession:
Lot: Lees Ave. (Algonquin College)
Easting: 447700
Northing: 5029080
Zone: 18
Date Closed: 1947
Status: CLOSED
Classification: A5 - POTENTIAL HUMAN IMPACT-URBAN MUNICIPAL/DOMESTIC WASTE - CLOSED 10-20 YRS
%CommericialWste: n/a
%DomesticWste Rec: n/a
%LiquidWste Rec: n/a
%HazardousWste Rec: n/a
%Non-haz.Wste Rec: n/a
%Sewage/Sludge Rec: n/a
%Other Wste Rec: n/a

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
17	1 of 1	NNE/97.4	63.8 / 1.26	Ottawa ON	WWIS

Well ID: 7190979
Construction Date:
Primary Water Use: Monitoring and Test Hole
Sec. Water Use: 0
Final Well Status: Test Hole
Water Type:
Casing Material:
Audit No: Z156955
Tag: A135006
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:
Data Entry Status:
Data Src:
Date Received: 11/9/2012
Selected Flag: Yes
Abandonment Rec:
Contractor: 7241
Form Version: 7
Owner:
Street Name: 191 LEES AVE
County: OTTAWA-CARLETON
Municipality: OTTAWA CITY
Site Info:
Lot:
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 1004199581
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 9/26/2012
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:
Elevation: 61.280536
Elevrc:
Zone: 18
East83: 447667
North83: 5029463
Org CS: UTM83
UTMRC: 4
UTMRC Desc: margin of error : 30 m - 100 m
Location Method: wwr

Overburden and Bedrock Materials Interval

Formation ID:	1004486845
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	02
Most Common Material:	TOPSOIL
Mat2:	06
Other Materials:	SILT
Mat3:	77
Other Materials:	LOOSE
Formation Top Depth:	0
Formation End Depth:	0.61
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004486846
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Other Materials:	GRAVEL
Mat3:	77
Other Materials:	LOOSE
Formation Top Depth:	0.61
Formation End Depth:	3.1
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004486848
Layer:	4
Color:	2
General Color:	GREY
Mat1:	28
Most Common Material:	SAND
Mat2:	06
Other Materials:	SILT
Mat3:	05
Other Materials:	CLAY
Formation Top Depth:	6.1
Formation End Depth:	9.14
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004486847
Layer:	3
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11

Other Materials:	GRAVEL
Mat3:	73
Other Materials:	HARD
Formation Top Depth:	3.1
Formation End Depth:	6.1
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004486856
Layer:	1
Plug From:	0
Plug To:	7.32
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004486857
Layer:	2
Plug From:	7.32
Plug To:	9.14
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	
Method Construction Code:	2
Method Construction:	Rotary (Convent.)
Other Method Construction:	

Pipe Information

Pipe ID:	1004486844
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1004486851
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	0
Depth To:	7.62
Casing Diameter:	4.08
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1004486852
Layer:	1
Slot:	10
Screen Top Depth:	7.62
Screen End Depth:	9.14
Screen Material:	5
Screen Depth UOM:	m

Screen Diameter UOM: cm
Screen Diameter: 4.82

Hole Diameter

Hole ID: 1004486849
Diameter: 10.92
Depth From: 0
Depth To: 9.14
Hole Depth UOM: m
Hole Diameter UOM: cm

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18 | **1 of 2** | **NNE/104.4** | **63.8 / 1.26** | **REGIONAL MUNICIPAITY OF OTTAWA CARLETON**
195 LEES AVE.
OTTAWA CITY ON | **CA**

Certificate #: 8-4059-86-
Application Year: 86
Issue Date: 11/21/1986
Approval Type: Industrial air
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description: COAL-FOR TREATMENT SYSTEM EXHAUST
Contaminants: Benzene (Carcinogen Requires Bact), Toluene(Pentyl Methane)(Methyl Benzene), Xylene, Ethyl Benzene, Other Organic Compounds
Emission Control: Act. Charcoal Filter

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18 | **2 of 2** | **NNE/104.4** | **63.8 / 1.26** | **City of Ottawa**
195 Lees Avenue
Ottawa ON | **CA**

Certificate #: 3-1458-86-006
Application Year: 2005
Issue Date: 1/6/2005
Approval Type: Municipal and Private Sewage Works
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

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19 | **1 of 1** | **NNE/104.4** | **63.8 / 1.26** | **City of Ottawa**
195 Lees Avenue
Ottawa ON K1P 1J1 | **ECA**

Approval No: 3-1458-86-006
Approval Date: 2005-01-06
Status: Approved
Record Type: ECA
Link Source: IDS
SWP Area Name: Rideau Valley
Approval Type: ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
MOE District: Ottawa
City:
Longitude: -75.66592
Latitude: 45.41795
Geometry X:
Geometry Y:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Project Type: MUNICIPAL AND PRIVATE SEWAGE WORKS
Address: 195 Lees Avenue
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/3294-67APJQ-14.pdf

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20 **1 of 1** **SW/104.4** **60.6 / -1.99** **190 Lees Ave**
Ottawa ON K1S5L5 **EHS**

Order No: 20150506076
Status: C
Report Type: Standard Report
Report Date: 13-MAY-15
Date Received: 06-MAY-15
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:

Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): .25
X: -75.67
Y: 45.415132

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21 **1 of 1** **N/107.2** **63.9 / 1.34**
ON **BORE**

Borehole ID: 847633
OGF ID: 215589290
Status: Decommissioned
Type: Borehole
Use: Geotechnical/Geological Investigation
Completion Date: 22-FEB-1964
Static Water Level:
Primary Water Use:
Sec. Water Use:
Total Depth m: 4.1
Depth Ref: Ground Surface
Depth Elev:
Drill Method: Diamond Drill
Orig Ground Elev m: 60.3
Elev Reliabil Note:
DEM Ground Elev m: 62.4
Concession: BROKEN FRONT D
Location D:
Survey D:
Comments: BOREHOLE DRY AFTER DRILLING

Inclin FLG: No
SP Status: Initial Entry
Surv Elev: No
Piezometer: No
Primary Name:
Municipality:
Lot: LOT G
Township: NEPEAN
Latitude DD: 45.416845
Longitude DD: -75.669055
UTM Zone: 18
Easting: 447652
Northing: 5029476
Location Accuracy:
Accuracy: Within 20 metres

Borehole Geology Stratum

Geology Stratum ID: 6558312
Top Depth: 2.7
Bottom Depth: 4.1
Material Color: Dark
Material 1: Sand
Material 2: Silt
Material 3: Gravel
Material 4:
Gsc Material Description:
Stratum Description: VERY DENSE DARK GREY SAND TRACE TO SOME SILT AND GRAVEL **Note: Many records provided by the department have a truncated [Stratum Description] field.

Mat Consistency: Very Dense
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Geology Stratum ID: 6558311
Top Depth: 0
Bottom Depth: 2.7
Material Color: Dark
Material 1: Fill
Material 2: sand silt

Mat Consistency: Dense
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:

Material 3:	Gravel	**Geologic Period:**	
Material 4:	cobble	**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	DENSE TO VERY DENSE DARK BROWN SILTY SAND WITH GRAVEL A FEW COBBLES AND BOULDERS TILL **Note: Many records provided by the department have a truncated [Stratum Description] field.		

22 **1 of 1** **N/107.6** **64.0 / 1.46** **ON** **BORE**

Borehole ID:	847624	**Inclin FLG:**	No
OGF ID:	215589281	**SP Status:**	Initial Entry
Status:	Decommissioned	**Surv Elev:**	No
Type:	Borehole	**Piezometer:**	No
Use:	Geotechnical/Geological Investigation	**Primary Name:**	
Completion Date:	14-FEB-1964	**Municipality:**	
Static Water Level:	3.6	**Lot:**	LOT G
Primary Water Use:		**Township:**	NEPEAN
Sec. Water Use:		**Latitude DD:**	45.416853
Total Depth m:	14.1	**Longitude DD:**	-75.669272
Depth Ref:	Ground Surface	**UTM Zone:**	18
Depth Elev:		**Easting:**	447635
Drill Method:	Diamond Drill	**Northing:**	5029477
Orig Ground Elev m:	59.8	**Location Accuracy:**	
Elev Reliabil Note:		**Accuracy:**	Within 20 metres
DEM Ground Elev m:	63.4		
Concession:	BROKEN FRONT D		
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	6558272	**Mat Consistency:**	Dense
Top Depth:	0	**Material Moisture:**	
Bottom Depth:	2.2	**Material Texture:**	
Material Color:	Dark	**Non Geo Mat Type:**	
Material 1:	Fill	**Geologic Formation:**	
Material 2:	sand silt	**Geologic Group:**	
Material 3:	Gravel	**Geologic Period:**	
Material 4:	Clay	**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	DENSE DARK BROWN TO BLACK SILTY SAND WITH GRAVEL TRACE OF CLAY OCCASIONAL CINDERS PIECES OF CEMENT AND COBBLES FILL **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Geology Stratum ID:	6558276	**Mat Consistency:**	
Top Depth:	11.5	**Material Moisture:**	
Bottom Depth:	14.1	**Material Texture:**	
Material Color:	Dark	**Non Geo Mat Type:**	
Material 1:	Bedrock	**Geologic Formation:**	
Material 2:	Shale	**Geologic Group:**	
Material 3:	Clay	**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	FAIRLY SOUND TO SOUND DARK GREY SHALE BEDROCK OCCASIONAL THIN CLAYEY SEAMS **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Geology Stratum ID:	6558273	**Mat Consistency:**	Dense
Top Depth:	2.2	**Material Moisture:**	
Bottom Depth:	5.6	**Material Texture:**	
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Silt	**Geologic Group:**	
Material 3:	Gravel	**Geologic Period:**	

Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	DENSE TO VERY DENSE BROWN TO DARK GREY SAND TRACE OF SILT AND GRAVEL **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Geology Stratum ID:	6558275	**Mat Consistency:**	Very Dense
Top Depth:	7.8	**Material Moisture:**	
Bottom Depth:	11.5	**Material Texture:**	
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Till	**Geologic Formation:**	
Material 2:	sand silt	**Geologic Group:**	
Material 3:	Gravel	**Geologic Period:**	
Material 4:	cobble	**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	VERY DENSE BROWN TO DARK GREY SILTY SAND WITH GRAVEL COBBLES AND BOULDERS TRACE OF CLAY LOWER TILL **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Geology Stratum ID:	6558274	**Mat Consistency:**	Very Dense
Top Depth:	5.6	**Material Moisture:**	
Bottom Depth:	7.8	**Material Texture:**	Fine to Coarse
Material Color:	Grey	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Silt	**Geologic Group:**	
Material 3:	Sand	**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	VERY DENSE GREY SILTY FINE SAND WITH LAYERS OF SILT AND FINE TO COARSE SAND **Note: Many records provided by the department have a truncated [Stratum Description] field.		

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23 | **1 of 1** | **ESE/109.0** | **59.9 / -2.69** | **Algonquin College Dump**

Ottawa ON K1S 0C5

ANDR

Legal Description:	Gloucester
Location Description:	Lees Ave (Algonquin College), S side of High School [?], adj. Rideau River, S of Lees Ave*
Municipality:	Ottawa City
Current Municipality:	Ottawa City
RM:	Ottawa-Carleton Region
Facility:	Dump
Date Active:	1947
Date Begun:	
Date Complete:	1947
Area (Ha):	
Landfill Type:	
Group Name:	Rideau River
Operated By:	
Serial:	MOEE 1017
NTS:	31G05
Diameter (m):	

Historical Summary:

Algonquin College Dump MOEE 1994 Lees Ave (Algonquin College) cited as closed waste disposal site ([Ontario Ministry of the Environment [1994] Waste disposal site inventory, [Toronto]: Ontario Environment, 1994., i, 196 p. : maps. ISBN 0772984093). 1965 Military Town Plan ASE 306 Not marked, site is on S side of High School [?], adj. Rideau River, S of Lees Ave* [1965 Military Town Plan Ottawa-Hull ASE 306 Edition 1 (produced 1965)]. 1982 Military Town Plan MCE 306 Not marked, site is part of Algonquin College [1982 Military Town Plan Ottawa-Hull MCE 306 Edition 5 (information 1980, produced 1982)]. *[1992] MapArt Corporation Ontario, Towns and Cities [Street Atlas].

Waste Type:	
UTM X Nad 27:	447700
UTM Y Nad 27:	5029080
UTM Zone:	18

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
24	1 of 1	SSW/111.1	60.0 / -2.61	ON	BORE

Borehole ID:	613267	**Inclin FLG:**	No
OGF ID:	215514569	**SP Status:**	Initial Entry
Status:		**Surv Elev:**	No
Type:	Borehole	**Piezometer:**	No
Use:		**Primary Name:**	
Completion Date:	FEB-1971	**Municipality:**	
Static Water Level:		**Lot:**	
Primary Water Use:		**Township:**	
Sec. Water Use:		**Latitude DD:**	45.414918
Total Depth m:	10.7	**Longitude DD:**	-75.66956
Depth Ref:	Ground Surface	**UTM Zone:**	18
Depth Elev:		**Easting:**	447611
Drill Method:		**Northing:**	5029262
Orig Ground Elev m:	57.2	**Location Accuracy:**	
Elev Reliabil Note:		**Accuracy:**	Not Applicable
DEM Ground Elev m:	60.1		
Concession:			
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	218394423	**Mat Consistency:**	
Top Depth:	0	**Material Moisture:**	
Bottom Depth:	1.7	**Material Texture:**	
Material Color:		**Non Geo Mat Type:**	
Material 1:		**Geologic Formation:**	
Material 2:	Sand	**Geologic Group:**	
Material 3:	Clay	**Geologic Period:**	
Material 4:	Gravel	**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	ARTIFICIAL.		

Geology Stratum ID:	218394425	**Mat Consistency:**	
Top Depth:	3	**Material Moisture:**	
Bottom Depth:	4.6	**Material Texture:**	
Material Color:		**Non Geo Mat Type:**	
Material 1:	Silt	**Geologic Formation:**	
Material 2:	Clay	**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	SILT.		

Geology Stratum ID:	218394429	**Mat Consistency:**	Dense
Top Depth:	6.6	**Material Moisture:**	
Bottom Depth:	7.5	**Material Texture:**	
Material Color:		**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Silt	**Geologic Group:**	
Material 3:	Gravel	**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	SAND. DENSE.		

Geology Stratum ID:	218394430	**Mat Consistency:**	Dense
Top Depth:	7.5	**Material Moisture:**	
Bottom Depth:	7.7	**Material Texture:**	
Material Color:		**Non Geo Mat Type:**	
Material 1:	Unknown	**Geologic Formation:**	
Material 2:	Till	**Geologic Group:**	

Material 3:	Shale	***Geologic Period:***	
Material 4:		***Depositional Gen:***	
Gsc Material Description:			
Stratum Description:	UNSPECIFIED. VERY DENSE.		

Geology Stratum ID:	218394424	***Mat Consistency:***	Stiff
Top Depth:	1.7	***Material Moisture:***	
Bottom Depth:	3	***Material Texture:***	
Material Color:	Brown	***Non Geo Mat Type:***	
Material 1:	Clay	***Geologic Formation:***	
Material 2:	Silt	***Geologic Group:***	
Material 3:		***Geologic Period:***	
Material 4:		***Depositional Gen:***	
Gsc Material Description:			
Stratum Description:	CLAY. BROWN,GREY,STIFF.		

Geology Stratum ID:	218394428	***Mat Consistency:***	Dense
Top Depth:	5.8	***Material Moisture:***	
Bottom Depth:	6.6	***Material Texture:***	
Material Color:		***Non Geo Mat Type:***	
Material 1:	Silt	***Geologic Formation:***	
Material 2:	Clay	***Geologic Group:***	
Material 3:	Sand	***Geologic Period:***	
Material 4:		***Depositional Gen:***	
Gsc Material Description:			
Stratum Description:	SILT. DENSE.		

Geology Stratum ID:	218394426	***Mat Consistency:***	Loose
Top Depth:	4.6	***Material Moisture:***	
Bottom Depth:	5.3	***Material Texture:***	
Material Color:	Grey	***Non Geo Mat Type:***	
Material 1:	Silt	***Geologic Formation:***	
Material 2:	Sand	***Geologic Group:***	
Material 3:	Clay	***Geologic Period:***	
Material 4:		***Depositional Gen:***	
Gsc Material Description:			
Stratum Description:	SILT. GREY,LOOSE.		

Geology Stratum ID:	218394427	***Mat Consistency:***	Loose
Top Depth:	5.3	***Material Moisture:***	
Bottom Depth:	5.8	***Material Texture:***	
Material Color:		***Non Geo Mat Type:***	
Material 1:	Silt	***Geologic Formation:***	
Material 2:	Clay	***Geologic Group:***	
Material 3:		***Geologic Period:***	
Material 4:		***Depositional Gen:***	
Gsc Material Description:			
Stratum Description:	SILT. LOOSE.		

Geology Stratum ID:	218394431	***Mat Consistency:***	
Top Depth:	7.7	***Material Moisture:***	
Bottom Depth:	10.7	***Material Texture:***	
Material Color:		***Non Geo Mat Type:***	
Material 1:	Bedrock	***Geologic Formation:***	
Material 2:	Shale	***Geologic Group:***	
Material 3:		***Geologic Period:***	
Material 4:		***Depositional Gen:***	
Gsc Material Description:			
Stratum Description:	BEDROCK. 00000 018 00055 053 00100 035 00150 025 00175 028 00190 020 00215 **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Source

Source Type:	Data Survey	***Source Appl:***	Spatial/Tabular
Source Orig:	Geological Survey of Canada	***Source Iden:***	1

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Source Date:	1956-1972	**Scale or Res:**	Varies
Confidence:	H	**Horizontal:**	NAD27
Observatio:		**Verticalda:**	Mean Average Sea Level
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Details:	File: OTTAWA2.txt RecordID: 057750 NTS_Sheet: 31G05G		
Confiden 1:	Logged by professional. Exact and complete description of material and properties.		

Source List

Source Identifier:	1	**Horizontal Datum:**	NAD27
Source Type:	Data Survey	**Vertical Datum:**	Mean Average Sea Level
Source Date:	1956-1972	**Projection Name:**	Universal Transverse Mercator
Scale or Resolution:	Varies		
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Originators:	Geological Survey of Canada		

25	*1 of 1*	*W/113.5*	*62.8 / 0.26*	***Ottawa Lees Avenue Gas Works*** ***175 Lees Avenue*** ***Ottawa ON***	***COAL***

Facility Type:	Retort coal gasification, later carburetted water gas
Size:	Large 3 hectare
NTS Map Sheet:	31 G/5
Planned Land Use:	High-rise development planned for 169 Lees Avenue
Present Land Use:	Bus transitway station (public use), high-rise apartment building (residentioal), gas metering station
Landuse Adj Property:	N-Highway 417, E-Algonquin College, S-Highrise apartments, Dept. of National Defense Armouries, W-Highway 417 on-off ramps
Underground Utilities:	Strom and sanitary sewers, watermain, telephone and gas mains along Lees Avenue; Storm sewer network for transitway station, sorm sewer from transitwa
Soil Conditions:	Fill (0-8 m), alluvium (3-8 m), till overlying shale bedrock
Site Access:	Uncontrolled access
Operating Period:	1920? - 1957 about 37 years
Surface Water:	Rideau River
Surface Water Prox:	150 m southeast
Surface Water Use:	Recreational
Groundwater Prox:	2-7 m below ground surface
Groundwater Use:	None reported
Existing Wells Prox:	None reported in impacted area
Historical Map/Photo:	1920 - Ottawa Gas Co. plan of works (Ottawa Gas); 1922 - fire insurance plan (Public Archives Canada, NMC 10837, key and sheet 259/263); 1940 - Ottawa Gas Company, Gas Works Lees Avenue, General plant layout (Ottawa Gas); 1956 - fire insurance plan (Public Archives Canada, NMC, Ottawa Vol. 2, 234-4)
Operators:	Ottawa Gas Co. (1920?-1939) Ottawa Heat Light and Power (1939-1950), Interprovincial Utilities (1950-1956), Consumers Gas Co. (1957)
Present Occupants:	RMOC - Lees Avenue Transitway Station, R. Vocisano: in trust, Consumers Gas Co.
Excavation History:	Queensway Highway Construction (1965); Bus transitway construction (1981-83), 169 Lees Avenue apartments (1985); installation of tar collector system on transitway property (1986)
Visible Wastes:	Observed during transitway constructrion, within transitway pumping station, during excavation for site remediation
Odour:	Observed in transitway station, transitway property, on Rideau River, on 169 Lees Avenue property
Water Pollution:	Estimated 40 m3 tar on bottom of Rideau River, oil slick on Rideau River observed in April - May 1986
Site Investigations:	Site investigations undertaken and ongoing on behalf of RMOC and MOE
Comments/Remarks:	Clean-up of transitway property and Rideau River ongoing, investigations continuing
Site Description:	Sometime between 1915 and 1920, the Ottawa Gas Co. relocated its gas works from the King Edward Street - York Street location to the site at 175 Lees Avenue. The Lees Avenue gas works was a large facility that operated for about 37 years or until 1957 when natural gas piplines made the operation uneconomical. The plant was operated under different company names including the Ottawa Gas Co., Ottawa Heat, Light and Power Co., Interprovincial Utilities Ltd. and Consumers Gas Co. The site is located on the north side of Lees Avenue, south of Highway 417 and between Lees Avenue on ramps to the west and the Lees Avenue overpass to the east. Gas plant operations changed from retort coal gasification to carburetted water gas in the late 1930s. Comprehensive air photo coverage of the site is available for the period 1925 to present. The site was demolished in 1966-67. The site is located 150 m northwest of the Rideau River. In 1981-83, the site was developed as a below ground bus transitway station by the Regional Municipality of Ottawa-Carleton. Because the bus station is below the groundwater table, continued pumping is required to prevent the bus station from flooding. A 1220 mm diameter storm sewer was constructed to discharge the pumped water from the transitwsy station directly to the Rideau River. The site is now occupied by the Lees Avenue transitway station and parking lot, a Consumers Gas metering station, an existing high rise apartment building (169 Lees Avenue - constructed in 1985) and vacant land proposed

for development as a high rise apartment building.

Potenial Environ Impact: Environmental impacts have already occurred for the Lees Avenue site. In late April 1986, tars were observed in the pumphouse of the Lees Avenue transitway station and in the adjacent Rideau River in the vicinity of the outfall from the pumping station. The discovery of this contamination resulted in closure of the Lees Avenue station and installation of a boom to contain the oil slick on the Rideau River. Subsequently, a leachate collection and treatment facility was constructed to collect and treat coal tar contaminated water at the transitwsy station and removal of an estimated 40 m3 of tar from the bottom of the River over a I00 m by 40 m area has been undertaken. Clean-up of the River is ongoing and will resume in spring 1987. Drilling and sampling investigations conducted on the property at 169 Lees Avenue have shown that the foundation of the 4,250 m3 gas holding tank is contaminated with coal tar. An underground parking lot and a second high-rise apartment building are planned for this property. A potential environmental impact exists for this site as a result of excavation of buried wastes and exposure of these wastes to workers involved in the excavation. Approval for this development is pending subject to the results of site investigations undertaken by the Ontario Ministry of the Environment. In addition to the gas works, a tar distillation plant operated south of the gas works and Lees Avenue from about 1920 to sometime in the late 1940s. This facility distilled coal tars received from the gas works and later from other sources. Because this facility handled and processed coal tars, it is a second industrial source of coal tar contamination in the Lees Avenue area. The plant was located on what is now 170 Lees Avenue. A high-rise apartment building now occupies the site. Soil and groundwater contamination have been discovered at this site, beside and below the 170 Lees Avenue apartment building.

Offsite Disposal Areas: Ash and cinder likely disposed on former dump site that is now Algonquin College, and south of Lees Avenue at 180 and 190 Lees Avenue, some tar and sp

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26 ***1 of 1*** ***N/113.6*** ***64.0 / 1.46*** ***ON*** ***WWIS***

Well ID:	7231849	***Data Entry Status:***	Yes
Construction Date:		***Data Src:***	
Primary Water Use:		***Date Received:***	1/27/2014
Sec. Water Use:		***Selected Flag:***	Yes
Final Well Status:		***Abandonment Rec:***	
Water Type:		***Contractor:***	6894
Casing Material:		***Form Version:***	5
Audit No:	C13939	***Owner:***	
Tag:	A157433	***Street Name:***	
Construction Method:		***County:***	OTTAWA-CARLETON
Elevation (m):		***Municipality:***	OTTAWA CITY
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	
Well Depth:		***Concession:***	
Overburden/Bedrock:		***Concession Name:***	
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1005300864	***Elevation:***	63.145713
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	447634
Code OB Desc:		***North83:***	5029483
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	1/9/2014	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
27	1 of 1	NNW/125.2	64.9 / 2.34	Ottawa ON	WWIS

Well ID:	7191091	**Data Entry Status:**	
Construction Date:		**Data Src:**	
Primary Water Use:	Monitoring and Test Hole	**Date Received:**	11/9/2012
Sec. Water Use:	0	**Selected Flag:**	Yes
Final Well Status:	Observation Wells	**Abandonment Rec:**	
Water Type:		**Contractor:**	7241
Casing Material:		**Form Version:**	7
Audit No:	Z156921	**Owner:**	
Tag:	A135005	**Street Name:**	191 LEES AVE
Construction Method:		**County:**	OTTAWA-CARLETON
Elevation (m):		**Municipality:**	OTTAWA CITY
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	
Well Depth:		**Concession:**	
Overburden/Bedrock:		**Concession Name:**	
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004200408	**Elevation:**	60.12804
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	18
Code OB:		**East83:**	447591
Code OB Desc:		**North83:**	5029485
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	9/25/2012	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1004490071
Layer:	3
Color:	2
General Color:	GREY
Mat1:	28
Most Common Material:	SAND
Mat2:	06
Other Materials:	SILT
Mat3:	73
Other Materials:	HARD
Formation Top Depth:	2.44
Formation End Depth:	4.88
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004490070
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	01
Other Materials:	FILL
Mat3:	85
Other Materials:	SOFT
Formation Top Depth:	0.31
Formation End Depth:	2.44
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004490069
Layer:	1
Color:	8
General Color:	BLACK
Mat1:	11
Most Common Material:	GRAVEL
Mat2:	
Other Materials:	
Mat3:	73
Other Materials:	HARD
Formation Top Depth:	0
Formation End Depth:	0.31
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004490080
Layer:	2
Plug From:	0.31
Plug To:	3.1
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004490079
Layer:	1
Plug From:	0
Plug To:	0.31
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004490081
Layer:	3
Plug From:	3.1
Plug To:	4.88
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:

Method Construction Code: D
Method Construction: Direct Push
Other Method Construction:

Pipe Information

Pipe ID: 1004490068
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1004490074
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0
Depth To: 3.35
Casing Diameter: 4.03
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1004490075
Layer: 1
Slot: 10
Screen Top Depth: 3.35
Screen End Depth: 4.88
Screen Material: 5
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter: 4.82

Hole Diameter

Hole ID: 1004490072
Diameter: 8.25
Depth From: 0
Depth To: 4.88
Hole Depth UOM: m
Hole Diameter UOM: cm

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28 **1 of 1** **N/127.2** **63.9 / 1.31** **ON** **BORE**

Borehole ID: 847625
OGF ID: 215589282
Status: Decommissioned
Type: Borehole
Use: Geotechnical/Geological Investigation
Completion Date: 17-FEB-1964
Static Water Level: 4.5
Primary Water Use:
Sec. Water Use:
Total Depth m: 14.5
Depth Ref: Ground Surface
Depth Elev:
Drill Method: Diamond Drill
Orig Ground Elev m: 60.8
Elev Reliabil Note:

Inclin FLG: No
SP Status: Initial Entry
Surv Elev: No
Piezometer: No
Primary Name:
Municipality:
Lot: LOT G
Township: NEPEAN
Latitude DD: 45.417025
Longitude DD: -75.669032
UTM Zone: 18
Easting: 447654
Northing: 5029496
Location Accuracy:
Accuracy: Within 20 metres

DEM Ground Elev m: 61.8
Concession: BROKEN FRONT D
Location D:
Survey D:
Comments:

Borehole Geology Stratum

Geology Stratum ID: 6558281
Top Depth: 11.1
Bottom Depth: 14.5
Material Color: Dark
Material 1: Bedrock
Material 2: Shale
Material 3:
Material 4:
Gsc Material Description:
Stratum Description: SOUND DARK GREY TO BLACK SHALE BEDROCK **Note: Many records provided by the department have a truncated [Stratum Description] field.

Mat Consistency:
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Geology Stratum ID: 6558280
Top Depth: 8.7
Bottom Depth: 11.1
Material Color: Grey
Material 1: Sand
Material 2: Silt
Material 3: Gravel
Material 4: cobble
Gsc Material Description:
Stratum Description: VERY DENSE DARK GREY SILTY SAND TO SANDY SILT WITH GRAVEL COBBLES AND BOULDERS TRACE TO SOME CLAY LOWER TILL **Note: Many records provided by the department have a truncated [Stratum Description] field.

Mat Consistency: Very Dense
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Geology Stratum ID: 6558278
Top Depth: 2.9
Bottom Depth: 6.7
Material Color: Brown
Material 1: Sand
Material 2: Silt
Material 3: Gravel
Material 4:
Gsc Material Description:
Stratum Description: VERY DENSE BROWN TO DARK GREY SAND TRACE TO SOME SILT AND GRAVEL **Note: Many records provided by the department have a truncated [Stratum Description] field.

Mat Consistency: Very Dense
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Geology Stratum ID: 6558279
Top Depth: 6.7
Bottom Depth: 8.7
Material Color: Grey
Material 1: Sand
Material 2: Silt
Material 3: Gravel
Material 4: Silt
Gsc Material Description:
Stratum Description: VERY DENSE GREY SILTY FINE SAND TRACE OF GRAVEL AND OCCASIONAL THIN LAYERS OF SILT AND SAND **Note: Many records provided by the department have a truncated [Stratum Description] field.

Mat Consistency: Very Dense
Material Moisture:
Material Texture: Fine
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Geology Stratum ID: 6558277
Top Depth: 0
Bottom Depth: 2.9
Material Color: Dark
Material 1: Fill
Material 2: sand silt
Material 3: Sand
Material 4: Gravel

Mat Consistency: Compact
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Gsc Material Description:
Stratum Description: COMPACT TO VERY DENSE DARK BROWN TO BLACK SILTY SAND TO SAND WITH GRAVEL AND LIMESTONE FRAGMENTS, OCCASIONAL CINDERS FILL **Note: Many records provided by the department have a truncated [Stratum Description] field.

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29 | **1 of 1** | **N/128.4** | **65.0 / 2.40** | **ON** | **BORE**

Borehole ID:	847632	**Inclin FLG:**	No
OGF ID:	215589289	**SP Status:**	Initial Entry
Status:	Decommissioned	**Surv Elev:**	No
Type:	Borehole	**Piezometer:**	No
Use:	Geotechnical/Geological Investigation	**Primary Name:**	
Completion Date:	22-FEB-1964	**Municipality:**	
Static Water Level:	4.5	**Lot:**	LOT G
Primary Water Use:		**Township:**	NEPEAN
Sec. Water Use:		**Latitude DD:**	45.417042
Total Depth m:	5.3	**Longitude DD:**	-75.669211
Depth Ref:	Ground Surface	**UTM Zone:**	18
Depth Elev:		**Easting:**	447640
Drill Method:	Diamond Drill	**Northing:**	5029498
Orig Ground Elev m:	60.8	**Location Accuracy:**	
Elev Reliabil Note:		**Accuracy:**	Within 20 metres
DEM Ground Elev m:	62.8		
Concession:	BROKEN FRONT D		
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	6558309	**Mat Consistency:**	Compact
Top Depth:	0	**Material Moisture:**	
Bottom Depth:	3.2	**Material Texture:**	
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Fill	**Geologic Formation:**	
Material 2:	Sand	**Geologic Group:**	
Material 3:	Silt	**Geologic Period:**	
Material 4:	Gravel	**Depositional Gen:**	

Gsc Material Description:
Stratum Description: COMPACT TO DENSE BROWN TO DARK BROWN SAND TO SILTY SAND WITH GRAVEL FILL **Note: Many records provided by the department have a truncated [Stratum Description] field.

Geology Stratum ID:	6558310	**Mat Consistency:**	Dense
Top Depth:	3.2	**Material Moisture:**	
Bottom Depth:	5.3	**Material Texture:**	
Material Color:	Dark	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Silt	**Geologic Group:**	
Material 3:	Gravel	**Geologic Period:**	
Material 4:		**Depositional Gen:**	

Gsc Material Description:
Stratum Description: DENSE TO VERY DENSE DARK GREY SAND TRACE OF SILT SOME GRAVEL **Note: Many records provided by the department have a truncated [Stratum Description] field.

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30 | **1 of 1** | **W/129.1** | **62.8 / 0.26** | **179 Lees Avenue Ottawa ON** | **SPL**

Ref No:	2840-AEPPWR	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	10/13/2016	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:		**Sector Type:**	Miscellaneous Industrial
Incident Event:	Leak/Break	**Agency Involved:**	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Contaminant Code:
Contaminant Name:
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1:
Environment Impact:
Nature of Impact:
Receiving Medium:
Receiving Env: Land
MOE Response:
Dt MOE Arvl on Scn:
MOE Reported Dt: 10/13/2016
Dt Document Closed:
Incident Reason: Unknown / N/A
Site Name: Lees Station<UNOFFICIAL>
Site County/District:
Site Geo Ref Meth:
Incident Summary: OLRT: 10-100 L concrete wash to sewer inlet
Contaminant Qty:

Nearest Watercourse:
Site Address: 179 Lees Avenue
Site District Office:
Site Postal Code:
Site Region:
Site Municipality: Ottawa
Site Lot:
Site Conc:
Northing:
Easting:
Site Geo Ref Accu:
Site Map Datum:
SAC Action Class: Land Spills
Source Type:

31	1 of 2	N/137.7	63.9 / 1.31	CAPITAL BEEF ATTN:FRANK VELLENERUVE 229 LEES AV OTTAWA ON K1N 8P1	PRT

Location ID: 10985
Type: private
Expiry Date:
Capacity (L): 35000.00
Licence #: 0001055614

31	2 of 2	N/137.7	63.9 / 1.31	CAPITAL BEEF ATTN:FRANK VELLENERUVE 229 LEES AVE OTTAWA ON K1N 8P1	FSTH

License Issue Date: 1/17/1991
Tank Status: Licensed
Tank Status As Of: August 2007
Operation Type: Private Fuel Outlet
Facility Type: Gasoline Station - Self Serve

--Details--
Status: Not-Active
Year of Installation: 1991
Corrosion Protection:
Capacity: 10000
Tank Fuel Type: Liquid Fuel Single Wall UST - Gasoline

Status: Not-Active
Year of Installation: 1991
Corrosion Protection:
Capacity: 25000
Tank Fuel Type: Liquid Fuel Single Wall UST - Diesel

32	1 of 1	WNW/139.2	63.9 / 1.31	Ottawa ON	WWIS

Well ID: 7191094
Construction Date:
Primary Water Use: Monitoring and Test Hole
Sec. Water Use: 0

Data Entry Status:
Data Src:
Date Received: 11/9/2012
Selected Flag: Yes

Final Well Status:	Test Hole	***Abandonment Rec:***	
Water Type:		***Contractor:***	7241
Casing Material:		***Form Version:***	7
Audit No:	Z156918	***Owner:***	
Tag:	A135000	***Street Name:***	191 LEES AVE
Construction Method:		***County:***	OTTAWA-CARLETON
Elevation (m):		***Municipality:***	NEPEAN TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	
Well Depth:		***Concession:***	
Overburden/Bedrock:		***Concession Name:***	
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004200417	***Elevation:***	57.912391
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	447509
Code OB Desc:		***North83:***	5029418
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	9/24/2012	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1004490127
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Other Materials:	GRAVEL
Mat3:	85
Other Materials:	SOFT
Formation Top Depth:	0.61
Formation End Depth:	6.1
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004490130
Layer:	5
Color:	2
General Color:	GREY
Mat1:	34
Most Common Material:	TILL
Mat2:	
Other Materials:	

Mat3: 73
Other Materials: HARD
Formation Top Depth: 8.53
Formation End Depth: 8.84
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1004490126
Layer: 1
Color: 6
General Color: BROWN
Mat1: 02
Most Common Material: TOPSOIL
Mat2: 28
Other Materials: SAND
Mat3: 85
Other Materials: SOFT
Formation Top Depth: 0
Formation End Depth: 0.61
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1004490128
Layer: 3
Color: 2
General Color: GREY
Mat1: 06
Most Common Material: SILT
Mat2: 05
Other Materials: CLAY
Mat3: 85
Other Materials: SOFT
Formation Top Depth: 6.1
Formation End Depth: 7.62
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1004490129
Layer: 4
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 06
Other Materials: SILT
Mat3:
Other Materials:
Formation Top Depth: 7.62
Formation End Depth: 8.53
Formation End Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1004490139
Layer: 2

Plug From: 7.01
Plug To: 8.84
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1004490138
Layer: 1
Plug From: 0
Plug To: 7.01
Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID:
Method Construction Code: 2
Method Construction: Rotary (Convent.)
Other Method Construction:

Pipe Information

Pipe ID: 1004490125
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1004490133
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0
Depth To: 7.32
Casing Diameter: 5.2
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1004490134
Layer: 1
Slot: 10
Screen Top Depth: 7.32
Screen End Depth: 8.84
Screen Material: 5
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter: 6.03

Hole Diameter

Hole ID: 1004490131
Diameter: 10.91
Depth From: 0
Depth To: 8.84
Hole Depth UOM: m
Hole Diameter UOM: cm

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
33	1 of 1	N/141.7	63.9 / 1.31	ALGONQUIN COLLEGE OF APPLIED ARTS & TECH LEES AVE/HIGHWAY 417 OTTAWA CITY ON	CA

Certificate #: 7-0998-97-
Application Year: 97
Issue Date: 9/10/1997
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
34	1 of 1	WNW/146.6	64.2 / 1.62	Ottawa ON	WWIS

Well ID: 7191096
Construction Date:
Primary Water Use: Monitoring and Test Hole
Sec. Water Use: 0
Final Well Status: Test Hole
Water Type:
Casing Material:
Audit No: Z156917
Tag: A135002
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Data Entry Status:
Data Src:
Date Received: 11/9/2012
Selected Flag: Yes
Abandonment Rec:
Contractor: 7241
Form Version: 7
Owner:
Street Name: 191 LEES AVE
County: OTTAWA-CARLETON
Municipality: NEPEAN TOWNSHIP
Site Info:
Lot:
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 1004200423
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 9/24/2012
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation: 55.722091
Elevrc:
Zone: 18
East83: 447517
North83: 5029450
Org CS: UTM83
UTMRC: 4
UTMRC Desc: margin of error : 30 m - 100 m
Location Method: wwr

Overburden and Bedrock Materials Interval

Formation ID:	1004490181
Layer:	3
Color:	2
General Color:	GREY
Mat1:	28
Most Common Material:	SAND
Mat2:	84
Other Materials:	SILTY
Mat3:	05
Other Materials:	CLAY
Formation Top Depth:	3.66
Formation End Depth:	6.1
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004490180
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Other Materials:	GRAVEL
Mat3:	74
Other Materials:	LAYERED
Formation Top Depth:	0.61
Formation End Depth:	3.66
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004490179
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	02
Most Common Material:	TOPSOIL
Mat2:	28
Other Materials:	SAND
Mat3:	85
Other Materials:	SOFT
Formation Top Depth:	0
Formation End Depth:	0.61
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004490182
Layer:	4
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	28
Other Materials:	SAND
Mat3:	84

Other Materials:	SILTY
Formation Top Depth:	6.1
Formation End Depth:	8.84
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004490191
Layer:	2
Plug From:	7.01
Plug To:	8.84
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004490190
Layer:	1
Plug From:	0
Plug To:	7.01
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	
Method Construction Code:	2
Method Construction:	Rotary (Convent.)
Other Method Construction:	

Pipe Information

Pipe ID:	1004490178
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1004490185
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	0
Depth To:	7.32
Casing Diameter:	5.2
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1004490186
Layer:	1
Slot:	10
Screen Top Depth:	7.32
Screen End Depth:	8.84
Screen Material:	5
Screen Depth UOM:	m
Screen Diameter UOM:	cm
Screen Diameter:	6.03

Hole Diameter

Hole ID:	1004490183
Diameter:	10.92
Depth From:	0
Depth To:	8.84
Hole Depth UOM:	m
Hole Diameter UOM:	cm

35 ***1 of 1*** ***N/146.9*** ***63.9 / 1.31*** ***ON*** ***BORE***

Borehole ID:	847629	***Inclin FLG:***	No
OGF ID:	215589286	***SP Status:***	Initial Entry
Status:	Decommissioned	***Surv Elev:***	No
Type:	Borehole	***Piezometer:***	No
Use:	Geotechnical/Geological Investigation	***Primary Name:***	
Completion Date:	22-FEB-1964	***Municipality:***	
Static Water Level:	4.0	***Lot:***	LOT G
Primary Water Use:		***Township:***	NEPEAN
Sec. Water Use:		***Latitude DD:***	45.417205
Total Depth m:	5	***Longitude DD:***	-75.669072
Depth Ref:	Ground Surface	***UTM Zone:***	18
Depth Elev:		***Easting:***	447651
Drill Method:	Diamond Drill	***Northing:***	5029516
Orig Ground Elev m:	60.3	***Location Accuracy:***	
Elev Reliabil Note:		***Accuracy:***	Within 20 metres
DEM Ground Elev m:	63.9		
Concession:	BROKEN FRONT D		
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	6558300	***Mat Consistency:***	Dense
Top Depth:	1.8	***Material Moisture:***	
Bottom Depth:	3	***Material Texture:***	
Material Color:	Brown-Grey	***Non Geo Mat Type:***	
Material 1:	Till	***Geologic Formation:***	
Material 2:	sand silt	***Geologic Group:***	
Material 3:	Gravel	***Geologic Period:***	
Material 4:	Clay	***Depositional Gen:***	
Gsc Material Description:			
Stratum Description:	DENS ETO VERY DENSE BROWN TO GREY SILTY SAND WITH GRAVEL TRACE OF CLAY WEATHERED UPPER TILL **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Geology Stratum ID:	6558301	***Mat Consistency:***	Very Dense
Top Depth:	3	***Material Moisture:***	
Bottom Depth:	5	***Material Texture:***	
Material Color:	Dark	***Non Geo Mat Type:***	
Material 1:	Sand	***Geologic Formation:***	
Material 2:	Gravel	***Geologic Group:***	
Material 3:	Silt	***Geologic Period:***	
Material 4:		***Depositional Gen:***	
Gsc Material Description:			
Stratum Description:	VERY DENSE DARK GREY SAND WITH GRAVEL TRACE OF SILT **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Geology Stratum ID:	6558299	***Mat Consistency:***	Compact
Top Depth:	0	***Material Moisture:***	
Bottom Depth:	1.8	***Material Texture:***	

Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Fill	**Geologic Formation:**	
Material 2:	Sand	**Geologic Group:**	
Material 3:	Silt	**Geologic Period:**	
Material 4:	Gravel	**Depositional Gen:**	
Gsc Material Description:			

Stratum Description: COMPACT TO DENSE BROWN SAND TO SILTY SAND WITH SOME GRAVEL FILL **Note: Many records provided by the department have a truncated [Stratum Description] field.

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36 | **1 of 1** | **WSW/151.6** | **61.9 / -0.69** | **180 Lees Ave, Ottawa ON K1S 5J6** | **EHS**

Order No:	20110720056	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Site Report	**Client Prov/State:**	ON
Report Date:	7/21/2011	**Search Radius (km):**	0.25
Date Received:	7/20/2011 2:58:06 PM	**X:**	-75.671059
Previous Site Name:		**Y:**	45.415511
Lot/Building Size:			
Additional Info Ordered:			

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37 | **1 of 1** | **NW/152.8** | **64.9 / 2.34** | **Ottawa ON** | **WWIS**

Well ID:	7191093	**Data Entry Status:**	
Construction Date:		**Data Src:**	
Primary Water Use:	Monitoring and Test Hole	**Date Received:**	11/9/2012
Sec. Water Use:	0	**Selected Flag:**	Yes
Final Well Status:	Test Hole	**Abandonment Rec:**	
Water Type:		**Contractor:**	7241
Casing Material:		**Form Version:**	7
Audit No:	Z156920	**Owner:**	
Tag:	A135003	**Street Name:**	191 LEES AVE
Construction Method:		**County:**	OTTAWA-CARLETON
Elevation (m):		**Municipality:**	NEPEAN TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	
Well Depth:		**Concession:**	
Overburden/Bedrock:		**Concession Name:**	
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004200414	**Elevation:**	57.037029
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	18
Code OB:		**East83:**	447535
Code OB Desc:		**North83:**	5029481
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	9/25/2012	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1004490107
Layer:	3
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	06
Other Materials:	SILT
Mat3:	85
Other Materials:	SOFT
Formation Top Depth:	2.44
Formation End Depth:	6.1
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004490105
Layer:	1
Color:	8
General Color:	BLACK
Mat1:	
Most Common Material:	
Mat2:	11
Other Materials:	GRAVEL
Mat3:	73
Other Materials:	HARD
Formation Top Depth:	0
Formation End Depth:	0.31
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004490106
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Other Materials:	GRAVEL
Mat3:	74
Other Materials:	LAYERED
Formation Top Depth:	0.31
Formation End Depth:	2.44
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004490108
Layer:	4
Color:	2
General Color:	GREY
Mat1:	28
Most Common Material:	SAND
Mat2:	06

Other Materials:	SILT
Mat3:	85
Other Materials:	SOFT
Formation Top Depth:	6.1
Formation End Depth:	8.99
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004490116
Layer:	1
Plug From:	0
Plug To:	0.31
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004490118
Layer:	3
Plug From:	7.16
Plug To:	8.99
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004490117
Layer:	2
Plug From:	0.31
Plug To:	7.16
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	
Method Construction Code:	D
Method Construction:	Direct Push
Other Method Construction:	

Pipe Information

Pipe ID:	1004490104
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1004490111
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	0
Depth To:	7.47
Casing Diameter:	4.03
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1004490112
Layer:	1
Slot:	10
Screen Top Depth:	7.47
Screen End Depth:	8.99
Screen Material:	5
Screen Depth UOM:	m
Screen Diameter UOM:	cm
Screen Diameter:	4.82

Hole Diameter

Hole ID:	1004490109
Diameter:	8.25
Depth From:	0
Depth To:	8.99
Hole Depth UOM:	m
Hole Diameter UOM:	cm

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38 ***1 of 1*** ***N/154.2*** ***65.0 / 2.40*** ***ON*** ***BORE***

Borehole ID:	613310	***Inclin FLG:***	No
OGF ID:	215514611	***SP Status:***	Initial Entry
Status:		***Surv Elev:***	No
Type:	Borehole	***Piezometer:***	No
Use:		***Primary Name:***	
Completion Date:	JUL-1962	***Municipality:***	
Static Water Level:	-6.6	***Lot:***	
Primary Water Use:		***Township:***	
Sec. Water Use:		***Latitude DD:***	45.417262
Total Depth m:	1.4	***Longitude DD:***	-75.668949
Depth Ref:	Ground Surface	***UTM Zone:***	18
Depth Elev:		***Easting:***	447661
Drill Method:		***Northing:***	5029522
Orig Ground Elev m:	60.3	***Location Accuracy:***	
Elev Reliabil Note:		***Accuracy:***	Not Applicable
DEM Ground Elev m:	62.2		
Concession:			
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	218394596	***Mat Consistency:***	Firm
Top Depth:	.8	***Material Moisture:***	
Bottom Depth:	1.4	***Material Texture:***	
Material Color:	Grey	***Non Geo Mat Type:***	
Material 1:		***Geologic Formation:***	
Material 2:	Silt	***Geologic Group:***	
Material 3:	Clay	***Geologic Period:***	
Material 4:	Sand	***Depositional Gen:***	
Gsc Material Description:			
Stratum Description:	ARTIFICIAL. WN,HARD. TILL. GREY,FIRM. BEDROCK. GREY,FRACTURED, WATER STABLE AT 219.4 FEET.		

Geology Stratum ID:	218394595	***Mat Consistency:***	
Top Depth:	0	***Material Moisture:***	
Bottom Depth:	.8	***Material Texture:***	
Material Color:		***Non Geo Mat Type:***	

Material 1:		**Geologic Formation:**	
Material 2:	Granuls	**Geologic Group:**	
Material 3:	Sand	**Geologic Period:**	
Material 4:	Gravel	**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	ARTIFICIAL.		

Source

Source Type:	Data Survey	**Source Appl:**	Spatial/Tabular
Source Orig:	Geological Survey of Canada	**Source Iden:**	1
Source Date:	1956-1972	**Scale or Res:**	Varies
Confidence:	H	**Horizontal:**	NAD27
Observatio:		**Verticalda:**	Mean Average Sea Level
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Details:	File: OTTAWA2.txt RecordID: 058180 NTS_Sheet: 31G05G		
Confiden 1:	Logged by professional. Exact and complete description of material and properties.		

Source List

Source Identifier:	1	**Horizontal Datum:**	NAD27
Source Type:	Data Survey	**Vertical Datum:**	Mean Average Sea Level
Source Date:	1956-1972	**Projection Name:**	Universal Transverse Mercator
Scale or Resolution:	Varies		
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Originators:	Geological Survey of Canada		

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39 | ***1 of 1*** | ***WSW/160.5*** | ***61.0 / -1.53*** | ***Rideau Transit Group***
180 Lees Avenue
Ottawa ON K1S5J6 | ***GEN***

Generator No:	ON9822825	**PO Box No:**	
Status:		**Country:**	Canada
Approval Years:	2016	**Choice of Contact:**	CO_ADMIN
Contam. Facility:	No	**Co Admin:**	Amanda Bromley
MHSW Facility:	No	**Phone No Admin:**	6133147012 Ext.
SIC Code:	237310		
SIC Description:	HIGHWAY, STREET AND BRIDGE CONSTRUCTION		

Detail(s)

Waste Class:	146
Waste Class Desc:	OTHER SPECIFIED INORGANICS

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40 | ***1 of 1*** | ***N/161.6*** | ***65.0 / 2.40*** | ***ON*** | ***BORE***

Borehole ID:	847626	**Inclin FLG:**	No
OGF ID:	215589283	**SP Status:**	Initial Entry
Status:	Decommissioned	**Surv Elev:**	No
Type:	Borehole	**Piezometer:**	No
Use:	Geotechnical/Geological Investigation	**Primary Name:**	
Completion Date:	19-FEB-1964	**Municipality:**	
Static Water Level:	4.2	**Lot:**	LOT G
Primary Water Use:		**Township:**	NEPEAN
Sec. Water Use:		**Latitude DD:**	45.41734
Total Depth m:	13.7	**Longitude DD:**	-75.66915
Depth Ref:	Ground Surface	**UTM Zone:**	18
Depth Elev:		**Easting:**	447645
Drill Method:	Diamond Drill	**Northing:**	5029531
Orig Ground Elev m:	60.7	**Location Accuracy:**	
Elev Reliabil Note:		**Accuracy:**	Within 20 metres

DEM Ground Elev m: 63.4
Concession: BROKEN FRONT D
Location D:
Survey D:
Comments:

Borehole Geology Stratum

Geology Stratum ID: 6558288
Top Depth: 10.9
Bottom Depth: 13.7
Material Color: Dark
Material 1: Bedrock
Material 2: Shale
Material 3:
Material 4:
Gsc Material Description:
Stratum Description: FAIRLY SOUND TO SOUND DARK GREY TO BLACK SHALE BEDROCK **Note: Many records provided by the department have a truncated [Stratum Description] field.

Mat Consistency:
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Geology Stratum ID: 6558287
Top Depth: 9
Bottom Depth: 10.9
Material Color: Dark
Material 1: Till
Material 2: Silt
Material 3: Sand
Material 4: Gravel
Gsc Material Description:
Stratum Description: VERY DENSE DARK GREY SANDY SILT WITH GRAVEL COBBLES AND BOULDERS TRACE OF CLAY LOWER TILL **Note: Many records provided by the department have a truncated [Stratum Description] field.

Mat Consistency: Very Dense
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Geology Stratum ID: 6558283
Top Depth: .8
Bottom Depth: 2.4
Material Color: Dark
Material 1: Fill
Material 2: sand silt
Material 3: Gravel
Material 4: Clay
Gsc Material Description:
Stratum Description: COMPACT TO DENSE DARK BROWN TO BROWN SILTY SAND WITH GRAVEL TRACE OF CLAY FILL **Note: Many records provided by the department have a truncated [Stratum Description] field.

Mat Consistency: Compact
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Geology Stratum ID: 6558286
Top Depth: 7.5
Bottom Depth: 9
Material Color: Grey
Material 1: Sand
Material 2: Silt
Material 3:
Material 4:
Gsc Material Description:
Stratum Description: VERY DENSE GREY FINE SAND TRACE TO SOME SILT **Note: Many records provided by the department have a truncated [Stratum Description] field.

Mat Consistency: Very Dense
Material Moisture:
Material Texture: Fine
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Geology Stratum ID: 6558282
Top Depth: 0
Bottom Depth: .8
Material Color: Brown
Material 1: Fill
Material 2: Sand
Material 3: Cinders
Material 4:
Gsc Material Description:

Mat Consistency: Loose
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Stratum Description: LOOSE TO COMPACT BROWN SAND WITH CINDERS FILL **Note: Many records provided by the department have a truncated [Stratum Description] field.

Geology Stratum ID:	6558284	**Mat Consistency:**	Dense
Top Depth:	2.4	**Material Moisture:**	
Bottom Depth:	3.7	**Material Texture:**	
Material Color:	Dark	**Non Geo Mat Type:**	
Material 1:	Till	**Geologic Formation:**	
Material 2:	sand silt	**Geologic Group:**	
Material 3:	Gravel	**Geologic Period:**	
Material 4:	Clay	**Depositional Gen:**	

Gsc Material Description:

Stratum Description: DENSE DARK BROWN SILTY SAND WITH GRAVEL TRACE OF CLAY WEATHERED UPPER TILL **Note: Many records provided by the department have a truncated [Stratum Description] field.

Geology Stratum ID:	6558285	**Mat Consistency:**	Dense
Top Depth:	3.7	**Material Moisture:**	
Bottom Depth:	7.5	**Material Texture:**	
Material Color:	Dark	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Gravel	**Geologic Group:**	
Material 3:	Silt	**Geologic Period:**	
Material 4:		**Depositional Gen:**	

Gsc Material Description:

Stratum Description: DENSE TO VERY DENSE DARK GREY SAND WITH GRAVEL TO SAND TRACE OF SILT AND GRAVEL **Note: Many records provided by the department have a truncated [Stratum Description] field.

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41 **1 of 1** **N/162.6** **65.0 / 2.40** **ON** **BORE**

Borehole ID:	847631	**Inclin FLG:**	No
OGF ID:	215589288	**SP Status:**	Initial Entry
Status:	Decommissioned	**Surv Elev:**	No
Type:	Borehole	**Piezometer:**	No
Use:	Geotechnical/Geological Investigation	**Primary Name:**	
Completion Date:	21-FEB-1964	**Municipality:**	
Static Water Level:	4.6	**Lot:**	LOT G
Primary Water Use:		**Township:**	NEPEAN
Sec. Water Use:		**Latitude DD:**	45.417341
Total Depth m:	5	**Longitude DD:**	-75.668984
Depth Ref:	Ground Surface	**UTM Zone:**	18
Depth Elev:		**Easting:**	447658
Drill Method:	Diamond Drill	**Northing:**	5029531
Orig Ground Elev m:	60.7	**Location Accuracy:**	
Elev Reliabil Note:		**Accuracy:**	Within 20 metres
DEM Ground Elev m:	62		
Concession:	BROKEN FRONT D		
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	6558307	**Mat Consistency:**	Very Dense
Top Depth:	2.4	**Material Moisture:**	
Bottom Depth:	3	**Material Texture:**	
Material Color:	Dark	**Non Geo Mat Type:**	
Material 1:	Till	**Geologic Formation:**	
Material 2:	sand silt	**Geologic Group:**	
Material 3:	Gravel	**Geologic Period:**	
Material 4:	cobble	**Depositional Gen:**	

Gsc Material Description:

Stratum Description: VERY DENSE BROWN TO DARK GREY SILTY SAND WITH GRAVEL OCCASIONAL COBBLES WEATHERED UPPER TILL **Note: Many records provided by the department have a truncated [Stratum Description] field.

Geology Stratum ID:	6558306	**Mat Consistency:**	Compact
Top Depth:	.6	**Material Moisture:**	
Bottom Depth:	2.4	**Material Texture:**	
Material Color:	Brown-Grey	**Non Geo Mat Type:**	
Material 1:	Fill	**Geologic Formation:**	
Material 2:	sand silt	**Geologic Group:**	
Material 3:	Gravel	**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	FILL COMPACT TO DENSE BROWN TO GREY SILTY SAND WITH GRAVEL **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Geology Stratum ID:	6558308	**Mat Consistency:**	Very Dense
Top Depth:	3	**Material Moisture:**	
Bottom Depth:	5	**Material Texture:**	
Material Color:	Dark	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Gravel	**Geologic Group:**	
Material 3:	Silt	**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	VERY DENSE DARK GREY SAND AND GRAVEL TRACE OF SILT **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Geology Stratum ID:	6558305	**Mat Consistency:**	Loose
Top Depth:	0	**Material Moisture:**	
Bottom Depth:	.6	**Material Texture:**	
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Till	**Geologic Formation:**	
Material 2:	Sand	**Geologic Group:**	
Material 3:	Cinders	**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	LOOSE TO COMPACT BROWN SAND AND CINDERS TILL **Note: Many records provided by the department have a truncated [Stratum Description] field.		

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42 **1 of 13** **WNW/166.5** **63.9 / 1.31** **City of Ottawa**
191 Lees Ave
Ottawa ON
SPL

Ref No:	1630-7QQNKZ	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:		**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	Unknown	**Sector Type:**	Motor Vehicle
Incident Event:		**Agency Involved:**	
Contaminant Code:		**Nearest Watercourse:**	
Contaminant Name:	COOLANT N.O.S.	**Site Address:**	
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	Not Anticipated	**Site Municipality:**	Ottawa
Nature of Impact:	Surface Water Pollution	**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	NA
MOE Response:	No Field Response	**Easting:**	NA
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	4/2/2009	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	Land Spills
Incident Reason:	Unknown - Reason not determined	**Source Type:**	
Site Name:	OC Transpo Spill		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	Spill of 3-5L engine coolant to CB OC Transpo		

Contaminant Qty: 5 L

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42 **2 of 13** **WNW/166.5** **63.9 / 1.31** **Marathon Drilling Company<UNOFFICIAL>** **SPL**
191 Lees Ave
Ottawa ON K1S 0B8

Ref No:	1577-8KZLPX	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:	8/17/2011	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	Other Discharges	**Sector Type:**	
Incident Event:		**Agency Involved:**	
Contaminant Code:	41	**Nearest Watercourse:**	
Contaminant Name:	CONTAMINATED GROUNDWATER/RUNOFF WATER	**Site Address:**	191 Lees Ave
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	Not Anticipated	**Site Municipality:**	Ottawa
Nature of Impact:		**Site Lot:**	
Receiving Medium:	Sewage - Municipal/Private and Commercial	**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:	No Field Response	**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	8/23/2011	**Site Map Datum:**	
Dt Document Closed:	12/3/2011	**SAC Action Class:**	Watercourse Spills
Incident Reason:	Error- Operator error	**Source Type:**	

Site Name: Lees Avenue Transit Station- on eastbound transit lane corridor Borehole E112<UNOFFICIAL>
Site County/District:
Site Geo Ref Meth:
Incident Summary: Marathon Drill: est 500L contaminated water to cb Aug 17th
Contaminant Qty: 500 L

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42 **3 of 13** **WNW/166.5** **63.9 / 1.31** **O.C. Transport <UNOFFICIAL>** **SPL**
191 Lee's Ave.
Ottawa ON

Ref No:	4871-95KU7W	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:	07-MAR-13	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	Leak/Break	**Sector Type:**	Motor Vehicle
Incident Event:		**Agency Involved:**	
Contaminant Code:	15	**Nearest Watercourse:**	
Contaminant Name:	HYDRAULIC OIL	**Site Address:**	191 Lee's Ave.
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	Confirmed	**Site Municipality:**	Ottawa
Nature of Impact:	Surface Water Pollution	**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:	No Field Response	**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	07-MAR-13	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	Watercourse Spills
Incident Reason:	Equipment Failure	**Source Type:**	

Site Name: Lee's Station <UNOFFICIAL>
Site County/District:
Site Geo Ref Meth:
Incident Summary: O.C. Transport - 20 L of hydraulic oil to c.b. from bus.
Contaminant Qty: 0 L

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

42	4 of 13	WNW/166.5	63.9 / 1.31	City of Ottawa 191 Lee's Station, on transit way Ottawa ON	SPL

Ref No:	3430-954TEZ	Discharger Report:	
Site No:		Material Group:	
Incident Dt:	20-FEB-13	Health/Env Conseq:	
Year:		Client Type:	
Incident Cause:	Leak/Break	Sector Type:	Valve/Fitting/Piping
Incident Event:		Agency Involved:	
Contaminant Code:	15	Nearest Watercourse:	
Contaminant Name:	TRANSMISSION OIL	Site Address:	191 Lee's Station, on transit way
Contaminant Limit 1:		Site District Office:	
Contam Limit Freq 1:		Site Postal Code:	
Contaminant UN No 1:		Site Region:	
Environment Impact:	Confirmed	Site Municipality:	Ottawa
Nature of Impact:	Surface Water Pollution	Site Lot:	
Receiving Medium:		Site Conc:	
Receiving Env:		Northing:	
MOE Response:	No Field Response	Easting:	
Dt MOE Arvl on Scn:		Site Geo Ref Accu:	
MOE Reported Dt:	20-FEB-13	Site Map Datum:	
Dt Document Closed:		SAC Action Class:	Land Spills
Incident Reason:	Equipment Failure	Source Type:	
Site Name:	Bus Station<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	2L transmission oil to drain; OC transpo		
Contaminant Qty:	0 L		

42	5 of 13	WNW/166.5	63.9 / 1.31	Dragados Canada Inc., EllisDon Corporation, and SNC-Lavalin Constructors (Pacific) Inc. 191 Lees Ave Ottawa ON K1Z 1G3	ECA

Approval No:	3910-AC4HR9	MOE District:	
Approval Date:	2016-08-15	City:	
Status:	Approved	Longitude:	
Record Type:	ECA	Latitude:	
Link Source:	IDS	Geometry X:	
SWP Area Name:		Geometry Y:	
Approval Type:	ECA-AIR		
Project Type:	AIR		
Address:	191 Lees Ave		
Full Address:			
Full PDF Link:	https://www.accessenvironment.ene.gov.on.ca/instruments/0376-ABMQ28-14.pdf		

42	6 of 13	WNW/166.5	63.9 / 1.31	191 Lees Rd Ottawa ON	SPL

Ref No:	7513-AC2QPZ	Discharger Report:	
Site No:	NA	Material Group:	
Incident Dt:	2016/07/20	Health/Env Conseq:	
Year:		Client Type:	
Incident Cause:		Sector Type:	Unknown / N/A
Incident Event:	Leak/Break	Agency Involved:	
Contaminant Code:	15	Nearest Watercourse:	
Contaminant Name:	HYDRAULIC OIL	Site Address:	191 Lees Rd
Contaminant Limit 1:		Site District Office:	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:		**Site Municipality:**	Ottawa
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Land	**Northing:**	5029415
MOE Response:	No	**Easting:**	447600
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2016/07/20	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	Land Spills
Incident Reason:	Equipment Failure	**Source Type:**	
Site Name:	OLRT Lees Station Site<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	OLRT: 1L hydraulic oil to soil. Ctnd & Clnd.		
Contaminant Qty:	1 L		

42	7 of 13	WNW/166.5	63.9 / 1.31	**191 Lees Avenue** **Ottawa ON**	SPL

Ref No:	5183-AA4KHU	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	2016/05/19	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:		**Sector Type:**	Miscellaneous Industrial
Incident Event:	Leak/Break	**Agency Involved:**	
Contaminant Code:	15	**Nearest Watercourse:**	
Contaminant Name:	HYDRAULIC OIL	**Site Address:**	191 Lees Avenue
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:		**Site Municipality:**	Ottawa
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Land	**Northing:**	5029415
MOE Response:	No	**Easting:**	447600
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2016/05/19	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	Land Spills
Incident Reason:	Equipment Failure	**Source Type:**	
Site Name:	cOLRT site<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	OLRT: ~ 5 L hydraulic oil to land, cntd & clng		
Contaminant Qty:	5 L		

42	8 of 13	WNW/166.5	63.9 / 1.31	**OLRT Constructors/Dragados/EllisDon Corp** **191 Lees Avenue - Lees Station** **Ottawa ON K1S5L5**	GEN

Generator No:	ON6492528	**PO Box No:**	
Status:		**Country:**	Canada
Approval Years:	2016	**Choice of Contact:**	CO_OFFICIAL
Contam. Facility:	No	**Co Admin:**	Eric Kelly
MHSW Facility:	No	**Phone No Admin:**	6134078153 Ext.
SIC Code:	493190		
SIC Description:	OTHER WAREHOUSING AND STORAGE		

Detail(s)

Waste Class:	251

Waste Class Desc: OIL SKIMMINGS & SLUDGES

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

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42 | **9 of 13** | **WNW/166.5** | **63.9 / 1.31** | **City of Ottawa - OC TRANSPO**
191 Lees Avenue
Ottawa ON K1S 5L5 | **GEN**

Generator No: ON8324209
Status:
Approval Years: 2016
Contam. Facility: No
MHSW Facility: No
SIC Code: 485110
SIC Description: 485110

PO Box No:
Country: Canada
Choice of Contact: CO_OFFICIAL
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

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42 | **10 of 13** | **WNW/166.5** | **63.9 / 1.31** | **OLRT Constructors/Dragados/EllisDon Corp**
191 Lees Avenue - Lees Station
Ottawa ON K1S5L5 | **GEN**

Generator No: ON6492528
Status: Registered
Approval Years: As of Dec 2018
Contam. Facility:
MHSW Facility:
SIC Code:
SIC Description:

PO Box No:
Country: Canada
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 251 L
Waste Class Desc: Waste oils/sludges (petroleum based)

Waste Class: 252 L
Waste Class Desc: Waste crankcase oils and lubricants

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42 | **11 of 13** | **WNW/166.5** | **63.9 / 1.31** | **191 Lees Ave**
Ottawa ON NA | **SPL**

Ref No: 4517-ASQJ58
Site No: 8625-ABMQ4W
Incident Dt: 2017/11/02
Year:
Incident Cause:
Incident Event: Unknown / N/A
Contaminant Code: 13
Contaminant Name: DIESEL FUEL
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1: 1202
Environment Impact:
Nature of Impact:
Receiving Medium:
Receiving Env: Land; Surface Water
MOE Response: No
Dt MOE Arvl on Scn:

Discharger Report:
Material Group:
Health/Env Conseq: 2 - Minor Environment
Client Type:
Sector Type: Miscellaneous Industrial
Agency Involved:
Nearest Watercourse:
Site Address: 191 Lees Ave
Site District Office: Ottawa
Site Postal Code: NA
Site Region: Eastern
Site Municipality: Ottawa
Site Lot:
Site Conc: NA
Northing: NA
Easting: NA
Site Geo Ref Accu: NA

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

MOE Reported Dt:	2017/11/02	**Site Map Datum:**	NA
Dt Document Closed:		**SAC Action Class:**	Land Spills
Incident Reason:	Unknown / N/A	**Source Type:**	Unknown / N/A
Site Name:	191 Lees Avenue		
Site County/District:	NA		
Site Geo Ref Meth:	NA		
Incident Summary:	OLRT: 5L of Diesel to grd/cb - Cleaning		
Contaminant Qty:	5 L		

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42 **12 of 13** **WNW/166.5** **63.9 / 1.31** **City of Ottawa**
191 Lees Avenue
Ottawa ON
SPL

Ref No:	7118-AWBVF7	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	2018/02/25	**Health/Env Conseq:**	2 - Minor Environment
Year:		**Client Type:**	Municipal Government
Incident Cause:		**Sector Type:**	Miscellaneous Communal
Incident Event:	Leak/Break	**Agency Involved:**	
Contaminant Code:	27	**Nearest Watercourse:**	
Contaminant Name:	COOLANT N.O.S.	**Site Address:**	191 Lees Avenue
Contaminant Limit 1:		**Site District Office:**	Ottawa
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:	n/a	**Site Region:**	Eastern
Environment Impact:		**Site Municipality:**	Ottawa
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Land	**Northing:**	5029614
MOE Response:	No	**Easting:**	447617
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2018/02/25	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	Land Spills
Incident Reason:	Equipment Failure	**Source Type:**	Motor Vehicle
Site Name:	Lees Station <UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	OC Transpo: 50L engine fluid to rdway, cb impacted, cnted.		
Contaminant Qty:	20 L		

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42 **13 of 13** **WNW/166.5** **63.9 / 1.31** **191 Lees Ave**
Ottawa ON NA
SPL

Ref No:	5813-B63DFN	**Discharger Report:**	
Site No:	8625-ABMQ4W	**Material Group:**	
Incident Dt:	2018/10/29	**Health/Env Conseq:**	2 - Minor Environment
Year:		**Client Type:**	
Incident Cause:		**Sector Type:**	Miscellaneous Industrial
Incident Event:	Leak/Break	**Agency Involved:**	
Contaminant Code:	15	**Nearest Watercourse:**	
Contaminant Name:	HYDRAULIC OIL	**Site Address:**	191 Lees Ave
Contaminant Limit 1:		**Site District Office:**	Ottawa
Contam Limit Freq 1:		**Site Postal Code:**	NA
Contaminant UN No 1:	n/a	**Site Region:**	Eastern
Environment Impact:		**Site Municipality:**	Ottawa
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	NA
Receiving Env:	Land	**Northing:**	NA
MOE Response:	No	**Easting:**	NA
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	NA
MOE Reported Dt:	2018/10/31	**Site Map Datum:**	NA
Dt Document Closed:		**SAC Action Class:**	Land Spills
Incident Reason:	Equipment Failure	**Source Type:**	Container/Drum/Tote

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Site Name: 191 Lees Avenue
Site County/District: NA
Site Geo Ref Meth: NA
Incident Summary: OLRT: 5 L hydraulic oil/water mixture to asphalt, cleaned
Contaminant Qty: 5 L

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43 | **1 of 25** | **E/169.0** | **60.2 / -2.38** | **200 Lees Avenue Ottawa ON K1S 5S9** | **EHS**

Order No: 20020403002
Status: C
Report Type: Complete Report
Report Date: 4/11/02
Date Received: 4/3/02
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:

Nearest Intersection:
Municipality:
Client Prov/State: QC
Search Radius (km): 0.25
X: -75.669277
Y: 45.416551

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43 | **2 of 25** | **E/169.0** | **60.2 / -2.38** | **ALGONQUIN COLLEGE 200 LECS AVE. OTTAWA ON K2G 1B8** | **GEN**

Generator No: ON0213601
Status:
Approval Years: 88,89,90
Contam. Facility:
MHSW Facility:
SIC Code: 8521
SIC Description: POST-SEC. NON-UNIV.

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 148
Waste Class Desc: INORGANIC LABORATORY CHEMICALS

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

---

43 | **3 of 25** | **E/169.0** | **60.2 / -2.38** | **ALGONQUIN COLLEGE 200 LEES AVENUE OTTAWA ON K1S 0C5** | **GEN**

Generator No: ON0213601
Status:
Approval Years: 92,93,97,98,99,00,01,02,03,04,05,06
Contam. Facility:
MHSW Facility:
SIC Code: 8521
SIC Description: POST-SEC. NON-UNIV.

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 213
Waste Class Desc: PETROLEUM DISTILLATES

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 148
Waste Class Desc: INORGANIC LABORATORY CHEMICALS

Waste Class: 243
Waste Class Desc: PCB'S

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

Waste Class: 312
Waste Class Desc: PATHOLOGICAL WASTES

Waste Class: 331
Waste Class Desc: WASTE COMPRESSED GASES

---

43 | ***4 of 25*** | ***E/169.0*** | ***60.2 / -2.38*** | ***ALGONQUIN COLLEGE 02-223***
200 LEES AVE.
OTTAWA ON K1S 5S9 | ***GEN***

Generator No: ON0213601
Status:
Approval Years: 94
Contam. Facility:
MHSW Facility:
SIC Code: 8521
SIC Description: POST-SEC. NON-UNIV.

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 148
Waste Class Desc: INORGANIC LABORATORY CHEMICALS

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

Waste Class: 312
Waste Class Desc: PATHOLOGICAL WASTES

---

43 | ***5 of 25*** | ***E/169.0*** | ***60.2 / -2.38*** | ***ALGONQUIN COLLEGE 02-223***
200 LEES AVENUE
OTTAWA ON K1S 0C5 | ***GEN***

Generator No: ON0213601
Status:
Approval Years: 95,96
Contam. Facility:
MHSW Facility:
SIC Code: 8521
SIC Description: POST-SEC. NON-UNIV.

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 312
Waste Class Desc: PATHOLOGICAL WASTES

Waste Class: 148
Waste Class Desc: INORGANIC LABORATORY CHEMICALS

Waste Class: 213

Waste Class Desc: PETROLEUM DISTILLATES

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

---

43 **6 of 25** **E/169.0** **60.2 / -2.38** **200 Lees Avenue**
Ottawa ON K1S 5S9 **EHS**

Order No: 20070523011
Status: C
Report Type: CAN - Complete Report
Report Date: 6/1/2007
Date Received: 5/23/2007
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:

Nearest Intersection: LeeSite is bounded by Lees Avenue, Highway 417, OC Transitway and the Rideau River
Municipality:
Client Prov/State:
Search Radius (km): 0.25
X: -75.66789
Y: 45.415983

---

43 **7 of 25** **E/169.0** **60.2 / -2.38** **UNIVERSITY OF OTTAWA**
200 LEES AVENUE
OTTAWA ON K1S 5S9 **GEN**

Generator No: ON5022535
Status:
Approval Years: 07,08
Contam. Facility:
MHSW Facility:
SIC Code: 611310
SIC Description: Universities

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 112
Waste Class Desc: ACID WASTE - HEAVY METALS

Waste Class: 121
Waste Class Desc: ALKALINE WASTES - HEAVY METALS

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 146
Waste Class Desc: OTHER SPECIFIED INORGANICS

Waste Class: 148
Waste Class Desc: INORGANIC LABORATORY CHEMICALS

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

Waste Class: 331
Waste Class Desc: WASTE COMPRESSED GASES

---

43 **8 of 25** **E/169.0** **60.2 / -2.38** **University of Ottawa**
200 Lees Ave
Ottawa ON K1S 5S9 **CA**

Certificate #: 0628-8BRMB3
Application Year: 2010

Issue Date: 12/18/2010
Approval Type: Air
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

---

43 | ***9 of 25*** | ***E/169.0*** | ***60.2 / -2.38*** | ***UNIVERSITY OF OTTAWA***
200 LEES AVENUE
OTTAWA ON K1S 5S9 | ***GEN***

Generator No: ON5022535
Status:
Approval Years: 2009
Contam. Facility:
MHSW Facility:
SIC Code: 611310
SIC Description: Universities

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 146
Waste Class Desc: OTHER SPECIFIED INORGANICS

Waste Class: 112
Waste Class Desc: ACID WASTE - HEAVY METALS

Waste Class: 121
Waste Class Desc: ALKALINE WASTES - HEAVY METALS

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

Waste Class: 331
Waste Class Desc: WASTE COMPRESSED GASES

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43 | ***10 of 25*** | ***E/169.0*** | ***60.2 / -2.38*** | ***Statistics Canada***
200 Lees Ave rear parking lot
Ottawa ON | ***GEN***

Generator No: ON9103006
Status:
Approval Years: 2009
Contam. Facility:
MHSW Facility:
SIC Code: 911910
SIC Description: Other Federal Government Public Administration

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 312

Waste Class Desc: PATHOLOGICAL WASTES

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43 | **11 of 25** | **E/169.0** | **60.2 / -2.38** | **UNIVERSITY OF OTTAWA**
200 LEES AVENUE
OTTAWA ON K1S 5S9 | **GEN**

Generator No: ON5022535
Status:
Approval Years: 2010
Contam. Facility:
MHSW Facility:
SIC Code: 611310
SIC Description: Universities

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

Waste Class: 121
Waste Class Desc: ALKALINE WASTES - HEAVY METALS

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

Waste Class: 312
Waste Class Desc: PATHOLOGICAL WASTES

Waste Class: 331
Waste Class Desc: WASTE COMPRESSED GASES

Waste Class: 112
Waste Class Desc: ACID WASTE - HEAVY METALS

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 146
Waste Class Desc: OTHER SPECIFIED INORGANICS

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43 | **12 of 25** | **E/169.0** | **60.2 / -2.38** | **UNIVERSITY OF OTTAWA**
200 LEES AVENUE
OTTAWA ON K1S 5S9 | **GEN**

Generator No: ON5022535
Status:
Approval Years: 2011
Contam. Facility:
MHSW Facility:
SIC Code: 611310
SIC Description: Universities

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 331
Waste Class Desc: WASTE COMPRESSED GASES

Waste Class: 146
Waste Class Desc: OTHER SPECIFIED INORGANICS

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

Waste Class: 121
Waste Class Desc: ALKALINE WASTES - HEAVY METALS

Waste Class: 312
Waste Class Desc: PATHOLOGICAL WASTES

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

Waste Class: 112
Waste Class Desc: ACID WASTE - HEAVY METALS

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43 | ***13 of 25*** | ***E/169.0*** | ***60.2 / -2.38*** | ***UNIVERSITY OF OTTAWA***
200 LEES AVENUE
OTTAWA ON K1S 5S9 | ***GEN***

Generator No: ON5022535
Status:
Approval Years: 2012
Contam. Facility:
MHSW Facility:
SIC Code: 611310
SIC Description: Universities

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 331
Waste Class Desc: WASTE COMPRESSED GASES

Waste Class: 312
Waste Class Desc: PATHOLOGICAL WASTES

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

Waste Class: 112
Waste Class Desc: ACID WASTE - HEAVY METALS

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

Waste Class: 146
Waste Class Desc: OTHER SPECIFIED INORGANICS

Waste Class: 121
Waste Class Desc: ALKALINE WASTES - HEAVY METALS

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43 | ***14 of 25*** | ***E/169.0*** | ***60.2 / -2.38*** | ***University of Ottawa***
200 Lees Ave
Ottawa ON K1N 7B7 | ***ECA***

Approval No: 0473-9ABLAT
Approval Date: 2013-08-30
Status: Approved
Record Type: ECA
Link Source: IDS
SWP Area Name: Rideau Valley

MOE District: Ottawa
City:
Longitude: -75.66667
Latitude: 45.415800000000004
Geometry X:
Geometry Y:

Approval Type:	ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type:	MUNICIPAL AND PRIVATE SEWAGE WORKS
Address:	200 Lees Ave
Full Address:	
Full PDF Link:	https://www.accessenvironment.ene.gov.on.ca/instruments/7542-98YKXV-14.pdf

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43 | **15 of 25** | **E/169.0** | **60.2 / -2.38** | **UNIVERSITY OF OTTAWA**
200 LEES AVENUE
OTTAWA ON | **GEN**

Generator No:	ON5022535	**PO Box No:**	
Status:		**Country:**	
Approval Years:	2013	**Choice of Contact:**	
Contam. Facility:		**Co Admin:**	
MHSW Facility:		**Phone No Admin:**	
SIC Code:	611310		
SIC Description:	UNIVERSITIES		

Detail(s)

Waste Class:	252
Waste Class Desc:	WASTE OILS & LUBRICANTS
Waste Class:	212
Waste Class Desc:	ALIPHATIC SOLVENTS
Waste Class:	251
Waste Class Desc:	OIL SKIMMINGS & SLUDGES
Waste Class:	145
Waste Class Desc:	PAINT/PIGMENT/COATING RESIDUES
Waste Class:	122
Waste Class Desc:	ALKALINE WASTES - OTHER METALS
Waste Class:	312
Waste Class Desc:	PATHOLOGICAL WASTES
Waste Class:	146
Waste Class Desc:	OTHER SPECIFIED INORGANICS
Waste Class:	112
Waste Class Desc:	ACID WASTE - HEAVY METALS
Waste Class:	331
Waste Class Desc:	WASTE COMPRESSED GASES
Waste Class:	263
Waste Class Desc:	ORGANIC LABORATORY CHEMICALS
Waste Class:	121
Waste Class Desc:	ALKALINE WASTES - HEAVY METALS

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43 | **16 of 25** | **E/169.0** | **60.2 / -2.38** | **University of Ottawa**
200 Lees Ave
Ottawa ON K1N 7B7 | **ECA**

Approval No:	3091-8URR5Z	**MOE District:**	Ottawa
Approval Date:	2012-05-31	**City:**	
Status:	Revoked and/or Replaced	**Longitude:**	-75.66667
Record Type:	ECA	**Latitude:**	45.415800000000004
Link Source:	IDS	**Geometry X:**	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

SWP Area Name: Rideau Valley **Geometry Y:**
Approval Type: ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type: MUNICIPAL AND PRIVATE SEWAGE WORKS
Address: 200 Lees Ave
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/8481-8SKLLH-14.pdf

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43 **17 of 25** **E/169.0** **60.2 / -2.38** **University of Ottawa**
200 Lees Ave
Ottawa ON K1N 6N5 **ECA**

Approval No: 0628-8BRMB3 **MOE District:** Ottawa
Approval Date: 2010-12-18 **City:**
Status: Approved **Longitude:** -75.66667
Record Type: ECA **Latitude:** 45.415800000000004
Link Source: IDS **Geometry X:**
SWP Area Name: Rideau Valley **Geometry Y:**
Approval Type: ECA-AIR
Project Type: AIR
Address: 200 Lees Ave
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/8673-7WYJUX-14.pdf

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43 **18 of 25** **E/169.0** **60.2 / -2.38** **Enbridge Gas Distribution Inc.**
200 Lees Avenue
Ottawa ON K1N 6N5 **GEN**

Generator No: ON3624334 **PO Box No:**
Status: **Country:** Canada
Approval Years: 2016 **Choice of Contact:** CO_OFFICIAL
Contam. Facility: No **Co Admin:**
MHSW Facility: No **Phone No Admin:**
SIC Code: 221210
SIC Description: NATURAL GAS DISTRIBUTION

Detail(s)

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

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43 **19 of 25** **E/169.0** **60.2 / -2.38** **UNIVERSITY OF OTTAWA**
200 LEES AVENUE
OTTAWA ON K1S 5S9 **GEN**

Generator No: ON5022535 **PO Box No:**
Status: **Country:** Canada
Approval Years: 2016 **Choice of Contact:** CO_OFFICIAL
Contam. Facility: No **Co Admin:** SABRINA DUSSAULT
MHSW Facility: No **Phone No Admin:** 613-562-5800 Ext.3055
SIC Code: 611310
SIC Description: UNIVERSITIES

Detail(s)

Waste Class: 331
Waste Class Desc: WASTE COMPRESSED GASES

Waste Class: 121
Waste Class Desc: ALKALINE WASTES - HEAVY METALS

Waste Class: 312
Waste Class Desc: PATHOLOGICAL WASTES

Waste Class: 146
Waste Class Desc: OTHER SPECIFIED INORGANICS

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

Waste Class: 212
Waste Class Desc: ALIPHATIC SOLVENTS

Waste Class: 122
Waste Class Desc: ALKALINE WASTES - OTHER METALS

Waste Class: 112
Waste Class Desc: ACID WASTE - HEAVY METALS

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

43	20 of 25	E/169.0	60.2 / -2.38	UNIVERSITY OF OTTAWA 200 LEES AVENUE OTTAWA ON K1S 5S9	GEN

Generator No: ON5022535
Status:
Approval Years: 2015
Contam. Facility: No
MHSW Facility: No
SIC Code: 611310
SIC Description: UNIVERSITIES

PO Box No:
Country: Canada
Choice of Contact: CO_OFFICIAL
Co Admin: SABRINA DUSSAULT
Phone No Admin: 613-562-5800 Ext.3055

Detail(s)

Waste Class: 122
Waste Class Desc: ALKALINE WASTES - OTHER METALS

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

Waste Class: 331
Waste Class Desc: WASTE COMPRESSED GASES

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

Waste Class: 121
Waste Class Desc: ALKALINE WASTES - HEAVY METALS

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

Waste Class: 112
Waste Class Desc: ACID WASTE - HEAVY METALS

Waste Class: 146
Waste Class Desc: OTHER SPECIFIED INORGANICS

Waste Class: 312
Waste Class Desc: PATHOLOGICAL WASTES

Waste Class: 212
Waste Class Desc: ALIPHATIC SOLVENTS

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43 **21 of 25** **E/169.0** **60.2 / -2.38**

Enbridge Gas Distribution Inc.
200 Lees Avenue
Ottawa ON K1N 6N5

GEN

Generator No: ON3624334
Status:
Approval Years: 2015
Contam. Facility: No
MHSW Facility: No
SIC Code: 221210
SIC Description: NATURAL GAS DISTRIBUTION

PO Box No:
Country: Canada
Choice of Contact: CO_OFFICIAL
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

---

43 **22 of 25** **E/169.0** **60.2 / -2.38**

UNIVERSITY OF OTTAWA
200 LEES AVENUE
OTTAWA ON K1S 5S9

GEN

Generator No: ON5022535
Status:
Approval Years: 2014
Contam. Facility: No
MHSW Facility: No
SIC Code: 611310
SIC Description: UNIVERSITIES

PO Box No:
Country: Canada
Choice of Contact: CO_OFFICIAL
Co Admin: PASCAL SIMARD
Phone No Admin: 613-562-5800 Ext.2487

Detail(s)

Waste Class: 212
Waste Class Desc: ALIPHATIC SOLVENTS

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 112
Waste Class Desc: ACID WASTE - HEAVY METALS

Waste Class: 121
Waste Class Desc: ALKALINE WASTES - HEAVY METALS

Waste Class: 312
Waste Class Desc: PATHOLOGICAL WASTES

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

Waste Class: 146
Waste Class Desc: OTHER SPECIFIED INORGANICS

Waste Class: 251

Waste Class Desc: OIL SKIMMINGS & SLUDGES

Waste Class: 331
Waste Class Desc: WASTE COMPRESSED GASES

Waste Class: 122
Waste Class Desc: ALKALINE WASTES - OTHER METALS

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

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43 | **23 of 25** | **E/169.0** | **60.2 / -2.38** | **UNIVERSITY OF OTTAWA**
200 LEES AVENUE
OTTAWA ON K1S 5S9 | **GEN**

Generator No: ON5022535
Status: Registered
Approval Years: As of Dec 2018
Contam. Facility:
MHSW Facility:
SIC Code:
SIC Description:

PO Box No:
Country: Canada
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 112 C
Waste Class Desc: Acid solutions - containing heavy metals

Waste Class: 121 C
Waste Class Desc: Alkaline slutions - containing heavy metals

Waste Class: 122 C
Waste Class Desc: Alkaline slutions - containing other metals and non-metals (not cyanide)

Waste Class: 145 I
Waste Class Desc: Wastes from the use of pigments, coatings and paints

Waste Class: 146 R
Waste Class Desc: Other specified inorganic sludges, slurries or solids

Waste Class: 146 T
Waste Class Desc: Other specified inorganic sludges, slurries or solids

Waste Class: 212 L
Waste Class Desc: Aliphatic solvents and residues

Waste Class: 251 L
Waste Class Desc: Waste oils/sludges (petroleum based)

Waste Class: 252 T
Waste Class Desc: Waste crankcase oils and lubricants

Waste Class: 263 A
Waste Class Desc: Misc. waste organic chemicals

Waste Class: 263 I
Waste Class Desc: Misc. waste organic chemicals

Waste Class: 312 P
Waste Class Desc: Pathological wastes

Waste Class: 331 I
Waste Class Desc: Waste compressed gases including cylinders

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
43	24 of 25	E/169.0	60.2 / -2.38	200 Lees Avenue, Ottawa Ottawa ON	SPL

Ref No:	4011-B5NRYA	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	2018/10/18	**Health/Env Conseq:**	2 - Minor Environment
Year:		**Client Type:**	
Incident Cause:		**Sector Type:**	Miscellaneous Industrial
Incident Event:	Leak/Break	**Agency Involved:**	
Contaminant Code:	15	**Nearest Watercourse:**	
Contaminant Name:	HYDRAULIC OIL	**Site Address:**	200 Lees Avenue, Ottawa
Contaminant Limit 1:		**Site District Office:**	Ottawa
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:	n/a	**Site Region:**	Eastern
Environment Impact:		**Site Municipality:**	Ottawa
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Land; Surface Water	**Northing:**	5029673.84
MOE Response:	No	**Easting:**	447529.69
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2018/10/18	**Site Map Datum:**	
Dt Document Closed:	2018/10/31	**SAC Action Class:**	Land Spills
Incident Reason:	Equipment Failure	**Source Type:**	Motor Vehicle

Site Name: 200 Lees Avenue, Ottawa<UNOFFICIAL>
Site County/District:
Site Geo Ref Meth:
Incident Summary: OC Transpo: 1-5L hydraulic oil spill, contained
Contaminant Qty: 5 L

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
43	25 of 25	E/169.0	60.2 / -2.38	UNIVERSITY OF OTTAWA 200 LEES AVENUE OTTAWA ON K1S 5S9	GEN

Generator No:	ON5022535	**PO Box No:**	
Status:	Registered	**Country:**	Canada
Approval Years:	As of Oct 2019	**Choice of Contact:**	
Contam. Facility:		**Co Admin:**	
MHSW Facility:		**Phone No Admin:**	
SIC Code:			
SIC Description:			

Detail(s)

Waste Class: 146 R
Waste Class Desc: Other specified inorganic sludges, slurries or solids

Waste Class: 212 L
Waste Class Desc: Aliphatic solvents and residues

Waste Class: 331 I
Waste Class Desc: Waste compressed gases including cylinders

Waste Class: 263 I
Waste Class Desc: Misc. waste organic chemicals

Waste Class: 112 C
Waste Class Desc: Acid solutions - containing heavy metals

Waste Class: 121 C
Waste Class Desc: Alkaline slutions - containing heavy metals

Waste Class: 252 T

Waste Class Desc: Waste crankcase oils and lubricants

Waste Class: 145 I
Waste Class Desc: Wastes from the use of pigments, coatings and paints

Waste Class: 263 A
Waste Class Desc: Misc. waste organic chemicals

Waste Class: 312 P
Waste Class Desc: Pathological wastes

Waste Class: 251 L
Waste Class Desc: Waste oils/sludges (petroleum based)

Waste Class: 122 C
Waste Class Desc: Alkaline slutions - containing other metals and non-metals (not cyanide)

Waste Class: 146 T
Waste Class Desc: Other specified inorganic sludges, slurries or solids

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44 | **1 of 1** | **SSW/171.3** | **52.0 / -10.52** | ***n/a*** ***Ottawa ON*** | **EHS**

Order No: 20160406069
Status: C
Report Type: Custom Report
Report Date: 11-APR-16
Date Received: 06-APR-16
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:

Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): .25
X: -75.669665
Y: 45.414379

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45 | **1 of 2** | **N/175.7** | **65.0 / 2.40** | ***DANBAR HOLDINGS (OTTAWA) LIMITED*** ***ROBINSON AVE/LEES AVE.*** ***OTTAWA CITY ON*** | **CA**

Certificate #: 7-0924-97-
Application Year: 97
Issue Date: 8/28/1997
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

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45 | **2 of 2** | **N/175.7** | **65.0 / 2.40** | ***DANBAR HOLDINGS (OTTAWA) LIMITED*** ***LEES AVE./ROBINSON AVE., CSO*** ***OTTAWA CITY ON*** | **CA**

Certificate #: 3-1213-97-
Application Year: 97
Issue Date: 8/27/1997
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name:

Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

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46 **1 of 1** **N/187.1** **64.9 / 2.31** **ON** **BORE**

Borehole ID:	847627	**Inclin FLG:**	No
OGF ID:	215589284	**SP Status:**	Initial Entry
Status:	Decommissioned	**Surv Elev:**	No
Type:	Borehole	**Piezometer:**	No
Use:	Geotechnical/Geological Investigation	**Primary Name:**	
Completion Date:	20-FEB-1964	**Municipality:**	
Static Water Level:	3.7	**Lot:**	LOT G
Primary Water Use:		**Township:**	NEPEAN
Sec. Water Use:		**Latitude DD:**	45.417565
Total Depth m:	13.9	**Longitude DD:**	-75.669012
Depth Ref:	Ground Surface	**UTM Zone:**	18
Depth Elev:		**Easting:**	447656
Drill Method:	Diamond Drill	**Northing:**	5029556
Orig Ground Elev m:	60.8	**Location Accuracy:**	
Elev Reliabil Note:		**Accuracy:**	Within 20 metres
DEM Ground Elev m:	63.7		
Concession:	BROKEN FRONT D		
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	6558291	**Mat Consistency:**	Compact
Top Depth:	.7	**Material Moisture:**	
Bottom Depth:	3.2	**Material Texture:**	
Material Color:	Brown-Grey	**Non Geo Mat Type:**	
Material 1:	Till	**Geologic Formation:**	
Material 2:	Silt	**Geologic Group:**	
Material 3:	Sand	**Geologic Period:**	
Material 4:	Gravel	**Depositional Gen:**	
Gsc Material Description:			

Stratum Description: COMPACT BROWN TO GREY BROWN SANDY SILT TO SILTY SAND WITH GRAVEL TRACE OF CLAY WEATHERED UPPER TILL **Note: Many records provided by the department have a truncated [Stratum Description] field.

Geology Stratum ID:	6558293	**Mat Consistency:**	Very Dense
Top Depth:	7.6	**Material Moisture:**	
Bottom Depth:	8.8	**Material Texture:**	Fine
Material Color:	Grey	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Gravel	**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			

Stratum Description: VERY DENSE GREY FINE SAND OCCASIONAL GRAVEL **Note: Many records provided by the department have a truncated [Stratum Description] field.

Geology Stratum ID:	6558290	**Mat Consistency:**	Loose
Top Depth:	0	**Material Moisture:**	
Bottom Depth:	.7	**Material Texture:**	
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Fill	**Geologic Formation:**	

Material 2:	Sand	**Geologic Group:**	
Material 3:	Gravel	**Geologic Period:**	
Material 4:	Cinders	**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	LOOSE TO COMPACT BROWN SAND WITH GRAVEL AND CINDERS FILL **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Geology Stratum ID:	6558292	**Mat Consistency:**	Compact
Top Depth:	3.2	**Material Moisture:**	
Bottom Depth:	7.6	**Material Texture:**	Fine
Material Color:	Dark	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Sand	**Geologic Group:**	
Material 3:	Gravel	**Geologic Period:**	
Material 4:	Silt	**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	COMPACT TO DENSE DARK GREY FINE SAND TO SAND WITH GRAVEL TRACE TO SOME SILT **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Geology Stratum ID:	6558294	**Mat Consistency:**	Very Dense
Top Depth:	8.8	**Material Moisture:**	
Bottom Depth:	11.5	**Material Texture:**	
Material Color:	Dark	**Non Geo Mat Type:**	
Material 1:	Till	**Geologic Formation:**	
Material 2:	Silt	**Geologic Group:**	
Material 3:	Sand	**Geologic Period:**	
Material 4:	Gravel	**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	VERY DENSE DARK GREY SANDY SILT TO SILTY SAND WITH GRAVEL COBBLES AND BOULDERS TRACE OF CLAY LOWER TILL **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Geology Stratum ID:	6558295	**Mat Consistency:**	
Top Depth:	11.5	**Material Moisture:**	
Bottom Depth:	13.9	**Material Texture:**	
Material Color:	Dark	**Non Geo Mat Type:**	
Material 1:	Bedrock	**Geologic Formation:**	
Material 2:	Shale	**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	FAIRLY SOUND TO SOUND DARK GREY TO BLACK SHALE BEDROCK **Note: Many records provided by the department have a truncated [Stratum Description] field.		

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47 | **1 of 1** | **N/187.4** | **65.1 / 2.52** | **ON** | **BORE**

Borehole ID:	847630	**Inclin FLG:**	No
OGF ID:	215589287	**SP Status:**	Initial Entry
Status:	Decommissioned	**Surv Elev:**	No
Type:	Borehole	**Piezometer:**	No
Use:	Geotechnical/Geological Investigation	**Primary Name:**	
Completion Date:	21-FEB-1964	**Municipality:**	
Static Water Level:		**Lot:**	LOT G
Primary Water Use:		**Township:**	NEPEAN
Sec. Water Use:		**Latitude DD:**	45.417573
Total Depth m:	4.9	**Longitude DD:**	-75.66923
Depth Ref:	Ground Surface	**UTM Zone:**	18
Depth Elev:		**Easting:**	447639
Drill Method:	Diamond Drill	**Northing:**	5029557
Orig Ground Elev m:	60.9	**Location Accuracy:**	
Elev Reliabil Note:		**Accuracy:**	Within 20 metres
DEM Ground Elev m:	64.3		
Concession:	BROKEN FRONT D		
Location D:			

Survey D:
Comments:

Borehole Geology Stratum

Geology Stratum ID:	6558302	***Mat Consistency:***	Compact
Top Depth:	0	***Material Moisture:***	
Bottom Depth:	2.1	***Material Texture:***	
Material Color:	Dark	***Non Geo Mat Type:***	
Material 1:	Fill	***Geologic Formation:***	
Material 2:	sand silt	***Geologic Group:***	
Material 3:	Gravel	***Geologic Period:***	
Material 4:	cobble	***Depositional Gen:***	
Gsc Material Description:			

Stratum Description: COMPACT TO VERY DENSE DARK BROWN SILTY SAND GRAVEL COBBLES AND BOULDERS **Note: Many records provided by the department have a truncated [Stratum Description] field.

Geology Stratum ID:	6558304	***Mat Consistency:***	Very Dense
Top Depth:	3.4	***Material Moisture:***	
Bottom Depth:	4.9	***Material Texture:***	
Material Color:	Dark	***Non Geo Mat Type:***	
Material 1:	Sand	***Geologic Formation:***	
Material 2:	Gravel	***Geologic Group:***	
Material 3:	Silt	***Geologic Period:***	
Material 4:		***Depositional Gen:***	
Gsc Material Description:			

Stratum Description: VERY DENSE DARK GREY SAND AND GRAVEL TRACE OF SILT **Note: Many records provided by the department have a truncated [Stratum Description] field.

Geology Stratum ID:	6558303	***Mat Consistency:***	Very Dense
Top Depth:	2.1	***Material Moisture:***	
Bottom Depth:	3.4	***Material Texture:***	
Material Color:	Grey-Brown	***Non Geo Mat Type:***	
Material 1:	Till	***Geologic Formation:***	
Material 2:	sand silt	***Geologic Group:***	
Material 3:	Gravel	***Geologic Period:***	
Material 4:	Clay	***Depositional Gen:***	
Gsc Material Description:			

Stratum Description: WEATHERED UPPER TILL VERY DENSE GREY BROWN SILTY SAND WITH GRAVEL TRACE OF CLAY **Note: Many records provided by the department have a truncated [Stratum Description] field.

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48 ***1 of 1*** ***NW/189.2*** ***65.9 / 3.38*** ***Ottawa ON*** ***WWIS***

Well ID:	7201658	***Data Entry Status:***	
Construction Date:		***Data Src:***	
Primary Water Use:	Monitoring and Test Hole	***Date Received:***	5/15/2013
Sec. Water Use:		***Selected Flag:***	Yes
Final Well Status:	Test Hole	***Abandonment Rec:***	
Water Type:		***Contractor:***	7241
Casing Material:		***Form Version:***	7
Audit No:	Z168581	***Owner:***	
Tag:	A145284	***Street Name:***	1 ROBINSON AVE
Construction Method:		***County:***	OTTAWA-CARLETON
Elevation (m):		***Municipality:***	OTTAWA CITY
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	
Well Depth:		***Concession:***	
Overburden/Bedrock:		***Concession Name:***	
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004301550	***Elevation:***	60.662399
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	447546
Code OB Desc:		***North83:***	5029534
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	4/12/2013	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1004843130
Layer:	4
Color:	6
General Color:	BROWN
Mat1:	08
Most Common Material:	FINE SAND
Mat2:	
Other Materials:	
Mat3:	73
Other Materials:	HARD
Formation Top Depth:	3.66
Formation End Depth:	6.71
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004843128
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	10
Most Common Material:	COARSE SAND
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	1.22
Formation End Depth:	3.1
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004843127
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND

Mat2:
Other Materials:
Mat3: 77
Other Materials: LOOSE
Formation Top Depth: 0
Formation End Depth: 1.22
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1004843129
Layer: 3
Color: 6
General Color: BROWN
Mat1: 08
Most Common Material: FINE SAND
Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 3.1
Formation End Depth: 3.66
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1004843131
Layer: 5
Color: 6
General Color: BROWN
Mat1: 34
Most Common Material: TILL
Mat2:
Other Materials:
Mat3: 73
Other Materials: HARD
Formation Top Depth: 6.71
Formation End Depth: 7.62
Formation End Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1004843139
Layer: 1
Plug From: 0
Plug To: 4.27
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1004843140
Layer: 2
Plug From: 4.27
Plug To: 7.62
Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID:
Method Construction Code: 6
Method Construction: Boring
Other Method Construction:

Pipe Information

Pipe ID: 1004843126
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1004843134
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0
Depth To: 4.57
Casing Diameter: 5.2
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1004843135
Layer: 1
Slot: 10
Screen Top Depth: 4.57
Screen End Depth: 7.62
Screen Material: 5
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter: 6.03

Hole Diameter

Hole ID: 1004843132
Diameter: 10.92
Depth From: 0
Depth To: 7.62
Hole Depth UOM: m
Hole Diameter UOM: cm

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49 ***1 of 1*** ***SW/189.5*** ***59.5 / -3.08*** ***ON*** ***BORE***

Borehole ID: 613258
OGF ID: 215514560
Status:
Type: Borehole
Use:
Completion Date: SEP-1968
Static Water Level:
Primary Water Use:
Sec. Water Use:
Total Depth m: -999
Depth Ref: Ground Surface
Depth Elev:
Drill Method:

Inclin FLG: No
SP Status: Initial Entry
Surv Elev: No
Piezometer: No
Primary Name:
Municipality:
Lot:
Township:
Latitude DD: 45.414373
Longitude DD: -75.670321
UTM Zone: 18
Easting: 447551
Northing: 5029202

Orig Ground Elev m:	58.7	**Location Accuracy:**	
Elev Reliabil Note:		**Accuracy:**	Not Applicable
DEM Ground Elev m:	56.6		
Concession:			
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	218394382	**Mat Consistency:**	Stiff
Top Depth:	1.4	**Material Moisture:**	
Bottom Depth:	9.9	**Material Texture:**	
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Silt	**Geologic Formation:**	
Material 2:	Clay	**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	SILT. BROWN,STIFF,LAYERED.		

Geology Stratum ID:	218394381	**Mat Consistency:**	
Top Depth:	0	**Material Moisture:**	
Bottom Depth:	1.4	**Material Texture:**	
Material Color:		**Non Geo Mat Type:**	
Material 1:	Fill	**Geologic Formation:**	
Material 2:		**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	fill
Gsc Material Description:			
Stratum Description:	FILL.		

Geology Stratum ID:	218394383	**Mat Consistency:**	
Top Depth:	9.9	**Material Moisture:**	
Bottom Depth:	13.1	**Material Texture:**	
Material Color:		**Non Geo Mat Type:**	
Material 1:	Till	**Geologic Formation:**	
Material 2:		**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	TILL.		

Geology Stratum ID:	218394384	**Mat Consistency:**	
Top Depth:	13.1	**Material Moisture:**	
Bottom Depth:		**Material Texture:**	
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Bedrock	**Geologic Formation:**	
Material 2:	Shale	**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	BEDROCK. . 00000 012 00050 064 00080 070 00000011D. TILL. BEDROCK. BROWN **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Source

Source Type:	Data Survey	**Source Appl:**	Spatial/Tabular
Source Orig:	Geological Survey of Canada	**Source Iden:**	1
Source Date:	1956-1972	**Scale or Res:**	Varies
Confidence:		**Horizontal:**	NAD27
Observatio:		**Verticalda:**	Mean Average Sea Level
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Details:	File: OTTAWA2.txt RecordID: 057660 NTS_Sheet: 31G05G		

Confiden 1:

Source List

Source Identifier:	1	***Horizontal Datum:***	NAD27
Source Type:	Data Survey	***Vertical Datum:***	Mean Average Sea Level
Source Date:	1956-1972	***Projection Name:***	Universal Transverse Mercator
Scale or Resolution:	Varies		
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Originators:	Geological Survey of Canada		

50 ***1 of 1*** ***W/190.1*** ***63.9 / 1.31*** ***Ottawa ON*** ***WWIS***

Well ID:	7191095	***Data Entry Status:***	
Construction Date:		***Data Src:***	
Primary Water Use:	Monitoring and Test Hole	***Date Received:***	11/9/2012
Sec. Water Use:	0	***Selected Flag:***	Yes
Final Well Status:	0	***Abandonment Rec:***	
Water Type:		***Contractor:***	7241
Casing Material:		***Form Version:***	7
Audit No:	Z156919	***Owner:***	
Tag:	A135001	***Street Name:***	191 LEES AVE
Construction Method:		***County:***	OTTAWA-CARLETON
Elevation (m):		***Municipality:***	NEPEAN TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	
Well Depth:		***Concession:***	
Overburden/Bedrock:		***Concession Name:***	
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004200420	***Elevation:***	57.173645
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	447456
Code OB Desc:		***North83:***	5029419
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	9/24/2012	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1004490155
Layer:	3
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY

Mat2:	06
Other Materials:	SILT
Mat3:	74
Other Materials:	LAYERED
Formation Top Depth:	4.57
Formation End Depth:	7.62
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004490153
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	02
Most Common Material:	TOPSOIL
Mat2:	28
Other Materials:	SAND
Mat3:	85
Other Materials:	SOFT
Formation Top Depth:	0
Formation End Depth:	0.61
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004490154
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Other Materials:	GRAVEL
Mat3:	85
Other Materials:	SOFT
Formation Top Depth:	0.61
Formation End Depth:	4.57
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004490167
Layer:	1
Plug From:	0
Plug To:	5.79
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004490168
Layer:	2
Plug From:	5.79
Plug To:	7.62
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID: 1004490166
Layer: 1
Plug From:
Plug To:
Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID:
Method Construction Code: 2
Method Construction: Rotary (Convent.)
Other Method Construction:

Pipe Information

Pipe ID: 1004490152
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1004490158
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0
Depth To: 6.1
Casing Diameter: 5.2
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1004490159
Layer: 1
Slot: 10
Screen Top Depth: 6.1
Screen End Depth: 7.62
Screen Material: 5
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter: 6.03

Hole Diameter

Hole ID: 1004490156
Diameter: 10.92
Depth From: 0
Depth To: 7.62
Hole Depth UOM: m
Hole Diameter UOM: cm

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51 ***1 of 1*** ***NNW/191.3*** ***66.0 / 3.40*** ***OTTAWA ON*** ***WWIS***

Well ID: 7211118
Construction Date:
Primary Water Use:
Data Entry Status:
Data Src:
Date Received: 11/14/2013

Sec. Water Use:		**Selected Flag:**	Yes
Final Well Status:	Abandoned-Other	**Abandonment Rec:**	Yes
Water Type:		**Contractor:**	6894
Casing Material:		**Form Version:**	7
Audit No:	Z096875	**Owner:**	
Tag:	A152323	**Street Name:**	1 ROBINSON
Construction Method:		**County:**	OTTAWA-CARLETON
Elevation (m):		**Municipality:**	OTTAWA CITY
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	
Well Depth:		**Concession:**	
Overburden/Bedrock:		**Concession Name:**	
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004633168	**Elevation:**	61.154476
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	18
Code OB:		**East83:**	447568
Code OB Desc:		**North83:**	5029547
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:		**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Annular Space/Abandonment Sealing Record

Plug ID:	1004895877
Layer:	1
Plug From:	0
Plug To:	7.65
Plug Depth UOM:	ft

Pipe Information

Pipe ID:	1004895870
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1004895874
Layer:	
Material:	
Open Hole or Material:	
Depth From:	
Depth To:	
Casing Diameter:	
Casing Diameter UOM:	inch

Casing Depth UOM: ft

Construction Record - Screen

Screen ID: 1004895875
Layer:
Slot:
Screen Top Depth:
Screen End Depth:
Screen Material:
Screen Depth UOM: ft
Screen Diameter UOM: inch
Screen Diameter:

Water Details

Water ID: 1004895873
Layer: 1
Kind Code: 8
Kind: Untested
Water Found Depth: 6.05
Water Found Depth UOM: ft

Hole Diameter

Hole ID: 1004895872
Diameter:
Depth From:
Depth To:
Hole Depth UOM: ft
Hole Diameter UOM: inch

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52 ***1 of 1*** ***ENE/198.2*** ***61.9 / -0.69*** ***Ottawa ON*** ***WWIS***

Well ID: 7180700
Construction Date:
Primary Water Use:
Sec. Water Use:
Final Well Status: Abandoned-Other
Water Type:
Casing Material:
Audit No: Z145267
Tag:
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Data Entry Status:
Data Src:
Date Received: 5/10/2012
Selected Flag: Yes
Abandonment Rec: Yes
Contractor: 7241
Form Version: 7
Owner:
Street Name: 200 LEES AVE
County: OTTAWA-CARLETON
Municipality: NEPEAN TOWNSHIP
Site Info:
Lot:
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 1003760707
DP2BR:
Spatial Status:
Code OB:

Elevation: 62.405906
Elevrc:
Zone: 18
East83: 447827

Code OB Desc:		**North83:**	5029434
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	2/24/2012	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Annular Space/Abandonment Sealing Record

Plug ID:	1004304047
Layer:	1
Plug From:	0
Plug To:	5.2
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	
Method Construction Code:	6
Method Construction:	Boring
Other Method Construction:	

Pipe Information

Pipe ID:	1004304040
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1004304044
Layer:	
Material:	
Open Hole or Material:	
Depth From:	
Depth To:	
Casing Diameter:	
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1004304045
Layer:	
Slot:	
Screen Top Depth:	
Screen End Depth:	
Screen Material:	
Screen Depth UOM:	m
Screen Diameter UOM:	cm
Screen Diameter:	

Hole Diameter

Hole ID:	1004304042
Diameter:	10.92
Depth From:	0
Depth To:	5.2
Hole Depth UOM:	m
Hole Diameter UOM:	cm

53 **1 of 1** **NW/207.0** **66.3 / 3.77** **Ottawa ON** **WWIS**

Well ID:	7182966	**Data Entry Status:**	
Construction Date:		**Data Src:**	
Primary Water Use:		**Date Received:**	6/19/2012
Sec. Water Use:	Test Hole	**Selected Flag:**	Yes
Final Well Status:	Abandoned-Other	**Abandonment Rec:**	
Water Type:		**Contractor:**	6964
Casing Material:		**Form Version:**	7
Audit No:	Z134687	**Owner:**	
Tag:		**Street Name:**	1 ROBINSON AVE
Construction Method:		**County:**	
Elevation (m):		**Municipality:**	
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	
Well Depth:		**Concession:**	
Overburden/Bedrock:		**Concession Name:**	
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1003941785	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	
Code OB:		**East83:**	
Code OB Desc:		**North83:**	
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	9
Date Completed:	4/11/2012	**UTMRC Desc:**	unknown UTM
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1004376328
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	01
Other Materials:	FILL
Mat3:	28
Other Materials:	SAND

Formation Top Depth: 0
Formation End Depth: 2.4
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1004376330
Layer: 3
Color:
General Color:
Mat1: 28
Most Common Material: SAND
Mat2: 11
Other Materials: GRAVEL
Mat3:
Other Materials:
Formation Top Depth: 2.7
Formation End Depth: 3.3
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1004376333
Layer: 6
Color: 2
General Color: GREY
Mat1: 28
Most Common Material: SAND
Mat2: 84
Other Materials: SILTY
Mat3:
Other Materials:
Formation Top Depth: 7
Formation End Depth: 7.3
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1004376332
Layer: 5
Color: 2
General Color: GREY
Mat1: 28
Most Common Material: SAND
Mat2: 11
Other Materials: GRAVEL
Mat3:
Other Materials:
Formation Top Depth: 4.2
Formation End Depth: 7
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1004376329
Layer: 2
Color: 8
General Color: BLACK

Mat1: 04
Most Common Material: PEAT
Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 2.4
Formation End Depth: 2.7
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1004376331
Layer: 4
Color: 8
General Color: BLACK
Mat1: 06
Most Common Material: SILT
Mat2: 34
Other Materials: TILL
Mat3: 11
Other Materials: GRAVEL
Formation Top Depth: 3.3
Formation End Depth: 4.2
Formation End Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1004376340
Layer: 1
Plug From: 0
Plug To: 0.6
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1004376341
Layer: 2
Plug From: 0.6
Plug To: 7.3
Plug Depth UOM: m

Pipe Information

Pipe ID: 1004376327
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1004376336
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0
Depth To: 4.4
Casing Diameter: 5.2
Casing Diameter UOM: cm

Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1004376337
Layer: 1
Slot: 10
Screen Top Depth: 4.4
Screen End Depth: 7.3
Screen Material: 5
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter: 6

Water Details

Water ID: 1004376335
Layer: 1
Kind Code:
Kind:
Water Found Depth: 5.8
Water Found Depth UOM: m

Hole Diameter

Hole ID: 1004376334
Diameter:
Depth From:
Depth To:
Hole Depth UOM: m
Hole Diameter UOM: cm

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54 | ***1 of 1*** | ***NNE/212.4*** | ***62.9 / 0.31*** | ***DANBAR HOLDINGS (OTTAWA) LIMITED ROBINSON AVE/HURDMAN RD. OTTAWA CITY ON*** | ***CA***

Certificate #: 7-1132-97-
Application Year: 97
Issue Date: 10/17/1997
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

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55 | ***1 of 1*** | ***NNW/216.3*** | ***65.8 / 3.20*** | ***Ottawa ON*** | ***WWIS***

Well ID: 7201656
Construction Date:
Primary Water Use: Monitoring and Test Hole
Sec. Water Use:
Final Well Status: Test Hole
Water Type:
Casing Material:
Audit No: Z168582
Data Entry Status:
Data Src:
Date Received: 5/15/2013
Selected Flag: Yes
Abandonment Rec:
Contractor: 7241
Form Version: 7
Owner:

Tag:	A145285	***Street Name:***	1 ROBINSON AVE
Construction Method:		***County:***	OTTAWA-CARLETON
Elevation (m):		***Municipality:***	OTTAWA CITY
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	
Well Depth:		***Concession:***	
Overburden/Bedrock:		***Concession Name:***	
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004301544	***Elevation:***	61.432575
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	447569
Code OB Desc:		***North83:***	5029574
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	4/12/2013	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1004843103
Layer:	3
Color:	6
General Color:	BROWN
Mat1:	34
Most Common Material:	TILL
Mat2:	
Other Materials:	
Mat3:	73
Other Materials:	HARD
Formation Top Depth:	6.71
Formation End Depth:	7.62
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004843102
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	08
Most Common Material:	FINE SAND
Mat2:	
Other Materials:	
Mat3:	73
Other Materials:	HARD
Formation Top Depth:	3.1
Formation End Depth:	6.71

Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004843101
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	10
Most Common Material:	COARSE SAND
Mat2:	
Other Materials:	
Mat3:	77
Other Materials:	LOOSE
Formation Top Depth:	0
Formation End Depth:	3.1
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004843112
Layer:	2
Plug From:	4.27
Plug To:	7.62
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004843111
Layer:	1
Plug From:	0
Plug To:	4.27
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	
Method Construction Code:	6
Method Construction:	Boring
Other Method Construction:	

Pipe Information

Pipe ID:	1004843100
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1004843106
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	0
Depth To:	4.57
Casing Diameter:	5.2

Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1004843107
Layer:	1
Slot:	10
Screen Top Depth:	4.57
Screen End Depth:	7.62
Screen Material:	5
Screen Depth UOM:	m
Screen Diameter UOM:	cm
Screen Diameter:	6.03

Hole Diameter

Hole ID:	1004843104
Diameter:	10.92
Depth From:	0
Depth To:	7.62
Hole Depth UOM:	m
Hole Diameter UOM:	cm

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56 ***1 of 1*** ***NNW/220.3*** ***65.9 / 3.31*** ***Ottawa ON*** ***WWIS***

Well ID:	7201657	**Data Entry Status:**	
Construction Date:		**Data Src:**	
Primary Water Use:	Monitoring and Test Hole	**Date Received:**	5/15/2013
Sec. Water Use:		**Selected Flag:**	Yes
Final Well Status:	Test Hole	**Abandonment Rec:**	
Water Type:		**Contractor:**	7241
Casing Material:		**Form Version:**	7
Audit No:	Z168580	**Owner:**	
Tag:	A145286	**Street Name:**	1 ROBINSON AVE
Construction Method:		**County:**	OTTAWA-CARLETON
Elevation (m):		**Municipality:**	OTTAWA CITY
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	
Well Depth:		**Concession:**	
Overburden/Bedrock:		**Concession Name:**	
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004301547	**Elevation:**	61.84629
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	18
Code OB:		**East83:**	447585
Code OB Desc:		**North83:**	5029583
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	4/12/2013	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			

Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID:	1004843114
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	10
Most Common Material:	COARSE SAND
Mat2:	
Other Materials:	
Mat3:	77
Other Materials:	LOOSE
Formation Top Depth:	0
Formation End Depth:	3.1
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004843116
Layer:	3
Color:	6
General Color:	BROWN
Mat1:	34
Most Common Material:	TILL
Mat2:	
Other Materials:	
Mat3:	73
Other Materials:	HARD
Formation Top Depth:	6.71
Formation End Depth:	8.53
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1004843115
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	08
Most Common Material:	FINE SAND
Mat2:	
Other Materials:	
Mat3:	73
Other Materials:	HARD
Formation Top Depth:	3.1
Formation End Depth:	6.71
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004843125
Layer:	2
Plug From:	5.18
Plug To:	8.53

Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1004843124
Layer: 1
Plug From: 0
Plug To: 5.18
Plug Depth UOM: m

Pipe Information

Pipe ID: 1004843113
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1004843119
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0
Depth To: 5.49
Casing Diameter: 5.2
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1004843120
Layer: 1
Slot: 10
Screen Top Depth: 5.49
Screen End Depth: 8.53
Screen Material: 5
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter: 6.03

Hole Diameter

Hole ID: 1004843117
Diameter: 10.92
Depth From: 0
Depth To: 8.53
Hole Depth UOM: m
Hole Diameter UOM: cm

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57 ***1 of 6*** ***WSW/221.8*** ***60.9 / -1.69*** ***773925 ONTARIO INC.***
170 LEES AVE., C/O 7-1419 CARLING AVE.
OTTAWA ON K1S 5G5 ***GEN***

Generator No: ON1161300
Status:
Approval Years: 89
Contam. Facility:
MHSW Facility:
SIC Code: 3699

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

SIC Description: OTHER PETRO. & COAL

Detail(s)

Waste Class: 222
Waste Class Desc: HEAVY FUELS

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57 ***2 of 6*** ***WSW/221.8*** ***60.9 / -1.69*** ***HAMA INVESTMENTS LTD. 43-156*** ***GEN***
170 LEES AVENUE
OTTAWA ON K1S 5G5

Generator No: ON1161300
Status:
Approval Years: 92,93,96,97,98
Contam. Facility:
MHSW Facility:
SIC Code: 3699
SIC Description: OTHER PETRO. & COAL

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 146
Waste Class Desc: OTHER SPECIFIED INORGANICS

Waste Class: 222
Waste Class Desc: HEAVY FUELS

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57 ***3 of 6*** ***WSW/221.8*** ***60.9 / -1.69*** ***773925 ONTARIO INC. 43-156*** ***GEN***
170 LEES AVE., C/O 7-1419 CARLING AVE.
OTTAWA ON K1S 5G5

Generator No: ON1161300
Status:
Approval Years: 94,95
Contam. Facility:
MHSW Facility:
SIC Code: 3699
SIC Description: OTHER PETRO. & COAL

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 222
Waste Class Desc: HEAVY FUELS

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57 ***4 of 6*** ***WSW/221.8*** ***60.9 / -1.69*** ***HAMA INVESTMENTS LIMITED*** ***GEN***
170 LEES AVENUE
OTTAWA ON K1S 5G5

Generator No: ON1161300
Status:
Approval Years: 99,00,01
Contam. Facility:
MHSW Facility:
SIC Code: 3699
SIC Description: OTHER PETRO. & COAL

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 146
Waste Class Desc: OTHER SPECIFIED INORGANICS

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Waste Class: 222
Waste Class Desc: HEAVY FUELS

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57 **5 of 6** **WSW/221.8** **60.9 / -1.69** **Currie Products Ltd.**
170 Lees Avenue
Ottawa ON K1S 5G5 **COAL**

Facility Type: Coal tar distillation plant
Size: 1.7 hectare
NTS Map Sheet: 31 G/5
Planned Land Use: Same as present
Present Land Use: Apartment building (residential)
Landuse Adj Property: North, east - residential; west - institutional (Armories); south - Rideau River
Underground Utilities: Storm sewer at west boundary other utilities along Lees Avenue; underground parking for apartment building
Soil Conditions: Sand fill overlying silty clay
Site Access: Uncontrolled
Operating Period: 1922-1949 (27 years) (storage site until early 1960s)
Surface Water: Rideau River
Surface Water Prox: Adjacent (southern boundary)
Surface Water Use: Recreational
Groundwater Prox: Shallow groundwater within 3 m of surface
Groundwater Use: Not used
Existing Wells Prox: None in impacted area
Historical Map/Photo: 1922 surveyed map (City of Ottawa map LS45); 1956 fire insurance plant (Public Archives Canada NMC, sheet 234-4); 1928 air photo (NAPL A18-10); 1961 oblique air photo (City of Ottawa Archived, CA-8494)
Operators: Hamilton Tar Products, Currie Products Ltd. 1922-1949 (tar storage site until early 1960s)
Present Occupants: Controlex Realty Ltd. (property managers)
Excavation History: Apartment building built in 1973 - 3 level; underground parking garage
Visible Wastes: Tar seeping into underground parking garage
Odour: Odour of tar in parking garage
Water Pollution: Shallow groundwater contaminated by coal tar
Site Investigations: Hydrogeological study for MOE by Intera Technologies Ltd. (1987). Soils studies for apartment construction by Golder Associates (1968,1972).
Comments/Remarks: Site has residual tar and oils in subsurface. Tar seeping into parking garage is most significant impact.
Site Description: A coal tar distillation plant was located at 170 Lees Avenue in Ottawa from about 1922 to about 1949. The property was operated by Currie Products Ltd. who also used the property for tar storage until about 1970. The company produced creosote oils, pitch, road tar, tarred felts and sheeting, tar paints and cements and other products. The plant received its raw materials (i.e., tar) from the Ottawa Gas Company's coal gasification plant until 1939 and later from Stelco, Hamilton. The plant covered about 1.7 hectares of area between Lees Avenue and the Rideau River to the south. The property today is occupied by a high-rise apartment building with underground parking. Other apartment buildings are also found to the north and east while an armory is located to the west.
Potenial Environ Impact: Coal tar wastes have been identified in the subsurface in the area of the former plant and a hydrogeologic study has been completed for MOE as part of investigations of the Ottawa Lees Avenue coal tar problems. Coal tar was identified in soils and groundwater in the area to the west of and under the apartment building. Tar was also found to be seeping into the lowest floor of the underground parking garage, resulting in odours in the garage. The coal tar in the soil has also caused shallow groundwater contamination which is migrating easterly towards an adjacent apartment building. Coal tar was also found adjacent to a storm sewer line that discharges to the river at the western boundary of the property. The potential environmental impacts of this site result from free coal tar in the soil and groundwater contamination. The coal tar seeping into the building results in odour problems in the garage and increases the possibility of direct contact with the tar. These impacts have been reduced by closing off and limiting access to the lowest level of the garage. It is also possible that the free coal tar may be migrating to the river via the bedding material of the storm sewer but there is presently insufficient evidence to support this hypothesis. In terms of groundwater contamination, the groundwater flow direction is to the east to the drainage system and sump of the adjacent apartment building which is the low point in the area and below Rideau River level. If contaminated groundwater reaches the sump it will be discharged to the storm sewer which will in turn discharge the contaminated water to the Rideau River. Although the impact on the river may not be measurable, it may increase the loading of PAH to the river.
Offsite Disposal Areas:

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57 **6 of 6** **WSW/221.8** **60.9 / -1.69** **HAMA Investments Limited**
170 LEES AVE, OTTAWA, ON, K1S 5G5
OTTAWA ON K1S 5G5 **RSC**

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

RSC ID:	12901	**Cert Date:**	22-Dec-06
RA No:		**Cert Prop Use No:**	No CPU
RSC Type:		**Intended Prop Use:**	Residential
Curr Property Use:	Residential	**Qual Person Name:**	Mr. Klaus Maier
Ministry District:	OTTAWA	**Stratified (Y/N):**	
Filing Date:	30-Mar-07	**Audit (Y/N):**	
Date Ack:		**Entire Leg Prop. (Y/N):**	No
Date Returned:		**Accuracy Estimate:**	6 to 10 meters
Restoration Type:		**Telephone:**	780-4840000
Soil Type:		**Fax:**	780-4864695
Criteria:		**Email:**	klausbmw@telusplanet.net
CPU Issued Sect 1686:	No		

Asmt Roll No: 6.14032E+17
Prop ID No (PIN): 04203-0628
Property Municipal Address: 170 LEES AVE, OTTAWA, ON, K1S 5G5
Mailing Address: 18925 Stony Plain Road NW, Edmonton, Alberta, T5S 2Y4
Latitude & Latitude: 45.41444440N 75.67166670W
UTM Coordinates: NAD83 18-447445-5029211 (converted from Latitude & Longitude)
Consultant:
Legal Desc: Part of the South Half of Lot G, Concession D, Rideau Front, City of Ottawa, (formerly in the Township of Nepean), Regional Municipality of Ottawa-Carleton *note: portion of property located within 31 m of the Rideau River has been excluded from this Record of Site Condition
Measurement Method: Digitized from a satellite image
Applicable Standards: Full Depth Site Conditions Standard, with Nonpotable Ground Water, Medium/Fine Textured Soil, for Residential/Parkland/Institutional property use
RSC PDF:

58	1 of 1	WNW/224.7	64.7 / 2.11	**TRANSPORT TRUCK AT THE NICHOLAS ST. TRANSITWAY & QUEENSWAY MOTOR VEHICLE (OPERATING FLUID) OTTAWA CITY ON**	SPL

Ref No:	102879	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:	7/18/1994	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	OTHER CONTAINER LEAK	**Sector Type:**	
Incident Event:		**Agency Involved:**	
Contaminant Code:		**Nearest Watercourse:**	
Contaminant Name:		**Site Address:**	
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	POSSIBLE	**Site Municipality:**	20101
Nature of Impact:	Water course or lake	**Site Lot:**	
Receiving Medium:	LAND / WATER	**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:		**Easting:**	REGION OF OTTAWA/CARLETON
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	7/18/1994	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	
Incident Reason:	ERROR	**Source Type:**	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			

Incident Summary: TRANSPORT TRUCK - 90 L OF DIESEL TO ROAD & SEWERDUE TO ACCIDENT.
Contaminant Qty:

59	1 of 1	NW/226.6	66.6 / 4.01	**ON**	WWIS

Well ID:	7251494	**Data Entry Status:**	
Construction Date:		**Data Src:**	
Primary Water Use:		**Date Received:**	11/4/2015
Sec. Water Use:		**Selected Flag:**	Yes
Final Well Status:	Abandoned-Other	**Abandonment Rec:**	Yes
Water Type:		**Contractor:**	6894
Casing Material:		**Form Version:**	7
Audit No:	Z82652	**Owner:**	
Tag:	A145285	**Street Name:**	1 ROBINSON ROAD
Construction Method:		**County:**	OTTAWA-CARLETON
Elevation (m):		**Municipality:**	OTTAWA CITY
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	
Well Depth:		**Concession:**	
Overburden/Bedrock:		**Concession Name:**	
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1005782117	**Elevation:**	61.238483
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	18
Code OB:		**East83:**	447532
Code OB Desc:		**North83:**	5029569
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:		**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Annular Space/Abandonment Sealing Record

Plug ID:	1005807022
Layer:	1
Plug From:	0
Plug To:	7.38
Plug Depth UOM:	ft

Pipe Information

Pipe ID:	1005807015
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1005807019
Layer:	
Material:	
Open Hole or Material:	
Depth From:	

Depth To:
Casing Diameter:
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Screen

Screen ID: 1005807020
Layer:
Slot:
Screen Top Depth:
Screen End Depth:
Screen Material:
Screen Depth UOM: ft
Screen Diameter UOM: inch
Screen Diameter:

Water Details

Water ID: 1005807018
Layer: 1
Kind Code: 8
Kind: Untested
Water Found Depth: 6.1
Water Found Depth UOM: ft

Hole Diameter

Hole ID: 1005807017
Diameter:
Depth From:
Depth To:
Hole Depth UOM: ft
Hole Diameter UOM: inch

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60 ***1 of 1*** ***N/226.9*** ***64.9 / 2.31*** ***Ottawa ON*** ***WWIS***

Well ID:	7293327	***Data Entry Status:***	
Construction Date:		***Data Src:***	
Primary Water Use:	Test Hole	***Date Received:***	8/18/2017
Sec. Water Use:	Monitoring	***Selected Flag:***	Yes
Final Well Status:	Monitoring and Test Hole	***Abandonment Rec:***	
Water Type:		***Contractor:***	7241
Casing Material:		***Form Version:***	7
Audit No:	Z206426	***Owner:***	
Tag:	A182472	***Street Name:***	3 HURDMAN ROAD
Construction Method:		***County:***	OTTAWA-CARLETON
Elevation (m):		***Municipality:***	OTTAWA CITY
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	
Well Depth:		***Concession:***	
Overburden/Bedrock:		***Concession Name:***	
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1006710691	***Elevation:***	65.135307

DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	18
Code OB:		**East83:**	447665
Code OB Desc:		**North83:**	5029595
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	7/19/2017	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1006830479
Layer:	4
Color:	2
General Color:	GREY
Mat1:	28
Most Common Material:	SAND
Mat2:	06
Other Materials:	SILT
Mat3:	11
Other Materials:	GRAVEL
Formation Top Depth:	3.1
Formation End Depth:	4.57
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1006830477
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	01
Most Common Material:	FILL
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	0.61
Formation End Depth:	1.83
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1006830476
Layer:	1
Color:	2
General Color:	GREY
Mat1:	11
Most Common Material:	GRAVEL
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	0

Formation End Depth: 0.61
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1006830478
Layer: 3
Color: 6
General Color: BROWN
Mat1: 11
Most Common Material: GRAVEL
Mat2: 06
Other Materials: SILT
Mat3: 81
Other Materials: SANDY
Formation Top Depth: 1.83
Formation End Depth: 3.1
Formation End Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1006830489
Layer: 3
Plug From: 1.22
Plug To: 4.57
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1006830488
Layer: 2
Plug From: 0.31
Plug To: 1.22
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1006830487
Layer: 1
Plug From: 0
Plug To: 0.31
Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID:
Method Construction Code: D
Method Construction: Direct Push
Other Method Construction:

Pipe Information

Pipe ID: 1006830475
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID:	1006830482
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	0
Depth To:	1.5
Casing Diameter:	5.2
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1006830483
Layer:	1
Slot:	10
Screen Top Depth:	1.5
Screen End Depth:	4.57
Screen Material:	5
Screen Depth UOM:	m
Screen Diameter UOM:	cm
Screen Diameter:	6.03

Hole Diameter

Hole ID:	1006830480
Diameter:	11.4
Depth From:	0
Depth To:	4.57
Hole Depth UOM:	m
Hole Diameter UOM:	cm

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61 ***1 of 2*** ***NNE/227.1*** ***62.9 / 0.31*** ***9 Robinson Ave.***
Ottawa ON K1N 8N8 ***CA***

Certificate #:	7132-4N2QFS
Application Year:	00
Issue Date:	8/11/00
Approval Type:	Municipal & Private sewage
Status:	Approved
Application Type:	New Certificate of Approval
Client Name:	Pegasus Development Corporation
Client Address:	1914 Merivale Rd.
Client City:	Nepean
Client Postal Code:	K2G 1E8
Project Description:	Storm & Sanitary Sewers
Contaminants:	
Emission Control:	

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61 ***2 of 2*** ***NNE/227.1*** ***62.9 / 0.31*** ***Pegasus Development Corporation***
9 Robinson Ave.
Ottawa ON K2G 1E8 ***ECA***

Approval No:	7132-4N2QFS	***MOE District:***	Ottawa
Approval Date:	2000-08-11	***City:***	
Status:	Approved	***Longitude:***	-75.67134
Record Type:	ECA	***Latitude:***	45.417545
Link Source:	IDS	***Geometry X:***	
SWP Area Name:	Rideau Valley	***Geometry Y:***	

Approval Type:	ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type:	MUNICIPAL AND PRIVATE SEWAGE WORKS
Address:	9 Robinson Ave.
Full Address:	
Full PDF Link:	https://www.accessenvironment.ene.gov.on.ca/instruments/4482-4MBPU4-14.pdf

62 **1 of 1** **WSW/227.9** **60.9 / -1.69** **ON** **BORE**

Borehole ID:	613261	**Inclin FLG:**	No
OGF ID:	215514563	**SP Status:**	Initial Entry
Status:		**Surv Elev:**	No
Type:	Borehole	**Piezometer:**	No
Use:		**Primary Name:**	
Completion Date:	AUG-1972	**Municipality:**	
Static Water Level:		**Lot:**	
Primary Water Use:		**Township:**	
Sec. Water Use:		**Latitude DD:**	45.414547
Total Depth m:	19.8	**Longitude DD:**	-75.671409
Depth Ref:	Ground Surface	**UTM Zone:**	18
Depth Elev:		**Easting:**	447466
Drill Method:		**Northing:**	5029222
Orig Ground Elev m:	59.3	**Location Accuracy:**	
Elev Reliabil Note:		**Accuracy:**	Not Applicable
DEM Ground Elev m:	61.3		
Concession:			
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	218394399	**Mat Consistency:**	
Top Depth:	16.9	**Material Moisture:**	
Bottom Depth:	19.8	**Material Texture:**	
Material Color:		**Non Geo Mat Type:**	
Material 1:	Bedrock	**Geologic Formation:**	
Material 2:	Shale	**Geologic Group:**	
Material 3:	Limestone	**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	BEDROCK. SOUND,STRATIFIED. 00000011000401000010000500230017003251000018510004000250070007500600 **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Geology Stratum ID:	218394394	**Mat Consistency:**	
Top Depth:	1.2	**Material Moisture:**	
Bottom Depth:	2.6	**Material Texture:**	
Material Color:	Dark	**Non Geo Mat Type:**	
Material 1:		**Geologic Formation:**	
Material 2:	Granuls	**Geologic Group:**	
Material 3:	Wood Fragments	**Geologic Period:**	
Material 4:	Brick fragments	**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	ARTIFICIAL. DARK,GREY.		

Geology Stratum ID:	218394398	**Mat Consistency:**	Dense
Top Depth:	9.9	**Material Moisture:**	
Bottom Depth:	16.9	**Material Texture:**	
Material Color:	Dark	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Silt	**Geologic Group:**	
Material 3:	Till	**Geologic Period:**	

Material 4: **Depositional Gen:**
Gsc Material Description:
Stratum Description: SAND. DARK,GREY,VERY DENSE.

Geology Stratum ID: 218394395 **Mat Consistency:**
Top Depth: 2.6 **Material Moisture:**
Bottom Depth: 3 **Material Texture:** Coarse
Material Color: Brown **Non Geo Mat Type:**
Material 1: Sand **Geologic Formation:**
Material 2: **Geologic Group:**
Material 3: **Geologic Period:**
Material 4: **Depositional Gen:**
Gsc Material Description:
Stratum Description: SAND-COARSE. BROWN.

Geology Stratum ID: 218394396 **Mat Consistency:** Stiff
Top Depth: 3 **Material Moisture:**
Bottom Depth: 7 **Material Texture:**
Material Color: Brown **Non Geo Mat Type:**
Material 1: Clay **Geologic Formation:**
Material 2: Silt **Geologic Group:**
Material 3: **Geologic Period:**
Material 4: **Depositional Gen:**
Gsc Material Description:
Stratum Description: CLAY. BROWN,GREY,STIFF.

Geology Stratum ID: 218394397 **Mat Consistency:** Compact
Top Depth: 7 **Material Moisture:**
Bottom Depth: 9.9 **Material Texture:**
Material Color: Grey **Non Geo Mat Type:**
Material 1: Silt **Geologic Formation:**
Material 2: Sand **Geologic Group:**
Material 3: **Geologic Period:**
Material 4: **Depositional Gen:**
Gsc Material Description:
Stratum Description: SILT. GREY,COMPACT.

Geology Stratum ID: 218394393 **Mat Consistency:** Compact
Top Depth: 0 **Material Moisture:**
Bottom Depth: 1.2 **Material Texture:**
Material Color: Brown **Non Geo Mat Type:**
Material 1: **Geologic Formation:**
Material 2: Sand **Geologic Group:**
Material 3: Silt **Geologic Period:**
Material 4: Gravel **Depositional Gen:**
Gsc Material Description:
Stratum Description: ARTIFICIAL. BROWN,COMPACT.

Source

Source Type: Data Survey **Source Appl:** Spatial/Tabular
Source Orig: Geological Survey of Canada **Source Iden:** 1
Source Date: 1956-1972 **Scale or Res:** Varies
Confidence: H **Horizontal:** NAD27
Observatio: **Verticalda:** Mean Average Sea Level
Source Name: Urban Geology Automated Information System (UGAIS)
Source Details: File: OTTAWA2.txt RecordID: 057690 NTS_Sheet: 31G05G
Confiden 1: Logged by professional. Exact and complete description of material and properties.

Source List

Source Identifier: 1 **Horizontal Datum:** NAD27
Source Type: Data Survey **Vertical Datum:** Mean Average Sea Level
Source Date: 1956-1972 **Projection Name:** Universal Transverse Mercator

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Scale or Resolution: Varies
Source Name: Urban Geology Automated Information System (UGAIS)
Source Originators: Geological Survey of Canada

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63 | **1 of 1** | **W/228.8** | **63.0 / 0.40** | **169 Lees Avenue Ottawa ON** | **EHS**

Order No:	20170908146	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Standard Report	**Client Prov/State:**	ON
Report Date:	15-SEP-17	**Search Radius (km):**	.25
Date Received:	08-SEP-17	**X:**	-75.672122
Previous Site Name:		**Y:**	45.415771
Lot/Building Size:			
Additional Info Ordered:			

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64 | **1 of 1** | **NNE/230.0** | **62.9 / 0.31** | **PRIVATE OWNER 5-9 HURDMAN STREET MOTOR VEHICLE (OPERATING FLUID) OTTAWA CITY ON K1N 8N6** | **SPL**

Ref No:	74304	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:	8/6/1992	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	OTHER CONTAINER LEAK	**Sector Type:**	
Incident Event:		**Agency Involved:**	
Contaminant Code:		**Nearest Watercourse:**	
Contaminant Name:		**Site Address:**	
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	NOT ANTICIPATED	**Site Municipality:**	20101
Nature of Impact:		**Site Lot:**	
Receiving Medium:	LAND	**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:		**Easting:**	CITY OF OTTAWA
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	8/6/1992	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	
Incident Reason:	INTENTIONAL/PLANNED	**Source Type:**	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			

Incident Summary: PRIVATE VEHICLE: 10 L MOTOR OIL DUMPED ON ROAD/CATCHBASIN
Contaminant Qty:

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65 | **1 of 1** | **WSW/230.4** | **60.9 / -1.61** | **ON** | **BORE**

Borehole ID:	613266	**Inclin FLG:**	No
OGF ID:	215514568	**SP Status:**	Initial Entry
Status:		**Surv Elev:**	No
Type:	Borehole	**Piezometer:**	No
Use:		**Primary Name:**	
Completion Date:	AUG-1972	**Municipality:**	
Static Water Level:		**Lot:**	
Primary Water Use:		**Township:**	
Sec. Water Use:		**Latitude DD:**	45.414905
Total Depth m:	19.2	**Longitude DD:**	-75.671797
Depth Ref:	Ground Surface	**UTM Zone:**	18

Depth Elev: ***Easting:*** 447436
Drill Method: ***Northing:*** 5029262
Orig Ground Elev m: 59.1 ***Location Accuracy:***
Elev Reliabil Note: ***Accuracy:*** Not Applicable
DEM Ground Elev m: 60.3
Concession:
Location D:
Survey D:
Comments:

Borehole Geology Stratum

Geology Stratum ID: 218394420 ***Mat Consistency:*** Compact
Top Depth: 7 ***Material Moisture:***
Bottom Depth: 8.8 ***Material Texture:***
Material Color: Grey ***Non Geo Mat Type:***
Material 1: Silt ***Geologic Formation:***
Material 2: Sand ***Geologic Group:***
Material 3: ***Geologic Period:***
Material 4: ***Depositional Gen:***
Gsc Material Description:
Stratum Description: SILT. GREY,COMPACT.

Geology Stratum ID: 218394414 ***Mat Consistency:***
Top Depth: 0 ***Material Moisture:***
Bottom Depth: 1.2 ***Material Texture:***
Material Color: Brown ***Non Geo Mat Type:***
Material 1: ***Geologic Formation:***
Material 2: Clay ***Geologic Group:***
Material 3: Silt ***Geologic Period:***
Material 4: Sand ***Depositional Gen:***
Gsc Material Description:
Stratum Description: ARTIFICIAL. BROWN.

Geology Stratum ID: 218394419 ***Mat Consistency:*** Stiff
Top Depth: 4.9 ***Material Moisture:***
Bottom Depth: 7 ***Material Texture:***
Material Color: Grey ***Non Geo Mat Type:***
Material 1: Silt ***Geologic Formation:***
Material 2: Clay ***Geologic Group:***
Material 3: ***Geologic Period:***
Material 4: ***Depositional Gen:***
Gsc Material Description:
Stratum Description: SILT. GREY,STIFF,STRATIFIED.

Geology Stratum ID: 218394416 ***Mat Consistency:*** Compact
Top Depth: 2.4 ***Material Moisture:***
Bottom Depth: 3.1 ***Material Texture:*** Coarse
Material Color: Brown ***Non Geo Mat Type:***
Material 1: Sand ***Geologic Formation:***
Material 2: ***Geologic Group:***
Material 3: ***Geologic Period:***
Material 4: ***Depositional Gen:***
Gsc Material Description:
Stratum Description: SAND-MEDIUM TO COARSE. BROWN,COMPACT.

Geology Stratum ID: 218394417 ***Mat Consistency:*** Stiff
Top Depth: 3.1 ***Material Moisture:***
Bottom Depth: 4.6 ***Material Texture:***
Material Color: Brown ***Non Geo Mat Type:***
Material 1: Clay ***Geologic Formation:***
Material 2: Silt ***Geologic Group:***
Material 3: ***Geologic Period:***
Material 4: ***Depositional Gen:***
Gsc Material Description:

Stratum Description: CLAY. BROWN,STIFF.

Geology Stratum ID: 218394422
Top Depth: 15.8
Bottom Depth: 19.2
Material Color:
Material 1: Bedrock
Material 2: Shale
Material 3: Limestone
Material 4:
Gsc Material Description:
Mat Consistency:
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:
Stratum Description: BEDROCK. SOUND,STRATIFIED.
00000023000400100010200300160004002300180029010000520100001860037 5 **Note: Many records provided by the department have a truncated [Stratum Description] field.

Geology Stratum ID: 218394415
Top Depth: 1.2
Bottom Depth: 2.4
Material Color: Dark
Material 1:
Material 2: Granuls
Material 3:
Material 4:
Gsc Material Description:
Mat Consistency: Compact
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:
Stratum Description: ARTIFICIAL. DARK,GREY,COMPACT.

Geology Stratum ID: 218394418
Top Depth: 4.6
Bottom Depth: 4.9
Material Color: Grey
Material 1: Cobbles
Material 2: Silt
Material 3:
Material 4:
Gsc Material Description:
Mat Consistency: Stiff
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:
Stratum Description: COBBLE. GREY,STIFF.

Geology Stratum ID: 218394421
Top Depth: 8.8
Bottom Depth: 15.8
Material Color: Dark
Material 1: Sand
Material 2: Silt
Material 3: Till
Material 4:
Gsc Material Description:
Mat Consistency: Dense
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:
Stratum Description: SAND. DARK,GREY,VERY DENSE.

Source

Source Type: Data Survey
Source Orig: Geological Survey of Canada
Source Date: 1956-1972
Confidence: H
Observatio:
Source Name: Urban Geology Automated Information System (UGAIS)
Source Details: File: OTTAWA2.txt RecordID: 057740 NTS_Sheet: 31G05G
Confiden 1: Logged by professional. Exact and complete description of material and properties.
Source Appl: Spatial/Tabular
Source Iden: 1
Scale or Res: Varies
Horizontal: NAD27
Verticalda: Mean Average Sea Level

Source List

Source Identifier: 1
Source Type: Data Survey
Source Date: 1956-1972
Horizontal Datum: NAD27
Vertical Datum: Mean Average Sea Level
Projection Name: Universal Transverse Mercator

Scale or Resolution:	Varies
Source Name:	Urban Geology Automated Information System (UGAIS)
Source Originators:	Geological Survey of Canada

66 **1 of 1** **NNW/234.0** **66.9 / 4.31** **Ottawa ON** **WWIS**

Well ID:	7201661	**Data Entry Status:**	
Construction Date:		**Data Src:**	
Primary Water Use:	Monitoring and Test Hole	**Date Received:**	5/15/2013
Sec. Water Use:		**Selected Flag:**	Yes
Final Well Status:	Abandoned-Other	**Abandonment Rec:**	
Water Type:		**Contractor:**	7241
Casing Material:		**Form Version:**	7
Audit No:	Z168577	**Owner:**	
Tag:	A136982	**Street Name:**	1 ROBINSON AVE
Construction Method:		**County:**	OTTAWA-CARLETON
Elevation (m):		**Municipality:**	NEPEAN TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	
Well Depth:		**Concession:**	
Overburden/Bedrock:		**Concession Name:**	
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004301575	**Elevation:**	61.254817
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	18
Code OB:		**East83:**	447546
Code OB Desc:		**North83:**	5029584
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	4/15/2013	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Annular Space/Abandonment Sealing Record

Plug ID:	1004843175
Layer:	1
Plug From:	0
Plug To:	
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	
Method Construction Code:	B
Method Construction:	Other Method
Other Method Construction:	HAND PULLED

Pipe Information

Pipe ID:	1004843166
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1004843170
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	0
Depth To:	2.74
Casing Diameter:	5.2
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1004843171
Layer:	1
Slot:	10
Screen Top Depth:	2.74
Screen End Depth:	5.79
Screen Material:	5
Screen Depth UOM:	m
Screen Diameter UOM:	cm
Screen Diameter:	6.03

Hole Diameter

Hole ID:	1004843168
Diameter:	6.03
Depth From:	0
Depth To:	5.79
Hole Depth UOM:	m
Hole Diameter UOM:	cm

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67 ***1 of 1*** ***E/235.7*** ***59.9 / -2.69*** ***Ottawa ON*** ***WWIS***

Well ID:	7180693	***Data Entry Status:***	
Construction Date:		***Data Src:***	
Primary Water Use:	Monitoring and Test Hole	***Date Received:***	5/10/2012
Sec. Water Use:	0	***Selected Flag:***	Yes
Final Well Status:	Abandoned-Other	***Abandonment Rec:***	Yes
Water Type:		***Contractor:***	7241
Casing Material:		***Form Version:***	7
Audit No:	Z146455	***Owner:***	
Tag:		***Street Name:***	200 LEOS AVE
Construction Method:		***County:***	OTTAWA-CARLETON
Elevation (m):		***Municipality:***	OTTAWA CITY
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	
Well Depth:		***Concession:***	
Overburden/Bedrock:		***Concession Name:***	
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	

Flow Rate:
Clear/Cloudy:
UTM Reliability:

Bore Hole Information

Bore Hole ID:	1003760650	***Elevation:***	58.705989
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	447871
Code OB Desc:		***North83:***	5029325
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	2/24/2012	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Annular Space/Abandonment Sealing Record

Plug ID:	1004303967
Layer:	1
Plug From:	0
Plug To:	8.2
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	
Method Construction Code:	6
Method Construction:	Boring
Other Method Construction:	

Pipe Information

Pipe ID:	1004303958
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1004303962
Layer:	
Material:	
Open Hole or Material:	
Depth From:	
Depth To:	
Casing Diameter:	
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1004303963
Layer:	

Slot:
Screen Top Depth:
Screen End Depth:
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter:

Hole Diameter

Hole ID: 1004303960
Diameter: 10.92
Depth From: 0
Depth To: 8.2
Hole Depth UOM: m
Hole Diameter UOM: cm

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68 | ***1 of 1*** | ***WNW/238.3*** | ***64.2 / 1.63*** | ***ON*** | ***WWIS***

Well ID: 7188805
Construction Date:
Primary Water Use:
Sec. Water Use:
Final Well Status:
Water Type:
Casing Material:
Audit No: C15830
Tag: A122899
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Data Entry Status: Yes
Data Src:
Date Received: 7/23/2012
Selected Flag: Yes
Abandonment Rec:
Contractor: 1844
Form Version: 8
Owner:
Street Name:
County: OTTAWA-CARLETON
Municipality: OTTAWA CITY
Site Info:
Lot:
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 1004197767
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 2/22/2012
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation: 59.274581
Elevrc:
Zone: 18
East83: 447416
North83: 5029452
Org CS: UTM83
UTMRC: 4
UTMRC Desc: margin of error : 30 m - 100 m
Location Method: wwr

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69 | ***1 of 4*** | ***W/238.9*** | ***63.0 / 0.40*** | ***BONA BUILDING MANAGEMENT***
169 LEES AVE.
OTTAWA CITY ON K1S 5M2 | ***CA***

Certificate #:	8-4107-87-
Application Year:	87
Issue Date:	9/22/1988
Approval Type:	Industrial air
Status:	Approved in 1988
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	COAL TAR EMISSION
Contaminants:	Odour/Fumes, Other Organic Compounds, Formetanate Hydrochloride
Emission Control:	No Controls

---

69 **2 of 4** **W/238.9** **63.0 / 0.40** **BONA BUILDING & MANAGEMENT LTD.** **GEN**
169 LEES AVENUE
OTTAWA ON K1S 5M2

Generator No:	ON0897000	**PO Box No:**	
Status:		**Country:**	
Approval Years:	86,87,88,89,90	**Choice of Contact:**	
Contam. Facility:		**Co Admin:**	
MHSW Facility:		**Phone No Admin:**	
SIC Code:	4012		
SIC Description:	APT. & MULT. HOUSING		

Detail(s)

Waste Class:	222
Waste Class Desc:	HEAVY FUELS

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69 **3 of 4** **W/238.9** **63.0 / 0.40** **BONA BUILDING & MANAGEMENT LTD. 05-222** **GEN**
169 LEES AVENUE
OTTAWA ON K1S 5M2

Generator No:	ON0897000	**PO Box No:**	
Status:		**Country:**	
Approval Years:	92,93,94,95,96,97,98	**Choice of Contact:**	
Contam. Facility:		**Co Admin:**	
MHSW Facility:		**Phone No Admin:**	
SIC Code:	4012		
SIC Description:	APT. & MULT. HOUSING		

Detail(s)

Waste Class:	222
Waste Class Desc:	HEAVY FUELS

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69 **4 of 4** **W/238.9** **63.0 / 0.40** **City of Ottawa** **SPL**
169 Lees Ave
Ottawa ON

Ref No:	6612-A7WPN6	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	2016/03/10	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:		**Sector Type:**	Miscellaneous Communal
Incident Event:	Leak/Break	**Agency Involved:**	
Contaminant Code:	27	**Nearest Watercourse:**	
Contaminant Name:	COOLANT N.O.S.	**Site Address:**	169 Lees Ave
Contaminant Limit 1:		**Site District Office:**	

Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:		**Site Municipality:**	Ottawa
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Land	**Northing:**	
MOE Response:	No	**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2016/03/10	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	Pollution Incident Reports (PIRs) and "Other" calls
Incident Reason:	Equipment Failure	**Source Type:**	
Site Name:	CB infront of<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	Ottawa Transport Bus: see IR 4442-A7WPJV		
Contaminant Qty:	0 other - see incident description		

70 **1 of 2** **NNW/239.0** **66.9 / 4.31** **Ottawa ON** **WWIS**

Well ID:	7201660	**Data Entry Status:**	
Construction Date:		**Data Src:**	
Primary Water Use:	Monitoring and Test Hole	**Date Received:**	5/15/2013
Sec. Water Use:		**Selected Flag:**	Yes
Final Well Status:	Abandoned-Other	**Abandonment Rec:**	
Water Type:		**Contractor:**	7241
Casing Material:		**Form Version:**	7
Audit No:	Z168579	**Owner:**	
Tag:	A136980	**Street Name:**	1 ROBINSON AVE
Construction Method:		**County:**	OTTAWA-CARLETON
Elevation (m):		**Municipality:**	NEPEAN TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	
Well Depth:		**Concession:**	
Overburden/Bedrock:		**Concession Name:**	
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004301572	**Elevation:**	61.253051
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	18
Code OB:		**East83:**	447545
Code OB Desc:		**North83:**	5029589
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	4/12/2013	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Annular Space/Abandonment Sealing Record

Plug ID: 1004843164
Layer: 2
Plug From: 0.31
Plug To: 1.83
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1004843165
Layer: 3
Plug From: 1.83
Plug To: 7.92
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1004843163
Layer: 1
Plug From: 0
Plug To: 0.31
Plug Depth UOM: m

Pipe Information

Pipe ID: 1004843154
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1004843158
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0
Depth To:
Casing Diameter: 5.2
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1004843159
Layer: 1
Slot:
Screen Top Depth:
Screen End Depth:
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter: 6.03

Hole Diameter

Hole ID: 1004843156
Diameter: 11.43
Depth From: 0

Depth To:	1.83
Hole Depth UOM:	m
Hole Diameter UOM:	cm

70 **2 of 2** **NNW/239.0** **66.9 / 4.31** **Ottawa ON** **WWIS**

Well ID:	7201662	**Data Entry Status:**	
Construction Date:		**Data Src:**	
Primary Water Use:	Monitoring and Test Hole	**Date Received:**	5/15/2013
Sec. Water Use:		**Selected Flag:**	Yes
Final Well Status:	Abandoned-Other	**Abandonment Rec:**	
Water Type:		**Contractor:**	7241
Casing Material:		**Form Version:**	7
Audit No:	Z168578	**Owner:**	
Tag:	A136984	**Street Name:**	1 ROBINSON AVE
Construction Method:		**County:**	OTTAWA-CARLETON
Elevation (m):		**Municipality:**	NEPEAN TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	
Well Depth:		**Concession:**	
Overburden/Bedrock:		**Concession Name:**	
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004301613	**Elevation:**	61.253051
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	18
Code OB:		**East83:**	447545
Code OB Desc:		**North83:**	5029589
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	4/15/2013	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Annular Space/Abandonment Sealing Record

Plug ID:	1004843186
Layer:	1
Plug From:	0
Plug To:	1.83
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004843187
Layer:	2
Plug From:	1.83
Plug To:	6.1

Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID:
Method Construction Code: 2
Method Construction: Rotary (Convent.)
Other Method Construction:

Pipe Information

Pipe ID: 1004843176
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1004843181
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0
Depth To:
Casing Diameter: 5.2
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1004843182
Layer: 1
Slot:
Screen Top Depth:
Screen End Depth:
Screen Material: 5
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter: 6.03

Hole Diameter

Hole ID: 1004843179
Diameter: 5.2
Depth From: 1.83
Depth To: 6.1
Hole Depth UOM: m
Hole Diameter UOM: cm

Hole Diameter

Hole ID: 1004843178
Diameter: 10.92
Depth From: 0
Depth To: 1.83
Hole Depth UOM: m
Hole Diameter UOM: cm

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
71	1 of 1	N/241.6	66.0 / 3.45	ON	BORE

Borehole ID:	847628	**Inclin FLG:**	No
OGF ID:	215589285	**SP Status:**	Initial Entry
Status:	Decommissioned	**Surv Elev:**	No
Type:	Borehole	**Piezometer:**	No
Use:	Geotechnical/Geological Investigation	**Primary Name:**	
Completion Date:	22-FEB-1964	**Municipality:**	
Static Water Level:	3.2	**Lot:**	LOT F
Primary Water Use:		**Township:**	NEPEAN
Sec. Water Use:		**Latitude DD:**	45.418059
Total Depth m:	4.7	**Longitude DD:**	-75.669338
Depth Ref:	Ground Surface	**UTM Zone:**	18
Depth Elev:		**Easting:**	447631
Drill Method:	Diamond Drill	**Northing:**	5029611
Orig Ground Elev m:	61.1	**Location Accuracy:**	
Elev Reliabil Note:		**Accuracy:**	Within 20 metres
DEM Ground Elev m:	68.3		
Concession:	BROKEN FRONT D		
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	6558296	**Mat Consistency:**	Loose
Top Depth:	0	**Material Moisture:**	
Bottom Depth:	.6	**Material Texture:**	
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Fill	**Geologic Formation:**	
Material 2:	Sand	**Geologic Group:**	
Material 3:	Gravel	**Geologic Period:**	
Material 4:	Cinders	**Depositional Gen:**	
Gsc Material Description:			

Stratum Description: LOOSE TO COMPACT BROWN SAND SOME GRAVEL AND CINDERS FILL **Note: Many records provided by the department have a truncated [Stratum Description] field.

Geology Stratum ID:	6558297	**Mat Consistency:**	Dense
Top Depth:	.6	**Material Moisture:**	
Bottom Depth:	2.7	**Material Texture:**	
Material Color:	Grey-Brown	**Non Geo Mat Type:**	
Material 1:	Till	**Geologic Formation:**	
Material 2:	Silt	**Geologic Group:**	
Material 3:	Sand	**Geologic Period:**	
Material 4:	Gravel	**Depositional Gen:**	
Gsc Material Description:			

Stratum Description: DENSE TO VERY DENSE GREY BROWN TO BROWN SANDY SILT TO SILTY SAND WITH GRAVEL TRACE OF CLAY WEATHERED UPPER TILL **Note: Many records provided by the department have a truncated [Stratum Description] field.

Geology Stratum ID:	6558298	**Mat Consistency:**	Very Dense
Top Depth:	2.7	**Material Moisture:**	
Bottom Depth:	4.7	**Material Texture:**	
Material Color:	Dark	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Silt	**Geologic Group:**	
Material 3:	Gravel	**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			

Stratum Description: VERY DENSE DARK GREY SILTY SAND TO SAND WITH GRAVEL **Note: Many records provided by the department have a truncated [Stratum Description] field.

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
72	1 of 1	SSE/241.7	56.9 / -5.69	Ottawa ON	WWIS

Well ID: 7101796
Construction Date:
Primary Water Use: Monitoring
Sec. Water Use:
Final Well Status: Test Hole
Water Type:
Casing Material:
Audit No: M01019
Tag: A045162
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Data Entry Status:
Data Src:
Date Received: 2/4/2008
Selected Flag: Yes
Abandonment Rec:
Contractor: 1844
Form Version: 5
Owner:
Street Name: HURDMAN SITE NORTH
County: OTTAWA-CARLETON
Municipality: OTTAWA CITY
Site Info:
Lot:
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 1001494248
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole: N
Cluster Kind:
Date Completed: 9/11/2007
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation: 60.202819
Elevrc:
Zone: 18
East83: 447709
North83: 5029138
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Overburden and Bedrock Materials Interval

Formation ID: 1002769289
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 28
Other Materials: SAND
Mat3: 84
Other Materials: SILTY
Formation Top Depth: 1.8
Formation End Depth: 2.5
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1002769288

Layer: 1
Color: 6
General Color: BROWN
Mat1: 01
Most Common Material: FILL
Mat2: 11
Other Materials: GRAVEL
Mat3: 28
Other Materials: SAND
Formation Top Depth: 0
Formation End Depth: 1.8
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1002769292
Layer: 5
Color: 2
General Color: GREY
Mat1: 17
Most Common Material: SHALE
Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 8.8
Formation End Depth: 10.4
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1002769290
Layer: 3
Color: 6
General Color: BROWN
Mat1: 06
Most Common Material: SILT
Mat2: 05
Other Materials: CLAY
Mat3: 81
Other Materials: SANDY
Formation Top Depth: 2.5
Formation End Depth: 6.9
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1002769291
Layer: 4
Color: 2
General Color: GREY
Mat1: 34
Most Common Material: TILL
Mat2: 28
Other Materials: SAND
Mat3: 11
Other Materials: GRAVEL
Formation Top Depth: 6.9
Formation End Depth: 8.8
Formation End Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID:	1002769295
Layer:	2
Plug From:	6
Plug To:	9
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1002769294
Layer:	1
Plug From:	0
Plug To:	2.1
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	
Method Construction Code:	F
Method Construction:	H.S.A.
Other Method Construction:	

Pipe Information

Pipe ID:	1002769286
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Screen

Screen ID:	1002769296
Layer:	1
Slot:	10
Screen Top Depth:	
Screen End Depth:	
Screen Material:	5
Screen Depth UOM:	m
Screen Diameter UOM:	cm
Screen Diameter:	3.8

Results of Well Yield Testing

Pump Test ID:	1002769287
Pump Set At:	
Static Level:	3.9
Final Level After Pumping:	
Recommended Pump Depth:	
Pumping Rate:	
Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	m
Rate UOM:	
Water State After Test Code:	0
Water State After Test:	
Pumping Test Method:	0

Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1002769293
Diameter: 20
Depth From: 0
Depth To: 10.4
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID: 1002769204
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind: This is a record from cluster log sheet
Date Completed: 9/26/2007
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation: 61.426128
Elevrc:
Zone: 18
East83: 448463
North83: 5029330
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Annular Space/Abandonment Sealing Record

Plug ID: 1002769208
Layer:
Plug From:
Plug To:
Plug Depth UOM:

Method of Construction & Well Use

Method Construction ID:
Method Construction Code:
Method Construction:
Other Method Construction: HSA

Pipe Information

Pipe ID: 1002769209
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002769211
Layer:
Material: 5
Open Hole or Material: PLASTIC

Depth From:
Depth To: 2
Casing Diameter:
Casing Diameter UOM:
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1002769210
Layer:
Slot:
Screen Top Depth: 2
Screen End Depth: 5.2
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pump Test ID: 1002769212
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM:
Rate UOM:
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1002769206
Diameter: 20
Depth From:
Depth To: 5.2
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID: 1002769213
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind: This is a record from cluster log sheet
Date Completed: 9/27/2007
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:

Elevation: 59.308574
Elevrc:
Zone: 18
East83: 448269
North83: 5029206
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Supplier Comment:

Annular Space/Abandonment Sealing Record

Plug ID: 1002769217
Layer:
Plug From:
Plug To:
Plug Depth UOM:

Method of Construction & Well Use

Method Construction ID:
Method Construction Code:
Method Construction:
Other Method Construction: HSA/AIR HAM

Pipe Information

Pipe ID: 1002769218
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002769220
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 4
Casing Diameter:
Casing Diameter UOM:
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1002769219
Layer:
Slot:
Screen Top Depth: 4
Screen End Depth: 7.3
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pump Test ID: 1002769221
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM:

Rate UOM:
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1002769215
Diameter: 20
Depth From:
Depth To: 7.3
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID: 1002769050
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind: This is a record from cluster log sheet
Date Completed: 9/13/2009
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:
Elevation: 58.224617
Elevrc:
Zone: 18
East83: 448239
North83: 5029353
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Annular Space/Abandonment Sealing Record

Plug ID: 1002769054
Layer:
Plug From:
Plug To:
Plug Depth UOM:

Method of Construction & Well Use

Method Construction ID:
Method Construction Code:
Method Construction:
Other Method Construction: HSA

Pipe Information

Pipe ID: 1002769055
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002769057
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 1.5
Casing Diameter:
Casing Diameter UOM:
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1002769056
Layer:
Slot:
Screen Top Depth: 1.5
Screen End Depth: 3.6
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pump Test ID: 1002769058
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM:
Rate UOM:
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1002769052
Diameter: 20
Depth From:
Depth To: 3.6
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID: 1002769222
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind: This is a record from cluster log sheet
Date Completed: 9/27/2007
Remarks:
Elevrc Desc:

Elevation: 59.771587
Elevrc:
Zone: 18
East83: 448297
North83: 5029223
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Annular Space/Abandonment Sealing Record

Plug ID: 1002769226
Layer:
Plug From:
Plug To:
Plug Depth UOM:

Method of Construction & Well Use

Method Construction ID:
Method Construction Code:
Method Construction:
Other Method Construction: HSA/AIR HAM

Pipe Information

Pipe ID: 1002769227
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002769229
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 2.5
Casing Diameter:
Casing Diameter UOM:
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1002769228
Layer:
Slot:
Screen Top Depth: 2.5
Screen End Depth: 7.3
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pump Test ID: 1002769230
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:

Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM:
Rate UOM:
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1002769224
Diameter: 20
Depth From:
Depth To: 7.3
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID: 1002769258
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind: This is a record from cluster log sheet
Date Completed: 9/27/2007
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:
Elevation: 60.418811
Elevrc:
Zone: 18
East83: 448798
North83: 5029986
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Annular Space/Abandonment Sealing Record

Plug ID: 1002769262
Layer:
Plug From:
Plug To:
Plug Depth UOM:

Method of Construction & Well Use

Method Construction ID:
Method Construction Code:
Method Construction:
Other Method Construction: HSA

Pipe Information

Pipe ID: 1002769263
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID:	1002769265
Layer:	
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	
Depth To:	3
Casing Diameter:	
Casing Diameter UOM:	
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1002769264
Layer:	
Slot:	
Screen Top Depth:	3
Screen End Depth:	6.1
Screen Material:	
Screen Depth UOM:	m
Screen Diameter UOM:	
Screen Diameter:	

Results of Well Yield Testing

Pump Test ID:	1002769266
Pump Set At:	
Static Level:	
Final Level After Pumping:	
Recommended Pump Depth:	
Pumping Rate:	
Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	
Rate UOM:	
Water State After Test Code:	
Water State After Test:	
Pumping Test Method:	
Pumping Duration HR:	
Pumping Duration MIN:	
Flowing:	

Hole Diameter

Hole ID:	1002769260
Diameter:	20
Depth From:	
Depth To:	6.1
Hole Depth UOM:	m
Hole Diameter UOM:	cm

Bore Hole Information

Bore Hole ID:	1002769005	***Elevation:***	58.284057
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	448079
Code OB Desc:		***North83:***	5029143
Open Hole:		***Org CS:***	UTM83
Cluster Kind:	This is a record from cluster log sheet	***UTMRC:***	3

Date Completed: 9/11/2009
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Annular Space/Abandonment Sealing Record

Plug ID: 1002769009
Layer:
Plug From:
Plug To:
Plug Depth UOM:

Method of Construction & Well Use

Method Construction ID:
Method Construction Code:
Method Construction:
Other Method Construction: HSA

Pipe Information

Pipe ID: 1002769010
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002769012
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 1.5
Casing Diameter:
Casing Diameter UOM:
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1002769011
Layer:
Slot:
Screen Top Depth: 1.5
Screen End Depth: 3.7
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pump Test ID: 1002769013
Pump Set At:

Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM:
Rate UOM:
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1002769007
Diameter: 20
Depth From:
Depth To: 3.7
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID: 1002769041
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind: This is a record from cluster log sheet
Date Completed: 9/13/2009
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation: 57.668773
Elevrc:
Zone: 18
East83: 448072
North83: 5029219
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Annular Space/Abandonment Sealing Record

Plug ID: 1002769045
Layer:
Plug From:
Plug To:
Plug Depth UOM:

Method of Construction & Well Use

Method Construction ID:
Method Construction Code:
Method Construction:
Other Method Construction: HSA

Pipe Information

Pipe ID: 1002769046

Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002769048
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 1.5
Casing Diameter:
Casing Diameter UOM:
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1002769047
Layer:
Slot:
Screen Top Depth: 1.5
Screen End Depth: 4.4
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pump Test ID: 1002769049
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM:
Rate UOM:
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1002769043
Diameter: 20
Depth From:
Depth To: 4.4
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID: 1002769059
DP2BR:
Spatial Status:
Code OB:
Elevation: 59.454418
Elevrc:
Zone: 18
East83: 448198

Code OB Desc:		***North83:***	5029304
Open Hole:		***Org CS:***	UTM83
Cluster Kind:	This is a record from cluster log sheet	***UTMRC:***	3
Date Completed:	9/13/2009	***UTMRC Desc:***	margin of error : 10 - 30 m
Remarks:		***Location Method:***	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Annular Space/Abandonment Sealing Record

Plug ID:	1002769063
Layer:	
Plug From:	
Plug To:	
Plug Depth UOM:	

Method of Construction & Well Use

Method Construction ID:	
Method Construction Code:	
Method Construction:	
Other Method Construction:	HSA

Pipe Information

Pipe ID:	1002769064
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1002769066
Layer:	
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	
Depth To:	1.5
Casing Diameter:	
Casing Diameter UOM:	
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1002769065
Layer:	
Slot:	
Screen Top Depth:	1.5
Screen End Depth:	4.8
Screen Material:	
Screen Depth UOM:	m
Screen Diameter UOM:	
Screen Diameter:	

Results of Well Yield Testing

Pump Test ID: 1002769067
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM:
Rate UOM:
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1002769061
Diameter: 20
Depth From:
Depth To: 4.8
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID: 1002769068
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind: This is a record from cluster log sheet
Date Completed: 9/13/2009
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation: 58.840473
Elevrc:
Zone: 18
East83: 448262
North83: 5029323
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Annular Space/Abandonment Sealing Record

Plug ID: 1002769072
Layer:
Plug From:
Plug To:
Plug Depth UOM:

Method of Construction & Well Use

Method Construction ID:
Method Construction Code:
Method Construction:
Other Method Construction: HSA

Pipe Information

Pipe ID: 1002769073
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002769075
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 1.5
Casing Diameter:
Casing Diameter UOM:
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1002769074
Layer:
Slot:
Screen Top Depth: 1.5
Screen End Depth: 4.5
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pump Test ID: 1002769076
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM:
Rate UOM:
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1002769070
Diameter: 20
Depth From:
Depth To: 4.5
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID: 1002769231 ***Elevation:*** 59.482913

DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	18
Code OB:		**East83:**	448294
Code OB Desc:		**North83:**	5029183
Open Hole:		**Org CS:**	UTM83
Cluster Kind:	This is a record from cluster log sheet	**UTMRC:**	3
Date Completed:	9/27/2007	**UTMRC Desc:**	margin of error : 10 - 30 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Annular Space/Abandonment Sealing Record

Plug ID:	1002769235
Layer:	
Plug From:	
Plug To:	
Plug Depth UOM:	

Method of Construction & Well Use

Method Construction ID:	
Method Construction Code:	
Method Construction:	
Other Method Construction:	HSA/AIR HAM

Pipe Information

Pipe ID:	1002769236
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1002769238
Layer:	
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	
Depth To:	3
Casing Diameter:	
Casing Diameter UOM:	
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1002769237
Layer:	
Slot:	
Screen Top Depth:	3
Screen End Depth:	6.1
Screen Material:	
Screen Depth UOM:	m
Screen Diameter UOM:	
Screen Diameter:	

Results of Well Yield Testing

Pump Test ID:	1002769239
Pump Set At:	
Static Level:	
Final Level After Pumping:	
Recommended Pump Depth:	
Pumping Rate:	
Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	
Rate UOM:	
Water State After Test Code:	
Water State After Test:	
Pumping Test Method:	
Pumping Duration HR:	
Pumping Duration MIN:	
Flowing:	

Hole Diameter

Hole ID:	1002769233
Diameter:	20
Depth From:	
Depth To:	6.1
Hole Depth UOM:	m
Hole Diameter UOM:	cm

Bore Hole Information

Bore Hole ID:	1002769240	***Elevation:***	59.190788
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	448269
Code OB Desc:		***North83:***	5029237
Open Hole:		***Org CS:***	UTM83
Cluster Kind:	This is a record from cluster log sheet	***UTMRC:***	3
Date Completed:	9/27/2007	***UTMRC Desc:***	margin of error : 10 - 30 m
Remarks:		***Location Method:***	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Annular Space/Abandonment Sealing Record

Plug ID:	1002769244
Layer:	
Plug From:	
Plug To:	
Plug Depth UOM:	

Method of Construction & Well Use

Method Construction ID:	
Method Construction Code:	
Method Construction:	

Other Method Construction: HSA

Pipe Information

Pipe ID: 1002769245
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002769247
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 1.5
Casing Diameter:
Casing Diameter UOM:
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1002769246
Layer:
Slot:
Screen Top Depth: 1.5
Screen End Depth: 4.5
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pump Test ID: 1002769248
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM:
Rate UOM:
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1002769242
Diameter: 20
Depth From:
Depth To: 4.5
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID:	1002769032	***Elevation:***	58.580863
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	447968
Code OB Desc:		***North83:***	5029175
Open Hole:		***Org CS:***	UTM83
Cluster Kind:	This is a record from cluster log sheet	***UTMRC:***	3
Date Completed:	9/12/2009	***UTMRC Desc:***	margin of error : 10 - 30 m
Remarks:		***Location Method:***	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Annular Space/Abandonment Sealing Record

Plug ID:	1002769036
Layer:	
Plug From:	
Plug To:	
Plug Depth UOM:	

Method of Construction & Well Use

Method Construction ID:	
Method Construction Code:	
Method Construction:	
Other Method Construction:	HSA

Pipe Information

Pipe ID:	1002769037
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1002769039
Layer:	
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	
Depth To:	6
Casing Diameter:	
Casing Diameter UOM:	
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1002769038
Layer:	
Slot:	
Screen Top Depth:	6
Screen End Depth:	7.8
Screen Material:	

Screen Depth UOM: m
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pump Test ID: 1002769040
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM:
Rate UOM:
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1002769034
Diameter: 20
Depth From:
Depth To: 7.8
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID: 1002768996
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind: This is a record from cluster log sheet
Date Completed: 9/10/2009
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation: 59.02227
Elevrc:
Zone: 18
East83: 448054
North83: 5029073
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Annular Space/Abandonment Sealing Record

Plug ID: 1002769000
Layer:
Plug From:
Plug To:
Plug Depth UOM:

Method of Construction & Well Use

Method Construction ID:
Method Construction Code:
Method Construction:
Other Method Construction: HSA

Pipe Information

Pipe ID: 1002769001
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002769003
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 3.5
Casing Diameter:
Casing Diameter UOM:
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1002769002
Layer:
Slot:
Screen Top Depth: 3.5
Screen End Depth: 6.7
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pump Test ID: 1002769004
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM:
Rate UOM:
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1002768998
Diameter: 20
Depth From:
Depth To: 6.7
Hole Depth UOM: m

Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID:	1002769077	**Elevation:**	59.652236
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	18
Code OB:		**East83:**	448243
Code OB Desc:		**North83:**	5029188
Open Hole:		**Org CS:**	UTM83
Cluster Kind:	This is a record from cluster log sheet	**UTMRC:**	3
Date Completed:	9/14/2009	**UTMRC Desc:**	margin of error : 10 - 30 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Annular Space/Abandonment Sealing Record

Plug ID: 1002769081
Layer:
Plug From:
Plug To:
Plug Depth UOM:

Method of Construction & Well Use

Method Construction ID:
Method Construction Code:
Method Construction:
Other Method Construction: HSA

Pipe Information

Pipe ID: 1002769082
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002769084
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 1.5
Casing Diameter:
Casing Diameter UOM:
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1002769083
Layer:
Slot:

Screen Top Depth: 1.5
Screen End Depth: 4.8
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pump Test ID: 1002769085
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM:
Rate UOM:
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1002769079
Diameter: 20
Depth From:
Depth To: 4.8
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID: 1002769249
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind: This is a record from cluster log sheet
Date Completed: 9/27/2007
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation: 59.936012
Elevrc:
Zone: 18
East83: 448949
North83: 5029975
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Annular Space/Abandonment Sealing Record

Plug ID: 1002769253
Layer:
Plug From:
Plug To:
Plug Depth UOM:

Method of Construction & Well Use

Method Construction ID:
Method Construction Code:
Method Construction:
Other Method Construction: HSA

Pipe Information

Pipe ID: 1002769254
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002769256
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 3
Casing Diameter:
Casing Diameter UOM:
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1002769255
Layer:
Slot:
Screen Top Depth: 3
Screen End Depth: 6.1
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pump Test ID: 1002769257
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM:
Rate UOM:
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1002769251
Diameter: 20

Depth From:
Depth To: 6.1
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID: 1002769277
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind: This is a record from cluster log sheet
Date Completed: 11/9/2007
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation: 59.11713
Elevrc:
Zone: 18
East83: 448237
North83: 5029228
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Annular Space/Abandonment Sealing Record

Plug ID: 1002769281
Layer:
Plug From:
Plug To:
Plug Depth UOM:

Method of Construction & Well Use

Method Construction ID:
Method Construction Code:
Method Construction:
Other Method Construction: HSA

Pipe Information

Pipe ID: 1002769282
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002769284
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 1.5
Casing Diameter:
Casing Diameter UOM:
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1002769283
Layer:
Slot:
Screen Top Depth: 1.5
Screen End Depth: 4.8
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pump Test ID: 1002769285
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM:
Rate UOM:
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1002769279
Diameter: 20
Depth From:
Depth To: 4.8
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID: 1002769195
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind: This is a record from cluster log sheet
Date Completed: 9/26/2007
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:
Elevation: 59.350101
Elevrc:
Zone: 18
East83: 448335
North83: 5029420
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Annular Space/Abandonment Sealing Record

Plug ID: 1002769199
Layer:
Plug From:

Plug To:
Plug Depth UOM:

Method of Construction & Well Use

Method Construction ID:
Method Construction Code:
Method Construction:
Other Method Construction: HSA

Pipe Information

Pipe ID: 1002769200
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002769202
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 3
Casing Diameter:
Casing Diameter UOM:
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1002769201
Layer:
Slot:
Screen Top Depth: 3
Screen End Depth: 6.1
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pump Test ID: 1002769203
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM:
Rate UOM:
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1002769197
Diameter: 20
Depth From:
Depth To: 6.1
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID: 1002769268
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind: This is a record from cluster log sheet
Date Completed: 9/27/2007
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation: 60.05614
Elevrc:
Zone: 18
East83: 447761
North83: 5029057
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Annular Space/Abandonment Sealing Record

Plug ID: 1002769272
Layer:
Plug From:
Plug To:
Plug Depth UOM:

Method of Construction & Well Use

Method Construction ID:
Method Construction Code:
Method Construction:
Other Method Construction: HSA

Pipe Information

Pipe ID: 1002769273
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002769275
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 3
Casing Diameter:
Casing Diameter UOM:
Casing Depth UOM: m

Construction Record - Screen

Screen ID:	1002769274
Layer:	
Slot:	
Screen Top Depth:	3
Screen End Depth:	6.1
Screen Material:	
Screen Depth UOM:	m
Screen Diameter UOM:	
Screen Diameter:	

Results of Well Yield Testing

Pump Test ID:	1002769276
Pump Set At:	
Static Level:	
Final Level After Pumping:	
Recommended Pump Depth:	
Pumping Rate:	
Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	
Rate UOM:	
Water State After Test Code:	
Water State After Test:	
Pumping Test Method:	
Pumping Duration HR:	
Pumping Duration MIN:	
Flowing:	

Hole Diameter

Hole ID:	1002769270
Diameter:	20
Depth From:	
Depth To:	6.1
Hole Depth UOM:	m
Hole Diameter UOM:	cm

Bore Hole Information

Bore Hole ID:	1002769014	***Elevation:***	58.810947
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	448089
Code OB Desc:		***North83:***	5029081
Open Hole:		***Org CS:***	UTM83
Cluster Kind:	This is a record from cluster log sheet	***UTMRC:***	3
Date Completed:	9/11/2009	***UTMRC Desc:***	margin of error : 10 - 30 m
Remarks:		***Location Method:***	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Annular Space/Abandonment Sealing Record

Plug ID: 1002769018
Layer:
Plug From:
Plug To:
Plug Depth UOM:

Method of Construction & Well Use

Method Construction ID:
Method Construction Code:
Method Construction:
Other Method Construction: HSA

Pipe Information

Pipe ID: 1002769019
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002769021
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 3
Casing Diameter:
Casing Diameter UOM:
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1002769020
Layer:
Slot:
Screen Top Depth: 3
Screen End Depth: 6.1
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pump Test ID: 1002769022
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM:
Rate UOM:
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:

Flowing:

Hole Diameter

Hole ID: 1002769016
Diameter: 20
Depth From:
Depth To: 6.1
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID: 1002769186
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind: This is a record from cluster log sheet
Date Completed: 9/26/2007
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:
Elevation: 58.407482
Elevrc:
Zone: 18
East83: 448307
North83: 5029438
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Annular Space/Abandonment Sealing Record

Plug ID: 1002769190
Layer:
Plug From:
Plug To:
Plug Depth UOM:

Method of Construction & Well Use

Method Construction ID:
Method Construction Code:
Method Construction:
Other Method Construction: HSA

Pipe Information

Pipe ID: 1002769191
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002769193
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 2

Casing Diameter:
Casing Diameter UOM:
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1002769192
Layer:
Slot:
Screen Top Depth: 2
Screen End Depth: 5.4
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pump Test ID: 1002769194
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM:
Rate UOM:
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1002769188
Diameter: 20
Depth From:
Depth To: 5.4
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID: 1002769023
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind: This is a record from cluster log sheet
Date Completed: 9/12/2009
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation: 58.882911
Elevrc:
Zone: 18
East83: 447869
North83: 5029149
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Annular Space/Abandonment Sealing Record

Plug ID:	1002769027
Layer:	
Plug From:	
Plug To:	
Plug Depth UOM:	

Method of Construction & Well Use

Method Construction ID:	
Method Construction Code:	
Method Construction:	
Other Method Construction:	HSA

Pipe Information

Pipe ID:	1002769028
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1002769030
Layer:	
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	
Depth To:	7.5
Casing Diameter:	
Casing Diameter UOM:	
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1002769029
Layer:	
Slot:	
Screen Top Depth:	7.5
Screen End Depth:	9.1
Screen Material:	
Screen Depth UOM:	m
Screen Diameter UOM:	
Screen Diameter:	

Results of Well Yield Testing

Pump Test ID:	1002769031
Pump Set At:	
Static Level:	
Final Level After Pumping:	
Recommended Pump Depth:	
Pumping Rate:	
Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	
Rate UOM:	
Water State After Test Code:	
Water State After Test:	

Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1002769025
Diameter: 20
Depth From:
Depth To: 9.1
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID: 1002769177
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind: This is a record from cluster log sheet
Date Completed: 11/9/2007
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation: 62.25119
Elevrc:
Zone: 18
East83: 448206
North83: 5029088
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Annular Space/Abandonment Sealing Record

Plug ID: 1002769181
Layer:
Plug From:
Plug To:
Plug Depth UOM:

Method of Construction & Well Use

Method Construction ID:
Method Construction Code:
Method Construction:
Other Method Construction: HSA

Pipe Information

Pipe ID: 1002769182
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002769184
Layer:
Material: 5

Open Hole or Material:	PLASTIC
Depth From:	
Depth To:	3.5
Casing Diameter:	
Casing Diameter UOM:	
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1002769183
Layer:	
Slot:	
Screen Top Depth:	3.5
Screen End Depth:	6.7
Screen Material:	
Screen Depth UOM:	m
Screen Diameter UOM:	
Screen Diameter:	

Results of Well Yield Testing

Pump Test ID:	1002769185
Pump Set At:	
Static Level:	
Final Level After Pumping:	
Recommended Pump Depth:	
Pumping Rate:	
Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	
Rate UOM:	
Water State After Test Code:	
Water State After Test:	
Pumping Test Method:	
Pumping Duration HR:	
Pumping Duration MIN:	
Flowing:	

Hole Diameter

Hole ID:	1002769179
Diameter:	20
Depth From:	
Depth To:	6.7
Hole Depth UOM:	m
Hole Diameter UOM:	cm

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73 ***1 of 1*** ***WNW/241.8*** ***64.9 / 2.35*** ***ON*** ***BORE***

Borehole ID:	613305	***Inclin FLG:***	No
OGF ID:	215514606	***SP Status:***	Initial Entry
Status:		***Surv Elev:***	No
Type:	Borehole	***Piezometer:***	No
Use:		***Primary Name:***	
Completion Date:	JUL-1962	***Municipality:***	
Static Water Level:	-3.0	***Lot:***	
Primary Water Use:		***Township:***	
Sec. Water Use:		***Latitude DD:***	45.416794
Total Depth m:	4.3	***Longitude DD:***	-75.672011
Depth Ref:	Ground Surface	***UTM Zone:***	18
Depth Elev:		***Easting:***	447421

Drill Method:
Orig Ground Elev m: 58.1
Elev Reliabil Note:
DEM Ground Elev m: 59.6
Concession:
Location D:
Survey D:
Comments:
Northing: 5029472
Location Accuracy:
Accuracy: Not Applicable

Borehole Geology Stratum

Geology Stratum ID: 218394582
Top Depth: 3.8
Bottom Depth: 4.3
Material Color: Grey
Material 1: Silt
Material 2: Sand
Material 3:
Material 4:
Gsc Material Description:
Stratum Description: SILT. 00075 017 00125 017 CLAY. GREY,FIRM. TILL. COMPACT. BEDROCK. FOSSILIFER **Note: Many records provided by the department have a truncated [Stratum Description] field.
Mat Consistency: Compact
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Geology Stratum ID: 218394580
Top Depth: 0
Bottom Depth: 2.3
Material Color:
Material 1:
Material 2: Granuls
Material 3: Sand
Material 4: Humus
Gsc Material Description:
Stratum Description: ARTIFICIAL.
Mat Consistency:
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Geology Stratum ID: 218394581
Top Depth: 2.3
Bottom Depth: 3.8
Material Color:
Material 1: Sand
Material 2: Silt
Material 3:
Material 4:
Gsc Material Description:
Stratum Description: SAND.
Mat Consistency:
Material Moisture:
Material Texture:
Non Geo Mat Type:
Geologic Formation:
Geologic Group:
Geologic Period:
Depositional Gen:

Source

Source Type: Data Survey
Source Orig: Geological Survey of Canada
Source Date: 1956-1972
Confidence: H
Observatio:
Source Name: Urban Geology Automated Information System (UGAIS)
Source Details: File: OTTAWA2.txt RecordID: 058130 NTS_Sheet: 31G05G
Confiden 1: Logged by professional. Exact and complete description of material and properties.
Source Appl: Spatial/Tabular
Source Iden: 1
Scale or Res: Varies
Horizontal: NAD27
Verticalda: Mean Average Sea Level

Source List

Source Identifier: 1
Source Type: Data Survey
Source Date: 1956-1972
Scale or Resolution: Varies
Source Name: Urban Geology Automated Information System (UGAIS)
Horizontal Datum: NAD27
Vertical Datum: Mean Average Sea Level
Projection Name: Universal Transverse Mercator

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Source Originators:		Geological Survey of Canada			

74 | **1 of 1** | **ENE/242.4** | **61.9 / -0.69** | **OTTAWA CITY-LEES AVE. LEES AVE./HURDMAN RD./ROBINSON OTTAWA CITY ON** | **CA**

Certificate #: 3-0584-90-
Application Year: 90
Issue Date: 4/18/1990
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

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75 | **1 of 2** | **W/244.3** | **62.8 / 0.23** | **R. W. Tomlinson 171 Lees Avenue Ottawa ON K1S 5L5** | **GEN**

Generator No: ON7676875
Status:
Approval Years: 2016
Contam. Facility: No
MHSW Facility: No
SIC Code: 237990
SIC Description: OTHER HEAVY AND CIVIL ENGINEERING CONSTRUCTION

PO Box No:
Country: Canada
Choice of Contact: CO_OFFICIAL
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

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75 | **2 of 2** | **W/244.3** | **62.8 / 0.23** | **R. W. Tomlinson Greenbelt Construction 171 Lees Avenue Ottawa ON K1S 5L5** | **GEN**

Generator No: ON7676875
Status: Registered
Approval Years: As of Dec 2017
Contam. Facility:
MHSW Facility:
SIC Code:
SIC Description:

PO Box No:
Country: Canada
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 251 L
Waste Class Desc: Waste oils/sludges (petroleum based)

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76 | **1 of 1** | **SSE/249.0** | **55.5 / -7.08** | **Rideau River Bridge Ottawa ON** | **SPL**

Ref No: 1414-AM6EHU
Site No:
Incident Dt: 5/6/2017

Discharger Report:
Material Group:
Health/Env Conseq: 2 - Minor Environment

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Year:		**Client Type:**	
Incident Cause:		**Sector Type:**	Miscellaneous Industrial
Incident Event:	Leak/Break	**Agency Involved:**	
Contaminant Code:	15	**Nearest Watercourse:**	
Contaminant Name:	HYDRAULIC OIL	**Site Address:**	Rideau River Bridge
Contaminant Limit 1:		**Site District Office:**	Ottawa
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:	n/a	**Site Region:**	Eastern
Environment Impact:		**Site Municipality:**	Ottawa
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Land	**Northing:**	5029128
MOE Response:		**Easting:**	447700
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	5/8/2017	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	
Incident Reason:	Equipment Failure	**Source Type:**	Valve/Fitting/Piping

Site Name: Hurdman Bridge<UNOFFICIAL>
Site County/District:
Site Geo Ref Meth:
Incident Summary: OLRT: 100 ml of hydraulic oil to concrete deck on the bridge; cleaned
Contaminant Qty: 100 mL

77	1 of 4	NE/249.4	62.0 / -0.60	**Kelly's Auto Body (1984) Limited** **23 Hurdman Road Ottawa Ontario K1N 8N7** **Ottawa** **ON**	EBR

EBR Registry No:	IA02E1108	**Decision Posted:**	
Ministry Ref No:	8345-5DX2QH	**Exception Posted:**	
Notice Type:	Instrument Decision	**Section:**	
Notice Stage:	800719663	**Act 1:**	
Notice Date:	March 10, 2003	**Act 2:**	
Proposal Date:	September 18, 2002	**Site Location Map:**	
Year:	2002		

Instrument Type: (EPA s. 9) - Approval for discharge into the natural environment other than water (i.e. Air)
Off Instrument Name:
Posted By:
Company Name: Kelly's Auto Body (1984) Limited
Site Address:
Location Other:
Proponent Name:
Proponent Address: 23 Hurdman Road, Ottawa Ontario, K1N 8N7
Comment Period:
URL:

Site Location Details:

23 Hurdman Road Ottawa Ontario K1N 8N7 Ottawa

77	2 of 4	NE/249.4	62.0 / -0.60	**Hydro Ottawa Limited** **23 HURDMAN<UNOFFICIAL>** **Ottawa ON K1N 8N7**	SPL

Ref No:	8445-62AMYH	**Discharger Report:**	
Site No:		**Material Group:**	Oil
Incident Dt:	6/25/2004	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:		**Sector Type:**	Other Plant
Incident Event:		**Agency Involved:**	
Contaminant Code:	15	**Nearest Watercourse:**	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Contaminant Name:	TRANSFORMER OIL (N.O.S.)	**Site Address:**	
Contaminant Limit 1:		**Site District Office:**	Ottawa
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	Eastern
Environment Impact:	Not Anticipated	**Site Municipality:**	Ottawa
Nature of Impact:		**Site Lot:**	
Receiving Medium:	Land	**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:		**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	6/25/2004	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	Spill to Land
Incident Reason:		**Source Type:**	
Site Name:	23 HURDMAN<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	Hydro-Ottawa, 110-115L non-PCB transf. oil		
Contaminant Qty:	115 L		

77	3 of 4	NE/249.4	62.0 / -0.60	**Kelly's Auto Body (1984) Limited** **23 Hurdman Road** **Ottawa ON K1N 8N7**	CA

Certificate #:	2062-5JRU49
Application Year:	2003
Issue Date:	3/4/2003
Approval Type:	Air
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

77	4 of 4	NE/249.4	62.0 / -0.60	**Kelly's Auto Body (1984) Limited** **23 Hurdman Road** **Ottawa ON K1N 8N7**	ECA

Approval No:	2062-5JRU49	**MOE District:**	Ottawa
Approval Date:	2003-03-04	**City:**	
Status:	Approved	**Longitude:**	-75.66695399999999
Record Type:	ECA	**Latitude:**	45.41755
Link Source:	IDS	**Geometry X:**	
SWP Area Name:	Rideau Valley	**Geometry Y:**	
Approval Type:	ECA-AIR		
Project Type:	AIR		
Address:	23 Hurdman Road		
Full Address:			
Full PDF Link:	https://www.accessenvironment.ene.gov.on.ca/instruments/8345-5DX2QH-14.pdf		

78	1 of 1	E/250.4	61.9 / -0.69	**Ottawa ON**	WWIS

Well ID:	7180694	**Data Entry Status:**	
Construction Date:		**Data Src:**	
Primary Water Use:	Monitoring and Test Hole	**Date Received:**	5/10/2012
Sec. Water Use:	0	**Selected Flag:**	Yes

Final Well Status:	Abandoned-Other	**Abandonment Rec:**	
Water Type:		**Contractor:**	7241
Casing Material:		**Form Version:**	7
Audit No:	Z146457	**Owner:**	
Tag:		**Street Name:**	200 LEES AVE
Construction Method:		**County:**	OTTAWA-CARLETON
Elevation (m):		**Municipality:**	NEPEAN TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	
Well Depth:		**Concession:**	
Overburden/Bedrock:		**Concession Name:**	
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1003760653	**Elevation:**	61.937717
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	18
Code OB:		**East83:**	447885
Code OB Desc:		**North83:**	5029419
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	2/24/2012	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Annular Space/Abandonment Sealing Record

Plug ID:	1004303977
Layer:	1
Plug From:	0
Plug To:	0.31
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1004303978
Layer:	2
Plug From:	0.31
Plug To:	8.5
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	
Method Construction Code:	6
Method Construction:	Boring
Other Method Construction:	

Pipe Information

Pipe ID: 1004303968
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1004303972
Layer:
Material:
Open Hole or Material:
Depth From:
Depth To:
Casing Diameter:
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1004303973
Layer:
Slot:
Screen Top Depth:
Screen End Depth:
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter:

Hole Diameter

Hole ID: 1004303970
Diameter: 10.92
Depth From: 0
Depth To: 8.5
Hole Depth UOM: m
Hole Diameter UOM: cm

Unplottable Summary

Total: 69 Unplottable sites

DB	Company Name/Site Name	Address	City	Postal
CA	R. W. Tomlinson Limited	Mobile Facility	Ottawa ON	
CA	R. W. Tomlinson Limited		Ottawa ON	
CA	R. W. Tomlinson Limited		Ottawa ON	
CA	R. W. Tomlinson Limited		Ottawa ON	
CA	R. W. Tomlinson Limited		Ottawa ON	
CA	R. W. Tomlinson Limited		Ottawa ON	
CA		Lees Avenue	Ottawa ON	
CA	SPENCER & ASSOC.CONSLTG. ENG.LTD.	LEES AVE.	OTTAWA ON	
CA	NATIONAL CAPITAL COMMISSION	ROBINSON AVE.	OTTAWA CITY ON	
CA	UNIVERSITY OF OTTAWA - CAMPUS	MARIE CURRIE/GLINSKI	OTTAWA CITY ON	
CA	UNIVERSITY OF OTTAWA	MARIE CURRIE/GLINSKI - CAMPUS	OTTAWA CITY ON	
CA	R.M. OF OTTAWA-CARLETON	LEES AVE.	OTTAWA CITY ON	
CONV	R. W. Tomlinson Limited		Ottawa ON	
EBR	R. W. Tomlinson Limited	Mobile Facility Ottawa CITY OF OTTAWA	ON	
EBR	R. W. Tomlinson Limited	Ontario CITY OF OTTAWA	ON	
EBR	University of Ottawa	University Street, Monpetit Hall CITY OF OTTAWA	ON	
EBR	R. W. Tomlinson Limited	Ontario CITY OF OTTAWA	ON	
ECA	R. W. Tomlinson Limited	Mobile Facility	Ottawa ON	K1G 3N4

ECA	SNC-Lavalin Constructors (Pacific) Inc., Dragados Canada Inc., EllisDon	Corporation Hurdman East Overpass to Blair Station	Ottawa ON	K1Z 1G3
ECA	SNC-Lavalin Constructors (Pacific) Inc., Dragados Canada, Inc., and EllisDon	Corporation	Ottawa ON	K1Z 1G3
ECA	R. W. Tomlinson Limited	Ottawa	ON	
ECA	R. W. Tomlinson Limited	Mobile Facility	Ottawa ON	K1G 3N4
EHS		Hwy 417	Ottawa ON	
GEN	CITY OF OTTAWA	LEES AVENUE TRANSIT STATION	OTTAWA ON	
GEN	National Capital Commission	Hurdman Park	Ottawa ON	
GEN	CLEAN WATER WORKS	LEES AVE @ OC TRANSPO TRANSIT WAY	OTTAWA ON	
GEN	CITY OF OTTAWA	LEES AVENUE TRANSIT STATION	OTTAWA ON	
GEN	National Capital Commission	Hurdman Park	Ottawa ON	
GEN	CITY OF OTTAWA	LEES AVENUE TRANSIT STATION	OTTAWA ON	
GEN	National Capital Commission	Hurdman Park	Ottawa ON	K1P 1C7
GEN	CITY OF OTTAWA	LEES AVENUE TRANSIT STATION	OTTAWA ON	K1V 1A6
GEN	CITY OF OTTAWA	LEES AVENUE TRANSIT STATION	OTTAWA ON	
GEN	RW Tomlinson	Lees Avenue Transit Station	Ottawa ON	
GEN	National Capital Commission	Hurdman Park	Ottawa ON	
GEN	CLEAN WATER WORKS	LEES AVE @ OC TRANSPO TRANSIT WAY	OTTAWA ON	
GEN	OTTAWA-CARLTON, REGIONAL MUNICIPAL	(STORM WATER PUMPING STATION, LEES AVE) C/O 222 QUEEN STREET	OTTAWA ON	K1P 5Z3
GEN	OTTAWA-CARLTON, REGIONAL MUNICIPALITY OF	(STORM WATER PUMPING STATION, LEES AVE) C/O 222 QUEEN STREET	OTTAWA ON	K1P 5Z3
GEN	OTTAWA-CARLTON, REGIONAL MUN. OF	LEES AVENUE TRANSIT STATION C/O 222 QUEEN STREET	OTTAWA ON	K1P 5Z3
GEN	OTTAWA-CARLTON, REGIONAL MUNICIPALITY OF	LEES AVENUE TRANSIT STATION	OTTAWA ON	
GEN	OTTAWA-CARLTON, REGIONAL MUN. OF 29-120	LEES AVENUE TRANSIT STATION C/O 222 QUEEN STREET	OTTAWA ON	K1P 5Z3

GEN	CITY OF OTTAWA	LEES AVENUE TRANSIT STATION	OTTAWA ON	K1V 1A6
GEN	PITTS ENGINEERING CONSTRUCTION	BANISTER CONT. LTD. C/O BOX 8008 OTTAWA TERMINAL HURDMAN BRIDGE AT HWY. 417	OTTAWA-CARLETON ON	K1G 3H6
GEN	PITTS ENGINEERING CONSTRUCTION 31-354	BANISTER CONT. LTD. C/O BOX 8008 OTTAWA TERMINAL HURDMAN BRIDGE AT HWY. 417	OTTAWA-CARLETON ON	K1G 3H6
GEN	PITTS (OUT OF BUS) 31-354	BANISTER CONT. LTD. C/O BOX 8008 OTTAWA TERMINAL HURDMAN BRIDGE AT HWY. 417	OTTAWA-CARLETON ON	K1G 3H6
LIMO		Lot G BROKEN FRONT C NEPEAN Ottawa	ON	
LIMO		Lot G BROKEN FRONT D NEPEAN Ottawa	ON	
LIMO	Algonquin College Dump	Lot G BROKEN FRONT D NEPEAN Ottawa	ON	
LIMO		Lot G BROKEN FRONT C NEPEAN Ottawa	ON	
PTTW	R. W. Tomlinson	Surface water from dugout pond for aggregate processing plant surface water from Lake Huron for top up water to the dugout pond GLOUCESTER	ON	
RST	CANADIAN TIRE PIT STOP & PROPANE		OTTAWA ON	K2H 5Z2
RST	CANADIAN TIRE PIT STOP & PROPANE		OTTAWA ON	K2H5Z2
SPL		HIGHWAY 417 EASTBOUND, EAST OF ROCKDALE EXIT<UNOFFICIAL>	Ottawa ON	
SPL	Enbridge Gas Distribution Inc.	HWY 417 at Vars Bridge	Ottawa ON	
SPL	City of Ottawa	Highway 417	Ottawa ON	
SPL	Ferguson Fuels<UNOFFICIAL>	HWY 417 EASTBOUND AT THE EAGLESON OFF RAMP<UNOFFICIAL>	Ottawa ON	
SPL	OTTAWA STRUCTURAL CONCRETE SER	GRAHAM CREEK AT QUEENSWAY FROM BAYSHORE SHOPP'G CTRE.	NEPEAN CITY ON	
SPL	Hughson Barriers Inc.	Hurdman Road and Lees Road; Highway 417 at Rideau River	Ottawa; Ottawa ON	
SPL	UNIVERSITY OF OTTAWA		OTTAWA CITY ON	
SPL	TRANSPORT TRUCK	QUEENSWAY MOTOR VEHICLE (OPERATING FLUID)	OTTAWA CITY ON	
SPL	TRANSPORT TRUCK	HWY. 417 MOTOR VEHICLE (OPERATING FLUID)	OTTAWA ON	
SPL		QUEENSWAY EASTBOUND AT METCALFE \	OTTAWA CITY ON	

SPL	SNC-Lavalin Constructors (Pacific) Inc., Dragados Canada, Inc.	South of Hwy 417 between Hurman Bridge and Lees Ave	Ottawa ON
SPL	OLRT Constructors<UNOFFICIAL>	Hurdman Bridge NE side	Ottawa ON
SPL	UNKNOWN	AT UNIVERSITY OF OTTAWA CAMPUS	OTTAWA CITY ON
SPL	UNKNOWN	BLAIR STATION AND QUEENSWAY	OTTAWA CITY ON
SPL	OLRT Constructors	Hurdman Park	Ottawa ON
SPL	R W Tomlinson		Ottawa ON
WWIS		lot 11	ON
WWIS		lot 11	ON

Unplottable Report

Site: ***R. W. Tomlinson Limited***
Mobile Facility Ottawa ON

Database: ***CA***

Certificate #: 9590-85TJS9
Application Year: 2010
Issue Date: 7/29/2010
Approval Type: Air
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***R. W. Tomlinson Limited***
Ottawa ON

Database: ***CA***

Certificate #: 9313-5N5KXL
Application Year: 2005
Issue Date: 5/3/2005
Approval Type: Industrial Sewage Works
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***R. W. Tomlinson Limited***
Ottawa ON

Database: ***CA***

Certificate #: 8392-5RPJWW
Application Year: 2004
Issue Date: 5/5/2004
Approval Type: Industrial Sewage Works
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***R. W. Tomlinson Limited***
Ottawa ON

Database: ***CA***

Certificate #: 6924-5YWQ3U
Application Year: 2004

Issue Date: 5/19/2004
Approval Type: Industrial Sewage Works
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***R. W. Tomlinson Limited***
Ottawa ON

Database: ***CA***

Certificate #: 3830-82GLKG
Application Year: 2010
Issue Date: 2/24/2010
Approval Type: Industrial Sewage Works
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***R. W. Tomlinson Limited***
Ottawa ON

Database: ***CA***

Certificate #: 1266-7RRSDS
Application Year: 2009
Issue Date: 5/29/2009
Approval Type: Air
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site:
Lees Avenue Ottawa ON

Database: ***CA***

Certificate #: 8377-4MUJUZ
Application Year: 00
Issue Date: 8/8/00
Approval Type: Municipal & Private water
Status: Approved
Application Type: New Certificate of Approval
Client Name: Corporation of the Regional Municipality of Ottawa-Carleton
Client Address: 4475 Trail Rd.
Client City: Nepean
Client Postal Code: K0A 2Z0
Project Description: Rehabilitation of existing watermain with new watermain & hydrants on Lees Avenue
Contaminants:
Emission Control:

Site: ***SPENCER & ASSOC.CONSLTG.ENG.LTD.***
LEES AVE. OTTAWA ON

Database: ***CA***

Certificate #: 3-0807-85-006
Application Year: 85
Issue Date: 7/30/85
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***NATIONAL CAPITAL COMMISSION***
ROBINSON AVE. OTTAWA CITY ON

Database: ***CA***

Certificate #: 7-0564-87-
Application Year: 87
Issue Date: 6/12/1987
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***UNIVERSITY OF OTTAWA - CAMPUS***
MARIE CURRIE/GLINSKI OTTAWA CITY ON

Database: ***CA***

Certificate #: 7-0118-91-
Application Year: 91
Issue Date: 2/18/1991
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***UNIVERSITY OF OTTAWA***
MARIE CURRIE/GLINSKI - CAMPUS OTTAWA CITY ON

Database: ***CA***

Certificate #: 3-0127-91-
Application Year: 91
Issue Date: 2/18/1991
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:

Contaminants:
Emission Control:

Site: ***R.M. OF OTTAWA-CARLETON***
LEES AVE. OTTAWA CITY ON

Database: ***CA***

Certificate #: 3-1317-86-
Application Year: 86
Issue Date: 9/23/1986
Approval Type: Municipal sewage
Status: Revised
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***R. W. Tomlinson Limited***
Ottawa ON

Database: ***CONV***

File No: 082173
Crown Brief No:
Court Location:
Publication City:
Publication Title:
Act:
Act(s):
First Matter:
Second Matter:
Investigation 1:
Investigation 2:
Penalty Imposed:
Description: On January 13, 2011, R. W. Tomlinson Limited was convicted of establishing a new or existing sewage works and operating a sewage works without a Certificate of Approval. The Court heard that the company operates a quarry in Ottawa. A routine inspection by the ministry conducted on June 16, 2009 revealed settling ponds from an aggregate wash operation were on site and in operation. These ponds were not part of any existing sewage works approval. The company was charged following an investigation by the ministry's Investigations and Enforcement Branch. The company was convicted and fined a total of $12,000 plus a victim fine surcharge and given 30 days to pay the fine.
Background:
URL:

Location:
Region:
Ministry District:

Additional Details

Publication Date:
Count: 1
Act:
Regulation:
Section:
Act/Regulation/Section:
Date of Offence:
Date of Conviction:
Date Charged: January 13, 2011
Charge Disposition: fine, victim fine surcharge
Fine: $12,000
Synopsis:

Site: ***R. W. Tomlinson Limited***
Mobile Facility Ottawa CITY OF OTTAWA ON

Database: ***EBR***

EBR Registry No: 011-0219
Ministry Ref No: 5698-7Q4PZC

Decision Posted:
Exception Posted:

Notice Type: Instrument Decision
Notice Stage: 803581856
Notice Date: August 04, 2010
Proposal Date: June 07, 2010
Year: 2010
Section:
Act 1:
Act 2:
Site Location Map:
Instrument Type: (EPA s. 9) - Approval for discharge into the natural environment other than water (i.e. Air)
Off Instrument Name:
Posted By:
Company Name: R. W. Tomlinson Limited
Site Address:
Location Other:
Proponent Name:
Proponent Address: 5597 Power Road, Gloucester Ontario, Canada K1G 3N4
Comment Period:
URL:

Site Location Details:

Mobile Facility Ottawa CITY OF OTTAWA

Site: ***R. W. Tomlinson Limited***
Ontario CITY OF OTTAWA ON

Database: ***EBR***

EBR Registry No: 012-3174
Ministry Ref No: 1482-9PALMZ
Notice Type: Instrument Decision
Notice Stage:
Notice Date: March 08, 2019
Proposal Date: December 04, 2014
Year: 2014
Decision Posted:
Exception Posted:
Section:
Act 1:
Act 2:
Site Location Map:
Instrument Type: Environmental Compliance Approval (project type: air) - EPA Part II.1-air
Off Instrument Name:
Posted By:
Company Name:
Site Address:
Location Other:
Proponent Name: R. W. Tomlinson Limited
Proponent Address: 5597 Power Road
Ottawa Ontario
Canada K1G 3N4
Comment Period:
URL: http://www.ebr.gov.on.ca/ERS-WEB-External/displaynoticecontent.do?noticeId=MTI0MDI3&statusId=MjA5NDA4&language=en

Site Location Details:

Ontario
CITY OF OTTAWA

Site: ***University of Ottawa***
University Street, Monpetit Hall CITY OF OTTAWA ON

Database: ***EBR***

EBR Registry No: IA6E1751
Ministry Ref No: 8423096 19961121
Notice Type: Instrument Exception
Notice Stage: 800472436
Notice Date: December 05, 1996
Proposal Date:
Year:
Decision Posted:
Exception Posted:
Section:
Act 1:
Act 2:
Site Location Map:
Instrument Type: (EPA s. 9) - Approval for discharge into the natural environment other than water (i.e. Air)
Off Instrument Name:
Posted By:
Company Name: University of Ottawa
Site Address:
Location Other:

Proponent Name:
Proponent Address:
Comment Period:
URL:

Site Location Details:

University Street, Monpetit Hall CITY OF OTTAWA

Site: ***R. W. Tomlinson Limited***
Ontario CITY OF OTTAWA ON

Database: ***EBR***

EBR Registry No: 012-3178
Ministry Ref No: 6198-9PALQX
Notice Type: Instrument Decision
Notice Stage:
Notice Date: August 01, 2018
Proposal Date: December 08, 2014
Year: 2014
Decision Posted:
Exception Posted:
Section:
Act 1:
Act 2:
Site Location Map:
Instrument Type: Environmental Compliance Approval (project type: air) - EPA Part II.1-air
Off Instrument Name:
Posted By:
Company Name: R. W. Tomlinson Limited(EPA Part II.1-air) - Environmental Compliance Approval (project type: air)
Site Address:
Location Other:
Proponent Name: R. W. Tomlinson Limited
Proponent Address: 100 CitiGate Drive
Ottawa Ontario
Canada K2J 6K7
Comment Period:
URL: http://www.ebr.gov.on.ca/ERS-WEB-External/displaynoticecontent.do?noticeId=MTI0MDMz&statusId=MjA2NzEw&language=en

Site Location Details:

Ontario
CITY OF OTTAWA

Site: ***R. W. Tomlinson Limited***
Mobile Facility Ottawa ON K1G 3N4

Database: ***ECA***

Approval No: 9590-85TJS9
Approval Date: 2010-07-29
Status: Approved
Record Type: ECA
Link Source: IDS
SWP Area Name:
MOE District:
City:
Longitude:
Latitude:
Geometry X:
Geometry Y:
Approval Type: ECA-AIR
Project Type: AIR
Address: Mobile Facility
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/5698-7Q4PZC-14.pdf

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Site: ***SNC-Lavalin Constructors (Pacific) Inc., Dragados Canada Inc., EllisDon Corporation Hurdman East Overpass to Blair Station Ottawa ON K1Z 1G3***

Database: ***ECA***

Approval No: 6366-A3GQ8M
Approval Date: 2015-11-02
Status: Approved
Record Type: ECA
Link Source: IDS
SWP Area Name:
MOE District:
City:
Longitude:
Latitude:
Geometry X:
Geometry Y:
Approval Type: ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS

Project Type: MUNICIPAL AND PRIVATE SEWAGE WORKS
Address: Hurdman East Overpass to Blair Station
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/1724-9X3PSK-14.pdf

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Site: ***SNC-Lavalin Constructors (Pacific) Inc., Dragados Canada, Inc., and EllisDon Corporation Ottawa ON K1Z 1G3***
Database: ***ECA***

Approval No: 3474-99NHUQ
Approval Date: 2013-08-07
Status: Approved
Record Type: ECA
Link Source: IDS
SWP Area Name:
MOE District:
City:
Longitude:
Latitude:
Geometry X:
Geometry Y:
Approval Type: ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type: MUNICIPAL AND PRIVATE SEWAGE WORKS
Address:
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/2982-99JLHL-14.pdf

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Site: ***R. W. Tomlinson Limited Ottawa ON***
Database: ***ECA***

Approval No: 4956-8TRRJU
Approval Date: 5/25/2012
Status: Approved
Record Type:
Link Source:
SWP Area Name:
MOE District:
City: Ottawa
Longitude:
Latitude:
Geometry X:
Geometry Y:
Approval Type:
Project Type: Air/Noise
Address:
Full Address:
Full PDF Link:

Site: ***R. W. Tomlinson Limited Mobile Facility Ottawa ON K1G 3N4***
Database: ***ECA***

Approval No: 3301-AEPJ5R
Approval Date: 2016-10-25
Status: Approved
Record Type: ECA
Link Source: IDS
SWP Area Name:
MOE District:
City:
Longitude:
Latitude:
Geometry X:
Geometry Y:
Approval Type: ECA-AIR
Project Type: AIR
Address: Mobile Facility
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/4690-8H9G82-14.pdf

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Site:
Database: ***EHS***

Hwy 417 Ottawa ON

Order No: 20120509053
Status: C
Report Type: Custom Report
Report Date: 5/16/2012
Date Received: 5/9/2012
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:
Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): 0.25
X: -75.670099
Y: 1

Site: ***CITY OF OTTAWA***
LEES AVENUE TRANSIT STATION OTTAWA ON

Database: ***GEN***

Generator No: ON0303104
Status:
Approval Years: 2009
Contam. Facility:
MHSW Facility:
SIC Code: 221320
SIC Description: Sewage Treatment Facilities

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 146
Waste Class Desc: OTHER SPECIFIED INORGANICS

Waste Class: 222
Waste Class Desc: HEAVY FUELS

Site: ***National Capital Commission***
Hurdman Park Ottawa ON

Database: ***GEN***

Generator No: ON6588263
Status:
Approval Years: 2010
Contam. Facility:
MHSW Facility:
SIC Code: 911910
SIC Description: Other Federal Government Public Administration

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 149
Waste Class Desc: LANDFILL LEACHATES

Waste Class: 221
Waste Class Desc: LIGHT FUELS

Site: ***CLEAN WATER WORKS***
LEES AVE @ OC TRANSPO TRANSIT WAY OTTAWA ON

Database: ***GEN***

Generator No: ON2883524
Status:
Approval Years: 2010
Contam. Facility:
MHSW Facility:
SIC Code: 238990
SIC Description: All Other Specialty Trade Contractors

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 221
Waste Class Desc: LIGHT FUELS

Site: ***CITY OF OTTAWA***
LEES AVENUE TRANSIT STATION OTTAWA ON

Database: ***GEN***

Generator No: ON0303104
Status:
Approval Years: 2010
Contam. Facility:
MHSW Facility:
SIC Code: 221320
SIC Description: Sewage Treatment Facilities

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 222
Waste Class Desc: HEAVY FUELS

Waste Class: 146
Waste Class Desc: OTHER SPECIFIED INORGANICS

Site: ***National Capital Commission***
Hurdman Park Ottawa ON

Database: ***GEN***

Generator No: ON6588263
Status:
Approval Years: 2011
Contam. Facility:
MHSW Facility:
SIC Code: 911910
SIC Description: Other Federal Government Public Administration

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 149
Waste Class Desc: LANDFILL LEACHATES

Waste Class: 221
Waste Class Desc: LIGHT FUELS

Site: ***CITY OF OTTAWA***
LEES AVENUE TRANSIT STATION OTTAWA ON

Database: ***GEN***

Generator No: ON0303104
Status:
Approval Years: 2011
Contam. Facility:
MHSW Facility:
SIC Code: 221320
SIC Description: Sewage Treatment Facilities

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 146
Waste Class Desc: OTHER SPECIFIED INORGANICS

Waste Class: 222
Waste Class Desc: HEAVY FUELS

Site: ***National Capital Commission***
Hurdman Park Ottawa ON K1P 1C7

Database: ***GEN***

Generator No: ON6588263
Status:
Approval Years: 2012
Contam. Facility:
MHSW Facility:
SIC Code: 911910
SIC Description: Other Federal Government Public Administration

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 221
Waste Class Desc: LIGHT FUELS

Waste Class: 149
Waste Class Desc: LANDFILL LEACHATES

Site: ***CITY OF OTTAWA***
LEES AVENUE TRANSIT STATION OTTAWA ON K1V 1A6

Database: ***GEN***

Generator No: ON0303104
Status:
Approval Years: 2012
Contam. Facility:
MHSW Facility:
SIC Code: 221320
SIC Description: Sewage Treatment Facilities

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 146
Waste Class Desc: OTHER SPECIFIED INORGANICS

Waste Class: 222
Waste Class Desc: HEAVY FUELS

Site: ***CITY OF OTTAWA***
LEES AVENUE TRANSIT STATION OTTAWA ON

Database: ***GEN***

Generator No: ON0303104
Status:
Approval Years: 2013
Contam. Facility:
MHSW Facility:
SIC Code: 221320
SIC Description: SEWAGE TREATMENT FACILITIES

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

Waste Class: 146
Waste Class Desc: OTHER SPECIFIED INORGANICS

Waste Class: 222
Waste Class Desc: HEAVY FUELS

Site: ***RW Tomlinson***
Lees Avenue Transit Station Ottawa ON

Database: ***GEN***

Generator No: ON9056839
Status:
Approval Years: 2013
Contam. Facility:
MHSW Facility:
SIC Code: 237310
SIC Description: HIGHWAY, STREET AND BRIDGE CONSTRUCTION

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

Site: ***National Capital Commission***
Hurdman Park Ottawa ON

Database: ***GEN***

Generator No: ON6588263
Status:
Approval Years: 2009
Contam. Facility:
MHSW Facility:
SIC Code: 911910

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

SIC Description: Other Federal Government Public Administration

Detail(s)

Waste Class: 149
Waste Class Desc: LANDFILL LEACHATES

Waste Class: 221
Waste Class Desc: LIGHT FUELS

Site: ***CLEAN WATER WORKS***
LEES AVE @ OC TRANSPO TRANSIT WAY OTTAWA ON

Database: ***GEN***

Generator No: ON2883524
Status:
Approval Years: 2009
Contam. Facility:
MHSW Facility:
SIC Code: 238990
SIC Description: All Other Specialty Trade Contractors

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 221
Waste Class Desc: LIGHT FUELS

Site: ***OTTAWA-CARLTON, REGIONAL MUNICIPAL***
(STORM WATER PUMPING STATION, LEES AVE) C/O 222 QUEEN STREET OTTAWA ON K1P 5Z3

Database: ***GEN***

Generator No: ON0303103
Status:
Approval Years: 86,87,88,89,90
Contam. Facility:
MHSW Facility:
SIC Code: 0000
SIC Description: *** NOT DEFINED ***

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Site: ***OTTAWA-CARLTON, REGIONAL MUNICIPALITY OF***
(STORM WATER PUMPING STATION, LEES AVE) C/O 222 QUEEN STREET OTTAWA ON K1P 5Z3

Database: ***GEN***

Generator No: ON0303103
Status:
Approval Years: 92,93,94
Contam. Facility:
MHSW Facility:
SIC Code: 0000
SIC Description: *** NOT DEFINED ***

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Site: ***OTTAWA-CARLTON, REGIONAL MUN. OF***
LEES AVENUE TRANSIT STATION C/O 222 QUEEN STREET OTTAWA ON K1P 5Z3

Database: ***GEN***

Generator No: ON0303104
Status:
Approval Years: 86,87,88,89,90
Contam. Facility:
MHSW Facility:
SIC Code: 3699
SIC Description: OTHER PETRO. & COAL

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 222
Waste Class Desc: HEAVY FUELS

Site: ***OTTAWA-CARLTON, REGIONAL MUNICIPALITY OF***
LEES AVENUE TRANSIT STATION OTTAWA ON

Database: ***GEN***

Generator No: ON0303104
Status:
Approval Years: 92,93,97,98,99,00,01
Contam. Facility:
MHSW Facility:
SIC Code: 3699
SIC Description: OTHER PETRO. & COAL

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 222
Waste Class Desc: HEAVY FUELS

Site: ***OTTAWA-CARLTON, REGIONAL MUN. OF 29-120***
LEES AVENUE TRANSIT STATION C/O 222 QUEEN STREET OTTAWA ON K1P 5Z3

Database: ***GEN***

Generator No: ON0303104
Status:
Approval Years: 94,95,96
Contam. Facility:
MHSW Facility:
SIC Code: 3699
SIC Description: OTHER PETRO. & COAL

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 222
Waste Class Desc: HEAVY FUELS

Site: ***CITY OF OTTAWA***
LEES AVENUE TRANSIT STATION OTTAWA ON K1V 1A6

Database: ***GEN***

Generator No: ON0303104
Status:
Approval Years: 02,03,04,05,06,07,08
Contam. Facility:
MHSW Facility:
SIC Code: 221320
SIC Description: Sewage Treatment Facilities

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 146
Waste Class Desc: OTHER SPECIFIED INORGANICS

Waste Class: 222
Waste Class Desc: HEAVY FUELS

Site: ***PITTS ENGINEERING CONSTRUCTION***
BANISTER CONT. LTD. C/O BOX 8008 OTTAWA TERMINAL HURDMAN BRIDGE AT HWY. 417 OTTAWA-CARLETON ON K1G 3H6

Database: ***GEN***

Generator No: ON0760802
Status:
Approval Years: 86,87,88,89,90
Contam. Facility:
MHSW Facility:
SIC Code: 4121
SIC Description: HIGHWAYS, STR., ETC.

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

Site: ***PITTS ENGINEERING CONSTRUCTION 31-354***
BANISTER CONT. LTD. C/O BOX 8008 OTTAWA TERMINAL HURDMAN BRIDGE AT HWY. 417 OTTAWA-CARLETON ON K1G 3H6

Database: ***GEN***

Generator No: ON0760802
Status:
Approval Years: 92,93,94,95,96
Contam. Facility:
MHSW Facility:
SIC Code: 4121
SIC Description: HIGHWAYS, STR., ETC.

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

Site: ***PITTS (OUT OF BUS) 31-354***
BANISTER CONT. LTD. C/O BOX 8008 OTTAWA TERMINAL HURDMAN BRIDGE AT HWY. 417 OTTAWA-CARLETON ON K1G 3H6

Database: ***GEN***

Generator No: ON0760802
Status:
Approval Years: 97,98
Contam. Facility:
MHSW Facility:
SIC Code: 4121
SIC Description: HIGHWAYS, STR., ETC.

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

Site:
Lot G BROKEN FRONT C NEPEAN Ottawa ON

Database: ***LIMO***

ECA/Instrument No: X1102
Oper Status 2016: Historic
C of A Issue Date:
C of A Issued to:
Lndfl Gas Mgmt (P):
Lndfl Gas Mgmt (F):
Lndfl Gas Mgmt (E):
Lndfl Gas Mgmt Sys:
Landfill Gas Mntr:
Leachate Coll Sys:
ERC Est Vol (m3):
ERC Volume Unit:
ERC Dt Last Det:
Landfill Type:
Source File Type: Historic and Closed Landfills
Fill Rate:
Fill Rate Unit:
Tot Fill Area (ha):
Tot Site Area (ha):
Footprint:
Tot Apprv Cap (m3):
Contam Atten Zone:
Grndwtr Mntr:
Surf Wtr Mntr:
Air Emis Monitor:
Approved Waste Type:

Natural Attenuation:
Liners:
Cover Material:
Leachate Off-Site:
Leachate On Site:
Req Coll Lndfll Gas:
Lndfll Gas Coll:
Total Waste Rec:
TWR Methodology:
TWR Unit:
Tot Aprv Cap Unit:
Financial Assurance:
Last Report Year:
MOE Region:
MOE District:
Site County:
Lot:
Concession:
Latitude:
Longitude:
Easting:
Northing:
UTM Zone:
Data Source:

Client Site Name:
ERC Methodology:
Site Name:
Site Location Details: Lot G BROKEN FRONT C NEPEAN

Ottawa
Service Area:
Page URL:

Site: ***Database:***
Lot G BROKEN FRONT D NEPEAN Ottawa ON ***LIMO***

ECA/Instrument No:	X1108	***Natural Attenuation:***	
Oper Status 2016:	Historic	***Liners:***	
C of A Issue Date:		***Cover Material:***	
C of A Issued to:		***Leachate Off-Site:***	
Lndfl Gas Mgmt (P):		***Leachate On Site:***	
Lndfl Gas Mgmt (F):		***Req Coll Lndfll Gas:***	
Lndfl Gas Mgmt (E):		***Lndfll Gas Coll:***	
Lndfl Gas Mgmt Sys:		***Total Waste Rec:***	
Landfill Gas Mntr:		***TWR Methodology:***	
Leachate Coll Sys:		***TWR Unit:***	
ERC Est Vol (m3):		***Tot Aprv Cap Unit:***	
ERC Volume Unit:		***Financial Assurance:***	
ERC Dt Last Det:		***Last Report Year:***	
Landfill Type:		***MOE Region:***	
Source File Type:	Historic and Closed Landfills	***MOE District:***	
Fill Rate:		***Site County:***	
Fill Rate Unit:		***Lot:***	
Tot Fill Area (ha):		***Concession:***	
Tot Site Area (ha):		***Latitude:***	
Footprint:		***Longitude:***	
Tot Apprv Cap (m3):		***Easting:***	
Contam Atten Zone:		***Northing:***	
Grndwtr Mntr:		***UTM Zone:***	
Surf Wtr Mntr:		***Data Source:***	
Air Emis Monitor:			
Approved Waste Type:			
Client Site Name:			
ERC Methodology:			
Site Name:			

Site Location Details: Lot G BROKEN FRONT D NEPEAN

Ottawa
Service Area:
Page URL:

Site: ***Algonquin College Dump*** ***Database:***
Lot G BROKEN FRONT D NEPEAN Ottawa ON ***LIMO***

ECA/Instrument No:	X1017	***Natural Attenuation:***	
Oper Status 2016:	Historic	***Liners:***	
C of A Issue Date:		***Cover Material:***	
C of A Issued to:		***Leachate Off-Site:***	
Lndfl Gas Mgmt (P):		***Leachate On Site:***	
Lndfl Gas Mgmt (F):		***Req Coll Lndfll Gas:***	
Lndfl Gas Mgmt (E):		***Lndfll Gas Coll:***	
Lndfl Gas Mgmt Sys:		***Total Waste Rec:***	
Landfill Gas Mntr:		***TWR Methodology:***	
Leachate Coll Sys:		***TWR Unit:***	
ERC Est Vol (m3):		***Tot Aprv Cap Unit:***	
ERC Volume Unit:		***Financial Assurance:***	
ERC Dt Last Det:		***Last Report Year:***	
Landfill Type:		***MOE Region:***	
Source File Type:	Historic and Closed Landfills	***MOE District:***	
Fill Rate:		***Site County:***	
Fill Rate Unit:		***Lot:***	

Tot Fill Area (ha):		***Concession:***	
Tot Site Area (ha):		***Latitude:***	
Footprint:		***Longitude:***	
Tot Apprv Cap (m3):		***Easting:***	
Contam Atten Zone:		***Northing:***	
Grndwtr Mntr:		***UTM Zone:***	
Surf Wtr Mntr:		***Data Source:***	
Air Emis Monitor:			
Approved Waste Type:			
Client Site Name:	Algonquin College Dump		
ERC Methodology:			
Site Name:			
Site Location Details:	Lot G BROKEN FRONT D NEPEAN		
	Ottawa		
Service Area:			
Page URL:			

Site: ***Database:***
LIMO

Lot G BROKEN FRONT C NEPEAN Ottawa ON

ECA/Instrument No:	X1097	***Natural Attenuation:***	
Oper Status 2016:	Historic	***Liners:***	
C of A Issue Date:		***Cover Material:***	
C of A Issued to:		***Leachate Off-Site:***	
Lndfl Gas Mgmt (P):		***Leachate On Site:***	
Lndfl Gas Mgmt (F):		***Req Coll Lndfll Gas:***	
Lndfl Gas Mgmt (E):		***Lndfll Gas Coll:***	
Lndfl Gas Mgmt Sys:		***Total Waste Rec:***	
Landfill Gas Mntr:		***TWR Methodology:***	
Leachate Coll Sys:		***TWR Unit:***	
ERC Est Vol (m3):		***Tot Aprv Cap Unit:***	
ERC Volume Unit:		***Financial Assurance:***	
ERC Dt Last Det:		***Last Report Year:***	
Landfill Type:		***MOE Region:***	
Source File Type:	Historic and Closed Landfills	***MOE District:***	
Fill Rate:		***Site County:***	
Fill Rate Unit:		***Lot:***	
Tot Fill Area (ha):		***Concession:***	
Tot Site Area (ha):		***Latitude:***	
Footprint:		***Longitude:***	
Tot Apprv Cap (m3):		***Easting:***	
Contam Atten Zone:		***Northing:***	
Grndwtr Mntr:		***UTM Zone:***	
Surf Wtr Mntr:		***Data Source:***	
Air Emis Monitor:			
Approved Waste Type:			
Client Site Name:			
ERC Methodology:			
Site Name:			
Site Location Details:	Lot G BROKEN FRONT C NEPEAN		
	Ottawa		
Service Area:			
Page URL:			

Site: ***R. W. Tomlinson*** ***Database:***
PTTW

Surface water from dugout pond for aggregate processing plant surface water from Lake Huron for top up water to the dugout pond GLOUCESTER ON

EBR Registry No:	IA8E0082	***Decision Posted:***	
Ministry Ref No:	98P6007	***Exception Posted:***	
Notice Type:	Instrument Decision	***Section:***	
Notice Stage:		***Act 1:***	
Notice Date:	March 09, 1998	***Act 2:***	
Proposal Date:	January 26, 1998	***Site Location Map:***	
Year:	1998		

Instrument Type: (OWRA s. 34) - Permit to Take Water
Off Instrument Name:
Posted By:
Company Name: R. W. Tomlinson
Site Address:
Location Other:
Proponent Name:
Proponent Address: 5597 Power Road, Gloucester Ontario, K1G 3N4
Comment Period:
URL:

Site Location Details:

Surface water from dugout pond for aggregate processing plant surface water from Lake Huron for top up water to the dugout pond GLOUCESTER

Site: ***CANADIAN TIRE PIT STOP & PROPANE***
OTTAWA ON K2H 5Z2

Database: ***RST***

Headcode: 00921430
Headcode Desc: OIL CHANGES & LUBRICATION SERVICE
Phone: 6138299488
List Name:
Description:

Site: ***CANADIAN TIRE PIT STOP & PROPANE***
OTTAWA ON K2H5Z2

Database: ***RST***

Headcode: 00921430
Headcode Desc: OIL CHANGES & LUBRICATION SERVICE
Phone: 6138299488
List Name:
Description:

Site:
HIGHWAY 417 EASTBOUND, EAST OF ROCKDALE EXIT<UNOFFICIAL> Ottawa ON

Database: ***SPL***

Ref No:	2415-6M4SUB	***Discharger Report:***	
Site No:		***Material Group:***	Oils
Incident Dt:	2/17/2006	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	Other Transport Accident	***Sector Type:***	Other Motor Vehicle
Incident Event:		***Agency Involved:***	
Contaminant Code:	12	***Nearest Watercourse:***	
Contaminant Name:	GASOLINE	***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	Ottawa
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	Not Anticipated	***Site Municipality:***	Ottawa
Nature of Impact:	Human Health/Safety; Other Impact(s); Soil Contamination	***Site Lot:***	
Receiving Medium:	Land	***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:		***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	2/17/2006	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	
Incident Reason:	Equipment Failure	***Source Type:***	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			

Incident Summary: Hwy 417 eastbound, 36 vehicle MVA - operating fluid to grnd
Contaminant Qty: Not specified 12

Site: ***Enbridge Gas Distribution Inc.***
HWY 417 at Vars Bridge Ottawa ON

Database: ***SPL***

Ref No:	6748-7X7R4U	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:		***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:		***Sector Type:***	
Incident Event:		***Agency Involved:***	
Contaminant Code:	46	***Nearest Watercourse:***	
Contaminant Name:	USED MOTOR OIL	***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	Not Anticipated	***Site Municipality:***	
Nature of Impact:		***Site Lot:***	
Receiving Medium:		***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:	No Field Response	***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	10/26/2009	***Site Map Datum:***	
Dt Document Closed:	1/8/2010	***SAC Action Class:***	Highway Spills (usually highway accidents)
Incident Reason:		***Source Type:***	
Site Name:	HWY 417 at Vars Bridge<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	Motor Vehicle-30 L Used Motor Oil to Hwy 417.		
Contaminant Qty:	30 L		

Site: ***City of Ottawa***
Highway 417 Ottawa ON

Database: ***SPL***

Ref No:	3043-7QMTYH	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:		***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	Pipe Or Hose Leak	***Sector Type:***	Other
Incident Event:		***Agency Involved:***	
Contaminant Code:		***Nearest Watercourse:***	
Contaminant Name:	ENGINE OIL	***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	Not Anticipated	***Site Municipality:***	Ottawa
Nature of Impact:	Other Impact(s)	***Site Lot:***	
Receiving Medium:		***Site Conc:***	
Receiving Env:		***Northing:***	NA
MOE Response:		***Easting:***	NA
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	3/30/2009	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	Primary Assessment of Incident
Incident Reason:	Unknown - Reason not determined	***Source Type:***	
Site Name:	EB Merge Lane Hwy 417 & Eagleson Road		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	OC Transpo: 10L engine oil to grnd on Hwy 417		
Contaminant Qty:	10 L		

Site: ***Ferguson Fuels<UNOFFICIAL>***
HWY 417 EASTBOUND AT THE EAGLESON OFF RAMP<UNOFFICIAL> Ottawa ON

Database: ***SPL***

Ref No:	2342-6QAQYF	***Discharger Report:***	
Site No:		***Material Group:***	Oils
Incident Dt:	5/30/2006	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	Other Transport Accident	***Sector Type:***	Other Motor Vehicle

Incident Event:		***Agency Involved:***	
Contaminant Code:	13	***Nearest Watercourse:***	
Contaminant Name:	DIESEL FUEL	***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	Ottawa
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	Confirmed	***Site Municipality:***	Ottawa
Nature of Impact:	Soil Contamination; Surface Water Pollution	***Site Lot:***	
Receiving Medium:	Land & Water	***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:		***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	5/30/2006	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	
Incident Reason:		***Source Type:***	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	Ferguson Fuels ~60 L diesel spill, Hwy 417, Eagleson exit		
Contaminant Qty:	60 L		

Site: ***OTTAWA STRUCTURAL CONCRETE SER***
GRAHAM CREEK AT QUEENSWAY FROM BAYSHORE SHOPP'G CTRE. NEPEAN CITY ON

Database: ***SPL***

Ref No:	74243	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	7/27/1992	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	OTHER CAUSE (N.O.S.)	***Sector Type:***	
Incident Event:		***Agency Involved:***	
Contaminant Code:		***Nearest Watercourse:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	CONFIRMED	***Site Municipality:***	20104
Nature of Impact:	Water course or lake	***Site Lot:***	
Receiving Medium:	WATER	***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:		***Easting:***	REGION OF OTTAWA-CARLTON
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	7/27/1992	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	
Incident Reason:	NEGLIGENCE (APPARENT)	***Source Type:***	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	OTTAWA STRUCT'L CONCRETE -WASHED OUT CONTAINERS IN STORM DRAIN.		
Contaminant Qty:			

Site: ***Hughson Barriers Inc.***
Hurdman Road and Lees Road; Highway 417 at Rideau River Ottawa; Ottawa ON

Database: ***SPL***

Ref No:	7112-9Z3SHS	***Discharger Report:***	
Site No:	NA; NA	***Material Group:***	
Incident Dt:	7/30/2015	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:		***Sector Type:***	Miscellaneous Industrial
Incident Event:		***Agency Involved:***	
Contaminant Code:	27	***Nearest Watercourse:***	
Contaminant Name:	CONCRETE	***Site Address:***	Hurdman Road and Lees Road; Highway 417 at Rideau River
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:		***Site Municipality:***	Ottawa; Ottawa
Nature of Impact:		***Site Lot:***	

Receiving Medium:		***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:	No	***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	8/4/2015	***Site Map Datum:***	
Dt Document Closed:	8/25/2015	***SAC Action Class:***	Land Spills
Incident Reason:	Unknown / N/A	***Source Type:***	
Site Name:	Ground Spill<UNOFFICIAL>; Ground Spill<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	Hughson Barriers Inc- Concrete Wash-out to Ground, clnd		
Contaminant Qty:	20 L		

Site: ***UNIVERSITY OF OTTAWA***
OTTAWA CITY ON

Database: ***SPL***

Ref No:	95052	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	12/29/1993	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	VALVE/FITTING LEAK OR FAILURE	***Sector Type:***	
Incident Event:		***Agency Involved:***	
Contaminant Code:		***Nearest Watercourse:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	POSSIBLE	***Site Municipality:***	20101
Nature of Impact:	Soil contamination	***Site Lot:***	
Receiving Medium:	LAND	***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:		***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	1/4/1994	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	
Incident Reason:	ERROR	***Source Type:***	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	UNIVERSITY OF OTTAWA: 180L BUNKER C FUEL TO GROUNDFROM STORAGE TANK.		
Contaminant Qty:			

Site: ***TRANSPORT TRUCK***
QUEENSWAY MOTOR VEHICLE (OPERATING FLUID) OTTAWA CITY ON

Database: ***SPL***

Ref No:	224201	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	4/19/2002	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	OTHER TRANSPORTATION ACCIDENT	***Sector Type:***	
Incident Event:		***Agency Involved:***	OPP-KANATA; MTO
Contaminant Code:		***Nearest Watercourse:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	CONFIRMED	***Site Municipality:***	20107
Nature of Impact:	Soil contamination	***Site Lot:***	
Receiving Medium:	LAND	***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:		***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	4/19/2002	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	
Incident Reason:	ERROR	***Source Type:***	
Site Name:			
Site County/District:			

Site Geo Ref Meth:
Incident Summary: LOBLAWS: 450L DIESEL FROMTRUCK TO ROAD ONLY; OPP; MTO.
Contaminant Qty:

Site: ***TRANSPORT TRUCK***
HWY. 417 MOTOR VEHICLE (OPERATING FLUID) OTTAWA ON

Database: ***SPL***

Ref No:	191523	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	12/4/2000	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	TRUCK/TRAILER OVERTURN	***Sector Type:***	
Incident Event:		***Agency Involved:***	
Contaminant Code:		***Nearest Watercourse:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	POSSIBLE	***Site Municipality:***	20107
Nature of Impact:	Soil contamination	***Site Lot:***	
Receiving Medium:	LAND	***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:		***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	12/4/2000	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	
Incident Reason:	OTHER	***Source Type:***	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			

Incident Summary: RSR ENVIRONMENTAL:SPILL OF 50-100 L DIESEL DUE TO ROLLOVER. CONTAINED.
Contaminant Qty:

Site:
QUEENSWAY EASTBOUND AT METCALFE \ OTTAWA CITY ON

Database: ***SPL***

Ref No:	162583	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	12/2/1998	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:		***Sector Type:***	
Incident Event:		***Agency Involved:***	
Contaminant Code:		***Nearest Watercourse:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:		***Site Municipality:***	20101
Nature of Impact:		***Site Lot:***	
Receiving Medium:	LAND / WATER	***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:		***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	12/2/1998	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	
Incident Reason:		***Source Type:***	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:			
Contaminant Qty:			

Site: ***SNC-Lavalin Constructors (Pacific) Inc., Dragados Canada, Inc.***
South of Hwy 417 between Hurman Bridge and Lees Ave Ottawa ON

Database: ***SPL***

Ref No:	8221-9JDKCS	***Discharger Report:***	
Site No:	NA	***Material Group:***	
Incident Dt:	2014/04/21	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	Overflow/Surcharge	***Sector Type:***	Tank - Above Ground
Incident Event:		***Agency Involved:***	
Contaminant Code:	12	***Nearest Watercourse:***	
Contaminant Name:	GASOLINE	***Site Address:***	South of Hwy 417 between Hurman Bridge and Lees Ave
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	Confirmed	***Site Municipality:***	Ottawa
Nature of Impact:	Soil Contamination	***Site Lot:***	
Receiving Medium:		***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:	No Field Response	***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	2014/04/21	***Site Map Datum:***	
Dt Document Closed:	2014/11/04	***SAC Action Class:***	Land Spills
Incident Reason:	Operator/Human Error	***Source Type:***	
Site Name:	OLRT Highway Widening Project Site<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	Ottawa LRT: 1L gasoline spill cleaned		
Contaminant Qty:	1 L		

Site: ***OLRT Constructors<UNOFFICIAL>***
Hurdman Bridge NE side Ottawa ON

Database: ***SPL***

Ref No:	0317-9HRLBM	***Discharger Report:***	
Site No:	NA	***Material Group:***	
Incident Dt:	2014/04/01	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	Unknown / N/A	***Sector Type:***	Unknown / N/A
Incident Event:		***Agency Involved:***	
Contaminant Code:	15	***Nearest Watercourse:***	
Contaminant Name:	OIL (PETROLEUM BASED, NOT SPECIFIED)	***Site Address:***	Hurdman Bridge NE side
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	Not Anticipated	***Site Municipality:***	Ottawa
Nature of Impact:	Surface Water Pollution	***Site Lot:***	
Receiving Medium:		***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:	No Field Response	***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	2014/04/01	***Site Map Datum:***	
Dt Document Closed:	2014/10/29	***SAC Action Class:***	Watercourse Spills
Incident Reason:	Unknown / N/A	***Source Type:***	
Site Name:	417 & Vanier Parkway <UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	OLRT Constructors: Sheen at outfall, no source		
Contaminant Qty:	0 other - see incident description		

Site: ***UNKNOWN***
AT UNIVERSITY OF OTTAWA CAMPUS OTTAWA CITY ON

Database: ***SPL***

Ref No:	129232	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	7/15/1996	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	UNKNOWN	***Sector Type:***	
Incident Event:		***Agency Involved:***	
Contaminant Code:		***Nearest Watercourse:***	
Contaminant Name:		***Site Address:***	

Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	POSSIBLE	***Site Municipality:***	20101
Nature of Impact:	Water course or lake	***Site Lot:***	
Receiving Medium:	LAND / WATER	***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:		***Easting:***	WORKS
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	7/15/1996	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	
Incident Reason:	UNKNOWN	***Source Type:***	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	SOURCE UNKNOWN: DIESEL FOUND ON STREET & SEWERS,OTTAWA WORKS CLEANED UP.		
Contaminant Qty:			

Site: ***UNKNOWN***
BLAIR STATION AND QUEENSWAY OTTAWA CITY ON

Database: ***SPL***

Ref No:	239018	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	9/11/2002	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	UNKNOWN	***Sector Type:***	
Incident Event:		***Agency Involved:***	
Contaminant Code:		***Nearest Watercourse:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	POSSIBLE	***Site Municipality:***	20107
Nature of Impact:	Water course or lake	***Site Lot:***	
Receiving Medium:	LAND, WATER	***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:		***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	9/11/2002	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	
Incident Reason:	UNKNOWN	***Source Type:***	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	SOURCE UNK: UNK VOLUME OF ANTIFREEZE IN THE STORMSEWER, CLEANING		
Contaminant Qty:			

Site: ***OLRT Constructors***
Hurdman Park Ottawa ON

Database: ***SPL***

Ref No:	6388-9ZDMP3	***Discharger Report:***	
Site No:	NA	***Material Group:***	
Incident Dt:	8/14/2015	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:		***Sector Type:***	Unknown / N/A
Incident Event:		***Agency Involved:***	
Contaminant Code:	98	***Nearest Watercourse:***	
Contaminant Name:	UNKNOWN	***Site Address:***	Hurdman Park
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:		***Site Municipality:***	Ottawa
Nature of Impact:		***Site Lot:***	
Receiving Medium:		***Site Conc:***	
Receiving Env:		***Northing:***	4815175
MOE Response:	No	***Easting:***	542241
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	

MOE Reported Dt:	8/14/2015	***Site Map Datum:***	NAD83
Dt Document Closed:		***SAC Action Class:***	Land Spills
Incident Reason:	Unknown / N/A	***Source Type:***	
Site Name:	construction site<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	Ottawa - 2L unknown hydrocarbon to ground, cleaning		
Contaminant Qty:	2 L		

Site: ***R W Tomlinson***
Ottawa ON

Database: ***SPL***

Ref No:	0423-A2EPDC	***Discharger Report:***	
Site No:	NA	***Material Group:***	
Incident Dt:	9/4/2015	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:		***Sector Type:***	Miscellaneous Industrial
Incident Event:		***Agency Involved:***	
Contaminant Code:	27	***Nearest Watercourse:***	
Contaminant Name:	CONCRETE	***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:		***Site Municipality:***	Ottawa
Nature of Impact:		***Site Lot:***	
Receiving Medium:		***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:	No	***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	9/16/2015	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	Land Spills
Incident Reason:	Unknown / N/A	***Source Type:***	
Site Name:	Hurdman Bus terminal Station<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	R W Tomlinson- 10L Concrete Wash-out to ground		
Contaminant Qty:	10 L		

Site:
lot 11 ON

Database: ***WWIS***

Well ID:	1517130	***Data Entry Status:***	
Construction Date:		***Data Src:***	1
Primary Water Use:	Domestic	***Date Received:***	9/24/1979
Sec. Water Use:		***Selected Flag:***	Yes
Final Well Status:	Water Supply	***Abandonment Rec:***	
Water Type:		***Contractor:***	3644
Casing Material:		***Form Version:***	1
Audit No:		***Owner:***	
Tag:		***Street Name:***	
Construction Method:		***County:***	OTTAWA-CARLETON
Elevation (m):		***Municipality:***	GLOUCESTER TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	011
Well Depth:		***Concession:***	
Overburden/Bedrock:		***Concession Name:***	
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10039010	***Elevation:***	
DP2BR:	38	***Elevrc:***	

Spatial Status:
Code OB: r
Code OB Desc: Bedrock
Open Hole:
Cluster Kind:
Date Completed: 9/10/1979
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931034222
Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 38
Formation End Depth: 55
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931034221
Layer: 1
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 0
Formation End Depth: 38
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID:
Method Construction Code: 5
Method Construction: Air Percussion
Other Method Construction:

Pipe Information

Pipe ID: 10587580
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930068382

Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 41
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 991517130
Pump Set At:
Static Level: 18
Final Level After Pumping: 45
Recommended Pump Depth: 45
Pumping Rate: 12
Flowing Rate:
Recommended Pump Rate: 10
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: N

Draw Down & Recovery

Pump Test Detail ID: 934644169
Test Type:
Test Duration: 45
Test Level: 45
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934102665
Test Type:
Test Duration: 15
Test Level: 45
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934901650
Test Type:
Test Duration: 60
Test Level: 45
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934382666
Test Type:
Test Duration: 30
Test Level: 45
Test Level UOM: ft

Water Details

Water ID: 933473552
Layer: 1
Kind Code: 1

Kind:	FRESH
Water Found Depth:	50
Water Found Depth UOM:	ft

Site:

lot 11 ON

Database:
WWIS

Well ID:	1534269	***Data Entry Status:***	
Construction Date:		***Data Src:***	1
Primary Water Use:	Not Used	***Date Received:***	11/17/2003
Sec. Water Use:		***Selected Flag:***	Yes
Final Well Status:	Not A Well	***Abandonment Rec:***	
Water Type:		***Contractor:***	6907
Casing Material:		***Form Version:***	2
Audit No:	265848	***Owner:***	
Tag:		***Street Name:***	
Construction Method:		***County:***	OTTAWA-CARLETON
Elevation (m):		***Municipality:***	NEPEAN TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	011
Well Depth:		***Concession:***	
Overburden/Bedrock:		***Concession Name:***	
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	11097321	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:	_	***East83:***	
Code OB Desc:	No formation data	***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	9/26/2003	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Method of Construction & Well Use

Method Construction ID:	
Method Construction Code:	B
Method Construction:	Other Method
Other Method Construction:	

Pipe Information

Pipe ID:	11101036
Casing No:	1
Comment:	
Alt Name:	

Appendix: Database Descriptions

Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. ***Note:*** *Databases denoted with " * " indicates that the database will no longer be updated. See the individual database description for more information.*

Abandoned Aggregate Inventory: Provincial AAGR

The MAAP Program maintains a database of abandoned pits and quarries. Please note that the database is only referenced by lot and concession and city/town location. The database provides information regarding the location, type, size, land use, status and general comments.*

Government Publication Date: Sept 2002*

Aggregate Inventory: Provincial AGR

The Ontario Ministry of Natural Resources maintains a database of all active pits and quarries. The database provides information regarding the registered owner/operator, location name, operation type, approval type, and maximum annual tonnage.

Government Publication Date: Up to Sep 2019

Abandoned Mine Information System: Provincial AMIS

The Abandoned Mines Information System contains data on known abandoned and inactive mines located on both Crown and privately held lands. The information was provided by the Ministry of Northern Development and Mines (MNDM), with the following disclaimer: "the database provided has been compiled from various sources, and the Ministry of Northern Development and Mines makes no representation and takes no responsibility that such information is accurate, current or complete". Reported information includes official mine name, status, background information, mine start/end date, primary commodity, mine features, hazards and remediation.

Government Publication Date: 1800-Oct 2018

Anderson's Waste Disposal Sites: Private ANDR

The information provided in this database was collected by examining various historical documents which aimed to characterize the likely position of former waste disposal sites from 1860 to present. The research initiative behind the creation of this database was to identify those sites that are missing from the Ontario MOE Waste Disposal Site Inventory, as well as to provide revisions and corrections to the positions and descriptions of sites currently listed in the MOE inventory. In addition to historic waste disposal facilities, the database also identifies certain auto wreckers and scrap yards that have been extrapolated from documentary sources. Please note that the data is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

Government Publication Date: 1860s-Present

Aboveground Storage Tanks: Provincial AST

Historical listing of aboveground storage tanks made available by the Department of Natural Resources and Forestry. Includes tanks used to hold water or petroleum. This dataset has been retired as of September 25, 2014 and will no longer be updated.

Government Publication Date: May 31, 2014

Automobile Wrecking & Supplies: Private AUWR

This database provides an inventory of known locations that are involved in the scrap metal, automobile wrecking/recycling, and automobile parts & supplies industry. Information is provided on the company name, location and business type.

Government Publication Date: 1999-Jan 31, 2020

Borehole: Provincial BORE

A borehole is the generalized term for any narrow shaft drilled in the ground, either vertically or horizontally. The information here includes geotechnical investigations or environmental site assessments, mineral exploration, or as a pilot hole for installing piers or underground utilities. Information is from many sources such as the Ministry of Transportation (MTO) boreholes from engineering reports and projects from the 1950 to 1990's in Southern Ontario. Boreholes from the Ontario Geological Survey (OGS) including The Urban Geology Analysis Information System (UGAIS) and the York Peel Durham Toronto (YPDT) database of the Conservation Authority Moraine Coalition. This database will include fields such as location, stratigraphy, depth, elevation, year drilled, etc. For all water well data or oil and gas well data for Ontario please refer to WWIS and OOGW.

Government Publication Date: 1875-Jul 2018

Certificates of Approval: Provincial CA

This database contains the following types of approvals: Air & Noise, Industrial Sewage, Municipal & Private Sewage, Waste Management Systems and Renewable Energy Approvals. The MOE in Ontario states that any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste, must have a Certificate of Approval before it can operate lawfully. Fields include approval number, business name, address, approval date, approval type and status. This database will no longer be updated, as CofA's have been replaced by either Environmental Activity and Sector Registry (EASR) or Environmental Compliance Approval (ECA). Please refer to those individual databases for any information after Oct.31, 2011.

Government Publication Date: 1985-Oct 30, 2011*

Dry Cleaning Facilities: Federal CDRY

List of dry cleaning facilities made available by Environment and Climate Change Canada. Environment and Climate Change Canada's Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations (SOR/2003-79) are intended to reduce releases of tetrachloroethylene to the environment from dry cleaning facilities.

Government Publication Date: Jan 2004-Dec 2017

Commercial Fuel Oil Tanks: Provincial CFOT

Locations of commercial underground fuel oil tanks. This is not a comprehensive or complete inventory of commercial fuel tanks in the province; this listing is a copy of records of registered commercial underground fuel oil tanks obtained under Access to Public Information.
Note that the following types of tanks do not require registration: waste oil tanks in apartments, office buildings, residences, etc.; aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2017

Chemical Register: Private CHEM

This database includes information from both a one time study conducted in 1992 and private source and is a listing of facilities that manufacture or distribute chemicals. The production of these chemical substances may involve one or more chemical reactions and/or chemical separation processes (i.e. fractionation, solvent extraction, crystallization, etc.).

Government Publication Date: 1999-Jan 31, 2020

Compressed Natural Gas Stations: Private CNG

Canada has a network of public access compressed natural gas (CNG) refuelling stations. These stations dispense natural gas in compressed form at 3,000 pounds per square inch (psi), the pressure which is allowed within the current Canadian codes and standards. The majority of natural gas refuelling is located at existing retail gasoline that have a separate refuelling island for natural gas. This list of stations is made available by the Canadian Natural Gas Vehicle Alliance.

Government Publication Date: Dec 2012 - Feb 2020

Inventory of Coal Gasification Plants and Coal Tar Sites: Provincial COAL

This inventory includes both the "Inventory of Coal Gasification Plant Waste Sites in Ontario-April 1987" and the Inventory of Industrial Sites Producing or Using Coal Tar and Related Tars in Ontario-November 1988) collected by the MOE. It identifies industrial sites that produced and continue to produce or use coal tar and other related tars. Detailed information is available and includes: facility type, size, land use, information on adjoining properties, soil condition, site operators/occupants, site description, potential environmental impacts and historic maps available. This was a one-time inventory.*

Government Publication Date: Apr 1987 and Nov 1988*

Compliance and Convictions: Provincial CONV

This database summarizes the fines and convictions handed down by the Ontario courts beginning in 1989. Companies and individuals named here have been found guilty of environmental offenses in Ontario courts of law.

Government Publication Date: 1989-Dec 2019

Certificates of Property Use: Provincial CPU

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all CPU's on the registry such as (EPA s. 168.6) - Certificate of Property Use.

Government Publication Date: 1994-May 31, 2020

Drill Hole Database: Provincial DRL

The Ontario Drill Hole Database contains information on more than 113,000 percussion, overburden, sonic and diamond drill holes from assessment files on record with the department of Mines and Minerals. Please note that limited data is available for southern Ontario, as it was the last area to be completed. The database was created when surveys submitted to the Ministry were converted in the Assessment File Research Image Database (AFRI) project. However, the degree of accuracy (coordinates) as to the exact location of drill holes is dependent upon the source document submitted to the MNDM. Levels of accuracy used to locate holes are: centering on the mining claim; a sketch of the mining claim; a 1:50,000 map; a detailed company map; or from submitted a "Report of Work".

Government Publication Date: 1886 - Sep 2019

Environmental Activity and Sector Registry: Provincial EASR

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. The EASR allows businesses to register certain activities with the ministry, rather than apply for an approval. The registry is available for common systems and processes, to which preset rules of operation can be applied. The EASR is currently available for: heating systems, standby power systems and automotive refinishing. Businesses whose activities aren't subject to the EASR may apply for an ECA (Environmental Compliance Approval), Please see our ECA database.

Government Publication Date: Oct 2011-May 31, 2020

Environmental Registry: Provincial EBR

The Environmental Registry lists proposals, decisions and exceptions regarding policies, Acts, instruments, or regulations that could significantly affect the environment. Through the Registry, thirteen provincial ministries notify the public of upcoming proposals and invite their comments. For example, if a local business is requesting a permit, license, or certificate of approval to release substances into the air or water; these are notified on the registry. Data includes: Approval for discharge into the natural environment other than water (i.e. Air) - EPA s. 9, Approval for sewage works - OWRA s. 53(1), and EPA s. 27 - Approval for a waste disposal site. For information regarding Permit to Take Water (PTTW), Certificate of Property Use (CPU) and (ORD) Orders please refer to those individual databases.

Government Publication Date: 1994-May 31, 2020

Environmental Compliance Approval: Provincial ECA

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. In the past, a business had to apply for multiple approvals (known as certificates of approval) for individual processes and pieces of equipment. Today, a business either registers itself, or applies for a single approval, depending on the types of activities it conducts. Businesses whose activities aren't subject to the EASR may apply for an ECA. A single ECA addresses all of a business's emissions, discharges and wastes. Separate approvals for air, noise and waste are no longer required. This database will also include Renewable Energy Approvals. For certificates of approval prior to Nov 1st, 2011, please refer to the CA database. For all Waste Disposal Sites please refer to the WDS database.

Government Publication Date: Oct 2011-May 31, 2020

Environmental Effects Monitoring: Federal EEM

The Environmental Effects Monitoring program assesses the effects of effluent from industrial or other sources on fish, fish habitat and human usage of fisheries resources. Since 1992, pulp and paper mills have been required to conduct EEM studies under the Pulp and Paper Effluent Regulations. This database provides information on the mill name, geographical location and sub-lethal toxicity data.

Government Publication Date: 1992-2007*

ERIS Historical Searches: Private EHS

ERIS has compiled a database of all environmental risk reports completed since March 1999. Available fields for this database include: site location, date of report, type of report, and search radius. As per all other databases, the ERIS database can be referenced on both the map and "Statistical Profile" page.

Government Publication Date: 1999-Apr 30, 2020

Environmental Issues Inventory System: Federal EIIS

The Environmental Issues Inventory System was developed through the implementation of the Environmental Issues and Remediation Plan. This plan was established to determine the location and severity of contaminated sites on inhabited First Nation reserves, and where necessary, to remediate those that posed a risk to health and safety; and to prevent future environmental problems. The EIIS provides information on the reserve under investigation, inventory number, name of site, environmental issue, site action (Remediation, Site Assessment), and date investigation completed.

Government Publication Date: 1992-2001*

Emergency Management Historical Event: Provincial EMHE

List of locations of historical occurrences of emergency events, including those assigned to the Ministry of Natural Resources by Order-In-Council (OIC) under the Emergency Management and Civil Protection Act, as well as events where MNR provided requested emergency response assistance. Many of these events will have involved community evacuations, significant structural loss, and/or involvement of MNR emergency response staff. These events fall into one of ten (10) type categories: Dam Failure; Drought / Low Water; Erosion; Flood; Forest Fire; Soil and Bedrock Instability; Petroleum Resource Center Event, EMO Requested Assistance, Continuity of Operations Event, Other Requested Assistance. EMHE record details are reproduced by ERIS under License with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2017.

Government Publication Date: Dec 31, 2016

Environmental Penalty Annual Report: Provincial EPAR

This database contains data from Ontario's annual environmental penalty report published by the Ministry of the Environment and Climate Change. These reports provide information on environmental penalties for land or water violations issued to companies in one of the nine industrial sectors covered by the Municipal Industrial Strategy for Abatement (MISA) regulations.

Government Publication Date: Jan 1, 2011 - Dec 31, 2019

List of Expired Fuels Safety Facilities: Provincial EXP

List of facilities and tanks for which there was once a fuel registration. This is not a comprehensive or complete inventory of expired tanks/tank facilities in the province; this listing is a copy of previously registered tanks and facilities obtained under Access to Public Information. Includes private fuel outlets, bulk plants, fuel oil tanks, gasoline stations, marinas, propane filling stations, liquid fuel tanks, piping systems, etc; includes tanks which have been removed from the ground.
Notes: registration was not required for private fuel underground/aboveground storage tanks prior to January 1990, nor for furnace oil tanks prior to May 1, 2002; registration is not required for waste oil tanks in apartments, office buildings, residences, etc., or aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2017

Federal Convictions: Federal FCON

Environment Canada maintains a database referred to as the "Environmental Registry" that details prosecutions under the Canadian Environmental Protection Act (CEPA) and the Fisheries Act (FA). Information is provided on the company name, location, charge date, offence and penalty.

Government Publication Date: 1988-Jun 2007*

Contaminated Sites on Federal Land: Federal FCS

The Federal Contaminated Sites Inventory includes information on known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility. It does not include sites where contamination has been caused by, and which are under the control of, enterprise Crown corporations, private individuals, firms or other levels of government. Includes fire training sites and sites at which Per- and Polyfluoroalkyl Substances (PFAS) are a concern.

Government Publication Date: Jun 2000-Apr 2020

Fisheries & Oceans Fuel Tanks: Federal FOFT

Fisheries & Oceans Canada maintains an inventory of aboveground & underground fuel storage tanks located on Fisheries & Oceans property or controlled by DFO. Our inventory provides information on the site name, location, tank owner, tank operator, facility type, storage tank location, tank contents & capacity, and date of tank installation.

Government Publication Date: 1964-Sep 2019

Federal Identification Registry for Storage Tank Systems (FIRSTS): Federal FRST

A list of federally regulated Storage tanks from the Federal Identification Registry for Storage Tank Systems (FIRSTS). FIRSTS is Environment and Climate Change Canada's database of storage tank systems subject to the Storage Tank for Petroleum Products and Allied Petroleum Products Regulations. The main objective of the Regulations is to prevent soil and groundwater contamination from storage tank systems located on federal and aboriginal lands. Storage tank systems that do not have a valid identification number displayed in a readily visible location on or near the storage tank system may be refused product delivery.

Government Publication Date: May 31, 2018

Fuel Storage Tank: Provincial FST

List of registered private and retail fuel storage tanks. This is not a comprehensive or complete inventory of private and retail fuel storage tanks in the province; this listing is a copy of registered private and retail fuel storage tanks, obtained under Access to Public Information.
Notes: registration was not required for private fuel underground/aboveground storage tanks prior to January 1990, nor for furnace oil tanks prior to May 1, 2002; registration is not required for waste oil tanks in apartments, office buildings, residences, etc., or aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2017

Fuel Storage Tank - Historic: Provincial FSTH

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks. Public records of private fuel storage tanks are only available since the registration became effective in September 1989. This information is now collected by the Technical Standards and Safety Authority.

Government Publication Date: Pre-Jan 2010*

Ontario Regulation 347 Waste Generators Summary: Provincial GEN

Regulation 347 of the Ontario EPA defines a waste generation site as any site, equipment and/or operation involved in the production, collection, handling and/or storage of regulated wastes. A generator of regulated waste is required to register the waste generation site and each waste produced, collected, handled, or stored at the site. This database contains the registration number, company name and address of registered generators including the types of hazardous wastes generated. It includes data on waste generating facilities such as: drycleaners, waste treatment and disposal facilities, machine shops, electric power distribution etc. This information is a summary of all years from 1986 including the most currently available data. Some records may contain, within the company name, the phrase "See & Use..." followed by a series of letters and numbers. This occurs when one company is amalgamated with or taken over by another registered company. The number listed as "See & Use", refers to the new ownership and the other identification number refers to the original ownership. This phrase serves as a link between the 2 companies until operations have been fully transferred.

Government Publication Date: 1986-Jan 31, 2020

Greenhouse Gas Emissions from Large Facilities: Federal GHG

List of greenhouse gas emissions from large facilities made available by Environment Canada. Greenhouse gas emissions in kilotonnes of carbon dioxide equivalents (kt CO2 eq).

Government Publication Date: 2013-Dec 2017

TSSA Historic Incidents: Provincial HINC

List of historic incidences of spills and leaks of diesel, fuel oil, gasoline, natural gas, propane, and hydrogen recorded by the TSSA in their previous incident tracking system. The TSSA's Fuels Safety Program administers the Technical Standards & Safety Act 2000, providing fuel-related safety services associated with the safe transportation, storage, handling and use of fuels such as gasoline, diesel, propane, natural gas and hydrogen. Under this Act, the TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. Records are not verified for accuracy or completeness. This is not a comprehensive or complete inventory of historical fuel spills and leaks in the province. This listing is a copy of the data captured at one moment in time and is hence limited by the record date provided here.

Government Publication Date: 2006-June 2009*

Indian & Northern Affairs Fuel Tanks: Federal IAFT

The Department of Indian & Northern Affairs Canada (INAC) maintains an inventory of aboveground & underground fuel storage tanks located on both federal and crown land. Our inventory provides information on the reserve name, location, facility type, site/facility name, tank type, material & ID number, tank contents & capacity, and date of tank installation.

Government Publication Date: 1950-Aug 2003*

Fuel Oil Spills and Leaks: Provincial INC

Listing of spills and leaks of diesel, fuel oil, gasoline, natural gas, propane, and hydrogen reported to the Spills Action Centre (SAC). This is not a comprehensive or complete inventory of fuel-related leaks, spills, and incidents in the province; this listing in a copy of incidents reported to the SAC, obtained under Access to Public Information. Includes incidents from fuel-related hazards such as spills, fires, and explosions. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2017

Landfill Inventory Management Ontario: Provincial LIMO

The Landfill Inventory Management Ontario (LIMO) database is updated every year, as the ministry compiles new and updated information. The inventory will include small and large landfills. Additionally, each year the ministry will request operators of the larger landfills complete a landfill data collection form that will be used to update LIMO and will include the following information from the previous operating year. This will include additional information such as estimated amount of total waste received, landfill capacity, estimated total remaining landfill capacity, fill rates, engineering designs, reporting and monitoring details, size of location, service area, approved waste types, leachate of site treatment, contaminant attenuation zone and more. The small landfills will include information such as site owner, site location and certificate of approval # and status.

Government Publication Date: Feb 28, 2019

Canadian Mine Locations: Private MINE

This information is collected from the Canadian & American Mines Handbook. The Mines database is a national database that provides over 290 listings on mines (listed as public companies) dealing primarily with precious metals and hard rocks. Listed are mines that are currently in operation, closed, suspended, or are still being developed (advanced projects). Their locations are provided as geographic coordinates (x, y and/or longitude, latitude). As of 2002, data pertaining to Canadian smelters and refineries has been appended to this database.

Government Publication Date: 1998-2009*

Mineral Occurrences: Provincial MNR

In the early 70's, the Ministry of Northern Development and Mines created an inventory of approximately 19,000 mineral occurrences in Ontario, in regard to metallic and industrial minerals, as well as some information on building stones and aggregate deposits. Please note that the "Horizontal Positional Accuracy" is approximately +/- 200 m. Many reference elements for each record were derived from field sketches using pace or chain/tape measurements against claim posts or topographic features in the area. The primary limiting factor for the level of positional accuracy is the scale of the source material. The testing of horizontal accuracy of the source materials was accomplished by comparing the plan metric (X and Y) coordinates of that point with the coordinates of the same point as defined from a source of higher accuracy.

Government Publication Date: 1846-Jan 2020

National Analysis of Trends in Emergencies System (NATES): Federal NATE

In 1974 Environment Canada established the National Analysis of Trends in Emergencies System (NATES) database, for the voluntary reporting of significant spill incidents. The data was to be used to assist in directing the work of the emergencies program. NATES ran from 1974 to 1994. Extensive information is available within this database including company names, place where the spill occurred, date of spill, cause, reason and source of spill, damage incurred, and amount, concentration, and volume of materials released.

Government Publication Date: 1974-1994*

Non-Compliance Reports: Provincial NCPL

The Ministry of the Environment provides information about non-compliant discharges of contaminants to air and water that exceed legal allowable limits, from regulated industrial and municipal facilities. A reported non-compliance failure may be in regard to a Control Order, Certificate of Approval, Sectoral Regulation or specific regulation/act.

Government Publication Date: Dec 31, 2018

National Defense & Canadian Forces Fuel Tanks: Federal NDFT

The Department of National Defense and the Canadian Forces maintains an inventory of all aboveground & underground fuel storage tanks located on DND lands. Our inventory provides information on the base name, location, tank type & capacity, tank contents, tank class, date of tank installation, date tank last used, and status of tank as of May 2001. This database will no longer be updated due to the new National Security protocols which have prohibited any release of this database.

Government Publication Date: Up to May 2001*

National Defense & Canadian Forces Spills: Federal NDSP

The Department of National Defense and the Canadian Forces maintains an inventory of spills to land and water. All spill sites have been classified under the "Transportation of Dangerous Goods Act - 1992". Our inventory provides information on the facility name, location, spill ID #, spill date, type of spill, as well as the quantity of substance spilled & recovered.

Government Publication Date: Mar 1999-Apr 2018

National Defence & Canadian Forces Waste Disposal Sites: Federal NDWD

The Department of National Defence and the Canadian Forces maintains an inventory of waste disposal sites located on DND lands. Where available, our inventory provides information on the base name, location, type of waste received, area of site, depth of site, year site opened/closed and status.

Government Publication Date: 2001-Apr 2007*

National Energy Board Pipeline Incidents: Federal NEBI

Locations of pipeline incidents from 2008 to present, made available by the Canada Energy Regulator (CER) - previously the National Energy Board (NEB). Includes incidents reported under the Onshore Pipeline Regulations and the Processing Plant Regulations related to pipelines under federal jurisdiction, does not include incident data related to pipelines under provincial or territorial jurisdiction.

Government Publication Date: 2008-Mar 31, 2020

National Energy Board Wells: Federal NEBP

The NEBW database contains information on onshore & offshore oil and gas wells that are outside provincial jurisdiction(s) and are thereby regulated by the National Energy Board. Data is provided regarding the operator, well name, well ID No./UWI, status, classification, well depth, spud and release date.

Government Publication Date: 1920-Feb 2003*

National Environmental Emergencies System (NEES): Federal NEES

In 2000, the Emergencies program implemented NEES, a reporting system for spills of hazardous substances. For the most part, this system only captured data from the Atlantic Provinces, some from Quebec and Ontario and a portion from British Columbia. Data for Alberta, Saskatchewan, Manitoba and the Territories was not captured. However, NEES is also a repository for previous Environment Canada spill datasets. NEES is composed of the historic datasets ' or Trends ' which dates from approximately 1974 to present. NEES Trends is a compilation of historic databases, which were merged and includes data from NATES (National Analysis of Trends in Emergencies System), ARTS (Atlantic Regional Trends System), and NEES. In 2001, the Emergencies Program determined that variations in reporting regimes and requirements between federal and provincial agencies made national spill reporting and trend analysis difficult to achieve. As a consequence, the department has focused efforts on capturing data on spills of substances which fall under its legislative authority only (CEPA and FA). As such, the NEES database will be decommissioned in December 2004.

Government Publication Date: 1974-2003*

National PCB Inventory: Federal NPCB

Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. Federal out-of-service PCB containing equipment and PCB waste owned by the federal government or by federally regulated industries such as airlines, railway companies, broadcasting companies, telephone and telecommunications companies, pipeline companies, etc. are also listed. Although it is not Environment Canada's mandate to collect data on non-federal PCB waste, the National PCB inventory includes some information on provincial and private PCB waste and storage sites. Some addresses provided may be Head Office addresses and are not necessarily the location of where the waste is being used or stored.

Government Publication Date: 1988-2008*

National Pollutant Release Inventory: Federal NPRI

Environment Canada has defined the National Pollutant Release Inventory ("NPRI") as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances.

Government Publication Date: 1993-May 2017

Oil and Gas Wells: Private OGWE

The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com.

Government Publication Date: 1988-Feb 29, 2020

Ontario Oil and Gas Wells: Provincial OOGW

In 1998, the MNR handed over to the Ontario Oil, Gas and Salt Resources Corporation, the responsibility of maintaining a database of oil and gas wells drilled in Ontario. The OGSR Library has over 20,000+ wells in their database. Information available for all wells in the ERIS database include well owner/operator, location, permit issue date, and well cap date, license No., status, depth and the primary target (rock unit) of the well being drilled. All geology/stratigraphy table information, plus all water table information is also provide for each well record.

Government Publication Date: 1800-Jun 2019

Inventory of PCB Storage Sites: Provincial OPCB

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of PCB storage sites within the province. Ontario Regulation 11/82 (Waste Management - PCB) and Regulation 347 (Generator Waste Management) under the Ontario EPA requires the registration of inactive PCB storage equipment and/or disposal sites of PCB waste with the Ontario Ministry of Environment. This database contains information on: 1) waste quantities; 2) major and minor sites storing liquid or solid waste; and 3) a waste storage inventory.

Government Publication Date: 1987-Oct 2004; 2012-Dec 2013

Orders: Provincial ORD

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all Orders on the registry such as (EPA s. 17) - Order for remedial work, (EPA s. 18) - Order for preventative measures, (EPA s. 43) - Order for removal of waste and restoration of site, (EPA s. 44) - Order for conformity with Act for waste disposal sites, (EPA s. 136) - Order for performance of environmental measures.

Government Publication Date: 1994-May 31, 2020

Canadian Pulp and Paper: Private PAP

This information is part of the Pulp and Paper Canada Directory. The Directory provides a comprehensive listing of the locations of pulp and paper mills and the products that they produce.

Government Publication Date: 1999, 2002, 2004, 2005, 2009-2014

Parks Canada Fuel Storage Tanks: Federal PCFT

Canadian Heritage maintains an inventory of known fuel storage tanks operated by Parks Canada, in both National Parks and at National Historic Sites. The database details information on site name, location, tank install/removal date, capacity, fuel type, facility type, tank design and owner/operator.

Government Publication Date: 1920-Jan 2005*

Pesticide Register: Provincial PES

The Ontario Ministry of the Environment and Climate Change maintains a database of licensed operators and vendors of registered pesticides.

Government Publication Date: 1988 - May 2020

Pipeline Incidents: Provincial PINC

List of pipeline incidents (strikes, leaks, spills). This is not a comprehensive or complete inventory of pipeline incidents in the province; this listing in an historical copy of records previously obtained under Access to Public Information. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2017

Private and Retail Fuel Storage Tanks: Provincial PRT

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks and licensed retail fuel outlets. This database includes an inventory of locations that have gasoline, oil, waste oil, natural gas and/or propane storage tanks on their property. The MCCR no longer collects this information. This information is now collected by the Technical Standards and Safety Authority (TSSA).

Government Publication Date: 1989-1996*

Permit to Take Water: Provincial PTTW

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all PTTW's on the registry such as OWRA s. 34 - Permit to take water.

Government Publication Date: 1994-May 31, 2020

Ontario Regulation 347 Waste Receivers Summary: Provincial REC

Part V of the Ontario Environmental Protection Act ("EPA") regulates the disposal of regulated waste through an operating waste management system or a waste disposal site operated or used pursuant to the terms and conditions of a Certificate of Approval or a Provisional Certificate of Approval. Regulation 347 of the Ontario EPA defines a waste receiving site as any site or facility to which waste is transferred by a waste carrier. A receiver of regulated waste is required to register the waste receiving facility. This database represents registered receivers of regulated wastes, identified by registration number, company name and address, and includes receivers of waste such as: landfills, incinerators, transfer stations, PCB storage sites, sludge farms and water pollution control plants. This information is a summary of all years from 1986 including the most currently available data.

Government Publication Date: 1986-2016

Record of Site Condition: Provincial RSC

The Record of Site Condition (RSC) is part of the Ministry of the Environment's Brownfields Environmental Site Registry. Protection from environmental cleanup orders for property owners is contingent upon documentation known as a record of site condition (RSC) being filed in the Environmental Site Registry. In order to file an RSC, the property must have been properly assessed and shown to meet the soil, sediment and groundwater standards appropriate for the use (such as residential) proposed to take place on the property. The Record of Site Condition Regulation (O. Reg. 153/04) details requirements related to site assessment and clean up.
RSCs filed after July 1, 2011 will also be included as part of the new (O.Reg. 511/09).

Government Publication Date: 1997-Sept 2001, Oct 2004-May 2020

Retail Fuel Storage Tanks: Private RST

This database includes an inventory of retail fuel outlet locations (including marinas) that have on their property gasoline, oil, waste oil, natural gas and / or propane storage tanks.

Government Publication Date: 1999-Jan 31, 2020

Scott's Manufacturing Directory: Private SCT

Scott's Directories is a data bank containing information on over 200,000 manufacturers across Canada. Even though Scott's listings are voluntary, it is the most comprehensive database of Canadian manufacturers available. Information concerning a company's address, plant size, and main products are included in this database.

Government Publication Date: 1992-Mar 2011*

Ontario Spills: Provincial SPL

This database identifies information such as location (approximate), type and quantity of contaminant, date of spill, environmental impact, cause, nature of impact, etc. Information from 1988-2002 was part of the ORIS (Occurrence Reporting Information System). The SAC (Spills Action Centre) handles all spills reported in Ontario. Regulations for spills in Ontario are part of the MOE's Environmental Protection Act, Part X.

Government Publication Date: 1988-Nov 2019

Wastewater Discharger Registration Database: Provincial SRDS

Information under this heading is combination of the following 2 programs. The Municipal/Industrial Strategy for Abatement (MISA) division of the Ontario Ministry of Environment maintained a database of all direct dischargers of toxic pollutants within nine sectors including: Electric Power Generation; Mining; Petroleum Refining; Organic Chemicals; Inorganic Chemicals; Pulp & Paper; Metal Casting; Iron & Steel; and Quarries. All sampling information is now collected and stored within the Sample Result Data Store (SRDS).

Government Publication Date: 1990-Dec 31, 2017

Anderson's Storage Tanks: Private TANK

The information provided in this database was collected by examining various historical documents, which identified the location of former storage tanks, containing substances such as fuel, water, gas, oil, and other various types of miscellaneous products. Information is available in regard to business operating at tank site, tank location, permit year, permit & installation type, no. of tanks installed & configuration and tank capacity. Data contained within this database pertains only to the city of Toronto and is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

Government Publication Date: 1915-1953*

Transport Canada Fuel Storage Tanks: Federal TCFT

List of fuel storage tanks currently or previously owned or operated by Transport Canada. This inventory also includes tanks on The Pickering Lands, which refers to 7,530 hectares (18,600 acres) of land in Pickering, Markham, and Uxbridge owned by the Government of Canada since 1972; properties on this land has been leased by the government since 1975, and falls under the Site Management Policy of Transport Canada, but is administered by Public Works and Government Services Canada. This inventory provides information on the site name, location, tank age, capacity and fuel type.

Government Publication Date: 1970-Aug 2018

Variances for Abandonment of Underground Storage Tanks: Provincial VAR

Listing of variances granted for storage tank abandonment. This is not a comprehensive or complete inventory of tank abandonment variances in the province; this listing is a copy of tank abandonment variance records previously obtained under Access to Public Information. In Ontario, registered underground storage tanks must be removed within two years of disuse; if removal of a tank is not feasible, an application may be sought for a variance from this code requirement.
Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2017

Waste Disposal Sites - MOE CA Inventory: Provincial WDS

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of known open (active or inactive) and closed disposal sites in the Province of Ontario. Active sites maintain a Certificate of Approval, are approved to receive and are receiving waste. Inactive sites maintain Certificate(s) of Approval but are not receiving waste. Closed sites are not receiving waste. The data contained within this database was compiled from the MOE's Certificate of Approval database. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number. All new Environmental Compliance Approvals handed out after Oct 31, 2011 for Waste Disposal Sites will still be found in this database.

Government Publication Date: Oct 2011-May 31, 2020

Waste Disposal Sites - MOE 1991 Historical Approval Inventory: Provincial WDSH

In June 1991, the Ontario Ministry of Environment, Waste Management Branch, published the "June 1991 Waste Disposal Site Inventory", of all known active and closed waste disposal sites as of October 30st, 1990. For each "active" site as of October 31st 1990, information is provided on site location, site/CA number, waste type, site status and site classification. For each "closed" site as of October 31st 1990, information is provided on site location, site/CA number, closure date and site classification. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number.

Government Publication Date: Up to Oct 1990*

Water Well Information System: Provincial WWIS

This database describes locations and characteristics of water wells found within Ontario in accordance with Regulation 903. It includes such information as coordinates, construction date, well depth, primary and secondary use, pump rate, static water level, well status, etc. Also included are detailed stratigraphy information, approximate depth to bedrock and the approximate depth to the water table.

Government Publication Date: Feb 28, 2019

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

D

Appendix D
Site and Aerial Photographs

Aerial Photograph - geoOttawa
200 Lees Ave. Ottawa, ON - 2011
City of Ottawa (Ontario)

Aerial Photograph – Google Earth
200 Lees Ave. Ottawa, ON - 2012

City of Ottawa (Ontario)

Aerial Photograph – Google Earth
200 Lees Ave. Ottawa, ON - 2013

City of Ottawa (Ontario)

Aerial Photograph - geoOttawa
200 Lees Ave. Ottawa, ON - 2014

City of Ottawa (Ontario)

Aerial Photograph - geoOttawa
200 Lees Ave. Ottawa, ON - 2015

City of Ottawa (Ontario)

Aerial Photograph - geoOttawa
200 Lees Ave. Ottawa, ON - 2017

City of Ottawa (Ontario)

Aerial Photograph – Google Earth
200 Lees Ave. Ottawa, ON - 2018

City of Ottawa (Ontario)

Aerial Photograph – Google Earth
200 Lees Ave. Ottawa, ON - 2020

City of Ottawa (Ontario)

Site Location
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario

Photo #	Date	Cardinal Direction
1	07/08/20	East

Description

Photo of Site.
From west parking lot looking east.
To the east is Building C. To the west are residential apartment towers.
To the north is OC Transpo Lees Station and Highway 417.

Site Location
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario

Photo #	Date	Cardinal Direction
2	07/08/20	South

Description
Photo of Site. **From west parking lot looking south. Storage containers used to store hand sanitizer during COVID-19.** **To the east is Building C. To the west are residential apartment towers.** **To the north is OC Transpo Lees Station and Highway 417.**

Site Location		
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario		
Photo #	**Date**	**Cardinal Direction**
3	07/08/20	South
Description		
Photo of Site. From west parking lot looking south southeast. Building C entrance to the left. Exterior materials include stucco and concrete block mortar.		

Site Location		
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario		
Photo #	**Date**	**Cardinal Direction**
4	07/08/20	-
Description		
Photo of Building C garage interior. Minor staining likely do to condensation.		

Site Location		
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario		
Photo #	**Date**	**Cardinal Direction**
5	07/08/20	-
Description		
Photo of Building C interior—garage. Storage of used fluorescent bulbs and batteries. No evidence of spills or leaking from batteries.		

Site Location		
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario		
Photo #	**Date**	**Cardinal Direction**
5	07/08/20	-
Description		
Photo of Building C interior—garage. Waste bins and hot water tank. Tank was in good condition—no signs of rust, damage, or leaks.		

Site Location		
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario		
Photo #	**Date**	**Cardinal Direction**
6	07/08/20	-
Description		
Photo of interior of Building C Elevator mechanical room. Lubricant dripping from elevator motor. Catch bucket in place and no signs of staining on floor.		

Site Location		
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario		
Photo #	**Date**	**Cardinal Direction**
7	07/08/20	-
Description		
Photo of Building C interior— C109 storage room. Stored cleaners and supplies. No evidence of spills or staining.		

Site Location		
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario		
Photo #	**Date**	**Cardinal Direction**
8	07/08/20	-
Description		
Photo of interior—Building B mechanical room B151. Piping to and from air chilling inverter motor unit.		

Site Location		
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario		
Photo #	**Date**	**Cardinal Direction**
9	07/08/20	-
Description		
Photo of interior—Building B mechanical room B151. Condensate pools and staining on ground around chilled water return piping.		

Site Location		
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario		
Photo #	**Date**	**Cardinal Direction**
10	07/08/20	-
Description		
Photo of interior—Building B mechanical room B151. Dry style transformer.		

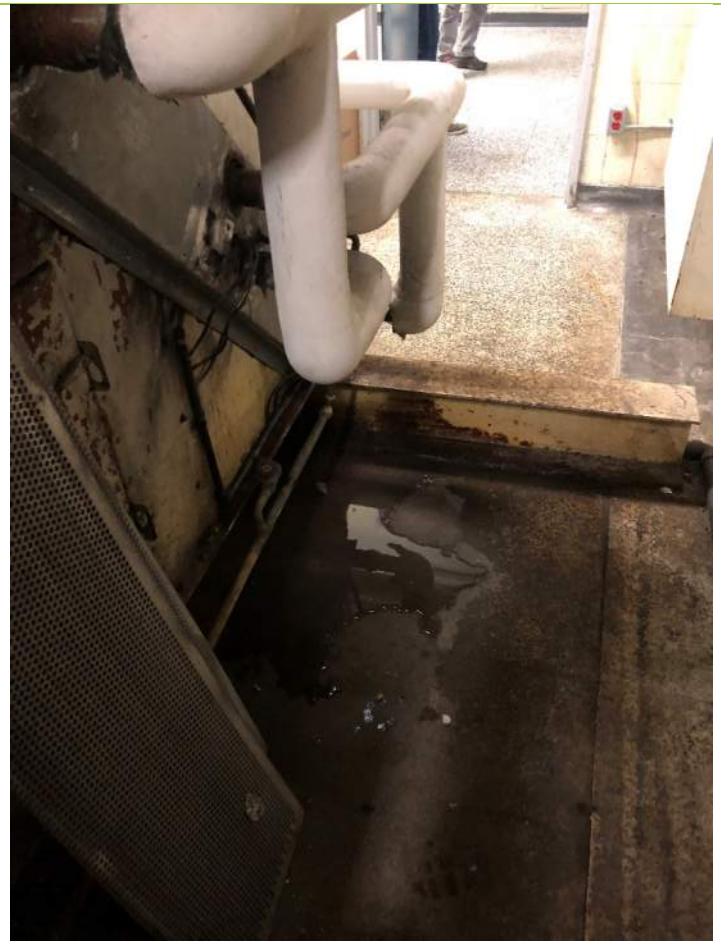
Site Location
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario

Photo #	Date	Cardinal Direction
11	07/08/20	-

Description

Photo of interior— Building B mechanical room B150. Air conditioning cabinet and chilled water insulated piping.

Site Location		
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario		
Photo #	**Date**	**Cardinal Direction**
12	07/08/20	-
Description		
Photo of interior—Building B mechanical room B150. Condensate pools and staining on ground around chilled water supply piping.		



Site Location		
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario		
Photo #	**Date**	**Cardinal Direction**
13	07/08/20	-
Description		
Photo of interior—Building B mechanical room B151. HVAC blower unit.		

Site Location		
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario		
Photo #	**Date**	**Cardinal Direction**
14	07/08/20	-
Description		
Photo of interior—Building D mechanical room. HVAC ducts and HVAC inverter motor. Transformer located against wall is a dry style transformer.		

Site Location
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario

Photo #	Date	Cardinal Direction
15	07/08/20	-

Description
Photo of interior— Building D mechanical room. Floor drain. Evidence of minor staining. No standing condensate pools.

Site Location		
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario		
Photo #	**Date**	**Cardinal Direction**
16	07/08/20	-
Description		
Photo of interior—Building D mechanical room. Insulated piping was in good condition. No evidence of leaks.		

Site Location		
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario		
Photo #	**Date**	**Cardinal Direction**
17	07/08/20	North
Description		
Photo of site. Exterior AC unit attached to the south side of Building C. Good condition.		

Site Location
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario

Photo #	Date	Cardinal Direction
18	07/08/20	South

Description
Photo of site. Exterior AC unit attached to the north side of Building D. Good condition.

Site Location
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario

Photo #	Date	Cardinal Direction
19	07/08/20	South

Description

Photo of site. Mobile fuel tank located in storage yard to the east of Building D. Contents unverified. Slight rusting of top of tank. No evidence of leaking or recent spills.

Site Location
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario

Photo #	Date	Cardinal Direction
20	07/08/20	South

Description
Photo of site. Empty drums located in storage yard to the east of Building D. Contents unverified. Rusting. No evidence of leaking or recent spills.

Site Location
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario

Photo #	Date	Cardinal Direction
21	07/08/20	East

Description

Photo of site. Waste bins located at the northwest corner of Building D. No evidence of recent spills and no staining of the concrete.

Site Location
Site Location – Part of 200 Lees Avenue, Ottawa, Ontario

Photo #	Date	Cardinal Direction
22	07/08/20	east

Description
Photo of site. Waste bins located at the east side of Building D. Flammable liquids locker was secured. No sign of rust or damage to locker. No evidence of stains or recent spills.

E

Appendix E
Assessor Qualifications

KAREN D GREER, M.Sc., P.Geo.

LEAD HYDROGEOLOGIST - ENVIRONMENT




Environmental Monitoring | Environmental Site Assessment | Site Remediation | Excess Soil Management

● Quality ● Respect ● Professionalism

CAREER

CIMA+ (since January 2020)

BluMetric (2003 - 2020)

Environment Canada, Environmental Research Assistant (2002)

Aqua Terre Solutions Inc., Field Technician (2001)

University of Waterloo, Hydrogeology Field Assistant (2000)

EDUCATION

M.Sc., Earth Science - Hydrogeology, University of Waterloo, 2009

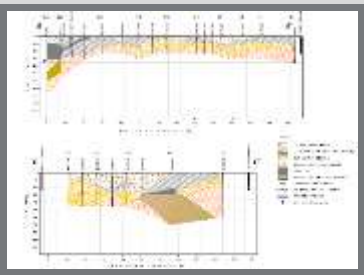
B.Sc., Earth Science / Environmental Hydrogeology Specialization, University of Waterloo, 2003

ASSOCIATIONS

Association of Professional Geoscientists of Ontario

National Ground Water Association in Ontario

International Association of Hydrogeologists



Hydrogeological Characterisation

Dewatering

PROFILE

Ms. Karen Greer is a Lead Professional/Senior Hydrogeologist/Project Manager with 18 years of technical and project management experience working extensively on projects detailing the hydrogeological properties and fate and transport of contaminants within the subsurface. Client sectors include federal, provincial, and municipal governments, large industry, commercial, and private enterprises.

She routinely manages and acts in a senior technical lead on projects relating to Environmental Site Assessments (ESA), contaminated site remediation, hydrogeological investigations as well as permitting and approvals. Her background, experience and understanding of physical and chemical hydrogeology allows her to take on the roll as a senior technical professional. Ms. Greer is Professional Geoscientist with the Professional Geoscientists of Ontario (P.Geo.), a Qualified Person (QP) as per Ontario Regulation 153/04 (QP_{ESA}) as well as a QP groundwater in Ontario.

DEVELOPMENT AND/OR ADVANCED TRAINING

- Expert Witness Forum 2018
- Fundamentals of Aquifer Test Interpretation, S.S. Papadopulos & Associates Inc.
- Advanced Construction Dewatering, Aquatech
- First Aid/CPR

PROJECT EXPERIENCE

Region of Peel. GE Booth Wastewater Treatment Plant New Plant 1 Hydrogeological Review, Toronto ON (2020 – on-going)

Engineering design of a new Plant 1 at the G.E. Booth Wastewater Treatment Plant was being completed. A third-party review was completed of the pre-design report including the geotechnical and hydrogeological reports. Completed a review of the initial reports as well as the third-party comments and worked with the sub-consultants to address hydrogeological concerns through the development, implementation and on-going review of additional investigations (drilling, seasonal water level monitoring, pump testing etc.).

Lead Hydrogeologist

City of Toronto. Ashbridges Bay Treatment Plant Refurbishing Hydrogeological Assessment, Toronto ON (2020 – on-going)

Refurbishing of existing digesters (9 to 12) at the Ashbridges Bay Water Treatment Plant required the dewatering of an excavation, located in the basement of the digester facility for the purpose of the installation of a concrete sump pit. Contractor was un-able to dewater the excavation to the required levels. Reviewed the existing contractor dewatering plan, geotechnical and hydrogeological site conditions, and site inspection reports and provided recommendations for additional geotechnical sub-surface investigation and based on the additional information provided hydrogeological recommendations to facilitate site dewatering.

Lead Hydrogeologist

Germain Hotels, Phase One and Two ESA for the Airport Hotel, Ottawa International Airport (2020).

Reviewed Phase One and Two ESAs as well as the remedial options and recommendations to be implemented during construction for work completed in support of the development of a commercial hotel development at the Ottawa International Airport. Based on the findings of fill of un-known quality and potential impacts associated with historical airport operations. The work was completed in accordance with O.Reg 153/04 as amended in support of a Site Plan Control Application with the City of Ottawa. *Peer*

Perley and Rideau Veterans' Health Centre, Phase One ESA, Perley and Rideau Vartan's Health Center, Ottawa (2020)

Provided technical support for recommendations of Phase One ESA for construction completed in support of site re-development. The Phase One ESA was completed in accordance with O.Reg 153/04, as amended in support of a Site Plan Control Application with the City of Ottawa. *Technical support.*

Private Client. Phase One ESA for Re-development of Residential Properties, Pretoria Ave. Ottawa ON (2019)

Completed a Phase One ESA in support of the re-development of two residential properties in down-town Ottawa. The report was completed in support of a Site Plan Control Application with the City of Ottawa. Facilitated the submission of the application in coordination with the site architect and planner and worked to address City comments resulting in a successful application. *Project Manager and Senior Hydrogeologist and QP_{ESA}*

Private Client. Phase One ESA and Limited Phase Two ESA for Re-development of Residential Property, Montreal Road, Ottawa ON (2017)

Phase One ESA was completed in support of the re-development of a residential property. Based on the findings of fill of un-known quality from the Phase One, a limited Phase Two was completed concluding that soil quality on the site met the applicable residential soil standards. The work was completed in support of a Site Plan Control Application with the City of Ottawa. *Project Manager and Senior Hydrogeologist and QP_{ESA}*

Commission Scolaire de la Vallee-Des-Tisserands. Ecole Omer Séguin Water Supply Development, Saint-Louis-de-Gonzague QC (2020 – on-going)

Final design of an expansion for Ecole Omer Sequin required the relocation of the existing water supply wells as well as the addition of water supply capacity to meet the demands of the larger school including the required drilling, hydraulic testing (pump tests), hydrogeological assessments and permitting.

Lead Hydrogeologist

PERMITTING AND APPROVALS

Waste Management of Canada Inc. Waste Water Treatment Plant Up-grade, Ottawa ON (2018 - 2020)

Waste Water Treatment Plant (WWTP) end of life assessment, feasibility, viability and options assessment was completed. Current WWTP was assessed and design completed to up-grade the WWTP to current Membrane Bioreactor technology. Oversaw the design, permitting (ECA), build and installation of the system.

Project Manager

Waste Management of Canada Inc. Excess Soil Management for West Carleton Environmental Centre, Ottawa ON (2019 - 2020)

Environmental Certificate of Approval was amended to facilitate a Soil Receiving Site. Excess Soil Management Plan was established along with Soil Management Plan, Fill Management Plan, Best Management Practices all based on a Risk Assessment completed for the suitability of the site. Soil pad was designed and built to facilitate soil received at the site for the purpose of on-site management and re-use. Acted as qualified person for the receiving site.

Project Manager and QP

Infrastructure Ontario. Pan Am Athletes' Village Geotechnical Engineering Related Services, Toronto ON. (2009-2011)

Completion of hydrogeological and geothermal assessments as part of a larger project to inform site design and construction and reduce the environmental impact of development. Hydrogeological investigation, including but not limited to dewatering assessments were completed for the purpose of obtaining PTTWs required for site redevelopment and building construction. The project required significant stakeholder communication involving many levels of government (Waterfront Toronto, Infrastructure Ontario, Port Land Authority, Ministry of the Environment etc.) and was on a tight timeline due to site re-development constraints.

Project Manager and Hydrogeologist

Regional Municipality of Waterloo. Hespeler Waste Water Treatment Plant, Cambridge ON. (2008-2011)

Development of a construction dewatering plan including site conceptual hydrogeologic model, determination of groundwater volumes for pumping and potential interference effects as well as permitting and approvals (PTTW, ECA).

Project Manager and Hydrogeologist

Private Client. Municipal Water Supply Development, Port Loring ON. (2003-2019)

Hydrogeological assessment that included drilling, aquifer testing, GUDI analysis, extensive chemical sampling and PTTW application for a new municipal water supply system. Hydrocarbons released from underground storage tanks in the late 1970s rendered private domestic groundwater supplies in the village unusable.

Hydrogeologist

Cornwall Gravel. Proposed Quarry Site Hydrogeological Investigation, Cornwall ON. (2018-2020)

Technical peer review of Level 2 Hydrogeological Investigation prepared in support of an Aggregate Resources Application for a proposed quarry site completed by others. Review completed following receipt of comments from the Ministry stakeholders (MECP and MNRF). Development and implementation of a detailed work plan to address comment and identified gaps in site conceptual model and hydrogeological understanding of the site to satisfy Ministry concerns.

Senior Hydrogeologist

Petawawa Pines and Forestry. Proposed Quarry Site Hydrogeological Investigation, Petawawa ON. (2014-2016)

Hydrogeological Investigations (Level 1 and 2) prepared in support of an Aggregate Resources Application for a proposed quarry site. Detailed studies were completed, public consultation as well as consultation with the Algonquins of Ontario, through the Aggregate Review panel was completed. Application was successfully submitted to the MECP and MNRF.

Project Manager and Senior Hydrogeologist

H&H Construction. Proposed Quarry Site Hydrogeological Investigation, Petawawa ON. (2018-2019)

Hydrogeological Investigations (Level 1 and 2) were submitted to the Ministry stakeholder (MECP and MNRF) in support of an Aggregate Resources Application for a proposed quarry site. Detailed review and comments received and addressed from the Ministry's as well as other stakeholders (public, Algonquins of Ontario, Town).

Senior Hydrogeologist

HYDROGEOLOGICAL INVESTIGATIONS AND ENVIRONMENTAL SITE ASSESSMENT

Public Works and Government Services Canada. Phase I/II/III ESA, Groundwater Investigations, CSM Update, Domestic Water Sampling, and Remedial Options Analysis. Former Fire Fighter Training Area at the Sault Ste. Marie Airport and Adjacent Pointe Des Chenes Campground, Sault Ste. Marie ON. (2015 - 2018)

Hydrogeological and site assessment investigations of the site and downgradient property with soil and groundwater impacted by PHC, BTEX, and PFAS. The project required; quick and effective response to changing client needs and project objectives; liaising with stakeholders (Ministry of the Environment in Ontario, Health Canada, downgradient property owner, City of Sault Ste. Marie, and general public); technical data interpretation and reporting oversight; preliminary remedial and risk management options assessments.

Project Manager and Senior Hydrogeologist

Public Works and Government Services Canada. Gap Analysis, Phase II/III ESA, Human Health and Ecological DQRA, Remedial Options Analysis, and Risk Management Plan Development/Implementation. Former RV Compound at CFB North Bay, North Bay ON. (July 2015 - March 2017)

The project saw the design and implementation of an environmental monitoring and maintenance plan, multi-year database and site- specific health and safety plan to manage human and ecological risks at a former small landfill site with soil, sediment, and groundwater impacted with PAH, PHC/BTEX, and inorganics. Project responsibilities for stakeholder communication; completing technical data interpretation and reporting oversight; and QA/QC of project deliverables.

Project Manager and Senior Hydrogeologist

Westboro Mortgage Investment. Terrain Analysis and Hydrogeological Investigation Proposed Riverbend Mixed Use Subdivision, Ottawa, ON (2015 – 2016)

A hydrogeological Investigations and terrain analysis were completed for a proposed sub-division within the City of Ottawa. The work involved a detailed investigation of the site geology and hydrogeology for the purpose of water supply quality and quantity assessments as well as sewage system design. Investigations and analysis were completed in accordance with the applicable technical guidance and regulations.

Senior Hydrogeologist

Private Client, Phase One / Two ESA and Remediation at a PAH Impacted Site. Cornwall ON. (2013 - 2016)

Phase One and Two, including remediation was completed in support of a RSC for the site which had been impacted by historic operations of an adjacent property where the contaminants of concern were identified as PHA. The project roll involved liaising with stakeholders (Ministry of the Environment, downgradient property owner, and general public); technical data interpretation and reporting oversight; excess soil management (QP); and detailed QA/QC of project deliverables. RSC was successfully filed.

Project Manager, Senior Hydrogeologist and QP_{ESA}

Private Client, Phase One and Two ESA, and Remediation at a PAH Impacted Site. Cornwall ON. (2011 - 2013)

Extensive remediation works to address historical PHA, PHC and metals impacts was completed for the site which had been contaminated by historic on- site industrial activities. A Phase One and Two ESA, including remediation was completed in support of filing an RSC. The project roll included liaising with stakeholders; completing detailed technical data interpretation and reporting oversight; excess soil management (QP); and oversaw and was responsible for QA/QC of project deliverables. RSC was successfully filed.

Project Manager, Senior Hydrogeologist and QP_{ESA}

Private Industrial Client, Phase I/II/III ESA for a former Industrial Facility. Thorold ON. (2007 - 2011)

Historical large industrial site with PCB, PHC, and metals-impacted soil, groundwater, and sediment. Work involved on-site and reporting of investigation, delineation, and remediation.

Project Hydrogeologist

City of Ottawa, Various Phase I/II ESAs Under Standing Offer Agreement Ottawa ON. (2009 - 2020)

Assessments were carried out to meet due diligence requirements for land purchases and sales, establish baseline conditions and assess properties where environmental impacts are known or suspected. Work occurred at various sites across the city.

Project Manager and Hydrogeologist

Private Client (Automotive Parts Manufacturer). Various Services Including Eight Phase I/II ESAs for Properties to be Closed or Divested, Various Sites ON and QC. Project Hydrogeologist. (2003 - 2011)

The properties represented a variety of geological and hydrogeological settings. Contaminants of concern included metals, PHC, chlorinated solvents, PAH, and PCB.

Project Hydrogeologist

Private Pulp and Paper client. Environmental Site Assessments. Various Sites ON and QC. (2017)

Phase I and II Environmental Site Assessments were conducted at rural active pulp and paper sites for due-diligence purposes in support of real estate transactions.

Project Hydrogeologist

Co-op Federal. Phase I ESA. Various Sites ON and QC. (2009)

Environmental Site Assessments were conducted at over 80 rural active pulp and paper sites for due-diligence purposes.

Project Hydrogeologist

Infrastructure Ontario. Phase I/II ESA, Huron Park ON. Project Hydrogeologist. (2005)

Assessment of a large former air force bases with multiple tenants undertaking various light industrial and commercial activities. The project included the collection of soil, ground water and indoor air samples in order to determine chemicals of concern. Reporting was completed to satisfy the client requirements for divestiture.

Project Hydrogeologist

CONTAMINANT SITE REMEDIATION

Private Client, Remedial Action Plan Development and Implementation for Site Remediation, Cornwall ON, (2017-2019) Remedial Action Plan development and implementation for a private client at a site located adjacent to the St. Lawrence Canal. The RAP detailed the remedial actions to be taken to clean up the site to background conditions. It included steps that needed to be take and mitigation measures around species at risk, proximity to water works, structural and geotechnical engineering requirements, excess soil management, infrastructure constraints (overhead power lines and buried gas lines), permitting and approvals, and regulatory requirements (provincial and federal). Project included an extensive soil remediation adjacent to the canal in the vicinity of structures (dam, bridge, pier, etc.) as well as existing infrastructure (hydro poles, high pressure gas line etc.). Stakeholder, sub-consultant and contractor management and communication were key to the successful completion of the Project.

Project Manager, Senior Hydrogeologist and QP_{ESA}

Foreign Government, Remedial Action Plan development and implementation, Ottawa ON. (2013 - 2018)

Remedial options assessment was completed based on site conditions with recommendations of multi-phase extraction system as the preferred solution. Work included detailed delineation of free and dissolved phase contamination, multi-source investigations, bench scale and pilot scale testing, product removal, and reporting.

Project Manager and Senior Hydrogeologist

Mac's Convenience Stores. Hydrogeological Study and Remediation, Fergus ON. (2003 - 2019)

Remediation consisted of free product removal, active plume management and containment (pump and treat with vacuum extraction), in-situ (per sulphate) and monitored natural attenuation. Project responsibilities included management of hydrogeological investigation, plume characterization and remediation of hydrocarbon contamination (dissolved and free phase) in fractured bedrock.

Project Hydrogeologist

Mac's Convenience Stores. Service Station Decommissioning or Upgrades, Various Sites ON. (2003 - 2019)

Work included contract management services and oversight of remedial activities and provision of on-going environmental consultation services

Project Manager, Senior Hydrogeologist and QP_{ESA}

Private Client. Environmental Site Assessment, Remedial Investigation, Feasibility Study and Design/Build of a Groundwater Remediation System, Cambridge ON. (2003 - 2018)

Work was conducted to address contamination at an industrial site contaminated with TCE and TCA. Detailed site investigation within fractured bedrock in support of a hydrogeological site conceptual model developed for the purpose of plum delineation and assessment of contaminate transport in the subsurface.

Project Hydrogeologist

Private Client. Remediation of Hydrocarbon Contamination at a Former Bulk Fuel and Retail Gas Station, Guelph ON (2003 - 2018).

The project included installation and sampling of groundwater monitoring wells, hydrocarbon fingerprinting, the development of a remedial action plan, risk assessment, excavation of impacted soil, in-situ remediation with persulphate, and reporting.

Project Hydrogeologist

Infrastructure Ontario. MNRF Pembroke Works Yard Limited Phase II ESA, Remediation Planning and Oversight and Long-Term Monitoring, Pembroke ON (2012 – 2016)

This project included development of a remedial action plan and remedial specifications (NMS format), remediation oversight and follow-up environmental monitoring and reporting. Contaminant of concern was PHC.

Project Hydrogeologist

WASTE DISPOSAL SITE MONITORING AND SOLID WASTE MANAGEMENT

Waste Management of Canada Inc. Various Waste Management Services for West Carleton Environmental Centre, Ottawa ON (2014 - 2020)

Responsible for: overall management of site environmental monitoring program for both groundwater and surface water; hydrogeologic investigations for leachate impact delineation; oversight and evaluation of effectiveness of leachate capture system and compliance within the contaminant attenuation zone (CAZ). Involved in environmental assessments for landfill expansion including public and government review team consultations and acting in the role of project team liaison.

Project Manager and Senior Hydrogeologist

Private Client Waste Disposal Site Environmental Compliance for an active site, Cornwall ON (2014 - 2020)

Responsible for: overall management of site environmental monitoring program (groundwater and surface water), CAZ assessment and compliance, and reporting.

Project Manager and Senior Hydrogeologist

Ingerdion Canada Inc. Waste Disposal Site Environmental Compliance for a closed site, Cardinal ON (2014 - 2020)

Responsible for the environmental monitoring and reporting of a solid waste disposal site including CAZ delineation and assessment, co-mingling plume examination and communication.

Senior Hydrogeologist

Magellan Aerospace (A Division of Magellan Aerospace Limited), Waste Management Services for an active site, Haley, ON. (2014 - 2020)

Responsible for the environmental monitoring and reporting of a solid waste disposal site including waste audits, volumetric surveying, contaminating life span and financial assurance calculations.

Senior Hydrogeologist

EXPERT TECHNICAL SUPPORT AND REVIEW

Victor Ages Vallance LLP. Peer review for a private commercial client in Ottawa ON. (2016)

Completed a review of work done by various environmental consultants historically on two properties known to have soil and groundwater impacts from the historical use of TCE. The review worked to address key issues including the origin of the source of impacts, were remedial activities previously completed successful, and the need and requirement for additional remediation.

Project Manager and Senior Hydrogeologist

Foreign Government, Review of historical site operations and remediation Ottawa ON. (2013 - 2018)

A review of all historical site operation and remediation completed by others relating to a former heating oil tank release. On-site remediation was completed in accordance with a remediation agreement with the down-gradient property owner. The review looked at the overall remediation efforts, the results of the remediation in the context of the remediation agreement, the current site conditions and next steps. Based on the results of the review a Remedial Options Assessment and ultimately a Remedial Action Plan was developed. The review work was all done under the supervision of council (Wilms and Shier LLP).

Project Manager and Senior Hydrogeologist

Borden Ladner Gervais LLP. Hydrogeological delineation and investigation related to road salt contamination of domestic water supply aquifer, Emsdale ON. (2011 - 2020)

The project involves delineation and CSM refinement of road salt impacted overburden and bedrock groundwater, data gap analysis, detailed bedrock characterization and well assessment. Involved project and client management, communication with residence, municipality and various other stakeholders including provincial governments and their legal teams. The work is being completed in support of a class action formed by a residence of the community who has been impacted.

Project Manager and Senior Hydrogeologist

PUBLICATIONS / PAPERS

- Greer, K.D., Barker, J.F., Molson, J.W., Thomson N.R., Donaldson, C.R. 2010. High-pressure injection of dissolved oxygen for hydrocarbon remediation in a fractured dolostone aquifer, Journal of Contaminant Hydrology 118 (2010) 13–26.
- Greer, K.D., 2009. Evaluation of an Oxygen Injection Technology for In-Situ Hydrocarbon Bioremediation in a Fractured Bedrock Environment. MSc Thesis, University of Waterloo.
- Greer, K.D., Barker, J.F., Molson, J.W., Donaldson, C.R., 2009. Evaluation of high-pressure oxygen injection for in-situ hydrocarbon bioremediation in a fractured bedrock environment, In Proceedings: 62nd Annual CGS and 10th Joint IAH-CNC Groundwater Specialty Conference, Halifax.
- Richard, F.A., van Walsum, N., Greer, K.D. and Novakowski, K. 2004. Continuous Downhole Hydraulic Testing of Fractured Bedrock Aquifers: Methodology and Field Example. Proceedings of the 57th Canadian Geotechnical Conference/5th Joint IAH-CNC/CGS Conference, Québec City, Canada, Oct. 24-28, 2004.

University of Ottawa

Phase Two Environmental Site Assessment

Proposed Site Redevelopment at 200 Lees Avenue, Ottawa, Ontario

A001049

CIMA+ file number: A001049
30 October 2020 – Review 00

University of Ottawa

Phase Two Environmental Site Assessment

Proposed Site Redevelopment at 200 Lees Avenue, Ottawa, Ontario

A001049

Prepared by:

Karen Greer, M.Sc., P.Geo., QP$_{ESA}$
Senior Hydrogeologist CIMA+

Verified by:

Raymond McNamara, ing.f.
Director – Environment CIMA+

240 Catherine Street, Suite 110, Ottawa, Ontario
Canada K2P 2G8

CIMA+ file number: A001049
30 October 2020 – Review 00

Confidentiality and ownership

1. Executive Summary

CIMA Canada Inc. (**CIMA+**) was retained by the University of Ottawa (uOttawa) to provide environmental services including the completion of a Phase Two Environmental Site Assessment (ESA) on a portion of the 200 Lees Avenue property planned for redevelopment. This Phase Two ESA report was prepared to meet the City of Ottawa's Site Plan Control application requirement and was therefore completed in generally accordance with the requirements of Ontario Regulation 153/04, as amended (O.Reg.153/04).

The Site is defined as the western portion of 200 Lees Avenue with an approximate area of 22,000 square meters (m^2). The Site is bounded by a naturalized 30 metres (m) buffer running along the Rideau River to the south, vacant properties and Highway 417 to the north, the Ottawa-Carleton Transitway Station to the west, and the remainder of the 200 Lees Avenue property (eastern portion) to the east (Building A, Building E, and the sports field). The Site was formerly a municipal landfill (UR-12) from 1906 to 1947, including a railway yard and an incinerator. Adjacent to the site was a former industrial area to the northwest that consisted of a former coal gasification plant (Franz, 2011). The Ottawa-Carleton Transitway Station and a groundwater control system facility are now located on the former coal gasification plant property.

The proposed redevelopment will see the demolition of Buildings B, C, and D and the construction of a new multi-storey "C" shaped building with no basement, with the exception for a small mechanical room. This new building will be located within the approximate footprint of existing Buildings C and D.

Past environmental investigations of the 200 Lees Avenue property, the Site (western portion of 200 Lees Avenue property) and the surrounding properties goes back to the mid 1980 when an oily tar-like substance (coal tar) was discovered in April 1986 at the pumphouse of the Lees Avenue Transitway Station and in the Rideau River (Intera, 1997). The source of the impacts was linked to historical site operations on properties located northwest of the Site. Following the discovery of the coal tar impacts extensive environmental investigations were completed, resulting in the installation of the Transitway Station groundwater collection system. The system acts to limit the migration of the impacts downgradient and creates a groundwater divide on the Site with groundwater in the northern portion of the Site flowing towards the northwest, and the system and within the south towards the Rideau River. Extensive soil and groundwater investigations have historically taken place on-Site. The investigations both on and off Site have resulted in an overall understanding of the sub-surface conditions and of the on-Site impacts in soil and groundwater. A Phase One ESA was completed by CIMA+ (2020) to assess on and off-Site Potentially Contaminating Activities (PCA) and associated Areas of Environmental Concern (APEC) on-Site. APEC's identified are summarized below.

APEC	Location of APEC	PCA	Location of PCA	Contaminants of Potential Concern	Media Potentially Impacted
A: Historic Landfill (cinder and ash fill layer)	Entire Site	58	On-Site	PAH, PHC and metals	Soil, Groundwater
B: Historic coal tar impacts	Northwest portion	5, 9	Off-site	PAH, PHC, and metals	Soil, Groundwater

On-Site intrusive activities to support the Phase Two ESA included a sub-surface investigation to further characterize the soil and groundwater conditions. The work was completed in support of the recommendations of the Phase One ESA (CIMA+, 2020) and in coordination with the geotechnical investigation completed by Golder (Golder, 2020). A summary of the result of the Phase Two ESA are as follows;

- Subsurface fill is heterogeneous in nature and is impacted with PAH and heavy metals;
- Soil analytical results of the fill reported concentrations of leachable lead above the applicable criteria and therefore classify the fill as leachate toxic waste if the fill is removed from Site;
- Groundwater elevations and flow in the overburden materials are dominated by the operation of the Transitway Station groundwater control system located on the property to the northwest of the Site;
- Groundwater impacts are limited to within the northwest portion of the Site closest to the known source of coal tar, that is being managed by the Transitway Station groundwater control system. Changes to the groundwater gradients on-Site as a results of construction dewatering or other Site operations could results in the mobilization of impacts onto the Site;
- Soil vapour is not a concern on-Site with the exception of within the northwest portion of the site where there is the potential for vapour migration, specifically for naphthalene and benzene within the unsaturated zone; and,
- Mercury concentrations in soil within the southern portion of the property have not be adequately characterized and therefore is remaining as a potential contaminate of concern (COC) within the southwest portion of the Site.

Based on the result of the Phase Two ESA, a Risk Assessment (RA) is recommended with the development of a Remedial Action Plan (RAP) to manage identified human health or ecological risks with the redevelopment of the Site. This Phase Two ESA and the preliminary results of the RA, which was initiated in parallel with the Phase Two ESA reporting component identify the benefit of a supplemental subsurface investigation in support of the RA and RAP. Recommendations for a supplemental site investigation are as follows:

- A Toxicity Leachate Characteristics Procedure (TCLP) sample for waste characterization of fill from the Site tested leachate toxic for lead and therefore additional investigation is recommended to better understand variation of the quality of the fill in terms of off-Site disposal if needed. The additional information would provide further insight for excess fill handling in support of the RAP.
- Mercury was reported to be present in one composite sample at the southwest of the site in excess of preliminary RA criteria. A supplemental assessment for mercury is recommended in order to verify the concentrations of mercury in soil. The additional information will aid to better understand the prevalence of mercury in the upper fill in this area and whether it needs to be further considered in the RA and RAP; and
- Concentrations of benzene and naphthalene in soil in the northwest corner of the site (MW12-11) were determined by the preliminary RA to require further soil vapour assessment to remove this item from the RA as a concern requiring vapour mitigation. A scope of work that allows for supplemental information to inform the RA on vapours associated with this soil quality is recommended.

Table of contents

List of Appendices

2. Introduction

CIMA Canada Inc. (**CIMA+**) was retained by the University of Ottawa (uOttawa) to provide environmental services on a portion of the 200 Lees Avenue property planned for redevelopment, herein referred to as the "Site". As a component of the environmental services, **CIMA+** completed a Phase Two Environmental Site Assessment (ESA).

The purpose of the work program was to determine if impacts to the natural environment are present at the Site within the identified Areas of Potential Environmental Concern (APEC) for the documented Potentially Contaminating Activities (PCA) as defined the Phase One ESA (CIMA+, 2020).

CIMA+ understands that the Site is being redeveloped by uOttawa and this Phase Two ESA report is being prepared to meet the City of Ottawa's Site Plan Control application requirements. In accordance with City of Ottawa requirements, the work was completed in generally accordance with the requirements of Ontario Regulation 153/04, as amended (O.Reg.153/04). A Record of Site Condition (RSC) was determined to not be required under O. Reg.153/04 for the proposed redevelopment as the land use of the property is not changing.

2.1 Site Description

The Site is defined as the western portion of 200 Lees Avenue with an approximate area of 22,000 square meters (m^2). The Site is bounded by a naturalized 30 metres (m) buffer running along the Rideau River to the south, vacant properties and Highway 417 to the north, the Ottawa-Carleton Transitway Station to the west, and the remainder of the 200 Lees Avenue property (eastern portion) to the east (Building A, Building E, and the sports field). Most of the Site is occupied by three (3) buildings (Building B, C, and D). Adjacent to the buildings are a storage yard (south of Building B), parking lots to the north and west and landscaping in much of the remaining open space. A Site location and Site plan is provided as **Figure 1 (Appendix A)**.

2.2 Phase Two Property Information

The Phase Two Property is defined as the western portion of 200 Lees Avenue and is referred to herein as the "Site", **Figure 1 (Appendix A)**. The Site is currently owned and managed by:

University of Ottawa (uOttawa)
75 Laurier Avenue East,
Ottawa, Ontario, K1N 6N5

2.3 Current and Proposed Future Uses

The 200 Lees Avenue property currently facilitates administrative and academic services for uOttawa. The Site was developed as its current use in the early 1960's for Algonquin College, and was subsequently transferred to uOttawa. Most of the main campus construction was completed in 1964, and included Buildings A to D, inclusive. The construction of Building E began and ceased with its completion in 1979; a second level was later added to Building C in 1993 (Franz, 2011).

The Site was formerly a municipal landfill (UR-12) from 1906 to 1947, including a railway yard and an incinerator. Adjacent to the site was a former industrial area to the northwest that consisted of a former coal gasification plant (Franz, 2011). The Ottawa-Carleton Transitway Station and a groundwater control system facility are now located on the former coal gasification plant property.

Following the demolition of Buildings B, C, and D the scope of the redevelopment consists of the construction of a new multi-storey “C” shaped building with no basement, with the exception for a small mechanical room. This new building will be located within the approximate footprint of existing Buildings C and D. It is understood that the use of the Site is to remain unchanged and will continue to operate as a university.

2.4 Applicable Site Condition Standards

The analytical results were assessed using the "Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act," MOE, July 1, 2011:

+ Samples were compared to the Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Ground Water Condition for community property use with coarse textured soils (Table 3 SCS).

Site specific aspects that support the use of the Table 3 SCS include:

+ The current and future land use of the Site is a university (**Section 2.3**) which is considered community property use, pursuant to Section 3 of the Post-secondary Education Choice and Excellence Act, 2000;
+ Grain size analysis was performed on two (2) samples (BH20-4 SS5 and BH20-4 SS12) which were found to be coarse in texture. Therefore, analytical results will be compared to coarse textured soil SCS;
+ Potable water for the Site is obtained from the City of Ottawa municipal system which primarily derives its water from the Ottawa River. There are no drinking water wells located on the Site or within 250 m of the Site (CIMA+, 2020);
+ Bedrock on-Site has been reported at a depth of approximately 10 to 13 meters below ground surface (mbgs);
+ The Site is bounded by a 30 m buffer between the Phase Two ESA study area and the Rideau River to the south; and
+ The Site does not to meet any other environmentally sensitive classification:
    - The Site is not located within or adjacent to an area of natural significance, as defined in O.Reg 153/04; and
    - Soil pH values were confirmed to be between 7.0 and 8.0 for all samples analysed (BH20-4-SS5).

3. Background Information

3.1 Physical Setting

The Site topography is relatively flat with an elevation of approximately 61 meters above sea level (masl) (AOV, 2020). Surface drainage is managed by a system of storm drains located throughout the 200 Lees Avenue property, inclusive of the Site that is connected to an outfall located on the western limit of the property (CIMA+, 2020). The Site is bounded by a naturalized area 30 m buffer area between the Site and the Rideau River to the south. No surface water features are located on-Site. Site Layout and Topography is shown in **Figure 2** (**Appendix A**).

Physiographically, the Site lies within the Ottawa Valley Clay Plains region (OGS, 2020). Stratigraphy at the Site from surface to depth consists primarily of sandy granular fill, cinders and ash, and construction debris; silty and fine sand alluvium with silty clay, coarse sand, and gravel; glacial till deposits with some clay and gravel; and fractured black shale the Billings Formation (Williams, 1984).

3.2 Past Investigations

Past environmental investigations of the 200 Lees Avenue property, the Site (western portion of 200 Lees Avenue property) and the surrounding properties goes back to the mid 1980 when an oily tar-like substance (coal tar) was discovered in April 1986 at the pumphouse of the Lees Avenue Transitway Station and in the Rideau River (Intera, 1997). The source of the impacts was linked to historical site operations on properties located northwest of the Site. The extent of contamination was first reported by Conestoga Rovers and Associates (CRA) in 1986 and was shown on a figure - 1986 Contaminant Distribution. The CRA report was not available for review but the figure is provided in **Appendix C** for reference. The figure shows the source of the coal tar originating off-Site to the northwest and migrating onto the Site.

Following the discovery of the coal tar impacts extensive environmental investigations were completed, resulting in the installation of the Transitway Station groundwater collection system. The previous Phase One ESA by Franz Environmental Inc. (Franz, 2011a) points to a historically multidirectional groundwater flow direction due to the operation of Transitway Station groundwater collection system that was installed by the City of Ottawa to control the migration of contaminants from the former coal gasification plant property located northwest of the Site. The system acts to limit the migration of the impacts downgradient and creates a groundwater divide on the Site with groundwater in the northern portion of the Site flowing towards the northwest, and the system and within the south towards the Rideau River.

Extensive soil and groundwater investigations have historically taken place on-Site. A Human Health and Ecological Site Specific Risk Assessment (SSRA) detailing site conditions in 2002 was completed by CH2MHill (CH2MHill, 2002) and most recently works in 2011 and 2013 by Franz (Franz, 2011 a, b and 2013), and uOttawa in 2019 (uOttawa, 2019). Investigations have also taken place most recently on the former coal gasification plant property to the northwest, as a known source of soil and groundwater impacts by Geofirma Engineering Ltd. in 2013 (Geofirma, 2013). The investigations both on and off Site have resulted in an overall understanding of the sub-surface conditions and of the on-Site impacts in soil and groundwater.

Key reports, as they relate to the Phase Two ESA are summarized below with additional information provided with the Phase One ESA completed by **CIMA+** (CIMA+, 2020).

Characterization of Subsurface Materials / Conditions – Geotechnical and Environmental Considerations. Algonquin College Rideau Campus, Ottawa Ontario. Golder Associates Ltd. August 2000.

Golder Associates Ltd. (Golder) completed an investigation on the 200 Lees Avenue property inclusive of the Site in 2000 (Golder, 2000) to assess the environmental and geotechnical conditions. The report concluded;

- The former land use of the Site and that of the adjacent property resulted in Polycyclic Aromatic Hydrocarbons (PAH) and metals impacts within soil above the applicable criteria at the time.
- PAH impacts were reported to be isolated however the metals (copper, lead, arsenic, zinc, boron, and mercury) impacts were widespread within the cinder and ash fill.
- The fill material was found to be non-hazardous, as per Ontario Regulation 347/90 (O. Reg 347).
- Groundwater was reported not to be impacted for the identified Contaminant of Concern (COC) of PAH, metals and Volatile Organic Compounds (VOC).
- Organic vapour and combustible gas measurements were obtained from monitoring wells and were reported to be at concentrations that could represent a risk to health and safety.
- The source of the vapour was attributed to biodegradation of waste and/or incomplete combustion of incinerated waste (within the former cinder and ash fill) that would produce methane.
- A Site-Specific Risk Assessment was recommended.

Final Report for MOE Submittal – Human-Health and Ecological Site-Specific Risk Assessment Algonquin College, Rideau Campus. CH2M Hill, July 2002

CH2MHill Canada Limited (CH2MHill) complete a Human Health and Ecological Site-Specific Risk Assessment (SSRA) for the property located at 200 Lees Avenue, inclusive of the Site in 2002 (CH2MHill, 2002). The SSRA was completed to assess the risks to human health and ecological receptors based on known COC in soil and groundwater as a result of historical coal gasification and landfilling operations in the area. The COC included the following;

- Metals – Antimony, Arsenic, Barium, Boron, Copper, Lead, Mercury, and Zinc; and
- PAH – Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluroanthene, Indeno(1,2,3-cd) pyrene, and Phenanthrene

As part of the SSRA, CH2MHill completed a detailed review of historical reports and various rounds of sub-surface investigations to fill in identified data gaps in order to better asses site specific human health exposure pathways. This included but was not limited to soil and groundwater sampling for COC (PAH, metals, sulphate, ammonia, and free cyanide) as well as methane and organic vapour monitoring for VOC.

As part of the soil sampling, composite soil samples were collected and analysed for metals including mercury. Soil results were consistent with those historical reported with concentration of metals (lead, barium, antimony) and PAH above the applicable criteria concentrations at the time. Impacts were not reported within the groundwater. Methane and organic vapour monitoring completed within the building crawl spaces and accessible groundwater monitoring wells noted as no methane or organic vapours detected.

SSRA results of the risk characterization indicated unacceptable risk for arsenic, lead, and PAH. Select metals (antimony, barium, boron, mercury and zinc), sulphate, ammonia and cyanide were removed from the list of COC based on the conclusions of the SSRA. The report also noted that the migration of vapours from groundwater would not be significant and therefore were not considered in the SSRA. Results of the SSRA concluded that no significant remedial action or rehabilitation was required at the time for the property and risk management measures were to be put in place to limit the potential exposure to the soil, sediment and groundwater contaminants. Additional landscaping and institutional controls were also suggested to minimize the acceptable risks to daily users of the property.

Geotechnical and Environmental Overview, Algonquin College Property – Rideau Campus. Golder Associates Ltd. April 2007.

Golder was retained to complete an overview of the available factual information and knowledge as it pertained to the geotechnical and environmental conditions for the 200 Lees Avenue property (Golder, 2007). The report summarized the Site conditions and provided recommendations for additional investigations and studies that was inclusive of a vapour monitoring program (basement of Building C and groundwater monitoring wells) to assess the vapours within the subsurface beneath the property as a result of the coal tar contamination on the property.

Phase Two Environmental Site Assessment University of Ottawa 200 Lees Avenue Ottawa, Ontario. Franz Environmental Inc. December 9, 2011

In 2011, Franz was retained to complete a Phase I and II ESA on the eastern portion of the 200 Lees Avenue property (not inclusive of the Site) (Franz, 2011a and 2011b). The results of the subsurface investigation (soil, groundwater, and vapour sampling) concluded; soil samples collected from the fill material in most of the boreholes exhibited results above the applicable SCS for metals and PAH; groundwater concentrations for Petroleum Hydrocarbons (PHC), metals, sVOC, phenols, PAH and VOC were below the applicable SCS; vapour and indoor air results did not demonstrate exceedances for any of the applicable volatile contaminants (BTEX - benzene, toluene, ethyl-benzene and xylene, PHC and naphthalene). Franz concluded that a human health risk assessment was warranted to manage the impacts in soil and groundwater.

After the 2011 Franz investigation, they completed a supplemental Phase II ESA on the western portion of the 200 Lees Avenue property (Franz, 2013). The portion of the property investigated by Franz is consistent with the Site boundaries as defined by this investigation. Multiple rounds of subsurface investigations along with soil and groundwater sampling were completed. Results indicated concentrations of PAH and metals (arsenic, cadmium, chromium, copper, lead, selenium, and zinc) in soil within the fill at locations across the Site. Soils were also analysed for PHC and Polychlorinated biphenyl (PCB) and were found to have concentrations below the applicable SCS. Groundwater samples analysed for PAH, metals, PHC and PCB were all below the applicable SCS except for the sample collected from MW12-11 located in the northwestern portion of the Site for PAH (acenaphthylene) and PHC (F2). Based upon the results Franz concluded the following;

+ Groundwater sampling indicates the presence of free phase product in the northwestern most portion of the Site;
+ Total area estimated to be impacted by coal tar at the Site is 3,200 m^2; and,
+ Mobility of impacted groundwater appears to be low as both free phase and dissolved impacts appear to be stable.

Risk Management Health and Safety Plan 200 Lees Ave. University of Ottawa. February 2012

A Risk Management Health and Safety Plan (HASP) was developed by the uOttawa as a supplemental plan in support of non-construction related activities to occur at the 200 Lees Avenue campus (uOttawa, 2012). The plan is based on a Human Health and Ecological SSRA that was completed for the property which found that the property conditions does not pose material human health or ecological risks (CH2MHill, 2002). This Risk Management HASP established protocols pertaining to personal protective equipment (PPE), associated safety procedures, and provided contingencies as a result of activities that would create a potential encounter with impacted subsurface soils and groundwater. The Risk Management HASP also provided critical safety advisories for minimizing risks with regards to third-party contractor activities. Additionally, the Risk Management HASP also outlines measures for reducing soil erosion along the riverbank, maintenance of soil cover, and fence maintenance.

Supplementary Phase 2 Environmental Site Assessment and Remedial Options Assessment 191 and 193 Lees Ave Ottawa, Ontario. Geofirma Engineering Ltd. February 4, 2013

Geofirma was retained by the City of Ottawa to complete a Supplementary Phase 2 ESA and Remedial Options Assessment (ROA) for 191 and 193 Lees Avenue, Ottawa, Ontario (Geofirma, 2013). 191 Lees Avenue is the Lees Avenue Transitway Station property and 193 Lees Avenue is vacant and located immediately north of the uOttawa property. Relevant to the Site are the findings at borehole and monitoring well location MW12-11. The remainder of the testing locations are off-Site but have been provided to put the off-Site information in context to the on-Site conditions. Historical occurrences of soil and groundwater quality that exceed the then applicable criterial; PAH in soil and groundwater; PHC-F1/BTEX in soil and groundwater; and metals in soil. Intrusive investigations were completed on the properties, City of Ottawa property, within the MTO right-of-way of Highway 417 and on uOttawa property (200 Lees Avenue). Seven (7) boreholes (BH12-13 to BH12-19) were drilled in various locations on the site. The boreholes were advanced to the top of till to delineate the known coal tar plume in the overlying permeable alluvial soils. Groundwater monitoring wells were installed within the permeable deep alluvium unit in all seven (7) boreholes drilled during the program described above. One round of groundwater sampling was performed. Groundwater samples were collected from 19 of the 2012 wells (7 installed in September and 12 installed in February 2012) and from 15 wells of the existing monitoring well network. Results of the drilling noted stratigraphic conditions consistent with those previously reported for the Site and detailed in the Site CSM. The patterns of groundwater flow in the deep alluvium showed the continued significant drawdown effect of the Transitway Station groundwater collection system on groundwater flow in the area of 191 and 193 Lees Avenue and extended impacts onto the 200 Lees Avenue property with groundwater flow in the north western portion of the site towards northwest and the Transitway Station groundwater collection system.

It was concluded in the report that the system provides hydraulic control over groundwater in the deep alluvium across the 191 and 193 Lees Avenue site, and beyond. The results of the drilling confirmed areas previously reported to have coal tar present (i.e., BH/MW12- 09, BH/MW12-10, BH/MW12-11 (located on-Site), BH/MW12-13, BH/MW12-15) below the Lees Avenue Transitway parking lot with less reported south of Lees Avenue on uOttawa property. A review of the soil analytical results indicated the following:

- Metals (barium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, silver, and zinc) impacts within the fill are low and not widespread. Only one impact was reported within the native soils (deep alluvium unit);
- PAH impacts within the fill and in the underlying native alluvium, predominately on the eastern side of the Transitway in the vicinity of the former gas plant structures. The highest PAH concentrations correspond to observed coal tar in recovered soil samples made in the field. Elevated PAH concentrations were found in boreholes BH12-09, BH12-10, and BH12-11 in the fill and below depths of 3 m within the deep alluvium;
- PHC-F1/BTEX impacts were from samples collected below a depth of 3 m in the fill and alluvium; and
- Notable product was not reported below the water table in several monitoring wells and visual coal tar was reported in the collected purge water from wells OW112B, MW12-09, MW12-10, MW12-11, MW12-13, and MW12-15.

Groundwater analytical results indicated the following:

- Metals and cyanide impacts in groundwater are not a concern at the site;
- PAH impacts of groundwater exceeding applicable Table 3 SCS were mainly in areas of identified coal tar impacts of soil. Concentrations above Table 3 SCS for several light to heavy molecular weight PAH were found in fill or deep alluvium groundwater at OW112B, MW12-09, MW12-10, MW12-11, MW12-13, and MW12-14;
- PHC-F1 and BTEX above of Table 3 SCS non-potable groundwater standards are limited to those boreholes with evidence of coal tar presence and/or PAH concentrations above Table 3 SCS. PHC-F1, benzene impacts were found at OW112B, MW12-09, MW12-10, MW12-11 (spring 2012 only), MW12-13, and MW12-14; and
- Bedrock groundwater quality was not investigated.

Overall soil and groundwater quality above the applicable SCS indicate that PAH and PHC-F1/BTEX remain the COC at the site. The distribution of coal tar contamination was determined from both visual/olfactory observation and laboratory chemical testing observed in 2012 is consistent with the distribution described in 1986 and 1987. Coal tar is present within the deep alluvium and to a lesser extent the shallow alluvium and fill units primarily on the east side of the Transitway below the parking lot. The highest concentrations of coal tar chemicals (i.e., PAH) were most often found in the fill and in the deep alluvium to the top of the low permeability basal till unit over the eastern half of the parking lot. Typically, coal tar is found in this part of the site at elevations of 53 to 50 masl at depths of 7 to 10 mbgs (e.g., BH12-09, BH12-10, and BH12-15). This coal tar appears to be pooled on top of the basal till unit.

The occurrence of coal tar at BH12-11 (and historically at OW120B) is consistent with historical movement of coal tar within the fill and deep alluvium and down the sloping till surface to the southeast of the parking lot. Coal tar is also shown to be present at shallow depths of 1.9 to 3.0 mbgs (elevations of 57.9 to 56.8 masl) within fill in the former relief gas holder (BH12-13) and in BH12-15. An initial assessment of potential remedial technologies and strategies to address the coal tar impacts at the site was completed.

Summary of Past Investigations

Prior to 2002, analytical results were summarized by CH2MHill (2002) as part of the SSRA and the concentrations for each COC were presented. Since 2012 additional investigations have been completed on the Site (Geofirma, 2013, Franz, 2012 and 2013) and concentrations for each COC reported. A summary of historical analytical results, maximum, minimum and average concentrations for each COC from before 2002 (as reported by CH2MHill) and investigations from 2012-2020 is summarized in **Table 1 (Appendix B)**. Historical sampling locations are shown on the Historical Investigation Locations figure included in **Appendix D** (prior to 2002) and on **Figure 3 (Appendix A)** (2012 to 2020).

A summary of historical analytical results with maximum, minimum and average concentrations for each COC within the groundwater on-Site is summarized in **Table 2 (Appendix B)**. The investigation locations and maximum concentrations above the SCS for each parameter are shown in **Figure 4 (Appendix A)**.

4. Scope of Investigation

4.1 Overview of Site Investigation

The Phase Two ESA included the completion of a subsurface investigation of soil and groundwater quality on-Site. Concurrent to the Phase Two ESA detailed herein, additional investigation and studies are being completed to support the development of the Site. Golder was retained by uOttawa to complete a geotechnical investigation (Golder, 2020) to provide geotechnical input to the details design of the proposed new buildings. The work was completed in coordination with the Phase Two ESA scope of work herein, as detailed below.

+ A utility locator was retained to complete public and private utility clearances and identify any underground utilities within the proposed work areas on the Site;
+ Golder supervised the drilling and sampling of three (3) boreholes which were completed as groundwater monitoring wells within the till and bedrock (BH20-1, BH20-2 and BH20-3) for the purpose of the geotechnical investigation (Golder, 2020). **CIMA+** oversaw the work and collected soil samples for environmental testing;
+ **CIMA+** supervised the drilling and sampling of two (2) boreholes which were completed as groundwater monitoring wells (BH20-4 and BH20-5);

Investigation Location	Rational	COC
BH20-1	fill and alluvium soil quality, bedrock water quality, adjacent to footprint on east side of Building C	PAH, PHC, metals
BH20-2	fill and alluvium soil quality, bedrock water quality, west of Building C between building footprint and Transitway to the west	PAH, PHC, metals

BH20-3	fill and alluvium soil quality, bedrock water quality, adjacent to footprint on west side of Building D	PAH, PHC, metals
BH20-4	fill and alluvium soil quality, alluvium water quality, adjacent to Building C and D footprint on west side of buildings	PAH, PHC, metals
BH20-5	fill and alluvium soil quality, alluvium water quality, northwest corner of the site to investigate known source of impacts (down-gradient of MW12-11)	PAH, PHC, metals

- The geology of the boreholes was logged, and representative soil samples were collected from each location for field screening and laboratory analysis. Any significant staining and/or odours were noted. A RKI Eagle II multi-gas detector equipped with photoionization detector (PID) capabilities was used to measure soil vapours in the collected samples;
- Collection of a minimum of two (2) soil samples from each borehole as well as a single duplicate sample using a split spoon sampler for submission to a certified laboratory for analysis of the following parameters: PHC, including BETX and PHC Fraction 1 and Fraction 4 (F1-F4), PAH, and metals. Select samples were submitted for pH, grain size, and fraction organic carbon;
- Composite soil sample (Bh20-4 and BH20-5) was collected and submitted as per the Toxicity Leachate Characteristics Procedure (TCLP) and compared to Schedule 4 of O.Reg 347 for soil disposal purposes;
- Newly installed monitoring wells were completed using 50.8 mm internal diameter (ID) schedule 40 polyvinyl chloride (PVC) screen with No. 10 slots, threaded onto a matching unslotted riser. The screening interval for each well was no greater than 3.1 m;
- Site reconnaissance was completed to locate and identify any groundwater monitoring wells installed as part of past investigations on the Site;
- Following the installation of the new groundwater monitoring well and the identification of existing locations, each monitoring well was developed by purging a minimum of three (3) well volumes using dedicated low-density polyethylene tubing and foot valve;
- Groundwater monitoring wells were monitored prior to sampling including initial vapour concentration readings from each well (as per soil screening method above), depth to non-aqueous phase liquid (NAPL), and water level using a Solinst interface meter;
- Low flow sampling techniques were used to sample each of the groundwater monitoring wells. Prior to sampling, water quality indicator parameters were measured using a YSI 556 multi-parameter meter equipped with a flow through cell. Samples were collected following the stabilization of water quality indicator parameters, including pH, conductivity, dissolved oxygen (DO), oxidation reduction potential (ORP) and temperature;
- Groundwater monitoring wells on-Site, five (5) newly installed and six (6) existing, were sampled for PHC, PAH, and metals;

- Approximately 10% of the samples, soil and groundwater consisted of quality assurance/quality control (QA/QC) samples. All samples were analysed by AGAT Labratories in Toronto, ON, a Canadian Association for Laboratory Accreditation Inc. (CALA) accredited laboratory; and
- A detail elevation survey of the newly installed and existing groundwater monitoring wells was surveyed by **CIMA+**.

Detailed methodologies, results and conclusions of the investigation are found herein.

4.2 Media Investigated

The media investigated as part of the Phase Two scope of work included;

- Soil sampling within the identified stratigraphic units inclusive of the fill, alluvium, and till;
- Coring of the site bedrock (Golder, 2020);
- Groundwater sampling of groundwater monitoring wells completed with the fill, alluvium, till, and bedrock;
- Soil vapour field screening of soil samples and headspace in groundwater monitoring wells; and
- Sediment samples were not collected as there is no surface water body present on-Site.

4.3 Phase One Conceptual Site Model (CSM)

Based on the information and data contained in the Phase One ESA report (CIMA+, 2020), including our understanding of the former property use, **CIMA+** developed a Conceptual Site Model (CSM) to understand possible impacts to the subsurface as a result of the APEC identified on-Site as per O. Reg. 153/04. The Phase One CSM is summarized in **Figure 5 (Appendix A)**, which illustrates key features on-Site and within 250 m of the Site.

The identified list of PCA as per O. Reg. 153/04, as amended, as per the results of the Phase One ESA (CIMA+, 2020) are listed in below. The locations of the PCA on and off-Site are depicted in **Figure 5 (Appendix A)**.

POTENTIALLY CONTAMINATING ACTIVITIES AS LISTED IN TABLE 2, SCHEDULE D OF O. REG. 153/04 (AS AMENDED)
Phase One Property/Site
58. Waste Disposal and Waste Management
Phase One Study Area/Study Area
5. Asphalt and Bitumen Manufacturing
9. Coal Gasification

Based on the results of the Phase One ESA (CIMA+, 2020), APEC identified for the Site are listed below. The general areas of the Site pertaining to each APEC are depicted in **Figure 5 (Appendix A)**.

APEC	Location of APEC	PCA	Location of PCA	Contaminants of Potential Concern	Media Potentially Impacted
A: Historic Landfill (cinder and ash fill layer)	Entire Site	58	On-Site	PAH, PHC and metals	Soil, Groundwater
B: Historic coal tar impacts	Northwest portion	5, 9	Off-site	PAH, PHC, and metals	Soil, Groundwater

The following describes the Phase One ESA CSM for the Site based on the information obtained and reviewed (CIMA+, 2020):

- The Site is defined as the western portion of 200 Lees Avenue with an approximate area of 22,000 m^2. The Site is bounded by a naturalized area with a 30 m buffer between the Site and the Rideau River to the south, vacant properties and Highway 417 to the north, the Transitway to the west, and the remainder of the 200 Lees Avenue property (eastern portion) to the east (Building A, Building E, and the sports field). Most of the site is occupied by three (3) buildings (Building B, C, and D). Adjacent to the buildings are a storage yard (south of Building B), parking lots to the north and west, and landscaping in much of the remaining open space.
- The Site has been used for educational purposes since Algonquin College developed the property in 1964. From circa 1906 to 1947, the Site was a former ash and cinder landfill of incinerator waste. As a result, the former industrial nature of the Site requires that the Site be treated as an enhanced investigation property. Adjacent to the Site was a former industrial area to the northwest that consisted of a former coal gasification plant and the location of the Transitway Station groundwater control system;
- Three (3) PCA were identified, one (1) of which was on the Site and two (2) off-Site. Based on-site characteristics and the locations of the off-Site PCA, a total of two (2) APEC were identified for the Site;
- Stratigraphy at the Site from surface to depth consists primarily of sandy granular fill, cinders and ash, and construction debris; silty and fine sand alluvium with silty clay, coarse sand, and gravel; glacial till deposits with some clay and gravel; and fractured black shale from the Billings Formation. The physiography of the soils is clay plains;
- Borehole records from previous environmental studies, both on and off-Site indicate the presence of wide-spread heterogeneous cinders and ash fill material 0 to 5 mbgs underlain by fine sand alluvium with silty clays and coarse sand and gravels at 3 to 10 mbgs, compacted glacial or basal till from 7 to 11 mbgs and black shale bedrock at a depth of approximately 10 to 13 mbgs;
- Previous soil vapour investigations concluded no concerns with respect to the volatile compounds (BTEX, PHC, naphthalene) or methane (CH2M Hill, 2002; Franz, 2011b);
- Past investigations have reported soil impacts being confirmed on-Site for PAH, PHC and metals within the fill and the native alluvium deposits (CH2M Hill, 2002);
- Samples historically collected as for TCLP reported concentrations below the applicable criteria as per Schedule 4 of O. Reg 347;
- Groundwater elevations on-Site were reported between 53.09 and 55.78 masl (uOttawa, 2019). Levels in the northwest portion of the Site are reported to be strongly influenced by

the Transitway Station groundwater collection system The system acts to limit the migration of the impacts downgradient and creates a groundwater divide on the Site with groundwater in the northern portion of the Site flowing towards the northwest, and the system and within the south towards the Rideau River.; and

+ Groundwater impacts have also been confirmed for PAH and PHC for wells completed within the fill and alluvium units located within the northwestern portion of the Site. Heavy metals have not impacted the groundwater within the fill and alluvium based on groundwater monitoring results to date. Limited groundwater investigations have been completed within the deep till and bedrock on-Site in the past.

4.4 Deviations from Sampling and Analysis Plan

The following deviation from the Phase Two ESA scope of work are documented:

+ Soil vapour readings were not measured for the soil samples collected during the drilling of three (3) of the boreholes (BH20-1, BH20-2 and BH20-3). The readings were not measured as a result of a shortage of soil available per sample because the soil samples were being split between Golder and **CIMA+**. Samples were screened for visual and olfactory evidence of impacts and were used as the basis for sample submission for analytical characterization;
+ The geotechnical investigation completed by Golder (2020) was to see the completion of three (3) boreholes and the installation of three (3) monitoring wells into bedrock. Due to the drilling conditions on-Site, one hole was terminated within the till unit (BH20-3) and the well installed. BH20-1 and BH20-2 were terminated in within the shale unit and monitoring wells installed in each; and
+ Historical well locations identified for inclusion within the groundwater monitoring and sampling program could not all be located or were found not to be in a suitable condition for sampling.

4.5 Impediments

The Phase Two ESA was completed in general accordance with the O.Reg 153/04. As part of the scope of work no impediments were noted and the overall table of contents as detailed in Appendix E of the regulation was followed. The scope of work however did not include full horizontal and vertical delineation of impacts within the fill stratigraphic unit on-Site, rather the scope of work confirmed the typical contaminant profile of the fill due to its heterogenous nature, which is considered appropriate for fill characterization. In addition, not all figures required as per the regulation were deemed to be necessary as these were provided in previous investigations completed (CH2MHill, 2002, Geofirma, 2013, Franz, 2013) and found to be representative of Site conditions (example cross-sections, horizontal and vertical contaminant concentrations figures etc.).

5. Investigation Method

5.1 General

The site work as part of the Phase Two ESA scope of work was completed between June and August 2020. Sampling and decontamination procedures and protocols used during this investigation were consistent with those established by the Ministry of the Environment (MOE) (now the Ministry of the Environment, Conservation and Parks [MECP]), as documented in the *Guide for Phase Two Environmental Site Assessments Under Ontario Regulation* 153/04, (June 2011) and the Association of Professional Geoscientists of Ontario (PGO) *Guidance for Environmental Site Assessments under Ontario Regulation* 153/04 as amended (April 2011).

5.2 Drilling and Excavating

Drilling activities were completed at the Site from July 6 to 10, 2020 by Grenville Drilling of Grenville Quebec a licensed well contractor as per Ontario Regulation 903/04 (O.Reg 903/04) in coordination with Golder (Golder, 2020). The drilling was completed by using a track mounted CME 55 Power Auger drill rig equipped with hollow stem augers and rotary diamond drilling techniques with HQ-sized rock coring capabilities.

CIMA+ field professional, under the supervision of the Qualified Person and in coordination with Golder, supervised the on-Site drilling activities; logged the boreholes, recorded detailed field observations, and collected representative soil samples.

A total of five (5) boreholes were advanced; three (3) of which were completed within the till or bedrock in coordination with Golder (BH20-1, BH20-2 and BH20-3) and two (2) additional locations were completed within the overburden (BH20-4 and BH20-5). Each of the five (5) locations were installed as groundwater monitoring wells (BH20-1 to BH20-5). A Site Plan depicting the location of all boreholes and monitoring wells is provided as **Figure 6 (Appendix A)** and drilling logs are provided in **Appendix E**.

Excavation activities were not included as part of the scope of work for this Phase Two ESA.

5.3 Soil: Sampling

Soil samples were retrieved during the drilling program with a percussion-driven system at continuous 300-millimeter (mm) intervals with a 50 mm diameter split spoon sampler. Upon opening the split spoon, **CIMA+** logged and recorded the soil type and physical characteristics. All samples were transported in coolers directly to the laboratory, within the laboratory specified hold times.

The following measures were taken to limit cross-contamination that could potentially occur during the drilling and soil sampling procedures:

+ Drilling augers were brushed clean between borehole locations;
+ Sampling equipment was de-contaminated with a phosphate-free soap and de-ionized water between each split spoon; and
+ The sampling technician wore nitrile gloves, minimized touching of the samples, and switched to a new pair of gloves prior to handling each new sample.

The frequency of soil sample collection for field screening purposes was, if possible, one (1) sample every 0.61 meter vertically, in each borehole, and as necessary to distinguish geologic strata. The actual soil sample intervals are shown on the borehole logs in **Appendix E**.

The frequency of soil sample collection for laboratory analyses was selected based on:

- A representative "worst case" soil sample, based on visual and/or olfactory considerations and field-measured vapour concentrations; and
- The sample location as required to delineate the contamination, if any, horizontally and vertically.

Soil samples selected for laboratory analysis were submitted for PHC, PAH, metals as well as select samples for pH, grain size, and fraction organic carbon. Blind duplicate soil samples were also collected and analysed for Quality Assurance/ Quality Control (QA/QC) purposes. Soil sampling included: nine (9) samples each for PHC, PAH, and metals including two (2) duplicate samples for QA/QC; one (1) sample for pH; two (2) samples for grain size analysis; and two (2) samples for fraction organic carbon.

5.4 Groundwater: Monitoring Well Installation

The groundwater monitoring wells were installed in coordination with the borehole installations as referenced in **Section 5.2**.

The monitoring wells consisted of a new 51 mm diameter polyvinyl chloride (PVC) screen with No. 10 slots, threaded onto matching un-slotted riser. The anticipated saturated length of the screen did not exceed 3.1 m. The screen interval extended within the stratigraphic unit of interest (alluvium, till, or bedrock). The annular space between the PVC well and the borehole wall was backfilled to approximately 0.3 m above the top of the screen with silica sand, and then with bentonite to approximately 0.3 mbgs. An air-tight cap was installed on the riser. The top of the monitoring well was then completed with a flush mount cover in the ground surface.

Monitoring well installation details are presented on the drilling logs in **Appendix E**. The water well records, as provided and submitted to the MECP by Grenville Drilling, are also provided in **Appendix E**.

5.5 Groundwater: Field Measurement of Water Quality Parameters

Groundwater level measurements were taken from each of the groundwater monitoring wells on July 20, 2020. Groundwater elevations were determined by subtracting the measured depth to the water level from the surveyed elevation of the point of measurement at the top of the plastic casing of the monitoring well after removal of the well cap. Well installation details and groundwater elevations are presented in **Table 3 (Appendix B)**.

The groundwater monitoring wells were developed on July 20, 2020 using new 16 mm ID low density polyethylene (LDPE) tubing equipped with the foot valve. Well water was removed until (a) the water was observed to be relatively free of turbidity, after removing a minimum of three (3) standing well-water casing volumes, or (b) the well became dry. During purging, groundwater appeared initially to be opaque, becoming clear during well development. Sheen, odours or discolouration was not observed at any of the monitoring well locations at the time of development.

Prior to sampling, each of the groundwater monitored wells were monitored and information relating to vapour concentrations, depth to water, depth/thickness of measurable free product (LNAPL and DNAPL), if present, and total well depth were recorded. The monitoring was completed using a RKI Eagle II and a Solinst Model 102 electronic oil/water interface meter.

5.6 Groundwater: Sampling

Groundwater sampling was conducted on July 22 and 23, 2020. Groundwater samples were collected, utilizing low sampling techniques (US EPA, 2017). During purging, field geochemical parameters were measured using YSI 556 multi-parameter meter and flow cell. Field parameters were recorded regularly for pH, conductivity, and temperature, ORP and DO). Elapsed time, flow rate, cumulative volume purges, and general observations regarding the quality of the purge water (sheen, odour) were recorded. Purging continued until parameters stabilized based on the following criteria;

Temperature:	+/-3%
pH:	+/- 0.1 pH units
DO:	+/- 10 or 0.2 mg/L (whichever is greater)
Conductivity:	+/- 3 %
ORP:	+/- 10 mV

Samples were collected in laboratory supplied bottles. Metals samples were field filtered using a dedicated, disposable 0.45 um Millipore filter. Groundwater sampling of 11 groundwater monitoring wells includes one (1) sample from each well for PHC, PAH, and metals with two (2) duplicated samples for QA/QC.

5.7 Sediment: Sampling

Sediment samples were not collected as part of this Phase Two ESA scope of work.

5.8 Analytical Testing

Soil and groundwater samples selected for chemical analysis were placed in clean, ice-packed coolers during transportation to a Canadian Association for Laboratory Accreditation Inc. (CALA) accredited laboratory for analysis. Samples were submitted to AGAT Laboratories in Ottawa, Ontario, under strict chain-of-custody protocols for chemical analysis. Analytical results are presented in **Appendix F**.

5.9 Residue Management Procedures

Purge water and soil cuttings were collected and stored in drums that were sealed and left on-Site for future off-Site disposal pending laboratory analytical results. A composite sample was collected from the soil cuttings (BH20-4 and BH20-5) and the sampled was submitted to the laboratory for analyses as per the Toxicity Leachate Characteristics Procedure (TCLP) as per O. Reg 347 for soil disposal purposes.

5.10 Elevation Surveying

On July 24, 2020, **CIMA+** completed a details site survey of the newly installed and existing groundwater monitoring on the Site. Well coordinates and elevations are provided within the drilling logs provided in **Appendix E**.

5.11 Quality Assurance/Quality Control (QA/QC) Measures

Strict quality assurance/quality control protocols are followed by **CIMA+** to ensure the accuracy and precision of analytical data, including:

- Drilling and monitoring well installation by a licensed well contractor in accordance with O. Reg. 903/90;
- Use of disposable equipment and/or cleaning of sampling equipment before initial use and between samples;
- Soil and groundwater sampling using dedicated filters (groundwater), and the use of new disposable nitrile gloves for collecting each sample;
- Maintaining a formal chain of custody record between **CIMA+** and the laboratory; and meeting laboratory hold times;
- The soil and groundwater samples were placed in clean, new containers that were supplied by the laboratory and contained any required preservatives. The containers were then immediately placed in coolers with ice. Each container was labelled with a unique sample name. The cooler contents were maintained at a temperature between 0 °C and 10 °C during shipment to the laboratory;
- Upon receipt of each cooler, the laboratory checks the following key items (and various others) and issues a report if any deficiency is found; the temperature of selected containers; consistency between the sample containers (number, labels types, etc.) and the laboratory analytical order form. The laboratory did not report any deficiencies regarding the sample submissions for this Site;
- Approximately 10% of the soil and groundwater samples collected were QA/QC samples, including bind field duplicates, and lab blanks. The relative percent difference (RPD) was calculated for blank samples, and are reported in **Section 6.9**;
- Using a YSI 556 multi-parameter meter and flow cell to measure pH, conductivity, temperature, ORP, and DO to ensure groundwater stabilization has been achieved; and
- Maintaining consistency with the standards established as per the *Guide for Completing Phase Two Environmental Site Assessments under Regulation 153/04* dated June 2011 and the Association of Professional Geoscientists of Ontario (PGO) *Guidance for Environmental Site Assessments under Ontario Regulation* 153/04 *as amended* (April 2011).

6. Review and Evaluation

6.1 Geology

The geology on-Site has been detailed extensively by others and was confirmed based on this Phase Two ESA scope of work to consist of four distinct geological units;

+ Fill materials referred to as a "cinder and ash" layer to varying depths and materials consisting of ash, sand, brick, wood, coal, and glass. The fill was confirmed as part of this investigation and was noted in each of the five (5) locations drilled at a depth ranging between 5.2 and 6 mbgs.
+ Silty and fine sand alluvium interbedded with silty clays and coarse sand and gravels, generally coarser with depth. The unit confirmed as part of this investigation and was noted in each of the five (5) locations drilled at a depth ranging between 5.3 and 7.6 mbgs;
+ Dense, basal sandy silt glacial till with some clay and gravel. The unit confirmed as part of this investigation and was noted in each of the five (5) locations drilled at a depth ranging between 6.8 and 7.6 mbgs; and
+ Fractured and weathered black shale of the Billings Formation was confirmed at depths of between 12.86 and 14.0 mbgs.

Drilling logs are presented in **Appendix E**.

6.2 Groundwater: Monitoring, Elevations and Flow Direction

As part of the groundwater monitoring, vapour readings were recorded and are noted in **Table 3 (Appendix B)**. Readings were below or just above the equipment detection limit of 1 ppm.

Groundwater level measurements were taken, and groundwater elevations were determined. Well installation details, water levels, and groundwater elevations are presented in **Table 3 (Appendix B)**. Groundwater levels were measured within the fill, alluvium, till and bedrock.

The groundwater levels within the shallow overburden units (fill and alluvium) is between 5.80 and 9.07 mbgs and range in elevation between 54.01 and 56.56 masl. Groundwater elevations and interpreted groundwater flow direction within the shallow overburden is provided in **Figure 7 (Appendix A)**. The flow within the shallow overburden is towards the northwest. The flow is consistent with that reported by others as being strongly influenced by the Transitway Station groundwater collection system (Geofirma, 2013). The water level in BH20-05 (4.65 mbgs) was noted to be an outlier at levels higher than others on-Site but this does not change the interpretation of overall groundwater flow. The groundwater divide, previously reported by others (Franz, 2013) was not noted on-Site as part of this investigation as no component of groundwater flow was observed to be towards the south and the Rideau River.

The groundwater elevations within the till and bedrock were noted to be consistent between 6.10 and 7.23 mbgs with a range in elevations between 54.34 and 56.66 masl. Based on the results and historical investigations on-Site, the till is known to act as an aquitard and restrict the downward groundwater flow, when present into the bedrock (Geofirma, 2013). The groundwater flow within the bedrock was not contoured as part of this investigation, as the wells were in locations that could not be triangulated. Groundwater elevations within the bedrock were noted to be consistent with those historically reported (Franz, 2013). Historical investigations note groundwater flow within the bedrock towards the south and the Rideau River (Geofirma, 2013).

6.3 Groundwater: Hydraulic Gradients

The horizontal and vertical gradient for groundwater flow is dominated by the operation of the Transitway Station groundwater collection system. The horizontal gradient becoming stronger with proximity to the pumping station and the vertical gradient being downward with pumping within the deeper portion of the alluvium unit (Geofirma, 2013).

6.4 Soil Texture

The predominant overburden material was observed to be silty and fine sand alluvium interbedded with silty clays and coarse sand and gravels, generally coarser with depth. Grain size analysis performed on two (2) samples (BH20-4 SS5 and BH20-4 SS12) was found to be coarse in texture. Therefore, analytical results will be compared to the more conservative, coarse textured soil SCS.

6.5 Soil: Field Screening

Soils samples were screened for soil vapours. The field screening results are shown on the drilling logs in **Appendix E**. The vapour readings detected during drilling were all below the detection limit (<1 ppm) for the field equipment.

6.6 Soil Quality

The analytical results for the soil samples collected during borehole drilling are summarized in **Table 4 (Appendix B)** and concentrations above the applicable SCS are noted on **Figure 8 (Appendix A)**. The Laboratory Certificates of Analysis are provided in **Appendix F**.

Soil analytical results are summarized as follow;

- Concentrations of PHC, including BTEX were reported below the applicable Table 3 SCS;
- PAH concentrations above the applicable Table 3 SCS were limited to samples collected within the fill at depths ranging between 2.3 and 2.9 mbgs;
- Various metals (arsenic, barium, cadmium, copper, lead, and zinc) were reported above Table 3 SCS within fill samples between 2.1 and 3.7 mbgs;
- Soil pH was reported to be 7.75 within the fill;
- Grain size within the fill and alluvium were noted as coarse grained; and
- Fraction Organic Carbon was reported to be 0.0024 within the fill and 0.019 within the alluvium.

The soil analytical results were compared to those historically report for the Site. Analytical results for PAH in soil have reported concentrations lower than the maximums reported prior to 2002 with an overall decrease in the average concentration of each PAH parameter. Metals concentrations continue to vary throughout the Site and therefore the variability in concentrations is not linked to time but to the heterogeneous nature of the impacts on-Site resulting in isolated “hot spots” and wide-spread impacts within the fill across the Site.

A composite sample was collected from the soil cuttings (from locations BH20-4 and BH20-5). The sampled was then submitted to the laboratory for analyses as per the Toxicity Leachate Characteristics Procedure (TCLP). Results are provided in **Table 6 (Appendix B)**. The results were then compared to Schedule 4 of O. Reg 347 for soil disposal purposes. Analytical results reported concentrations of leachable lead above the applicable criteria and are therefore deemed to be a leachate toxic waste as per the regulation. Various other metals (barium, boron, cadmium, and chromium) had concentrations above the reportable detection limit but below the criteria. Concentrations of other parameters analysed (VOC and PAH) were below laboratory detection limits.

6.7 Groundwater Quality

There was no evidence of free product such as Light Non-Aqueous Phase Liquids (LNAPL) or Dense Non-Aqueous Phase Liquids (DNAPL) during the advancement of the boreholes or field screening prior to water sampling. Vapour screening was completed with reading reported at less than 2 ppm in each of the monitoring wells.

The analytical results for the groundwater samples collected during the July 2020 sampling are provided in **Table 5 (Appendix B)** and concentrations above the applicable SCS are noted on **Figure 9 (Appendix A)**. The Laboratory Certificates of Analysis for all analyses are provided in **Appendix F**.

All groundwater samples reported at concentrations below the Table 3 SCS for PHC and metals. Concentrations of PAH (Acenaphthylene) were reported above the Table 3 SCS in MW12-11. Groundwater analytical results were compared to those historically reported for the Site. Impacts in groundwater continue to be limited to PAH parameters located within the northwest portion of the Site. Although maximum concentrations of metals are reported within groundwater across the site, the level remain below the applicable SCS.

6.8 Sediment Quality

There are no sediment sources on-Site, and as such sediment quality was not included in the scope of work.

6.9 Quality Assurance and Quality Control Results

Field blind duplicate samples and internal laboratory duplicate samples were analysed to assess potential variability introduced by field sampling procedures during soil and groundwater sampling. Blind duplicate sample at 10% frequency were collected for both soil and groundwater with samples taken by collecting a separate grab sample immediately following the collection of the original sample. The soil blind duplicate samples were collected from BH20-4 SS4 (DUP1) and BH20-4 SS12 (DUP2) and analysed for PAH, PHC, and metals.

The groundwater blind duplicate samples were collected from BH20-2-GW01 (DUP-1) and BH20-5-GW01 (DUP-2) and analysed for PAH, PHC, and metals.

A Relative Percent Difference (RPD) between the samples was calculated using the following formula:

Where: $$RPD = \left| \frac{(V_{field\ sample} - V_{field\ duplicate})}{mean} \right| \times 100$$

$v_{field\ sample}$: the concentration of the original field sample

$v_{field\ duplicate}$: the concentration of the field duplicate

RPDs less than 25% are considered acceptable. For an RPD > 25%, careful consideration of the quality of the sample is made to determine whether the value is representative of the site conditions before it is accepted.

The average RPD was below the target for acceptability of 25% for the blind duplicate BH20-4 SS12. For the blind duplicated BH20-4 SS4, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, cobalt, copper, lead, and zinc had RPD above the target of 25%. All other RPD that could be calculated for field duplicate samples of soil were found to be less than 25%. The variation in the RPD within sample for BH20-4 SS4 was attributed to the heterogeneous nature of the fill material on-Site and therefore acceptable and representative of Site conditions.

The only observed outlier was the result for the parameter Selenium with an RPD of 33.8% for groundwater sample BH20-5-GW01. All other RPD that could be calculated for field duplicate samples of groundwater were found to be less than 25%. Otherwise, RPD that were not calculated had concentrations that were too low to permit reliable results. Internal laboratory QA/QC testing results are shown as part of the laboratory results located in **Appendix F**.

6.10 Phase Two Conceptual Site Model

The purpose of the Phase Two CSM is to provide an understanding of the potential sources of contamination, the migration pathways for contamination, and potential receptors as a result of the potential environmental concerns identified.

- Geological conditions were confirmed with a heterogeneous fill layer laterally extensive across the Site consisting of sandy granular fill, cinders and ashes, and construction debris; silty and fine sand alluvium with silty clays, coarse sand, and gravels; glacial till deposits with some clay and gravel; and fractured black shale;
- Soil concentrations above the applicable SCS, are limited to PAH (Benz(a)anthracene, Benzo(b)fluoranthene, and Benzo(a)pyrene) and heavy metals (arsenic, cadmium, copper, lead, and zinc) within the fill material on-Site (between 2.1 and 3.7 mbgs);
- Analytical results for PAH in soil have reported concentrations lower than the maximums reported prior to 2002 with an overall decrease in the average concentration of PAH parameters. Metals concentrations continue to note variability across the Site due to the heterogeneous nature resulting in isolated “hot spots” and wide-spread impacts within the fill;
- Soil analytical results of fill reported concentrations of leachable lead above the applicable criteria and therefore are considered leachate toxic waste;

- Groundwater elevations and flow within the shallow overburden is dominated by the operation of the Transitway Station groundwater control system located on the property to the northwest of the Site, consistent with historical Site conditions.
- Groundwater concentrations were below applicable SCS with the exception for PAH (Acenaphthylene) in MW12-11. That well is in the northwestern portion of the Site closest to the known source of coal tar, that is being managed by the Transitway Station groundwater control system. Groundwater impacts are consistent with historical results and limited to PAH parameters located within the northwest portion of the Site and therefore not within the proposed development area or building footprint;
- Lowering of the groundwater table resulting in changes to the gradients, (construction dewatering etc.) could results in the mobilization of the coal tar;
- Groundwater concentrations within the bedrock were reported below the applicable SCS and/or below the laboratory reportable detection limit for each parameter analysed; and
- Groundwater analytical results were compared to historical and continue to be limited to PAH parameters located within the northwestern portion of the Site. With concentrations of metals in groundwater below the applicable SCS.

Subsequent to the Phase Two ESA scope of work, an updated RA and RAP are being completed to support the Site redevelopment. In support of the RA, a detailed review of the historical reports and site conditions was completed. Upon a detailed review of the SSRA completed by CH2MHill (2002), it was noted that the risk characterization for mercury and the subsequent removal of the contaminant from the list of COC, was done based on the previous applicable criteria (GUCSO Table B Residential / Commercial, 10 ug/g). With the introduction of the SCS Table 3 in 2011, the value for mercury was lowered to 0.27 ug/g. As part of the detailed review mercury results were noted to be above the current SCS in one (1) composite sample (although below at the time in 2002, pre 2011) collected in the southwest corner of the site. Upon further review the sample was noted not to have been collected in accordance with best practices (composite sample blended from four boreholes and not discreet samples from each borehole) and as a result the concentrations could be up to four (4) times higher than reported. This raised the concern that the mercury concentrations in soil within the southern portion of the property have not been adequately characterized and therefore remains an unknown within the RA.

The Geofirma report from 2012 (Geofirma, 2012) was also reviewed in detail as it pertains to the RA. The review noted that one soil sample collected above the water table at location MW 12-11 reported soil concentrations above the current MECP risk criteria. Based on the soil concentrations it raises concerns for potential vapour migration, specifically for naphthalene and benzene within the unsaturated zone on-Site.

Based on the preliminary results of the RA:

- The northwestern portion of the site has the potential for vapour migration, specifically for naphthalene and benzene within the un-saturated zone; and,
- Mercury concentrations in soil within the southern portion of the property have not be adequately characterized and therefore is remaining as a potential COC within the southwestern portion of the Site.

7. Conclusions and Recommendations

On-Site intrusive activities to support the Phase Two ESA included a sub-surface investigation to further characterize the soil and groundwater conditions. The work was completed in support of the recommendations of the Phase One ESA (CIMA+, 2020) and in coordination with the geotechnical investigation completed by Golder (Golder, 2020). A summary of the result of the Phase Two ESA are as follows;

- Subsurface fill is heterogeneous in nature and is impacted with PAH and heavy metals;
- Soil analytical results of the fill reported concentrations of leachable lead above the applicable criteria and therefore classify the fill as leachate toxic waste if the fill is removed from Site;
- Groundwater elevations and flow in the overburden materials are dominated by the operation of the Transitway Station groundwater control system located on the property to the northwest of the Site;
- Groundwater impacts are limited to within the northwest portion of the Site closest to the known source of coal tar, that is being managed by the Transitway Station groundwater control system. Changes to the groundwater gradients on-Site as a results of construction dewatering or other Site operations could results in the mobilization of impacts onto the Site;
- Soil vapour is not a concern on-Site with the exception of within the northwest portion of the site where there is the potential for vapour migration, specifically for naphthalene and benzene within the unsaturated zone; and,
- Mercury concentrations in soil within the southern portion of the property have not be adequately characterized and therefore is remaining as a potential COC within the southwest portion of the Site.

Based on the result of the Phase Two ESA, a RA is recommended with the development of a RAP to manage identified human health or ecological risks with the redevelopment of the Site. This Phase Two ESA and the preliminary results of the RA, which was initiated in parallel with the Phase Two ESA reporting component identify the benefit of a supplemental subsurface investigation in support of the RA and RAP. Recommendations for a supplemental site investigation are as follows:

- A TCLP sample for waste characterization of fill from the Site tested leachate toxic for lead and therefore additional investigation is recommended to better understand variation of the quality of the fill in terms of off-Site disposal if needed. The additional information would provide further insight for excess fill handling in support of the RAP.
- Mercury was reported to be present in one composite sample at the southwest of the site in excess of preliminary RA criteria (below the old SCS but above the 2011 SCS). A supplemental assessment for mercury is recommended in order to verify the concentrations of mercury in soil. The additional information will aid to better understand the prevalence of mercury in the upper fill in this area and whether it needs to be further considered in the RA and RAP; and
- Concentrations of benzene and naphthalene in soil in the northwest corner of the site (MW12-11) were determined by the preliminary RA to require further soil vapour assessment to remove this item from the RA as a concern requiring vapour mitigation. A scope of work that allows for supplemental information to inform the RA on vapours associated with this soil quality is recommended.

7.1 Study Limitations, Constraints and Acknowledgements

CIMA+ completed diligent and reasonable research in the conduct of this evaluation, with respect to the recognized laws, applicable regulations, and standards of practice. The facts presented in this report are strictly limited to the period of investigation. The conclusions presented in this report are based on the available information and documents, the observations made during the Site visit and the information obtained from communications with various contacts. The interpretation presented in this report is limited to this data.

CIMA+ is not responsible for erroneous conclusions due to voluntary abstention or the non-availability of pertinent information. Any opinion expressed in relation to legal or regulatory conformity is technical and should not be, in any case, considered as legal advice.

The work completed as part of this investigation was done under the direct supervision of Qualified Person, Ms. Karen Greer.

CIMA+

Karen Greer, M.Sc., P. Geo., QP_{ESA}

Senior Hydrogeologist

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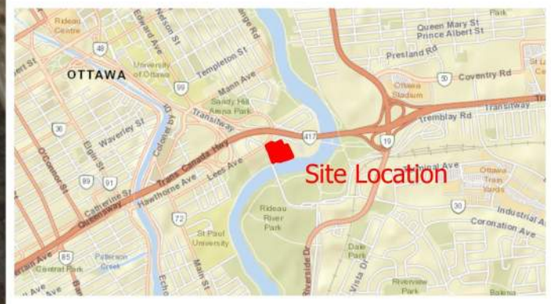
A

Appendix A
Figures

Phase Two Study Area

Property Parcel



Spatial Reference
Name: WGS 1984 UTM Zone 18N
PCS: WGS 1984 UTM Zone 18N
GCS: GCS WGS 1984
Datum: WGS 1984

Sources:
- Terrestrial Survey, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : Esri, HERE, Garmin, NGA, USGS, NPS, NRCan, GeoEye, Maxar

General Notes:

Figures are to be reviewed and interpreted with the associated report.
Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 1 - Site Location Map and Site Plan

Phase Two Environmental Site Assessment
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Ref # : C10-A001049-080-111

Survey by : J. Scott
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer

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Ontario

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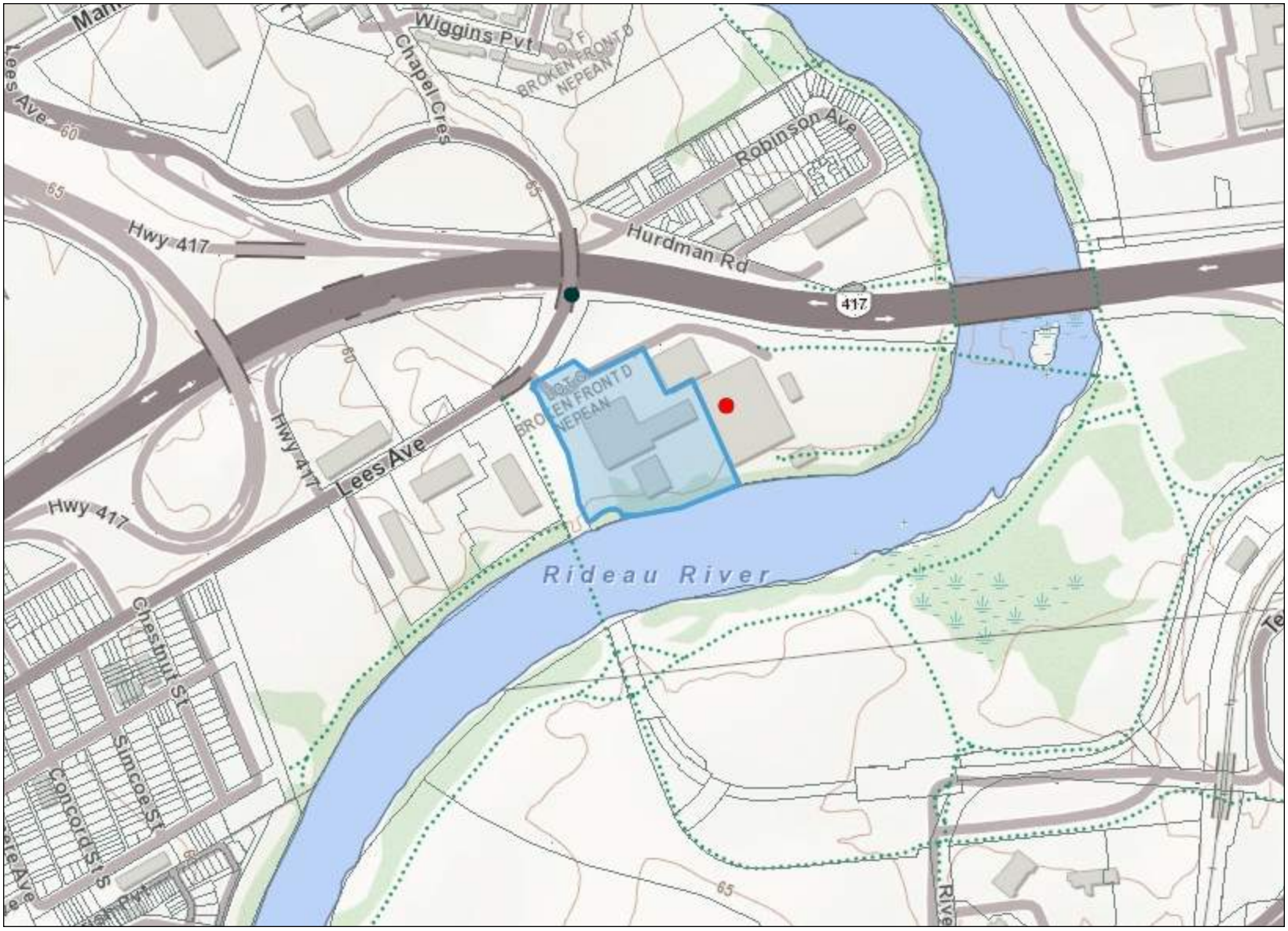
Make a Topographic Map

Figure 2 - Site Layout and Topography

Notes:



Legend

- Building as Symbol
- Building to Scale
- Airport
- Heliport \ Hospital Heliport
- Seaplane Base
- Ferry Route
- Trail Head \ Trail
- Railway \ Train Station
- Railway with Bridge
- Railway with Tunnel
- Road (Major → Minor)
- Winter Road
- Road with Bridge
- Road with Tunnel
- Primary, Kings or 400 Series Highway
- Secondary Highway
- Tertiary Highway
- District, County, Regional or Municipal Road
- Toll Highway
- One Way Road
- Road with Permanent Blocked Passage
- Road with Address Ranges
- Hydro Line, Communication Line or Unknown Transmission Line
- Natural Gas Pipeline, Water Pipeline or Unknown Pipeline
- Spot Height
- Index Contour
- Contour
- Wooded Area
- Wetland
- Waterbody
- Waterbody Elevation
- Watercourse
- Falls
- Rapids
- Rapids \ Falls
- Rapids
- Rocks
- Lock Gate
- Dam \ Hydro Wall
- Dam \ Hydro Wall
- Provincial \ State Boundary
- International Boundary
- Upper Tier \ District Municipal Boundary
- Lower Tier \ Single Tier Municipal Boundary
- Lot Line
- Indian Reserve
- Provincial Park
- National Park
- Conservation Reserve
- Military Lands

0 0.3 km

Projection: Web Mercator

N

Phase Two Study Area
Property Parcel
Previous Investigation Locations (Geofirma, 2013; Franz, 2013)
Investigation Locations (CIMA+, 2020)
Investigation Locations (Golder, 2020)

1:1,500
10 5 0 10 20 30 40
Meters

Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

Sources:
- Terrestrial Survey, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : GeoEye, Maxar

General Notes:

Figures are to be reviewed and interpreted with the associated report.
Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 3 - Summary of Sub-surface Investigation Locations (2012 - 2020)

Phase Two Environmental Site Assessement
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Ref # : C10-A001049-080-111

Survey by : J. Scott
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer

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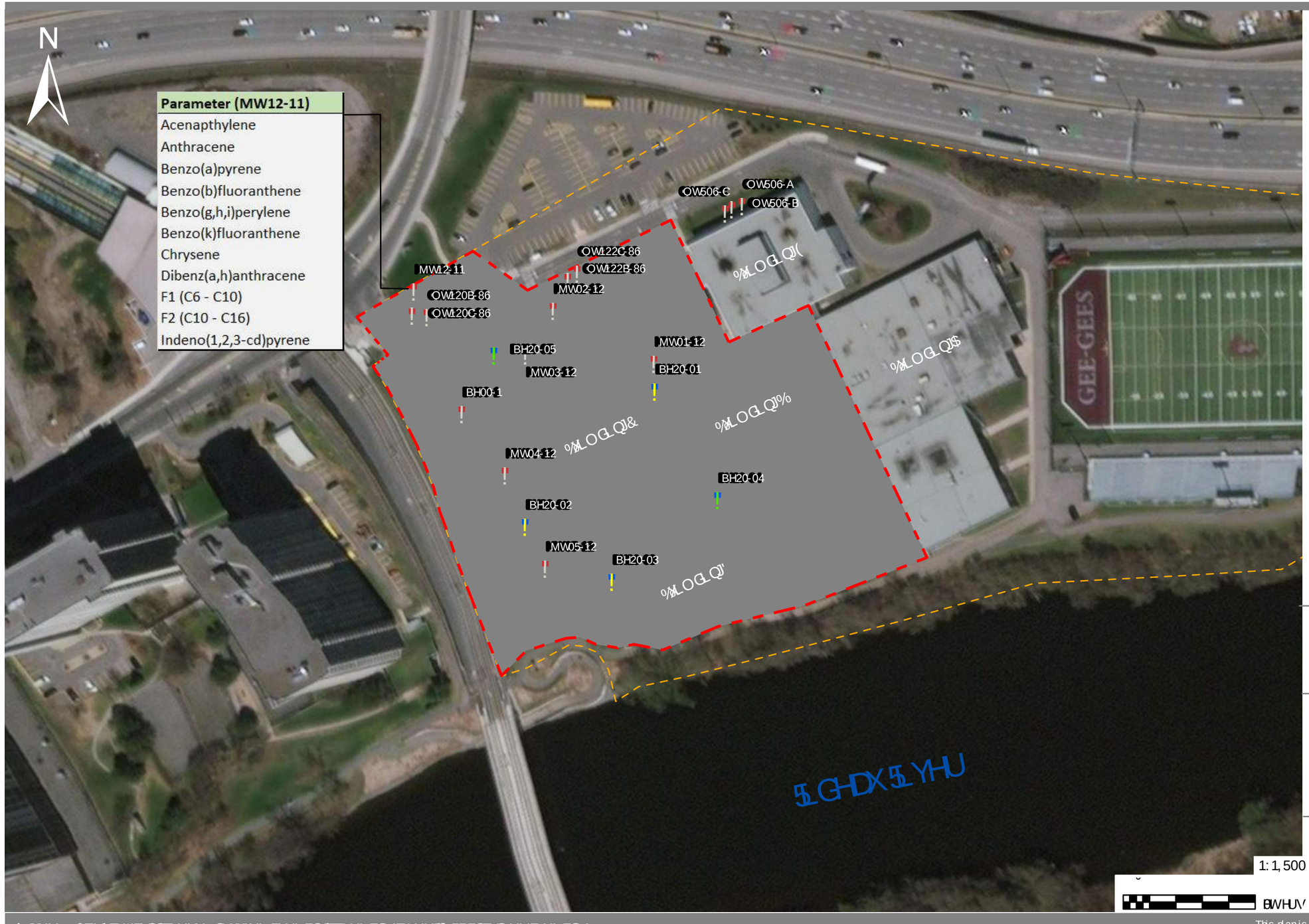


Phase Two Study Area

Property Parcel

Monitoring well locations (Geofirma, 2013; Franz, 2013; uOttawa, 2019)

Monitoring Well Locations (CIMA, 2020)

Monitoring Well Locations (Golder, 2020)

Indicates compounds with maximum concentrations above Table 3 SCS at well location.

Parameter (MW12-11)
Acenaphthene

Standards[1] - Table 3 SCS		MW12-11 Max
Parameter	µg/L	Concentrations (µg/L)
Acenaphthylene	1.8	**73.1**
Anthracene	2.4	**5.02**
Benzo(a)pyrene	0.81	**3.1**
Benzo(b)fluoranthene	0.75	**3.24**
Benzo(g,h,i)perylene	0.2	**1.3**
Benzo(k)fluoranthene	0.4	**1.25**
Chrysene	1	**3.24**
Dibenz(a,h)anthracene	0.52	**0.57**
F1 (C6-C10)	750	**1770**
F2 (C10 to C16)	150	**760**
Indeno(1,2,3-cd)pyrene	0.2	**1.32**

Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

1:1,500

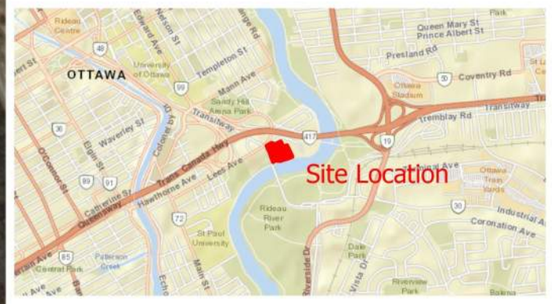
Phase Two Study Area
Property Parcel
Estimated Extent of Coal Tar Impacts on uOttawa property (from off-site sources)

Areas of Potential Environmental Concern (APEC)

APEC A: Historic Landfill
APEC B: Historic coal tar impacts

Potentially Contaminating Activity (PCA)

Waste Disposal and Waste Management (58) PCA
Asphalt and Bitumen Manufacturing (5) and Coal Gasification (9) PCA



Spatial Reference
Name: WGS 1984 UTM Zone 18N
PCS: WGS 1984 UTM Zone 18N
GCS: GCS WGS 1984
Datum: WGS 1984

Sources:
- Terrestrial Survey, 2020
- Coal Tar Plume, Suppl. ESA, Franz Environmental Ltd., 2011
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : Esri, HERE, Garmin, INCREMENT P, NGA, USGS, NRCan, GeoEye, Maxar

General Notes:

Figures are to be reviewed and interpreted with the associated report.
Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 5 - Phase One Conceptual Site Model

Phase Two Environmental Site Assessment
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Ref # : C10-A001049-080-111

Survey by : J. Scott
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer

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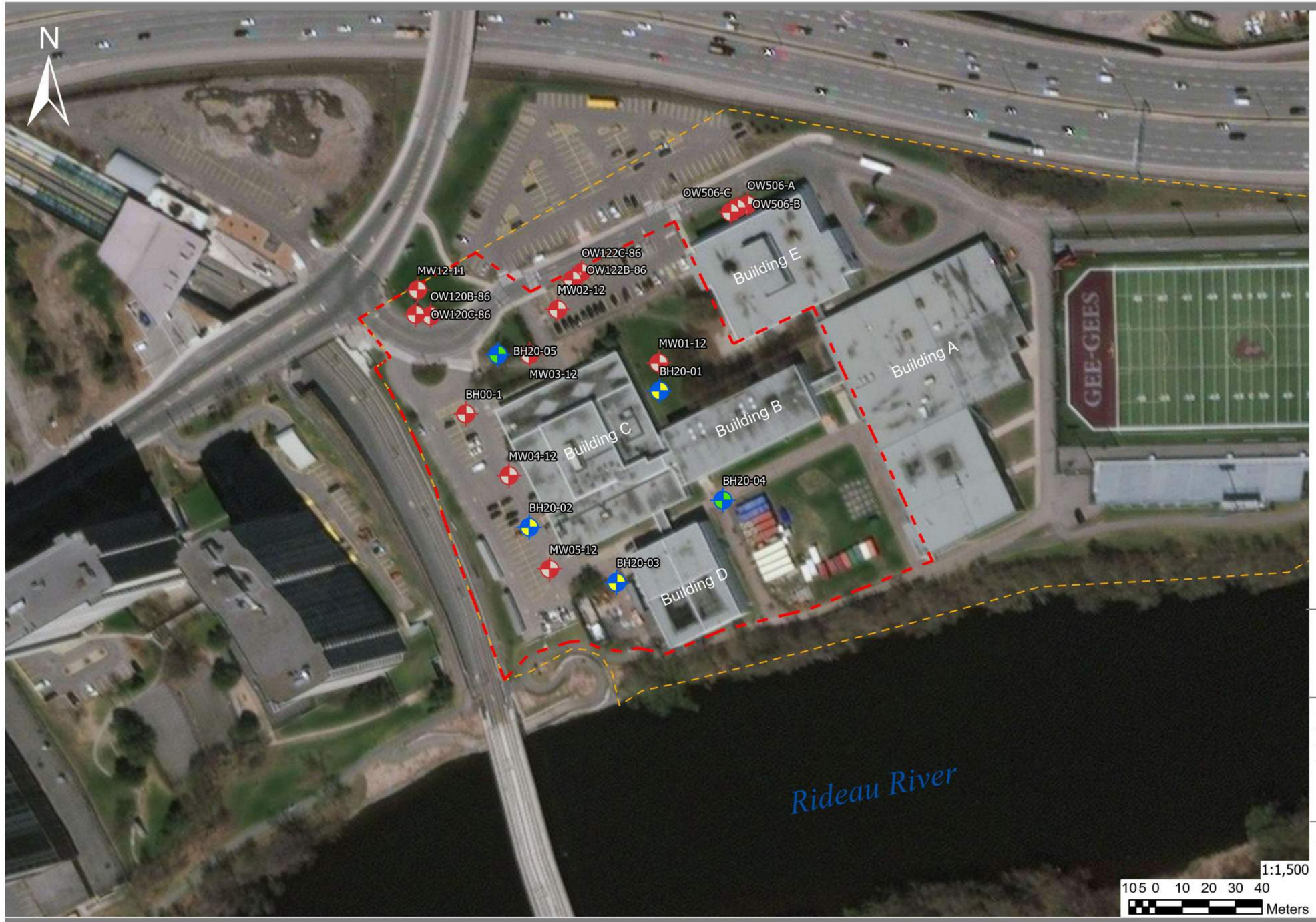

Phase Two Study Area
Property Parcel
Monitoring well locations (Geofirma, 2013; Franz, 2013; uOttawa, 2019)
Monitoring Well Locations (CIMA, 2020)
Monitoring Well Locations (Golder, 2020)

Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

Sources:
- Terrestrial Survey, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : Esri, HERE, Garmin, INCREMENT P, NGA, USGS, NRCan, GeoEye, Maxar

General Notes:

Figures are to be reviewed and interpreted with the associated report.
Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 6 - Soil and Groundwater Investigation Locations

Phase Two Environmental Site Assessment
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Ref # : C10-A001049-080-111

Survey by : J. Scott
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer

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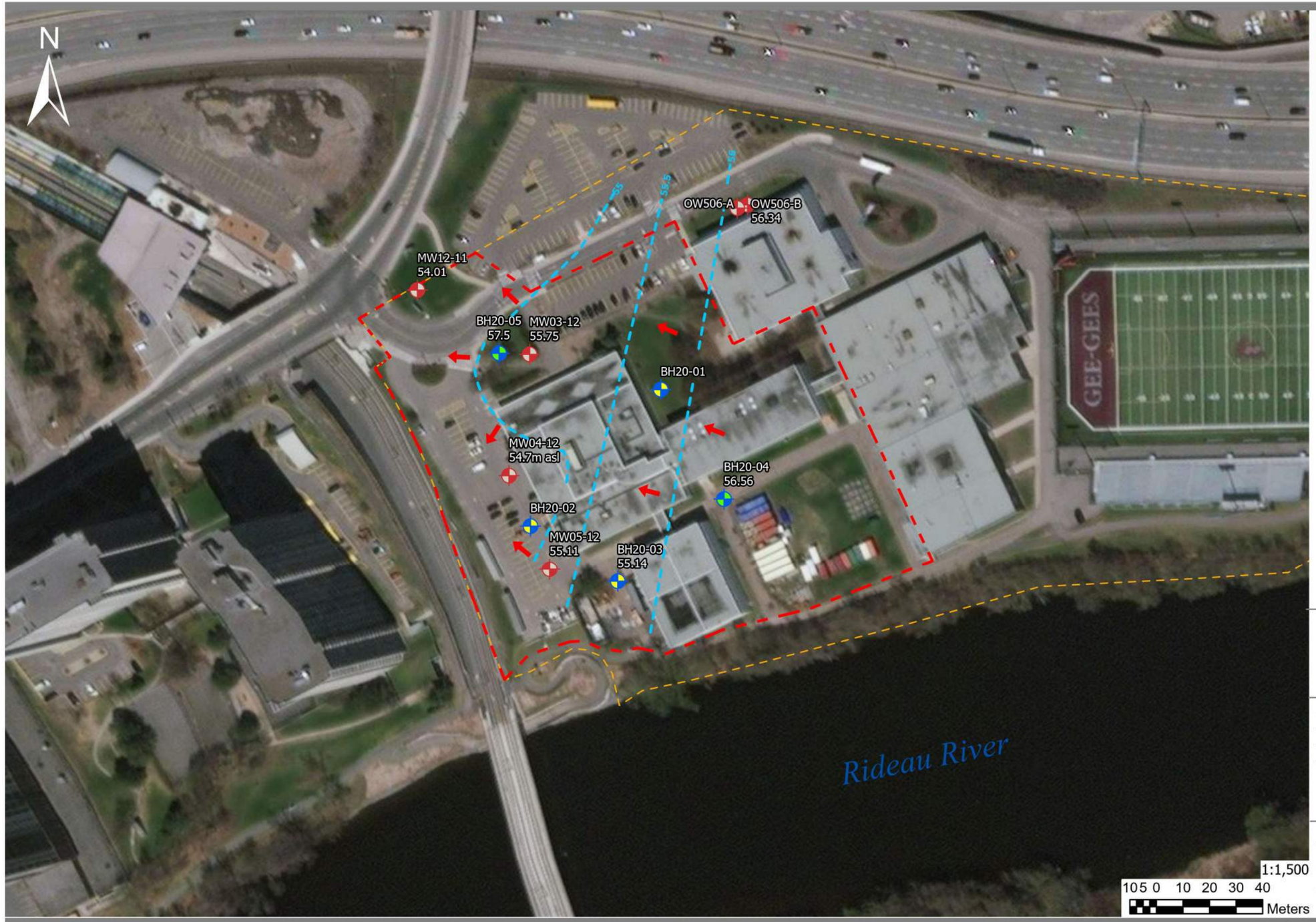

Phase Two Study Area
Property Parcel
Monitoring Well Locations (CIMA+, 2020)
Monitoring Well Locations (Golder, 2020)
Monitoring well locations (Geofirma, 2013; Franz, 2013; uOttawa, 2019)
Groundwater elevations (July 2020) - in meters above sea level (m asl)*
Overburden groundwater flow direction

Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

Sources:
- Terrestrial Survey, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : Esri, HERE, Garmin, INCREMENT P, NGA, USGS, NRCan, GeoEye, Maxar

General Notes:

*: GW elevation = Top of Well PVC Riser Elevation (m asl) - water level (m asl)
- Figures are to be reviewed and interpreted with the associated report.
Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 7 - Groundwater Elevation and Overburden Flow Direction

Phase Two - Environmental Site Assessment
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Ref # : C10-A001049-080-111

Survey by : J. Scott, L. Robert
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer
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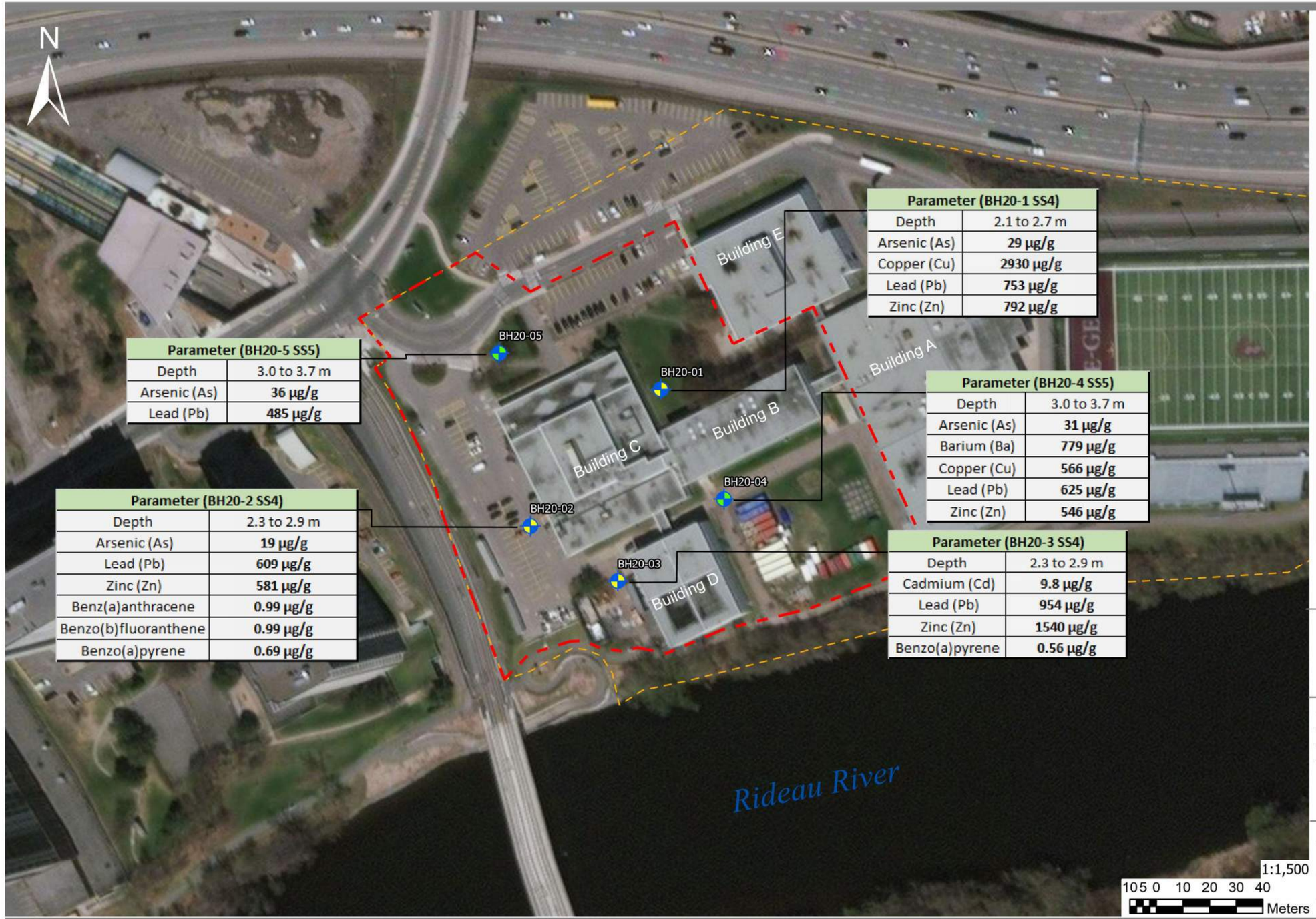

Phase Two Study Area
Property Parcel
Monitoring Well Locations (CIMA, 2020)
Monitoring Well Locations (Golder, 2020)

Standards[1] - Table 3 SCS (PAH)	
Parameter	µg/g
Naphthalene	9.6
Acenaphthylene	0.15
Acenaphthene	96
Fluorene	62
Phenanthrene	12
Anthracene	0.67
Fluoranthene	9.6
Pyrene	96
Benz(a)anthracene	0.96
Chrysene	9.6
Benzo(b)fluoranthene	0.96
Benzo(k)fluoranthene	0.96
Benzo(a)pyrene	0.3
Indeno(1,2,3-cd)pyrene	0.76
Dibenz(a,h)anthracene	0.1
Benzo(g,h,i)perylene	9.6
1 and 2 Methlynaphthalene	76

Standards[1] - Table 3 SCS (Metals)	
Parameter	µg/g
Antimony (Sb)	40
Arsenic (As)	18
Barium (Ba)	670
Beryllium (Be)	8
Boron (B)	120
Cadmium (Cd)	1.9
Chromium (Cr)	160
Cobalt (Co)	80
Copper (Cu)	230
Lead (Pb)	120
Molybdenum (Mo)	40
Nickel (Ni)	270
Selenium (Se)	5.5
Silver (Ag)	40
Thallium (Tl)	3.3
Uranium (U)	33
Vanadium (V)	86
Zinc (Zn)	340

0.0 - Exceedances above Table 3 SCS

Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

Sources:
- Terrestrial Survey, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : City of Ottawa imagery, 2017

General Notes:

1: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Community Property Use - Coarse Grained Soils
- Dimensions on the plan should be read and not measured.
Figures are to be reviewed and interpreted with the associated report.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 8 - Soil Analytical Results with Exceedances above SCS (2020)

Phase Two Environmental Site Assessment
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Ref # : C10-A001049-080-111

Survey by : J. Scott, L. Robert
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer

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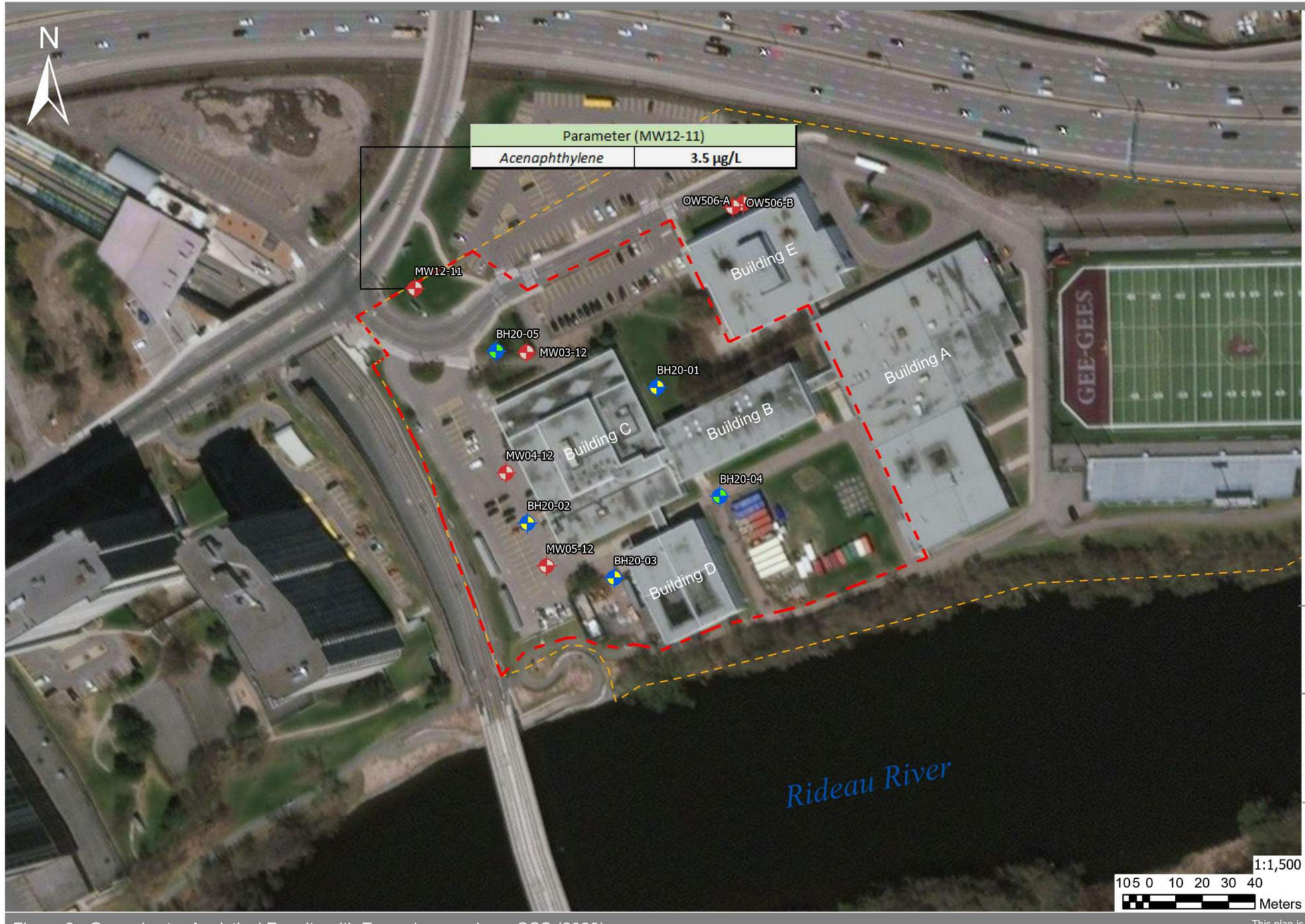


Phase Two Study Area
Property Parcel
Monitoring well locations (Geofirma, 2013; Franz, 2013; uOttawa, 2019)
Monitoring Well Locations (CIMA, 2020)
Monitoring Well Locations (Golder, 2020)

Standards[1] - Table 3 SCS (PAH)	
Parameter	µg/L
Naphthalene	1400
Acenaphthylene	1.8
Acenaphthene	600
Fluorene	400
Phenanthrene	580
Anthracene	2.4
Fluoranthene	130
Pyrene	68
Benzo(a)anthracene	4.7
Chrysene	1
Benzo(b)fluoranthene	0.75
Benzo(k)fluoranthene	0.4
Benzo(a)pyrene	0.81
Indeno(1,2,3-cd)pyrene	0.2
Dibenz(a,h)anthracene	0.52
Benzo(g,h,i)perylene	0.2
2-and 1-methyl Naphthalene	1800

0.0 - Exceedances above Table 3 SCS

Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

Sources:
- Terrestrial Survey, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : City of Ottawa imagery, 2017

General Notes:

1: Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Ground Water Condition - All types of property use
- Dimensions on the plan should be read and not measured. Figures are to be reviewed and interpreted with the associated report. Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 9 - Groundwater Analytical Results with Exceedances above SCS (2020)

Phase Two Environmental Site Assessment
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Ref # : C10-A001049-080-111

Survey by : J. Scott, L. Robert
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer
Revision 00 - - Issued for report - 09 October 2020

B

Appendix B
Tables

A001049 - uOttawa
Table 1 - Summary of Soil Analytical Result Summary (pre-2002 and 2012 - 2020)

Parameter	Units	Standards[1] Table 3 SCS	Sample ID/Sampling Depth (m)/Sampling Date CH2MHill 0 to 3 m prior to 2002			Geofirma, Franz, CIMA+ 2012-2020		
			Min[2]	Max	Avg	Min[2]	Max	Avg
Polyaromatic Hydrocarbons (PAH)								
Naphthalene	µg/g	9.6				0.0025	**15.60**	0.04
Acenaphthylene	µg/g	0.15				0.0025	**3.06**	0.04
Acenaphthene	µg/g	96				0.0025	4.37	0.05
Fluorene	µg/g	62				0.0025	3.71	0.06
Phenanthrene	µg/g	12	0.0016	163	7.77	0.0025	**35.30**	0.35
Anthracene	µg/g	0.67	0.00024	**55.3**	**2.66**	0.0025	**10.80**	0.12
Fluoranthene	µg/g	9.6	0.0214	**156**	8.54	0.0025	**70.80**	0.51
Pyrene	µg/g	96				0.0025	**56.40**	0.43
Benzo(a)anthracene	µg/g	0.96	0.017	**81.6**	**4.78**	0.0025	**38.40**	0.27
Chrysene	µg/g	9.6	0.00168	**174**	4.92	0.0025	**32.90**	0.27
Benzo(b)fluoranthene	µg/g	0.96	0.024	**115**	**8.31**	0.0025	**27.50**	0.25
Benzo(k)fluoranthene	µg/g	0.96	0.00112	**64.4**	**1.87**	0.0025	**18.20**	0.16
Benzo(a)pyrene	µg/g	0.3	0.000096	**60.2**	**3.82**	0.0025	**28.30**	0.18
Indeno(1,2,3-cd)pyrene	µg/g	0.76	0.0012	**28.4**	**2.09**	0.0025	**7.76**	0.08
Dibenz(a,h)anthracene	µg/g	0.1	0.00096	**12.8**	**0.79**	0.0025	**2.28**	0.03
Benzo(g,h,i)perylene	µg/g	9.6				0.0025	7.23	0.07
1 and 2 Methlynaphthalene (Calculated)	µg/g	76				0.0036	13.30	0.05
Petroleum Hydrocarbons (PHC)								
Benzene	µg/g	0.32				0.0100	**0.52**	0.01
Toluene	µg/g	68				0.0100	0.26	0.03
Ethylbenzene	µg/g	9.5				0.0100	1.09	0.03
Xylenes (Total)	µg/g	26				0.0200	0.13	0.03
F1 (C6 to C10)	µg/g	55				2.5000	16.0	4.00
F1 (C6 to C10) minus BTEX	µg/g	55				2.5000	16.0	4.00
F2 (C10 to C16)	µg/g	230				5.0000	15.0	6.11
F2 (C10 to C16) minus Naphthalene	µg/g					5.0000	15.0	6.11
F3 (C16 to C34)	µg/g	1700				2.5000	630.0	40.89
F3 (C16 to C34) minus PAHs	µg/g					2.5000	150.0	38.56
F4 (C34 to C50)	µg/g	3300				2.5000	230.0	14.83
Metals								
Antimony (Sb)	µg/g	40	0.5	34.7	2.66	0.1000	15.5	5.07
Arsenic (As)	µg/g	18	1.6	**40.8**	9.78	0.5000	**38**	18.78
Barium (Ba)	µg/g	670	2	**3490**	338	20.0000	**779**	317.83
Beryllium (Be)	µg/g	8				0.1000	1.4	0.57
Boron (B)	µg/g	120	0.03	9.82	0.47	2.5000	23	10.39
Cadmium (Cd)	µg/g	1.9				0.0500	13	1.57
Chromium (Cr)	µg/g	160				6.0000	**800**	29.33
Cobalt (Co)	µg/g	80				2.0000	19.3	10.01
Copper (Cu)	µg/g	230	12.4	**2580**	188	5.0000	**3100**	**456.56**
Lead (Pb)	µg/g	120	15.1	**22300**	**1203**	3.0000	**26000**	**472.67**
Mercury (Hg)	µg/g	3.9	0.05	**5.5**	0.66	0.0500	**4.4**	1.52
Molybdenum (Mo)	µg/g	40				0.6200	10	4.29
Nickel (Ni)	µg/g	270				2.5000	47	28.89
Selenium (Se)	µg/g	5.5				0.2000	6.6	2.19
Silver (Ag)	µg/g	40				0.1000	9.1	1.54
Thallium (Tl)	µg/g	3.3				0.0630	0.5	0.26
Uranium (U)	µg/g	33				0.2500	1.7	0.93
Vanadium (V)	µg/g	86				16.0000	46	29.11
Zinc (Zn)	µg/g	340	26.2	**8950**	**693**	10.0000	**1540**	**463**

[1]Ontario Regulation 153/04 (Amended April 15, 2011)
Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Ground Water Condition
Community Property Use - Coarse Grained Soils
[2]Includes non-detect values at half the method detection limit
123 Concentrations above applicable SCS

A001049 - uOttawa
Table 2 - Summary of Groundwater Analytical Results (2012 - 2020)

Parameter	Units	Standards[1] Table 3 SCS	RDL	Geofirma, Franz, uOttawa, CIMA+ 2012-2020		
				Min[2]	Max	Avg
Polyaromatic Hydrocarbons (PAH)						
Naphthalene	µg/L	1400	0.05	0.025	**1510**	115.18
Acenaphthylene	µg/L	1.8	0.05	0.010	**73.10**	**7.51**
Acenaphthene	µg/L	600	0.05	0.010	2.76	0.69
Fluorene	µg/L	400	0.05	0.010	13.40	1.61
Phenanthrene	µg/L	580	0.05	0.010	15.80	1.87
Anthracene	µg/L	2.4	0.05	0.005	**5.02**	0.49
Fluoranthene	µg/L	130	0.05	0.005	6.14	0.58
Pyrene	µg/L	68	0.05	0.005	11.90	1.00
Benzo(a)anthracene	µg/L	4.7	0.05	0.005	3.38	0.25
Chrysene	µg/L	1	0.05	0.010	**3.24**	0.22
Benzo(b)fluoranthene	µg/L	0.75	0.05	0.010	**3.24**	0.21
Benzo(k)fluoranthene	µg/L	0.4	0.05	0.010	**1.25**	0.11
Benzo(a)pyrene	µg/L	0.81	0.05	0.005	**3.10**	0.17
Indeno(1,2,3-cd)pyrene	µg/L	0.2	0.05	0.010	**1.32**	0.19
Dibenz(a,h)anthracene	µg/L	0.52	0.05	0.010	**0.57**	0.09
Benzo(g,h,i)perylene	µg/L	0.2	0.05	0.010	**1.30**	0.13
2-and 1-methyl Naphthalene	µg/L	1800	0.05	0.014	290	21.42
Petroleum Hydrocarbons (PHC)						
Benzene	µg/L	44	0.02	0.025	30.0	2.00
Toluene	µg/L	18000	0.05	0.025	17.0	1.14
Ethylbenzene	µg/L	2300	0.05	0.025	510	31.18
Xylenes (Total)	µg/L	4200	0.05	0.025	535	31.64
F1 (C6-C10)	µg/L	750	5	12.50	**1770**	129.67
F1 (C6 to C10) minus BTEX	µg/L		5	12.50	42.0	12.50
F2 (C10 to C16)	µg/L	150	10	50.0	**760**	50
F2 (C10 to C16) minus Naphthalene	µg/L		10	50.0	50.0	50
F3 (C16 to C34)	µg/L	500	50	50.0	125	60.71
F3 (C16 to C34) minus PAHs	µg/L		50	50.0	125	61.54
F4 (C34 to C50)	µg/L	500	50	50.0	125	60.71
Metals						
Dissolved Antimony	µg/L	20000	0.8	0.025	0.70	0.462
Dissolved Arsenic	µg/L	1900	1	0.500	46.8	17.9
Dissolved Barium	µg/L	29000	2	2.700	282	93.3
Dissolved Beryllium	µg/L	67	0.5	0.250	0.25	0.250
Dissolved Boron	µg/L	45000	5	158	929	506
Dissolved Cadmium	µg/L	2.7	0.5	0.050	0.43	0.113
Dissolved Chromium	µg/L	810	5	1.000	12.0	2.93
Dissolved Cobalt	µg/L	66	0.5	0.250	19.0	2.64
Dissolved Copper	µg/L	87	1	0.500	13.7	3.32
Dissolved Lead	µg/L	25	1	0.050	3.50	0.535
Dissolved Mercury	µg/L	0.29		0.050	0.05	0.050
Dissolved Molybdenum	µg/L	9200	0.5	0.250	10.0	1.142
Dissolved Nickel	µg/L	490	1	1.500	79.6	9.22
Dissolved Selenium	µg/L	63	0.4	0.050	48.5	6.45
Dissolved Silver	µg/L	1.5	0.2	0.025	0.10	0.088
Dissolved Thallium	µg/L	510	0.4	0.025	0.76	0.296
Dissolved Uranium	µg/L	420	0.5	0.250	2.26	0.718
Dissolved Vanadium	µg/L	250	1	0.200	8.93	2.06
Dissolved Zinc	µg/L	1100	5	2.500	120	8.66

[1]Ontario Regulation 153/04 (Amended April 15, 2011)
Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Ground Water Condition
Community Property Use - Coarse Grained Soils
[2]Includes non-detect values at half the method detection limit
123 Concentrations above applicable SCS

A001049 - uOttawa
Table 3 - Well Construction Details and Groundwater Elevations

Monitoring Well	Well Installed By	Installation Year	Screened Unit	Ground surface Elevation (masl)	Well Depth (mbgs)	Depth of Well Elevation (masl)	Top of Well PVC Riser Elevation (masl)	Water Level (mbTOR) July 2020	Groundwater Elevation (masl) July 2020	NAPL	Vapour Reading (ppm)
OW506A	Intera	1986	bedrock	62.39	15.3	47.09	62.76	6.10	56.66	NM	<1
OW506B	Intera	1986	alluvium	62.84	11.12	51.72	63.45	7.11	56.34	NM	<1
MW03-12	Franz Environmental	2012	alluvium	62.08	8.81	53.27	61.97	6.22	55.75	NM	1
MW04-12	Franz Environmental	2012	alluvium	61.83	9.17	52.66	61.73	7.03	54.70	NM	<1
MW05-12	Franz Environmental	2012	alluvium	61.91	10.08	51.83	61.77	6.66	55.11	NM	<1
MW12-11	Geofirma Engineering	2012	alluvium	62.24	10.01	52.23	63.08	9.07	54.01	NM	<1
MW/BH 20-1	Golder Associated Ltd.	2020	bedrock	61.74	15.33	46.41	61.14	6.80	54.34	NM	2
MW/BH 20-2	Golder Associated Ltd.	2020	bedrock	62.07	16.4	45.67	62.00	7.23	54.77	NM	1
MW/BH 20-3	Golder Associated Ltd.	2020	till	62.42	11.8	50.62	62.37	7.23	55.14	NM	<1
MW/BH 20-4	CIMA+	2020	alluvium	62.52	9.2	53.32	62.36	5.80	56.56	NM	<1
MW/BH 20-5	CIMA+	2020	alluvium	62.20	6.52	55.68	62.15	4.65	57.50	NM	<1

mbgs - metres below ground surface - measured from a reference point on well casing
masl - metres above sea level - wells surveyed with reference to geodetic datum
NM - none measured
NAPL - non aqueous phase liquid
ppm - parts per million

A001049 - uOttawa
Table 4 - Soil Analytical Results (2020)

Parameter	Units	Standards[1] Table 3 SCS	RDL	Sample ID/Sampling Depth (m)/Unit/Sampling Date										
				BH-20-1_SS4 2.1 to 2.7 m Fill 07/06/2020	BH20-2 SS4 2.3 to 2.9 m Fill 07/10/2020	BH20-2 SS16 11.4 to 12.0 m Alluvium 07/10/2020	BH20-3 SS4 2.3 to 2.9 m Fill 07/10/2020	BH20-4 SS4 2.3 to 2.9 m Fill 07/10/2020	DUP1 07/10/2020	BH20-4 SS5 3.0 to 3.7 m Fill 07/10/2020	BH20-4 SS12 8.2 to 8.8 m Alluvium 07/10/2020	DUP2 07/10/2020	BH20-5 SS5 3.0 to 3.7 m Fill 07/10/2020	BH20-5 SS9 6.1 to 6.7 m Alluvium 07/10/2020
Polyaromatic Hydrocarbons (PAH)														
Naphthalene	µg/g	9.6	0.05	<0.05	0.08	<0.05	0.10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	µg/g	0.15	0.05	<0.05	0.14	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	µg/g	96	0.05	<0.05	0.11	<0.05	0.13	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	µg/g	62	0.05	<0.05	0.16	<0.05	0.18	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	µg/g	12	0.05	0.10	1.3	0.28	1.3	0.05	0.30	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	µg/g	0.67	0.05	<0.05	0.41	0.08	0.43	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/g	9.6	0.05	0.21	1.9	0.49	1.7	0.15	0.52	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	µg/g	96	0.05	0.17	1.7	0.42	1.4	0.12	0.46	<0.05	<0.05	<0.05	<0.05	<0.05
Benz(a)anthracene	µg/g	0.96	0.05	0.09	**0.99**	0.30	0.94	0.05	0.30	<0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	µg/g	9.6	0.05	0.10	0.94	0.27	0.99	0.07	0.29	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	µg/g	0.96	0.05	0.07	**0.99**	0.25	0.74	0.10	0.26	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g	0.96	0.05	<0.05	0.65	0.16	0.46	0.05	0.17	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g	0.3	0.05	<0.05	**0.69**	0.19	**0.56**	0.05	0.20	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-cd)pyrene	µg/g	0.76	0.05	<0.05	0.28	0.07	0.19	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenz(a,h)anthracene	µg/g	0.1	0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/g	9.6	0.05	<0.05	0.26	0.06	0.16	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05
1 and 2 Methlynaphthalene (Calculated)	µg/g	76	0.05	<0.05	0.10	<0.05	0.13	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Petroleum Hydrocarbons (PHC)														
Benzene	µg/g	0.32	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g	68	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g	9.5	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylenes (Total)	µg/g	26	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g	55	5	<5	<5	16	<5	<5	<5	<5	<5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	55	5	<5	<5	16	<5	<5	<5	<5	<5	<5	<5	<5
F2 (C10 to C16)	µg/g	230	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	15	<10
F2 (C10 to C16) minus Naphthalene	µg/g		10	<10	<10	<10	<10	<10	<10	<10	<10	<10	15	<10
F3 (C16 to C34)	µg/g	1700	50	63	160	<50	130	<50	<50	<50	<50	<50	<50	<50
F3 (C16 to C34) minus PAHs	µg/g		50	62	150	<50	120	<50	<50	<50	<50	<50	<50	<50
F4 (C34 to C50)	µg/g	3300	50	<50	51	<50	65	<50	<50	<50	<50	<50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g	3300	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals														
Antimony (Sb)	µg/g	40	0.8	6.5	5.0	<0.8	5.3	1.30	2.7	10.8	<0.8	<0.8	15.5	<0.8
Arsenic (As)	µg/g	18	1	**29**	**19**	4	**29**	15	18	**31**	2	2	**36**	4
Barium (Ba)	µg/g	670	2	664	413	116	625	362	282	**779**	90	113	328	126
Beryllium (Be)	µg/g	8	0.5	0.7	<0.5	0.5	0.8	0.50	0.8	0.8	<0.5	<0.5	1.4	<0.5
Boron (B)	µg/g	120	5	12	17	11	16	<5	8	8	7	7	13	7
Cadmium (Cd)	µg/g	1.9	0.5	1.7	1.1	<0.5	**9.8**	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium (Cr)	µg/g	160	5	56	34	23	50	21	24	21	12	11	32	15
Cobalt (Co)	µg/g	80	0.5	7.0	6.2	8.9	10.7	8.9	12.1	18.0	5.0	5.0	19.3	6.1
Copper (Cu)	µg/g	230	1	**2930**	156	24	176	40	81	**566**	11	10	175	31
Lead (Pb)	µg/g	120	1	**753**	**609**	11	**954**	**755**	**349**	**625**	4	4	**485**	58
Molybdenum (Mo)	µg/g	40	0.5	4.2	2.7	2.6	3.6	3.8	3.9	10.0	1.2	1.0	8.5	2.0
Nickel (Ni)	µg/g	270	1	23	31	26	39	21	29	44	12	11	47	17
Selenium (Se)	µg/g	5.5	0.4	2.6	1.7	0.5	5.3	3.5	3.3	2.1	<0.4	<0.4	3.2	0.6
Silver (Ag)	µg/g	40	0.2	9.1	0.4	<0.2	1.8	0.30	0.4	1.0	<0.2	<0.2	1.0	<0.2
Thallium (Tl)	µg/g	3.3	0.4	<0.4	<0.4	<0.4	0.5	<0.4	<0.4	<0.4	<0.4	<0.4	0.4	<0.4
Uranium (U)	µg/g	33	0.5	1.0	<0.5	1.4	0.6	0.6	0.8	0.9	1.0	1.0	1.5	1.1
Vanadium (V)	µg/g	86	1	24	20	33	34	29	36	31	21	20	46	24
Zinc (Zn)	µg/g	340	5	**792**	**581**	53	**1540**	280	**468**	**546**	21	24	258	96
Other regulated parameters														
Fraction Organic Carbon (FCO)														
Fraction Organic Carbon-1	NA		0.003							0.024	0.019			
Fraction Organic Carbon-2	NA		0.003							0.024	0.019			
Fraction Organic Carbon-3	NA		0.003							0.024	0.019			
Fraction Organic Carbon-Avg	NA		0.003							0.024	0.019			
Potential of Hydrogen (pH)														
pH, 2:1 CaCl2 Extraction	pH Units	5.0-9.0	NA							7.75				
Particle Size by Sieve (Wet)														
Sieve Analysis - 75 µm (retained)	%		NA							79.10	82.88			
Sieve Analysis - 75 µm (passing)	%		NA							20.90	17.12			
Soil Texture										Coarse	Coarse			

Ontario Regulation 153/04 (Amended April 15, 2011)
Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Ground Water Condition
Community Property Use - Coarse Grained Soils
RDL Reportable Detection Limit
123 Concentrations above applicable SCS

A001049 - uOttawa
Table 5 - Groundwater Analytical Results (2020)

Parameter	Units	Standard[1] Table 3 SCS	RDL	Sample ID/Sampling Date BH20-1-GW01 07/23/2020	BH20-2-GW01 07/22/2020	DUP-1 07/22/2020	BH20-3-GW01 07/22/2020	BH20-4-GW01 07/23/2020	BH20-5-GW01 07/22/2020	DUP-2 07/22/2020	MW03-12-GW01 07/22/2020	MW04-12-GW01 07/22/2020	MW05-12-GW01 07/22/2020	MW12-11 07/22/2020	OW506A-GW01 07/23/2020	OW506B-GW01 07/23/2020
Polyaromatic Hydrocarbons (PAH)																
Naphthalene	µg/L	1400	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Acenaphthylene	µg/L	1.8	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**3.5**	<0.20	<0.20
Acenaphthene	µg/L	600	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.64	<0.20	<0.20
Fluorene	µg/L	400	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	1.2	<0.20	<0.20
Phenanthrene	µg/L	580	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.65	<0.10	<0.10
Anthracene	µg/L	2.4	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.21	<0.10	<0.10
Fluoranthene	µg/L	130	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.23	<0.20	<0.20
Pyrene	µg/L	68	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.34	<0.20	<0.20
Benzo(a)anthracene	µg/L	4.7	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chrysene	µg/L	1	0.1	<0.10	<0.10	<0.10	0.11	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(b)fluoranthene	µg/L	0.75	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(k)fluoranthene	µg/L	0.4	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(a)pyrene	µg/L	0.81	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	µg/L	0.2	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibenz(a,h)anthracene	µg/L	0.52	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(g,h,i)perylene	µg/L	0.2	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2-and 1-methyl Naphthalene	µg/L	1800	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	3.0	<0.20	<0.20
Petroleum Hydrocarbons (PHC)																
Benzene	µg/L	44	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.84	<0.20	<0.20
Toluene	µg/L	18000	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	µg/L	2300	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	6.9	<0.10	<0.10
Xylenes (Total)	µg/L	4200	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
F1 (C6-C10)	µg/L	750	25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
F1 (C6 to C10) minus BTEX	µg/L	750	25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
F2 (C10 to C16)	µg/L	150	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
F2 (C10 to C16) minus Naphthalene	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
F3 (C16 to C34)	µg/L	500	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
F3 (C16 to C34) minus PAHs	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
F4 (C34 to C50)	µg/L	500	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Gravimetric Heavy Hydrocarbons	µg/L		500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals																
Dissolved Antimony	µg/L	20000	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dissolved Arsenic	µg/L	1900	1	<1.0	31.5	27.6	28.1	<1.0	30.6	39.9	27.10	27	46.8	37.7	<1.0	1.6
Dissolved Barium	µg/L	29000	2	76.2	282	285	163	35.2	112	117	145	116	62.1	51.8	2.7	52.9
Dissolved Beryllium	µg/L	67	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dissolved Boron	µg/L	45000	10	478	813	767	512	814	446	421	317	559	929	158	323	288
Dissolved Cadmium	µg/L	2.7	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	0.43	0.49	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Chromium	µg/L	810	2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.3	3.2
Dissolved Cobalt	µg/L	66	0.5	<0.50	0.58	<0.50	0.85	1.36	3.82	3.58	<0.50	1.44	4.91	<0.50	<0.50	19
Dissolved Copper	µg/L	87	1	2	<1.0	<1.0	<1.0	3.4	4.2	2.7	5.80	13.7	2.3	1	4	3.9
Dissolved Lead	µg/L	25	0.5	<0.50	0.95	0.76	0.88	<0.50	0.74	0.78	0.63	0.9	1.51	<0.50	<0.50	<0.50
Dissolved Molybdenum	µg/L	9200	0.5	<0.50	<0.50	<0.50	3.76	0.96	0.75	<0.50	0.88	2.23	<0.50	<0.50	2.88	0.59
Dissolved Nickel	µg/L	490	3	<3.0	<3.0	<3.0	<3.0	<3.0	9.4	9.2	<3.0	5.5	3.3	<3.0	7.8	79.6
Dissolved Selenium	µg/L	63	1	<1.0	1.3	2.6	1.9	<1.0	48.5	39.5	19.7	1.6	4.1	1.7	1.4	2.5
Dissolved Silver	µg/L	1.5	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Thallium	µg/L	510	0.3	<0.30	0.56	0.48	0.76	<0.30	0.41	0.33	0.4	0.53	0.42	0.34	<0.30	<0.30
Dissolved Uranium	µg/L	420	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	2.04	2.01	2.26	1.4	<0.50	1.29	<0.50	<0.50
Dissolved Vanadium	µg/L	250	0.4	<0.40	0.5	<0.40	<0.40	0.69	<0.40	<0.40	<0.40	<0.40	<0.40	0.53	1.07	8.93
Dissolved Zinc	µg/L	1100	5	<5.0	<5.0	<5.0	39.5	7.2	8.2	6.2	<5.0	15.3	<5.0	7.8	<5.0	10.1

1 Ontario Regulation 153/04 (Amended April 15, 2011)
Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Ground Water Condition
All Types of Property Use - Coarse Grained Soils
RDL Recordable Detection Limits
123 Concentrations above applicable SCS

A001049 - uOttawa
Table 6 - Soil Analytical Results - TCLP

Parameter	Unit	Standards	RDL	07/10/2020
O. Reg. 558 Metals				
Arsenic Leachate	mg/L	2.5	0.01	<0.010
Barium Leachate	mg/L	100	0.1	2.27
Boron Leachate	mg/L	500	0.05	0.12
Cadmium Leachate	mg/L	0.5	0.01	0.016
Chromium Leachate	mg/L	5	0.01	0.014
Lead Leachate	mg/L	5	0.01	**9.98**
Mercury Leachate	mg/L	0.1	0.01	<0.01
Selenium Leachate	mg/L	1	0.01	<0.010
Silver Leachate	mg/L	5	0.01	<0.010
Uranium Leachate	mg/L	10	0.05	<0.050
O. Reg. 558 - Semi Volatile Organic Compounds (SVOC)				
Pyridine	mg/L	5	0.01	<0.010
Cresols	mg/L	200	0.012	<0.012
Ortho-Cresol	mg/L	200	0.004	<0.004
Meta & Para-Cresol	mg/L	200	0.008	<0.008
Hexachloroethane	mg/L	3	0.004	<0.004
Nitrobenzene	mg/L	2	0.004	<0.004
Hexachlorobutadiene	mg/L	0.5	0.004	<0.004
2,4,6-Trichlorophenol	mg/L	0.5	0.05	<0.05
2,4,5-Trichlorophenol	mg/L	400	0.004	<0.004
2,4-Dinitrotoluene	mg/L	0.13	0.004	<0.004
2,3,4,6-Tetrachlorophenol	mg/L	10	0.004	<0.004
Hexachlorobenzene	mg/L	0.13	0.004	<0.004
Dinoseb	mg/L	1	0.004	<0.004
Benzo(a)pyrene	mg/L	0.001	0.001	<0.001
2-Fluorophenol	%			74
Phenol-d6	%			69
2,4,6-Tribromophenol	%			84
Chrysene-d12	%			84
BNA Extr	NA			Y
O. Reg. 558 - Volatile Organic Compounds (VOC)				
Vinyl Chloride	mg/L	0.2	0.03	<0.030
1,1 Dichloroethene	mg/L	1.4	0.02	<0.020
Dichloromethane	mg/L	5	0.03	<0.030
Methyl Ethyl Ketone	mg/L	200	0.09	<0.090
Chloroform	mg/L	10	0.02	<0.020
1,2-Dichloroethane	mg/L	0.5	0.02	<0.020
Carbon Tetrachloride	mg/L	0.5	0.02	<0.020
Benzene	mg/L	0.5	0.02	<0.020
Trichloroethene	mg/L	5	0.02	<0.020
Tetrachloroethene	mg/L	3	0.05	<0.050
Chlorobenzene	mg/L	8	0.01	<0.010
1,2-Dichlorobenzene	mg/L	20	0.01	<0.010
1,4-Dichlorobenzene	mg/L	0.5	0.01	<0.010
Toluene-d8	% Recovery		1	86

RDL - Reported Detection Limit
The sample was leached according to Regulation 558 protocol. Analysis was performed on the leachate.

123 Concentration above applicable criteria

C

Appendix C
1986 Contaminant Distribution – Figure 1 (CRA, 1986)

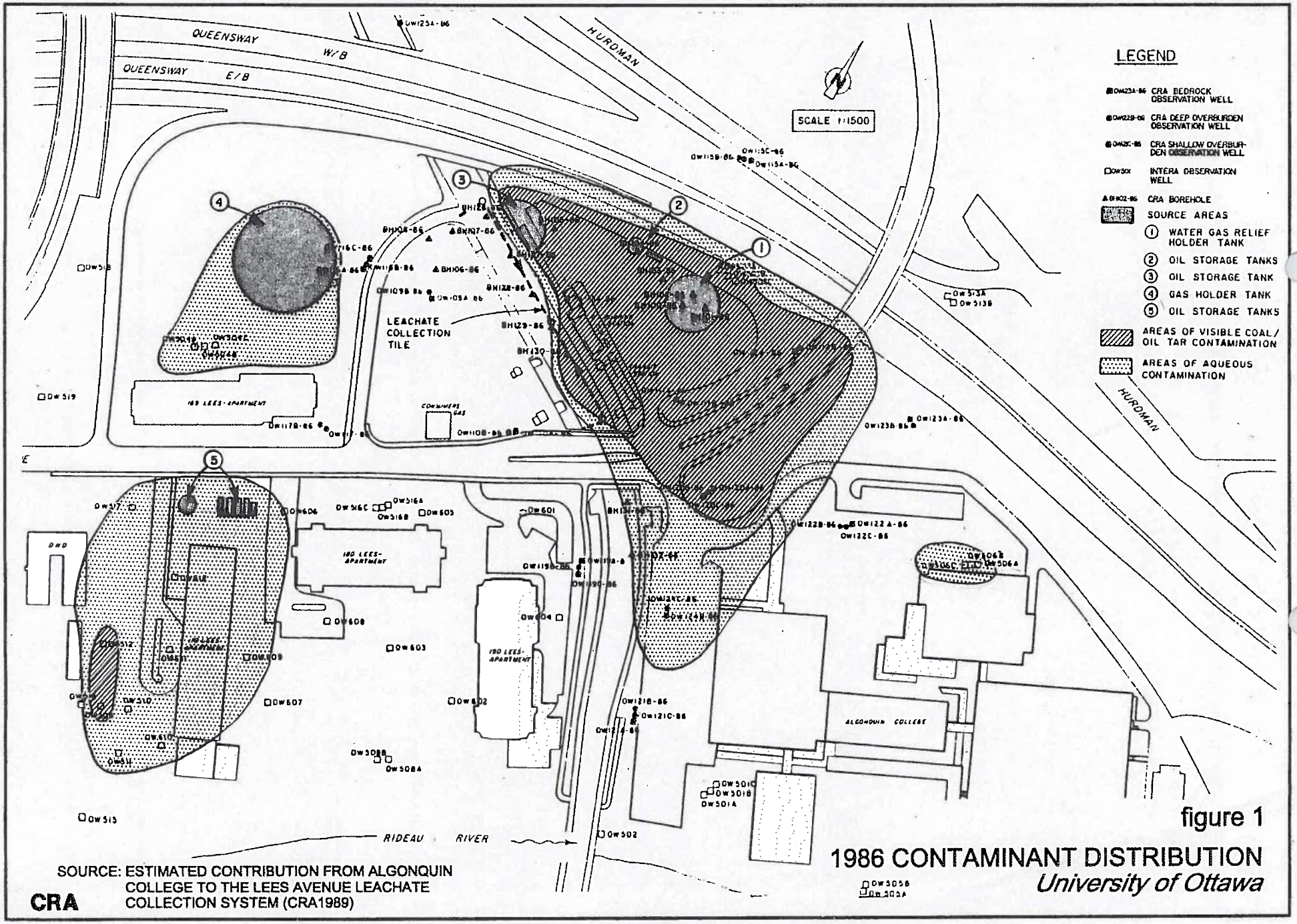


figure 1

1986 CONTAMINANT DISTRIBUTION

University of Ottawa

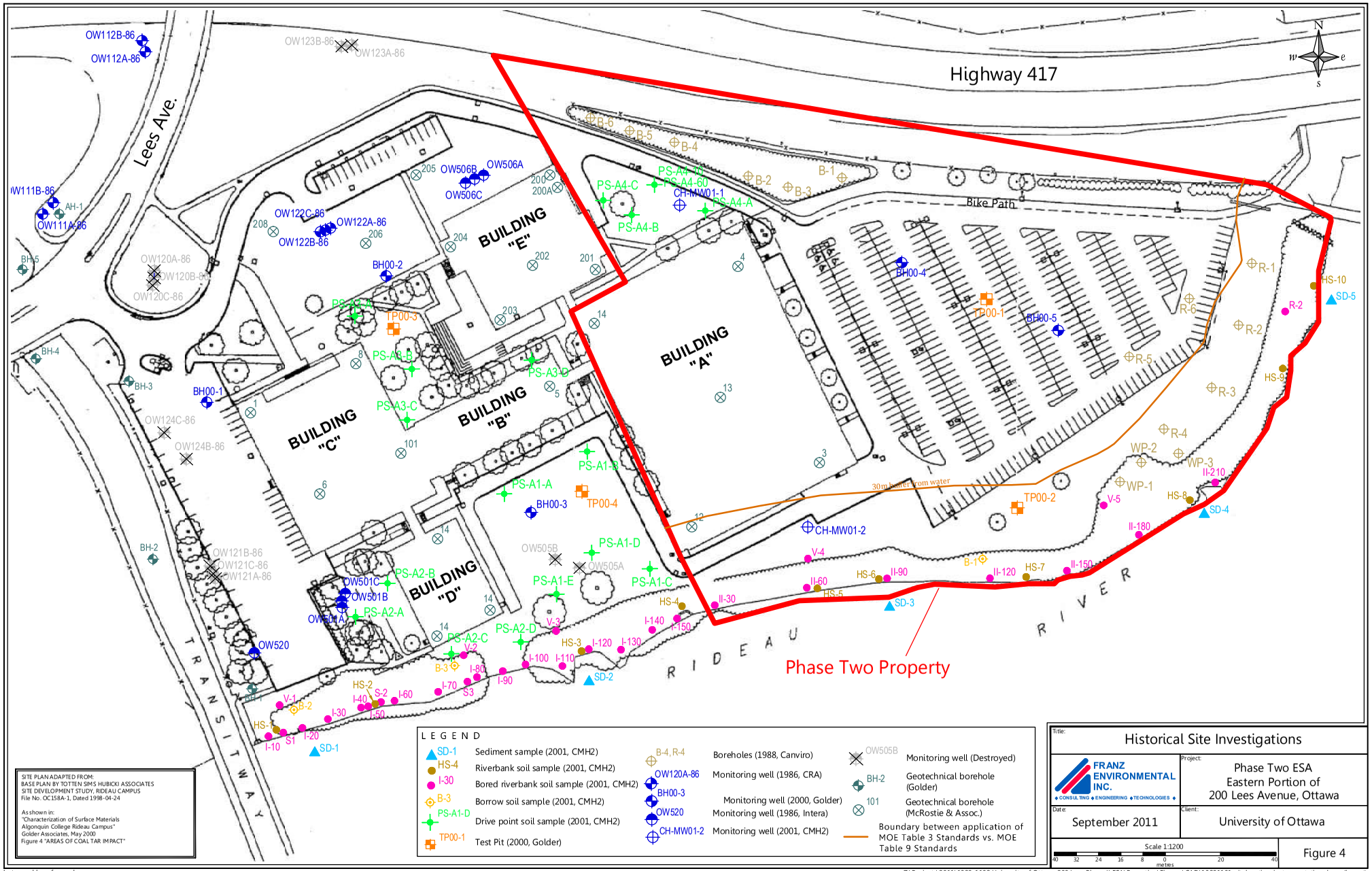
SOURCE: ESTIMATED CONTRIBUTION FROM ALGONQUIN COLLEGE TO THE LEES AVENUE LEACHATE COLLECTION SYSTEM (CRA1989)

CRA

15438-00(PUSC-2)GN-OT001 FEB 07/2000

D

Appendix D
Historical Site Investigations – Figure 4 (Franz, 2011b)



SITE PLAN ADAPTED FROM:
BASE PLAN BY TOTTEN SIMS HUBICKI ASSOCIATES
SITE DEVELOPMENT STUDY, RIDEAU CAMPUS
File No. OC158A-1, Dated 1998-04-24

As shown in:
"Characterization of Surface Materials
Algonquin College Rideau Campus"
Golder Associates, May 2000
Figure 4 "AREAS OF COAL TAR IMPACT"

LEGEND

- SD-1 — Sediment sample (2001, CMH2)
- HS-4 — Riverbank soil sample (2001, CMH2)
- I-30 — Bored riverbank soil sample (2001, CMH2)
- B-3 — Borrow soil sample (2001, CMH2)
- PS-A1-D — Drive point soil sample (2001, CMH2)
- TP00-1 — Test Pit (2000, Golder)
- B-4, R-4 — Boreholes (1988, Canviro)
- OW120A-86 — Monitoring well (1986, CRA)
- BH00-3 — Monitoring well (2000, Golder)
- OW520 — Monitoring well (1986, Intera)
- CH-MW01-2 — Monitoring well (2001, CMH2)
- OW505B — Monitoring well (Destroyed)
- BH-2 — Geotechnical borehole (Golder)
- 101 — Geotechnical borehole (McRostie & Assoc.)
- Boundary between application of MOE Table 3 Standards vs. MOE Table 9 Standards

Title: Historical Site Investigations

FRANZ ENVIRONMENTAL INC. — CONSULTING ENGINEERING TECHNOLOGIES

Project: Phase Two ESA
Eastern Portion of
200 Lees Avenue, Ottawa

Date: September 2011

Client: University of Ottawa

Scale 1:1200
40 32 24 16 8 0 20 40 metres

Figure 4

last saved by: cfernandes

Z:\Projects\2011\1329-1102 University of Ottawa 200 Lees Phase II ESA\Reporting\Figures\CAD\13291101_sitelocation_instrumentation.dwg (layout)

E

Appendix E
Borehole Logs and Well Records

PROJECT: 20144766

RECORD OF BOREHOLE: 20-01

SHEET 1 OF 3

LOCATION: N 5031000.8 ;E 369909.0

BORING DATE: July 6, 2020

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m; SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○)	HYDRAULIC CONDUCTIVITY, k, cm/s; WATER CONTENT PERCENT (Wp, W, Wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		62.34							
	Power Auger 200 mm Diam. (Hollow Stem)	FILL/TOPSOIL - (ML) sandy SILT; brown, contains wood; non-cohesive		0.00 / 0.08	1	SS	14				Flush Mount Casing
		FILL - (ML) sandy SILT, trace gravel; brown to dark brown, contains rootlets, ash and cinders; non-cohesive, moist, compact to very loose			2	SS	3				
					3	SS	2				
					4	SS	4				
3				59.29							
		FILL - (ML) gravelly sandy SILT, some plastic fines; dark grey, contains cinders and ash; non-cohesive, moist, loose to very loose		3.05	5	SS	4				
					6	SS	2				
				57.77							
		FILL - (SM) gravelly SILTY SAND, some plastic fines; grey, contains cinders and ash; non-cohesive, moist, very, loose		4.57	7	SS	2				
				57.15							Bentonite Seal
		(SM) gravelly SILTY SAND, some clay (GLACIAL TILL); wet, very loose to compact		5.19	8	SS	6				
					9	SS	15				
					10	SS	9				
					11	SS	10			MH	
					12	SS	2				
					13	SS	12				
10					14	SS	WH				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

GOLDER

LOGGED: RA

CHECKED: BB

MIS-BHS 001 20144766.GPJ GAL-MIS.GDT 9/4/20 JEM

PROJECT: 20144766

RECORD OF BOREHOLE: 20-01

SHEET 2 OF 3

LOCATION: N 5031000.8 ;E 369909.0

BORING DATE: July 6, 2020

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕; Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10		*--- CONTINUED FROM PREVIOUS PAGE ---*									
10	Power Auger 200 mm Diam. (Hollow Stem)	(SM) gravelly SILTY SAND, some clay (GLACIAL TILL); wet, very loose to compact			14	SS	WH				
11					15	SS	2		○		
12					16	SS	3				Bentonite Seal
12					17	SS	>50		○		
				49.48							
13		Borehole continued on RECORD OF DRILLHOLE 20-01		12.86							
14											
15											
16											
17											
18											
19											
20											

DEPTH SCALE

1 : 50

GOLDER

LOGGED: RA

CHECKED: BB

MIS-BHS 001 20144766.GPJ GAL-MIS.GDT 9/4/20 JEM

PROJECT: 20144766

RECORD OF DRILLHOLE: 20-01

SHEET 3 OF 3

LOCATION: N 5031000.8 ;E 369909.0

DRILLING DATE: July 6, 2020

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: —

DRILL RIG: CME-75

DRILLING CONTRACTOR: Grenville Drilling

JN - Joint, FLT - Fault, SHR - Shear, VN - Vein, CJ - Conjugate
BD - Bedding, FO - Foliation, CO - Contact, OR - Orthogonal, CL - Cleavage
PL - Planar, CU - Curved, UN - Undulating, ST - Stepped, IR - Irregular
PO - Polished, K - Slickensided, SM - Smooth, Ro - Rough, MB - Mechanical Break
BR - Broken Rock
NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	COLOUR / % RETURN / FLUSH	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jcon	Jr	Ja	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC 'Q' AVG.	
		GROUND SURFACE		49.48															
13	Rotary Drill / HQ Core	Slightly weathered to fresh, black, fine grained SHALE		12.86	1														Bentonite Seal
14					2														Silica Sand
15																			51 mm Diam. PVC #10 Slot Screen
16				46.24	3														
		End of Drillhole		16.10															WL in Screen at Elev. 54.94 m on July 21, 2020
17																			
18																			
19																			
20																			
21																			
22																			

DEPTH SCALE
1 : 50

GOLDER

LOGGED: RA
CHECKED: BB

MIS-RCK 004 20144766.GPJ GAL-MISS.GDT 9/4/20 JEM

PROJECT: 20144766

RECORD OF BOREHOLE: 20-02

SHEET 1 OF 3

LOCATION: N 5030948.6 ;E 369860.9

BORING DATE: July 9, 2020

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m; SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○)	HYDRAULIC CONDUCTIVITY, k, cm/s; WATER CONTENT PERCENT (Wp, W, Wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		62.14							
	Power Auger 200 mm Diam. (Hollow Stem)	ASPHALTIC CONCRETE		0.04							Flush Mount Casing
		FILL - (SM) gravelly SILTY SAND; brown, contains organics; non-cohesive, moist			1	SS	36				
				61.38							
1		FILL - (SM) gravelly SILTY SAND; grey black, contains cinders, ash, and red brick pieces; non-cohesive, moist, very loose to compact		0.76	2	SS	14				
2					3	SS	4				
					4	SS	7				
3					5	SS	3			M	
4					6	SS	3				
					7	SS	4				Bentonite Seal
5				56.80							
		(ML) CLAYEY SILT to SILT; grey brown (GLACIAL TILL); cohesive, w~PL, firm to stiff		5.34	8	SS	5				
6					9	SS	11			MH	
7				54.51							
		(SM) gravelly SILTY SAND, some clay; grey (GLACIAL TILL); non-cohesive, moist, compact to dense		7.63	10	SS	26				
8					11	SS	12			MH	
9					12	SS	35				
				52.23							
10				9.91	13	SS	35				
		CONTINUED NEXT PAGE									

DEPTH SCALE 1 : 50

GOLDER

LOGGED: RA

CHECKED: BB

MIS-BHS 001 20144766.GPJ GAL-MIS.GDT 9/4/20 JEM

PROJECT: 20144766

RECORD OF BOREHOLE: 20-02

SHEET 2 OF 3

LOCATION: N 5030948.6 ;E 369860.9

BORING DATE: July 9, 2020

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Power Auger 200 mm Diam. (Hollow Stem)	(ML) sandy SILT to SILT, some gravel; grey, contains shale fragments (GLACIAL TILL); non-cohesive, wet, dense to very dense			13	SS	35				
11					14	SS	39				
12					15	SS	78				
					16	SS	>50				Bentonite Seal
13					17	SS	>50				
				48.28	18	SS	>50				
14		Borehole continued on RECORD OF DRILLHOLE 20-02		13.86							
15											
16											
17											
18											
19											
20											

DEPTH SCALE

1 : 50

GOLDER

LOGGED: RA

CHECKED: BB

MIS-BHS 001 20144766.GPJ GAL-MIS.GDT 9/4/20 JEM

PROJECT: 20144766

RECORD OF DRILLHOLE: 20-02

SHEET 3 OF 3

LOCATION: N 5030948.6 ;E 369860.9

DRILLING DATE: July 9, 2020

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME-75

DRILLING CONTRACTOR: Grenville Drilling

JN - Joint, FLT - Fault, SHR - Shear, VN - Vein, CJ - Conjugate
BD - Bedding, FO - Foliation, CO - Contact, OR - Orthogonal, CL - Cleavage
PL - Planar, CU - Curved, UN - Undulating, ST - Stepped, IR - Irregular
PO - Polished, K - Slickensided, SM - Smooth, Ro - Rough, MB - Mechanical Break
BR - Broken Rock
NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	COLOUR % RETURN / FLUSH	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jcon	Jr	Ja	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC 'Q' AVG.	
		GROUND SURFACE		48.28															
14	Rotary Drill / HQ Core	Highly weathered to fresh, black, fine grained SHALE		13.86	1		80 60 40 20	80 60 40 20	80 60 40 20	5 10 15 20	0 30 60 90					10^{-6} 10^{-5} 10^{-4} 10^{-3}	2 4 6		Bentonite Seal
15																			Silica Sand
16					2														51 mm Diam. PVC #10 Slot Screen
17				45.02	3														
		End of Drillhole		17.12															WL in Screen at Elev. 54.84 m on July 21, 2020
18																			
19																			
20																			
21																			
22																			
23																			

DEPTH SCALE
1 : 50

GOLDER

LOGGED: RA
CHECKED: BB

MIS-RCK 004 20144766.GPJ GAL-MISS.GDT 9/4/20 JEM

PROJECT: 20144766

RECORD OF BOREHOLE: 20-03

SHEET 1 OF 2

LOCATION: N 5030932.9 ;E 369899.2

BORING DATE: July 13, 2020

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.47							
0	Power Auger	CONCRETE		0.00							Flush Mount Casing
		FILL - (SM) gravelly SILTY SAND; brown; non-cohesive, moist, compact to dense		0.13	1	SS	11				
1					2	SS	36				
				60.94							
		FILL - (SM) gravelly SILTY SAND; brown black, contains cinders, ash, and red brick pieces; non-cohesive, wet, loose		1.53	3	SS	5				
2					4	SS	4				
3					5	SS	6			CHEM	
4					6	SS	4				
					7	SS	4				Bentonite Seal
5				57.13							
		(CI) SILTY CLAY; grey brown; cohesive, w>PL, moist, firm to stiff		5.34	8	SS	12				
6					9	SS	7				
				55.61							
7		(ML) CLAYEY SILT to SILT; grey (GLACIAL TILL); cohesive, w~PL, wet, firm		6.86	10	SS	5				
				54.85							
		(SM) gravelly SILTY SAND, some clay; dark grey (GLACIAL TILL); cohesive, wet, loose to compact		7.62	11	SS	17				
8					12	SS	24				
9					13	SS	9				
				52.56							Silica Sand
10				9.91	14	SS	15				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

GOLDER

LOGGED: RA

CHECKED: BB

MIS-BHS 001 20144766.GPJ GAL-MIS.GDT 9/4/20 JEM

PROJECT: 20144766

RECORD OF BOREHOLE: 20-03

SHEET 2 OF 2

LOCATION: N 5030932.9 ;E 369899.2

BORING DATE: July 13, 2020

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Power Auger, 200 mm Diam. (Hollow Stem)	(ML) sandy SILT to SILT; grey (GLACIAL TILL); non-cohesive, compact to very dense			14	SS	15				Silica Sand
11					15	SS	64				
				51.03							
		(SM) gravelly SILTY SAND, some clay; grey (GLACIAL TILL); non-cohesive, wet, very dense		11.44	16	SS	55				51 mm Diam. PVC #10 Slot Screen
12					17	SS	>50				
13					18	SS	>50				WL in Screen at Elev. 55.19 m on July 21, 2020
					19	SS	>50				
14				48.35							
	Rotary Drill, HW Casing	Mechanically broken SHALE		14.12							
				47.67							
		End of Borehole		14.80							
15											
16											
17											
18											
19											
20											

DEPTH SCALE
1 : 50

GOLDER

LOGGED: RA
CHECKED: BB

MIS-BHS 001 20144766.GPJ GAL-MIS.GDT 9/4/20 JEM

240, Catherine Street
Office 110
Ottawa, Ontario
K2P 2G8
Telephone:(613) 860-2462

Borehole/Monitoring Well Log

BH/MW 20-4

Drilling date: 2020/07/04
Technician: L. Robert
Prepared by: I. Souza
Revised by: K Greer

Client: University of Ottawa
Project no: A001049
Project Name: uOttawa Phase II Environmental Site Assessment
Address: 200 Lees, Ottawa (ON)

Easting : 75.6678025
Northing : 45.4155449

Groud Surface Elevation : 62.52 m
Top of Casing Elevation : m
Groudwater Elevation : m

Contractor: Forage Grenville
Equipment: Diedrich
Drill type: D-50
Type of sample: Split Spoon - Ø 61 mm

Sample types

RC	Rock core
SS	Split spoon sample
MA	Manual auger
MS	Manual sampler
ST	Sherlby tube
CL	Clear liner

Terminology

traces	< 10 %
some	10 - 20 %
(ey) or (y)	20 - 35 %
and	35 - 50 %

Soil classification

Silt and clay	< 0,08 mm
Sand	0,08 - 5 mm
Gravier	5 - 80 mm
Cobbles	80 - 300 mm
Boulders	> 300 mm

Relative density 'N' blows

Very loose	0 - 4
Loose	4 - 10
Compact	10 - 30
Dense	30 - 50
Very dense	>50

Subsurface Profile			Sample Details						Well Completion	
Depth / Elevation (m)	Graphic Log	Description	Sample ID	Sample Type	Blows/15cm	Headspace Concentrations TOV (ppm)	Headspace Concentrations CVC (ppm / %lel)	Lab Analysis	Description	Diagram
0.61 / 61.91		Silty sand with some gravel.	SS1	SS	2-8-11-12	3			Flushmount protective cover with concrete seal	
		Fill : Silty sand and ash.	-			<5			50 mm ID solid PVC pipe backfilled with silica sand	
			SS2A + SS2B	SS	5-2-1-2	<5				
		Sand and ash with traces of brick and silt. Black.	-							
2			SS3	SS	1-2-1-2	<5				
		Sand and ash with traces of brick and porcelain. Black.	-							
			SS4	SS	3-2-1-3	<5		Metals, PHC F1-F4, PAH, FOC pH, Grain Size		
		Ash, sand, silt with traces of gravel.	-							
			SS5	SS	2-1-1-2	<5		Metals, PHC F1-F4, PAH, FOC pH, Grain Size		
4			-							
			SS6	SS	3-1-2-1	<5				
			-						50 mm ID solid PVC pipe backfilled with bentonite	
		Silty sand, ash, and presence of red brick.	SS7	SS	1-0-0-1	<5				
		Silt, sand with traces of gravel and clay mixed with silty clay to clayey silt. Black-blue.	-							
6			SS8A + SS8B	SS	5-3-3-6	<5			Water Level - 5.80 mbgs (July 21, 2020)	
5.95 / 56.57		Silt to clayey silt with traces of gravel. Greenish brown.	-							
			SS9	SS	5-7-8-12	<5				
6.71 / 55.81		Till : Crushed rock, silty sand. Black.	-							
			SS10	SS	35-20-4-1	<5				
		Sandy clay with traces of gravel.	-							
8			SS11	SS	8-6-4-4	<5				
		Sandy clay with traces of gravel. Moist.	-							
			SS12	SS	2-1-0-0	>5		Metals, PHC F1-F4, PAH, FOC pH, Grain Size	50 mm ID slotted PVC pipe backfilled with silica sand	
9.15 / 53.37		END OF BOREHOLE								

Notes :

240, Catherine Street
Office 110
Ottawa, Ontario
K2P 2G8
Telephone:(613) 860-2462

Borehole/Monitoring Well Log

BH/MW20-5

Drilling date: 2020/07/04
Technician: L. Robert
Prepared by: I. Souza
Revised by: K Greer

Client: University of Ottawa
Project no: A001049
Project Name: uOttawa Phase II Environmental Site Assessment
Address: 200 Lees, Ottawa (ON)

Easting : 75.6688904
Northing : 45.4160317

Groud Surface Elevation : 62.2 m
Top of Casing Elevation : m
Groudwater Elevation : m

Contractor: Forage Grenville
Equipment: Diedrich
Drill type: D-50
Type of sample: Split Spoon - Ø 61 mm

Sample types

RC	Rock core
SS	Split spoon sample
MA	Manual auger
MS	Manual sampler
ST	Sherlby tube
CL	Clear liner

Terminology

traces	< 10 %
some	10 - 20 %
(ey) or (y)	20 - 35 %
and	35 - 50 %

Soil classification

Silt and clay	< 0,08 mm
Sand	0,08 - 5 mm
Gravier	5 - 80 mm
Cobbles	80 - 300 mm
Boulders	> 300 mm

Relative density 'N' blows

Very loose	0 - 4
Loose	4 - 10
Compact	10 - 30
Dense	30 - 50
Very dense	>50

Subsurface Profile			Sample Details						Well Completion	
Depth / Elevation (m)	Graphic Log	Description	Sample ID	Sample Type	Blows/15cm	Headspace Concentrations TOV (ppm)	Headspace Concentrations CVC (ppm / %lel)	Lab Analysis	Description	Diagram
0										
0.33		Grassed surface : Silty, organic with traces of gravel.	SS1A			5			Flushmount protective cover with concrete seal	
61.87		Fill : Ash, glass, brick with traces of gravel. Mixed organic and fill, more ash and rust in depth.	SS1B	SS	3-4-5-4	<5			50 mm ID solid pipe backfilled with sand	
1			SS2	SS	5-6-4-2	<5				
		Silty sand, black, with ash, wood, metal debris and traces of gravel.	SS3	SS	2-1-2-4	<5				
2			SS4	SS	2-0-2-1	<5				
3			SS5	SS	1-2-2-3	<5		Metals, PHC F1-F4, PAH	50 mm ID solid PVC pipe backfilled with bentonite	
3.66										
58.54		Clayey silt (maybe organic, black) with traces of gravel.	SS6		2-2-2-3	<5				
4										
4.61										
57.59		Slight hydrocarbon odour. Till : Silt to clayey silt.	SS7	SS	2-2-2-6	<5			Water Level - 4.65 mbgs (July 21, 2020)	
5										
		Silty clay with traces of sand and gravel. Grey-black.	SS8A			<5				
			SS8B	SS	2-2-6-9	<5				
6			SS9A			<5		Metals, PHC F1-F4, PAH	50 mm ID slotted PVC pipe backfilled with silica sand	
		Hard dry till; Sandy clay with gravel. Black. Slight hydrocarbon odour.		SS	4-7-15-18					
7			SS10	SS	5-8-12-44	<5			Bentonite	
7.47										
54.73		END OF BOREHOLE								

Notes :

Ontario

Ministry of the Environment, Conservation and Parks

Measurements recorded in: ☐ Metric ☐ Imperial

Well Tag No. *(Place Sticker and/or Print Below)* A292533

Well Record

Regulation 903 Ontario Water Resources Act

Page _____ of _____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	Golder Associates	TNfoo@Golder.com	

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
1931 Robertson RD	Nepean	Ont	K2H5B7	6135912966

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
200 Lees Ave			

County/District/Municipality	City/Town/Village	Province	Postal Code
	Ottawa	Ontario	K1N6N5

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	446168	5029384		

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Black Grey	Silt, Sand, Gravel			0	18'
Grey	Clay, Silt			18'	225'

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0	16½	Bentonite	400 LBS
16½	22	SAND	150 LBS

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☑ Boring ☐ Digging
☐ Air percussion
☐ Other, *specify* _____

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☑ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, *specify* _____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
2"	Plastic		0	170

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
			17'	22'

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, *specify*
☐ Other, *specify*

Water Details

Water found at Depth (m/ft)	☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, *specify*

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	17'	4 1/4"
17	22½	3 3/4"

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, *specify* _____

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*

Pumping rate *(l/min / GPM)*

Duration of pumping ____ hrs + ____ min

Final water level end of pumping *(m/ft)*

If flowing give rate *(l/min / GPM)*

Recommended pump depth *(m/ft)*

Recommended pump rate *(l/min / GPM)*

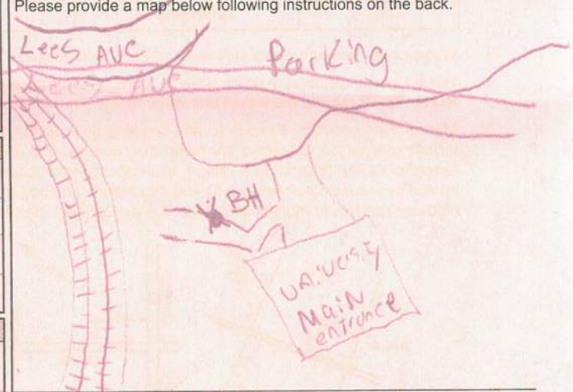
Well production *(l/min / GPM)*

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments: Main entrance west corner

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Forage Greenville Drilling	7517

Business Address (Street Number/Name)	Municipality
12 Chemin de l'Ecorcerie	Greenville

Province	Postal Code	Business E-mail Address
QC	J0L1T0	www.Greenville.co

Bus. Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)
8199214218669	Tyler Barcardox

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3191		2020/07/20

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☐ No		2020/07/14

Ministry Use Only

Audit No. Z335576

Received

0506E (2018/12)

Well Owner's Copy

Ontario

Ministry of the Environment, Conservation and Parks

Measurements recorded in: ☐ Metric ☐ Imperial

Well Tag No. *(Place Sticker and/or Print Below)* A292568

Well Record

Regulation 903 Ontario Water Resources Act

Page _____ of _____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	Golder Associates	JNto@Golder.com	

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
1931 Robertson RD		ont	K2H5B7	6135912716600

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
200 Lees Avenue			

County/District/Municipality	City/Town/Village	Province	Postal Code
	Ottawa	Ontario	K1N6N5

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	447798	5029354		

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Black, Grey	Silt, Sand, Gravel	Brick, Glass, Wood		0	18'
Grey	Till			18'	29 1/2'

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used *(Material and Type)*	Volume Placed (m^3/ft^3)
0	25'		450 LBS
25	30		150 LBS

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☒ Boring ☐ Digging
☐ Air percussion
☐ Other, *specify* _____

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☒ Test Hole ☒ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, *specify* _____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
2"	Plastic		0'	25

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
2"			25'	30'

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, *specify* _____
☐ Other, *specify* _____

Water Details

Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, *specify*

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	30'	8"

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, *specify* _____

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*

Pumping rate *(l/min / GPM)*

Duration of pumping _____ hrs + _____ min

Final water level end of pumping *(m/ft)*

If flowing give rate *(l/min / GPM)*

Recommended pump depth *(m/ft)*

Recommended pump rate *(l/min / GPM)*

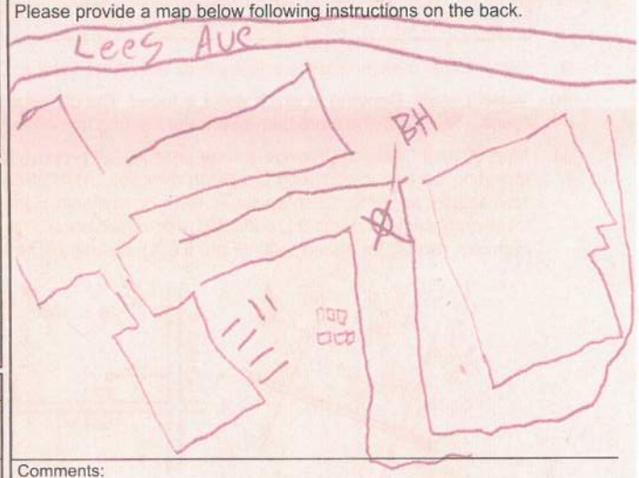
Well production *(l/min / GPM)*

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Forage Grenville Drilling	7517

Business Address (Street Number/Name)	Municipality
12 chemin de l'ecocentre	Grenville

Province	Postal Code	Business E-mail Address
QC	J0V1J0	www.grenville.co

Bus. Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)
5194248699	Tyler Boccardax

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3951		2020-07-20

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☐ No	YYYY MM DD	2020-07-16

Ministry Use Only

Audit No. Z335582

Received

0506E (2018/12)

Well Owner's Copy

F

Appendix F
Laboratory Certificates of Analysis

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: CIMA+ S.E.N.C.
240 CATHERINE STREET, SUITE 110
OTTAWA, ON K2P2G8
(613) 860-2462

ATTENTION TO: Karen Greer

PROJECT: A001049

AGAT WORK ORDER: 20Z621440

SOIL ANALYSIS REVIEWED BY: Jacky Zhu, Spectroscopy Technician

TRACE ORGANICS REVIEWED BY: Oksana Gushyla, Trace Organics Lab Supervisor

DATE REPORTED: Jul 14, 2020

PAGES (INCLUDING COVER): 11

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*Notes

Disclaimer:

- *All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.*
- *All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.*
- *AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.*
- *This Certificate shall not be reproduced except in full, without the written approval of the laboratory.*
- *The test results reported herewith relate only to the samples as received by the laboratory.*
- *Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.*
- *All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.*

AGAT Laboratories

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CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 20Z621440

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - Metals (Including Hydrides) (Soil)

DATE RECEIVED: 2020-07-06

DATE REPORTED: 2020-07-14

		SAMPLE DESCRIPTION:		BH-20-1_SS4
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2020-07-06
Parameter	Unit	G / S	RDL	1250652
Antimony	µg/g		0.8	6.5
Arsenic	µg/g		1	29
Barium	µg/g		2	664
Beryllium	µg/g		0.5	0.7
Boron	µg/g		5	12
Cadmium	µg/g		0.5	1.7
Chromium	µg/g		5	56
Cobalt	µg/g		0.5	7.0
Copper	µg/g		10	2930
Lead	µg/g		1	753
Molybdenum	µg/g		0.5	4.2
Nickel	µg/g		1	23
Selenium	µg/g		0.4	2.6
Silver	µg/g		0.2	9.1
Thallium	µg/g		0.4	<0.4
Uranium	µg/g		0.5	1.0
Vanadium	µg/g		1	24
Zinc	µg/g		5	792

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
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FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 20Z621440

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2020-07-06

DATE REPORTED: 2020-07-14

		SAMPLE DESCRIPTION:		BH-20-1_SS4
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2020-07-06
Parameter	Unit	G / S	RDL	1250652
Naphthalene	µg/g		0.05	<0.05
Acenaphthylene	µg/g		0.05	<0.05
Acenaphthene	µg/g		0.05	<0.05
Fluorene	µg/g		0.05	<0.05
Phenanthrene	µg/g		0.05	0.10
Anthracene	µg/g		0.05	<0.05
Fluoranthene	µg/g		0.05	0.21
Pyrene	µg/g		0.05	0.17
Benz(a)anthracene	µg/g		0.05	0.09
Chrysene	µg/g		0.05	0.10
Benzo(b)fluoranthene	µg/g		0.05	0.07
Benzo(k)fluoranthene	µg/g		0.05	<0.05
Benzo(a)pyrene	µg/g		0.05	<0.05
Indeno(1,2,3-cd)pyrene	µg/g		0.05	<0.05
Dibenz(a,h)anthracene	µg/g		0.05	<0.05
Benzo(g,h,i)perylene	µg/g		0.05	<0.05
1 and 2 Methlynaphthalene	µg/g		0.05	<0.05
Moisture Content	%		0.1	24.8
Surrogate	Unit	Acceptable Limits		
Naphthalene-d8	%	50-140		85
Acenaphthene-d10	%	50-140		104
Chrysene-d12	%	50-140		91

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

1250652 Results are based on the dry weight of the soil.
Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&j)Fluoranthene isomers because the isomers co-elute on the GC column.
2- and 1-Methyl Naphthalene is a calculated parameter. The calculated value is the sum of 2-Methyl Naphthalene and 1-Methyl Naphthalene.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 20Z621440

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2020-07-06

DATE REPORTED: 2020-07-14

		SAMPLE DESCRIPTION:		BH-20-1_SS4
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2020-07-06
Parameter	Unit	G / S	RDL	1250652
Benzene	µg/g		0.02	<0.02
Toluene	µg/g		0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05
Xylenes (Total)	µg/g		0.05	<0.05
F1 (C6 to C10)	µg/g		5	<5
F1 (C6 to C10) minus BTEX	µg/g		5	<5
F2 (C10 to C16)	µg/g		10	<10
F2 (C10 to C16) minus Naphthalene	µg/g		10	<10
F3 (C16 to C34)	µg/g		50	63
F3 (C16 to C34) minus PAHs	µg/g		50	62
F4 (C34 to C50)	µg/g		50	<50
Gravimetric Heavy Hydrocarbons	µg/g		50	NA
Moisture Content	%		0.1	24.8
Surrogate	Unit	Acceptable Limits		
Terphenyl	%	60-140		120

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 20Z621440

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2020-07-06

DATE REPORTED: 2020-07-14

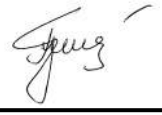
Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

1250652

Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.
C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX.
The calculated parameters are non-accredited. The parameters that are components of the calculation are accredited.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
C>10 – C16 (F2- Naphthalene) is a calculated parameter. The calculated value is F2 - Naphthalene.
C>16 - C34 (F3-PAH) is a calculated parameter. The calculated value is F3-PAH (PAH: sum of Phenanthrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-c,d)pyrene and Pyrene).
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:



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FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: CIMA+ S.E.N.C.
AGAT WORK ORDER: 20Z621440
PROJECT: A001049
ATTENTION TO: Karen Greer
SAMPLING SITE:
SAMPLED BY:

Soil Analysis

RPT Date: Jul 14, 2020			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals (Including Hydrides) (Soil)															
Antimony	1252412		<0.8	<0.8	NA	< 0.8	122%	70%	130%	99%	80%	120%	90%	70%	130%
Arsenic	1252412		2	1	NA	< 1	107%	70%	130%	105%	80%	120%	107%	70%	130%
Barium	1252412		37	37	0.0%	< 2	99%	70%	130%	100%	80%	120%	103%	70%	130%
Beryllium	1252412		<0.5	<0.5	NA	< 0.5	73%	70%	130%	85%	80%	120%	86%	70%	130%
Boron	1252412		<5	<5	NA	< 5	119%	70%	130%	89%	80%	120%	82%	70%	130%
Cadmium	1252412		<0.5	<0.5	NA	< 0.5	105%	70%	130%	100%	80%	120%	106%	70%	130%
Chromium	1252412		12	13	NA	< 5	92%	70%	130%	105%	80%	120%	109%	70%	130%
Cobalt	1252412		4.2	4.2	0.0%	< 0.5	92%	70%	130%	104%	80%	120%	105%	70%	130%
Lead	1252412		7	7	0.0%	< 1	98%	70%	130%	100%	80%	120%	99%	70%	130%
Molybdenum	1252412		<0.5	<0.5	NA	< 0.5	103%	70%	130%	105%	80%	120%	108%	70%	130%
Nickel	1252412		9	9	0.0%	< 1	90%	70%	130%	106%	80%	120%	101%	70%	130%
Selenium	1252412		<0.4	<0.4	NA	< 0.4	105%	70%	130%	102%	80%	120%	104%	70%	130%
Silver	1252412		<0.2	<0.2	NA	< 0.2	101%	70%	130%	107%	80%	120%	102%	70%	130%
Thallium	1252412		<0.4	<0.4	NA	< 0.4	101%	70%	130%	101%	80%	120%	101%	70%	130%
Uranium	1252412		<0.5	<0.5	NA	< 0.5	103%	70%	130%	97%	80%	120%	101%	70%	130%
Vanadium	1252412		17	18	5.7%	< 1	88%	70%	130%	96%	80%	120%	100%	70%	130%
Zinc	1252412		20	20	NA	< 5	94%	70%	130%	108%	80%	120%	112%	70%	130%

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Certified By:

AGAT Laboratories

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http://www.agatlabs.com

Quality Assurance

CLIENT NAME: CIMA+ S.E.N.C.
AGAT WORK ORDER: 20Z621440
PROJECT: A001049
ATTENTION TO: Karen Greer
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis

RPT Date: Jul 14, 2020			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)															
Benzene	1252415		< 0.02	< 0.02	NA	< 0.02	102%	50%	140%	92%	60%	130%	81%	50%	140%
Toluene	1252415		< 0.05	< 0.05	NA	< 0.05	82%	50%	140%	82%	60%	130%	92%	50%	140%
Ethylbenzene	1252415		< 0.05	< 0.05	NA	< 0.05	83%	50%	140%	102%	60%	130%	102%	50%	140%
Xylenes (Total)	1252415		< 0.05	< 0.05	NA	< 0.05	87%	50%	140%	99%	60%	130%	94%	50%	140%
F1 (C6 to C10)	1252415		< 5	< 5	NA	< 5	115%	60%	140%	87%	60%	140%	91%	60%	140%
F2 (C10 to C16)	1254053		< 10	< 10	NA	< 10	108%	60%	140%	103%	60%	140%	123%	60%	140%
F3 (C16 to C34)	1254053		< 50	< 50	NA	< 50	92%	60%	140%	99%	60%	140%	116%	60%	140%
F4 (C34 to C50)	1254053		< 50	< 50	NA	< 50	95%	60%	140%	103%	60%	140%	106%	60%	140%
O. Reg. 153(511) - PAHs (Soil)															
Naphthalene	1252414		<0.05	<0.05	NA	< 0.05	118%	50%	140%	57%	50%	140%	77%	50%	140%
Acenaphthylene	1252414		<0.05	<0.05	NA	< 0.05	98%	50%	140%	54%	50%	140%	85%	50%	140%
Acenaphthene	1252414		<0.05	<0.05	NA	< 0.05	134%	50%	140%	65%	50%	140%	87%	50%	140%
Fluorene	1252414		<0.05	<0.05	NA	< 0.05	113%	50%	140%	59%	50%	140%	89%	50%	140%
Phenanthrene	1252414		<0.05	<0.05	NA	< 0.05	109%	50%	140%	60%	50%	140%	92%	50%	140%
Anthracene	1252414		<0.05	<0.05	NA	< 0.05	88%	50%	140%	53%	50%	140%	92%	50%	140%
Fluoranthene	1252414		<0.05	<0.05	NA	< 0.05	115%	50%	140%	68%	50%	140%	104%	50%	140%
Pyrene	1252414		<0.05	<0.05	NA	< 0.05	113%	50%	140%	68%	50%	140%	105%	50%	140%
Benz(a)anthracene	1252414		<0.05	<0.05	NA	< 0.05	67%	50%	140%	55%	50%	140%	102%	50%	140%
Chrysene	1252414		<0.05	<0.05	NA	< 0.05	136%	50%	140%	72%	50%	140%	109%	50%	140%
Benzo(b)fluoranthene	1252414		<0.05	<0.05	NA	< 0.05	115%	50%	140%	72%	50%	140%	76%	50%	140%
Benzo(k)fluoranthene	1252414		<0.05	<0.05	NA	< 0.05	115%	50%	140%	72%	50%	140%	76%	50%	140%
Benzo(a)pyrene	1252414		<0.05	<0.05	NA	< 0.05	117%	50%	140%	73%	50%	140%	78%	50%	140%
Indeno(1,2,3-cd)pyrene	1252414		<0.05	<0.05	NA	< 0.05	127%	50%	140%	74%	50%	140%	74%	50%	140%
Dibenz(a,h)anthracene	1252414		<0.05	<0.05	NA	< 0.05	101%	50%	140%	66%	50%	140%	71%	50%	140%
Benzo(g,h,i)perylene	1252414		<0.05	<0.05	NA	< 0.05	125%	50%	140%	72%	50%	140%	73%	50%	140%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By:

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Method Summary

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20Z621440

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Zinc	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS

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Method Summary

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20Z621440

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Acenaphthylene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Acenaphthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Fluorene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Phenanthrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Anthracene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Fluoranthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Pyrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benz(a)anthracene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Chrysene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(b)fluoranthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(k)fluoranthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(a)pyrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Dibenz(a,h)anthracene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(g,h,i)perylene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
1 and 2 Methlynaphthalene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Moisture Content	ORG-91-5106	Tier 1 Method	BALANCE
Naphthalene-d8	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Acenaphthene-d10	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Chrysene-d12	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzene	VOL-91-5009	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Toluene	VOL-91-5009	modified from EPA SW-846 5035C & 8260D	P&T GC/MS
Ethylbenzene	VOL-91-5009	modified from EPA SW-846 5035C & 8260D	P&T GC/MS
Xylenes (Total)	VOL-91-5009	modified from EPA SW-846 5035C & 8260D	P&T GC/MS
F1 (C6 to C10)	VOL-91-5009	modified from CCME Tier 1 Method	P&T GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	modified from CCME Tier 1 Method	P&T GC/FID
F2 (C10 to C16)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F2 (C10 to C16) minus Naphthalene	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F3 (C16 to C34)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID

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Method Summary

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20Z621440

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
F3 (C16 to C34) minus PAHs	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F4 (C34 to C50)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE
Moisture Content	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID

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Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only

Work Order #: 2026214 40

Cooler Quantity: one - ice packs

Arrival Temperatures: 9.5 | 10.0 | 9.5
CT 6.0 | 5.4 | 5.8

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes: (on ice)

Report Information:

Company: IMAT
Contact: Karen Greer, Luc Robert
Address: 240 Catherine, #110, Ottawa K2P 2G8
Phone: 343 996-9656 Fax:
Reports to be sent to:
1. Email: Karen.greer@c.ma.ca
2. Email: Luc.Robert@c.ma.ca

Regulatory Requirements:

☐ No Regulatory Requirement
(Please check all applicable boxes)

☑ Regulation 153/04
Table 03 (Indicate One)
☐ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture (Check One)
☐ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region _____ (Indicate One)
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
_____ (Indicate One)

Is this submission for a **Record of Site Condition?** ☑ Yes ☐ No

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

_____

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: A001049
Site Location: 200 Leos, Ottawa
Sampled By: Luc Robert
AGAT Quote #: 335768 PO:
Please note: if quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☑ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics	O. Reg 153: ☐ All Metals ☐ 153 Metals (excl Hydrides) ☐ Hydride Metals ■ 153 Metals (incl Hydrides)	O. Reg 153: ORPs: ☐ B-HWS ☐ Cl ☐ CN ☐ Cr⁶⁺ ☐ EC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☒ BTEX ☐ THM 4+1	PHCs F1 - F4	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PC3s	Sewer Use	HOLD	Potentially Hazardous or High Concentration (Y/N)
BH-20-1_SS2	06-07-2020		3	S					4R				X						4R	X	
BH-20-1_SS4	↓		3	↓									X								
BH-20-1_SS6			3																	X	
BH-20-1_SS8			3																	X	
BH-20-1_SS10			3																	X	
BH-20-1_SS12			3																	X	
BH-20-1_SS14			3																	X	
BH-20-1_SS16			3																		

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign): Berthelet	2020-07-06	15h45
Samples Relinquished By (Print Name and Sign): CB/O to FedEx	2020/07/06	16h00	Samples Received By (Print Name and Sign):	Date	Time
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign): Shaun S	July 7 / 2020	10:15 am

Page 1 of 1

№: T 093993

Pink Copy - Client | Yellow Copy - AGAT | White Copy- AGAT

AGAT Laboratories

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CLIENT NAME: CIMA+ S.E.N.C.
240 CATHERINE STREET, SUITE 110
OTTAWA, ON K2P2G8
(613) 860-2462

ATTENTION TO: Karen Greer

PROJECT: A001049

AGAT WORK ORDER: 20Z624254

SOIL ANALYSIS REVIEWED BY: Jacky Zhu, Spectroscopy Technician

TRACE ORGANICS REVIEWED BY: Oksana Gushyla, Trace Organics Lab Supervisor

DATE REPORTED: Aug 04, 2020

PAGES (INCLUDING COVER): 31

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*Notes

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 20Z624254

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:Ottawa

SAMPLED BY:JL

O. Reg. 153(511) - Metals (Including Hydrides) (Soil)

DATE RECEIVED: 2020-07-10

DATE REPORTED: 2020-08-04

SAMPLE DESCRIPTION:				BH20-2 SS4	BH20-2 SS16	BH20-3 SS4	BH20-4 SS4	BH20-4 SS5	BH20-5 SS5	BH20-5 SS9	BH20-4 SS12
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2020-07-10	2020-07-10	2020-07-10	2020-07-10	2020-07-10	2020-07-10	2020-07-10	2020-07-10
Parameter	Unit	G / S	RDL	1268816	1268849	1268852	1268888	1268889	1268949	1268958	1268960
Antimony	µg/g	40	0.8	5.0	<0.8	5.3	1.3	10.8	15.5	<0.8	<0.8
Arsenic	µg/g	18	1	19	4	29	15	31	36	4	2
Barium	µg/g	670	2	413	116	625	362	779	328	126	90
Beryllium	µg/g	8	0.5	<0.5	0.5	0.8	0.5	0.8	1.4	<0.5	<0.5
Boron	µg/g	120	5	17	11	16	<5	8	13	7	7
Cadmium	µg/g	1.9	0.5	1.1	<0.5	9.8	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	µg/g	160	5	34	23	50	21	21	32	15	12
Cobalt	µg/g	80	0.5	6.2	8.9	10.7	8.9	18.0	19.3	6.1	5.0
Copper	µg/g	230	1	156	24	176	40	566	175	31	11
Lead	µg/g	120	1	609	11	954	755	625	485	58	4
Molybdenum	µg/g	40	0.5	2.7	2.6	3.6	3.8	10.0	8.5	2.0	1.2
Nickel	µg/g	270	1	31	26	39	21	44	47	17	12
Selenium	µg/g	5.5	0.4	1.7	0.5	5.3	3.5	2.1	3.2	0.6	<0.4
Silver	µg/g	40	0.2	0.4	<0.2	1.8	0.3	1.0	1.0	<0.2	<0.2
Thallium	µg/g	3.3	0.4	<0.4	<0.4	0.5	<0.4	<0.4	0.4	<0.4	<0.4
Uranium	µg/g	33	0.5	<0.5	1.4	0.6	0.6	0.9	1.5	1.1	1.0
Vanadium	µg/g	86	1	20	33	34	29	31	46	24	21
Zinc	µg/g	340	5	581	53	1540	280	546	258	96	21

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 20Z624254

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:Ottawa

SAMPLED BY:JL

O. Reg. 153(511) - Metals (Including Hydrides) (Soil)

DATE RECEIVED: 2020-07-10

DATE REPORTED: 2020-08-04

		SAMPLE DESCRIPTION:		DUP1	DUP2
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2020-07-10	2020-07-10
Parameter	Unit	G / S	RDL	1268974	1268975
Antimony	µg/g	40	0.8	2.7	<0.8
Arsenic	µg/g	18	1	18	2
Barium	µg/g	670	2	282	113
Beryllium	µg/g	8	0.5	0.8	<0.5
Boron	µg/g	120	5	8	7
Cadmium	µg/g	1.9	0.5	0.6	<0.5
Chromium	µg/g	160	5	24	11
Cobalt	µg/g	80	0.5	12.1	5.0
Copper	µg/g	230	1	81	10
Lead	µg/g	120	1	349	4
Molybdenum	µg/g	40	0.5	3.9	1.0
Nickel	µg/g	270	1	29	11
Selenium	µg/g	5.5	0.4	3.3	<0.4
Silver	µg/g	40	0.2	0.4	<0.2
Thallium	µg/g	3.3	0.4	<0.4	<0.4
Uranium	µg/g	33	0.5	0.8	1.0
Vanadium	µg/g	86	1	36	20
Zinc	µg/g	340	5	468	24

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 20Z624254

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:Ottawa

SAMPLED BY:JL

O. Reg. 153(511) - ORPs (Soil) - FOC

DATE RECEIVED: 2020-07-10

DATE REPORTED: 2020-08-04

		SAMPLE DESCRIPTION:		BH20-4 SS12
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2020-07-10
Parameter	Unit	G / S	RDL	1268960
Fraction Organic Carbon-1	NA		0.003	0.019
Fraction Organic Carbon-2	NA		0.003	0.019
Fraction Organic Carbon-3	NA		0.003	0.019
Fraction Organic Carbon-Avg	NA		0.003	0.019

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

1268960 FOC - Samples were analysed and are reported in triplicate. FOC was calculated from the Total Organic Matter, which was determined using the Loss on Ignition procedure.

Analysis performed at AGAT Toronto (unless marked by *)

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AGAT WORK ORDER: 20Z624254
PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.
SAMPLING SITE:Ottawa

ATTENTION TO: Karen Greer
SAMPLED BY:JL

O. Reg. 153(511) - ORPs (Soil) - FOC, pH

DATE RECEIVED: 2020-07-10 DATE REPORTED: 2020-08-04

		SAMPLE DESCRIPTION:		BH20-4 SS5
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2020-07-10
Parameter	Unit	G / S	RDL	1268889
pH, 2:1 CaCl2 Extraction	pH Units	5.0-9.0	NA	7.75
Fraction Organic Carbon-1	NA		0.003	0.024
Fraction Organic Carbon-2	NA		0.003	0.024
Fraction Organic Carbon-3	NA		0.003	0.024
Fraction Organic Carbon-Avg	NA		0.003	0.024

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

1268889 pH was determined on the 0.01M CaCl2 extract obtained from 2:1 leaching procedure (2 parts extraction fluid:1 part wet soil).
FOC - Samples were analysed and are reported in triplicate. FOC was calculated from the Total Organic Matter, which was determined using the Loss on Ignition procedure.

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AGAT WORK ORDER: 20Z624254

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:Ottawa

SAMPLED BY:JL

O. Reg. 558 Metals

DATE RECEIVED: 2020-07-10

DATE REPORTED: 2020-08-04

		SAMPLE DESCRIPTION:		TCLP
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2020-07-10
Parameter	Unit	G / S	RDL	1268976
Arsenic Leachate	mg/L	2.5	0.010	<0.010
Barium Leachate	mg/L	100	0.100	2.27
Boron Leachate	mg/L	500	0.050	0.120
Cadmium Leachate	mg/L	0.5	0.010	0.016
Chromium Leachate	mg/L	5	0.010	0.014
Lead Leachate	mg/L	5	0.010	9.98
Mercury Leachate	mg/L	0.1	0.01	<0.01
Selenium Leachate	mg/L	1	0.010	<0.010
Silver Leachate	mg/L	5	0.010	<0.010
Uranium Leachate	mg/L	10	0.050	<0.050

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

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AGAT WORK ORDER: 20Z624254

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:Ottawa

SAMPLED BY:JL

Particle Size by Sieve (Wet)

DATE RECEIVED: 2020-07-10

DATE REPORTED: 2020-08-04

				SAMPLE DESCRIPTION:	BH20-4 SS5	BH20-4 SS12
				SAMPLE TYPE:	Soil	Soil
				DATE SAMPLED:	2020-07-10	2020-07-10
Parameter	Unit	G / S	RDL		1268889	1268960
Sieve Analysis - 75 µm (retained)	%		NA		79.10	82.88
Sieve Analysis - 75 µm (passing)	%		NA		20.90	17.12
Soil Texture (Toronto)					Coarse	Coarse

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

1268889-1268960 Value reported is the amount of sample passing through or retained on sieve after wash with water and represents proportion by weight particles smaller or larger than indicated sieve size.

Analysis performed at AGAT Toronto (unless marked by *)

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AGAT WORK ORDER: 20Z624254

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:Ottawa

SAMPLED BY:JL

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2020-07-10

DATE REPORTED: 2020-08-04

SAMPLE DESCRIPTION:				BH20-2 SS4	BH20-2 SS16	BH20-3 SS4	BH20-4 SS4	BH20-4 SS5	BH20-5 SS5	BH20-5 SS9	BH20-4 SS12
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2020-07-10	2020-07-10	2020-07-10	2020-07-10	2020-07-10	2020-07-10	2020-07-10	2020-07-10
Parameter	Unit	G / S	RDL	1268816	1268849	1268852	1268888	1268889	1268949	1268958	1268960
Naphthalene	µg/g	9.6	0.05	0.08	<0.05	0.10	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	µg/g	0.15	0.05	0.14	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	µg/g	96	0.05	0.11	<0.05	0.13	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	µg/g	62	0.05	0.16	<0.05	0.18	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	µg/g	12	0.05	1.3	0.28	1.3	0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	µg/g	0.67	0.05	0.41	0.08	0.43	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/g	9.6	0.05	1.9	0.49	1.7	0.15	<0.05	<0.05	<0.05	<0.05
Pyrene	µg/g	96	0.05	1.7	0.42	1.4	0.12	<0.05	<0.05	<0.05	<0.05
Benz(a)anthracene	µg/g	0.96	0.05	0.99	0.30	0.94	0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	µg/g	9.6	0.05	0.94	0.27	0.99	0.07	<0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	µg/g	0.96	0.05	0.99	0.25	0.74	0.10	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g	0.96	0.05	0.65	0.16	0.46	0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g	0.3	0.05	0.69	0.19	0.56	0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-cd)pyrene	µg/g	0.76	0.05	0.28	0.07	0.19	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenz(a,h)anthracene	µg/g	0.1	0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/g	9.6	0.05	0.26	0.06	0.16	<0.05	<0.05	<0.05	<0.05	<0.05
1 and 2 Methlynaphthalene	µg/g	76	0.05	0.10	<0.05	0.13	<0.05	<0.05	<0.05	<0.05	<0.05
Moisture Content	%		0.1	35.7	18.6	27.5	19.4	22.2	8.8	9.6	12.1
Surrogate	Unit	Acceptable Limits									
Naphthalene-d8	%	50-140		74	70	85	71	71	93	78	76
Acenaphthene-d10	%	50-140		75	71	83	88	70	91	76	75
Chrysene-d12	%	50-140		84	77	95	75	84	106	112	105

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AGAT WORK ORDER: 20Z624254
PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.
SAMPLING SITE:Ottawa

ATTENTION TO: Karen Greer
SAMPLED BY:JL

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2020-07-10

DATE REPORTED: 2020-08-04

		SAMPLE DESCRIPTION:		DUP1	DUP2
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2020-07-10	2020-07-10
Parameter	Unit	G / S	RDL	1268974	1268975
Naphthalene	µg/g	9.6	0.05	<0.05	<0.05
Acenaphthylene	µg/g	0.15	0.05	<0.05	<0.05
Acenaphthene	µg/g	96	0.05	<0.05	<0.05
Fluorene	µg/g	62	0.05	<0.05	<0.05
Phenanthrene	µg/g	12	0.05	0.30	<0.05
Anthracene	µg/g	0.67	0.05	0.08	<0.05
Fluoranthene	µg/g	9.6	0.05	0.52	<0.05
Pyrene	µg/g	96	0.05	0.46	<0.05
Benz(a)anthracene	µg/g	0.96	0.05	0.30	<0.05
Chrysene	µg/g	9.6	0.05	0.29	<0.05
Benzo(b)fluoranthene	µg/g	0.96	0.05	0.26	<0.05
Benzo(k)fluoranthene	µg/g	0.96	0.05	0.17	<0.05
Benzo(a)pyrene	µg/g	0.3	0.05	0.20	<0.05
Indeno(1,2,3-cd)pyrene	µg/g	0.76	0.05	0.06	<0.05
Dibenz(a,h)anthracene	µg/g	0.1	0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/g	9.6	0.05	0.06	<0.05
1 and 2 Methlynaphthalene	µg/g	76	0.05	<0.05	<0.05
Moisture Content	%		0.1	17.1	11.3
Surrogate	Unit	Acceptable Limits			
Naphthalene-d8	%	50-140		81	63
Acenaphthene-d10	%	50-140		71	61
Chrysene-d12	%	50-140		92	88

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

1268816-1268975 Results are based on the dry weight of the soil.
Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&j)Fluoranthene isomers because the isomers co-elute on the GC column.
2- and 1-Methyl Naphthalene is a calculated parameter. The calculated value is the sum of 2-Methyl Naphthalene and 1-Methyl Naphthalene.

Analysis performed at AGAT Toronto (unless marked by *)

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AGAT WORK ORDER: 20Z624254

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:Ottawa

SAMPLED BY:JL

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2020-07-10

DATE REPORTED: 2020-08-04

SAMPLE DESCRIPTION:				BH20-2 SS4	BH20-2 SS16	BH20-3 SS4	BH20-4 SS4	BH20-4 SS5	BH20-5 SS5	BH20-5 SS9	BH20-4 SS12
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2020-07-10	2020-07-10	2020-07-10	2020-07-10	2020-07-10	2020-07-10	2020-07-10	2020-07-10
Parameter	Unit	G / S	RDL	1268816	1268849	1268852	1268888	1268889	1268949	1268958	1268960
Benzene	µg/g	0.32	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g	68	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g	9.5	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylenes (Total)	µg/g	26	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g	55	5	<5	16	<5	<5	<5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	55	5	<5	16	<5	<5	<5	<5	<5	<5
F2 (C10 to C16)	µg/g	230	10	<10	<10	<10	<10	<10	15	<10	<10
F2 (C10 to C16) minus Naphthalene	µg/g		10	<10	<10	<10	<10	<10	15	<10	<10
F3 (C16 to C34)	µg/g	1700	50	160	<50	130	<50	<50	<50	<50	<50
F3 (C16 to C34) minus PAHs	µg/g		50	150	<50	120	<50	<50	<50	<50	<50
F4 (C34 to C50)	µg/g	3300	50	51	<50	65	<50	<50	<50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g	3300	50	NA	NA	NA	NA	NA	NA	NA	NA
Moisture Content	%		0.1	35.7	18.6	27.5	19.4	22.2	8.8	9.6	12.1
Surrogate	Unit	Acceptable Limits									
Terphenyl	%	60-140		110	130	120	83	92	110	68	83

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AGAT WORK ORDER: 20Z624254

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:Ottawa

SAMPLED BY:JL

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2020-07-10

DATE REPORTED: 2020-08-04

		SAMPLE DESCRIPTION:		DUP1	DUP2
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2020-07-10	2020-07-10
Parameter	Unit	G / S	RDL	1268974	1268975
Benzene	µg/g	0.32	0.02	<0.02	<0.02
Toluene	µg/g	68	0.05	<0.05	<0.05
Ethylbenzene	µg/g	9.5	0.05	<0.05	<0.05
Xylenes (Total)	µg/g	26	0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g	55	5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	55	5	<5	<5
F2 (C10 to C16)	µg/g	230	10	<10	<10
F2 (C10 to C16) minus Naphthalene	µg/g		10	<10	<10
F3 (C16 to C34)	µg/g	1700	50	<50	<50
F3 (C16 to C34) minus PAHs	µg/g		50	<50	<50
F4 (C34 to C50)	µg/g	3300	50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g	3300	50	NA	NA
Moisture Content	%		0.1	17.1	11.3
Surrogate	Unit	Acceptable Limits			
Terphenyl	%	60-140		80	96

Certified By:

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AGAT WORK ORDER: 20Z624254

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:Ottawa

SAMPLED BY:JL

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2020-07-10

DATE REPORTED: 2020-08-04

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

1268816-1268975 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.
C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX.
The calculated parameters are non-accredited. The parameters that are components of the calculation are accredited.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
C>10 – C16 (F2- Naphthalene) is a calculated parameter. The calculated value is F2 - Naphthalene.
C>16 - C34 (F3-PAH) is a calculated parameter. The calculated value is F3-PAH (PAH: sum of Phenanthrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-c,d)pyrene and Pyrene).
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Analysis performed at AGAT Toronto (unless marked by *)

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AGAT WORK ORDER: 20Z624254
PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.
SAMPLING SITE:Ottawa

ATTENTION TO: Karen Greer
SAMPLED BY:JL

O. Reg. 558 - SVOCs

DATE RECEIVED: 2020-07-10

DATE REPORTED: 2020-08-04

		SAMPLE DESCRIPTION:		TCLP
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2020-07-10
Parameter	Unit	G / S	RDL	1268976
Pyridine	mg/L	5.0	0.010	<0.010
Cresols	mg/L	200	0.012	<0.012
Ortho-Cresol	mg/L	200	0.004	<0.004
Meta & Para-Cresol	mg/L	200	0.008	<0.008
Hexachloroethane	mg/L	3	0.004	<0.004
Nitrobenzene	mg/L	2.0	0.004	<0.004
Hexachlorobutadiene	mg/L	0.5	0.004	<0.004
2,4,6-Trichlorophenol	mg/L	0.5	0.05	<0.05
2,4,5-Trichlorophenol	mg/L	400	0.004	<0.004
2,4-Dinitrotoluene	mg/L	0.13	0.004	<0.004
2,3,4,6-Tetrachlorophenol	mg/L	10	0.004	<0.004
Hexachlorobenzene	mg/L	0.13	0.004	<0.004
Dinoseb	mg/L	1	0.004	<0.004
Benzo(a)pyrene	mg/L	0.001	0.001	<0.001
BNA Extr	NA			Y
Surrogate	Unit	Acceptable Limits		
2-Fluorophenol	%	30-130		74
Phenol-d6	%	30-130		69
2,4,6-Tribromophenol	%	50-140		84
Chrysene-d12	%	50-140		84

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

1268976 The sample was leached according to Regulation 558 protocol. Analysis was performed on the leachate.
Cresols total is a calculated parameter. The calculated value is the sum o-Cresol and m&p-Cresol.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

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AGAT WORK ORDER: 20Z624254

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:Ottawa

SAMPLED BY:JL

O. Reg. 558 - VOCs

DATE RECEIVED: 2020-07-10

DATE REPORTED: 2020-08-04

		SAMPLE DESCRIPTION:		TCLP
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2020-07-10
Parameter	Unit	G / S	RDL	1268976
Vinyl Chloride	mg/L	0.2	0.030	<0.030
1,1 Dichloroethene	mg/L	1.4	0.020	<0.020
Dichloromethane	mg/L	5.0	0.030	<0.030
Methyl Ethyl Ketone	mg/L	200	0.090	<0.090
Chloroform	mg/L	10.0	0.020	<0.020
1,2-Dichloroethane	mg/L	0.5	0.020	<0.020
Carbon Tetrachloride	mg/L	0.5	0.020	<0.020
Benzene	mg/L	0.5	0.020	<0.020
Trichloroethene	mg/L	5.0	0.020	<0.020
Tetrachloroethene	mg/L	3.0	0.050	<0.050
Chlorobenzene	mg/L	8.0	0.010	<0.010
1,2-Dichlorobenzene	mg/L	20.0	0.010	<0.010
1,4-Dichlorobenzene	mg/L	0.5	0.010	<0.010
Surrogate	Unit	Acceptable Limits		
Toluene-d8	% Recovery	50-140		86

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

1268976 Sample was prepared using Regulation 558 protocol and a zero headspace extractor.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

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Guideline Violation

AGAT WORK ORDER: 20Z624254

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
1268816	BH20-2 SS4	ON T3 S ICC CT	O. Reg. 153(511) - Metals (Including Hydrides) (Soil)	Arsenic	µg/g	18	19
1268816	BH20-2 SS4	ON T3 S ICC CT	O. Reg. 153(511) - Metals (Including Hydrides) (Soil)	Lead	µg/g	120	609
1268816	BH20-2 SS4	ON T3 S ICC CT	O. Reg. 153(511) - Metals (Including Hydrides) (Soil)	Zinc	µg/g	340	581
1268816	BH20-2 SS4	ON T3 S ICC CT	O. Reg. 153(511) - PAHs (Soil)	Benz(a)anthracene	µg/g	0.96	0.99
1268816	BH20-2 SS4	ON T3 S ICC CT	O. Reg. 153(511) - PAHs (Soil)	Benzo(a)pyrene	µg/g	0.3	0.69
1268816	BH20-2 SS4	ON T3 S ICC CT	O. Reg. 153(511) - PAHs (Soil)	Benzo(b)fluoranthene	µg/g	0.96	0.99
1268852	BH20-3 SS4	ON T3 S ICC CT	O. Reg. 153(511) - Metals (Including Hydrides) (Soil)	Arsenic	µg/g	18	29
1268852	BH20-3 SS4	ON T3 S ICC CT	O. Reg. 153(511) - Metals (Including Hydrides) (Soil)	Cadmium	µg/g	1.9	9.8
1268852	BH20-3 SS4	ON T3 S ICC CT	O. Reg. 153(511) - Metals (Including Hydrides) (Soil)	Lead	µg/g	120	954
1268852	BH20-3 SS4	ON T3 S ICC CT	O. Reg. 153(511) - Metals (Including Hydrides) (Soil)	Zinc	µg/g	340	1540
1268852	BH20-3 SS4	ON T3 S ICC CT	O. Reg. 153(511) - PAHs (Soil)	Benzo(a)pyrene	µg/g	0.3	0.56
1268888	BH20-4 SS4	ON T3 S ICC CT	O. Reg. 153(511) - Metals (Including Hydrides) (Soil)	Lead	µg/g	120	755
1268889	BH20-4 SS5	ON T3 S ICC CT	O. Reg. 153(511) - Metals (Including Hydrides) (Soil)	Arsenic	µg/g	18	31
1268889	BH20-4 SS5	ON T3 S ICC CT	O. Reg. 153(511) - Metals (Including Hydrides) (Soil)	Barium	µg/g	670	779
1268889	BH20-4 SS5	ON T3 S ICC CT	O. Reg. 153(511) - Metals (Including Hydrides) (Soil)	Copper	µg/g	230	566
1268889	BH20-4 SS5	ON T3 S ICC CT	O. Reg. 153(511) - Metals (Including Hydrides) (Soil)	Lead	µg/g	120	625
1268889	BH20-4 SS5	ON T3 S ICC CT	O. Reg. 153(511) - Metals (Including Hydrides) (Soil)	Zinc	µg/g	340	546
1268949	BH20-5 SS5	ON T3 S ICC CT	O. Reg. 153(511) - Metals (Including Hydrides) (Soil)	Arsenic	µg/g	18	36
1268949	BH20-5 SS5	ON T3 S ICC CT	O. Reg. 153(511) - Metals (Including Hydrides) (Soil)	Lead	µg/g	120	485
1268974	DUP1	ON T3 S ICC CT	O. Reg. 153(511) - Metals (Including Hydrides) (Soil)	Lead	µg/g	120	349
1268974	DUP1	ON T3 S ICC CT	O. Reg. 153(511) - Metals (Including Hydrides) (Soil)	Zinc	µg/g	340	468
1268976	TCLP	ON Reg 558	O. Reg. 558 Metals	Lead Leachate	mg/L	5	9.98

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Quality Assurance

CLIENT NAME: CIMA+ S.E.N.C.
PROJECT: A001049
SAMPLING SITE:Ottawa

AGAT WORK ORDER: 20Z624254
ATTENTION TO: Karen Greer
SAMPLED BY:JL

Soil Analysis

RPT Date: Aug 04, 2020			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals (Including Hydrides) (Soil)															
Antimony	1268816	1268816	5.0	5.2	3.9%	< 0.8	109%	70%	130%	103%	80%	120%	104%	70%	130%
Arsenic	1268816	1268816	19	20	5.1%	< 1	109%	70%	130%	100%	80%	120%	101%	70%	130%
Barium	1268816	1268816	413	444	7.2%	< 2	107%	70%	130%	106%	80%	120%	98%	70%	130%
Beryllium	1268816	1268816	<0.5	<0.5	NA	< 0.5	80%	70%	130%	95%	80%	120%	104%	70%	130%
Boron	1268816	1268816	17	17	NA	< 5	88%	70%	130%	102%	80%	120%	99%	70%	130%
Cadmium	1268816	1268816	1.1	1.1	NA	< 0.5	99%	70%	130%	101%	80%	120%	98%	70%	130%
Chromium	1268816	1268816	34	36	5.7%	< 5	96%	70%	130%	104%	80%	120%	104%	70%	130%
Cobalt	1268816	1268816	6.2	6.4	3.2%	< 0.5	94%	70%	130%	101%	80%	120%	91%	70%	130%
Copper	1268816	1268816	156	157	0.6%	< 1	91%	70%	130%	106%	80%	120%	100%	70%	130%
Lead	1268816	1268816	609	629	3.2%	< 1	104%	70%	130%	105%	80%	120%	108%	70%	130%
Molybdenum	1268816	1268816	2.7	2.9	7.1%	< 0.5	96%	70%	130%	105%	80%	120%	99%	70%	130%
Nickel	1268816	1268816	31	32	3.2%	< 1	96%	70%	130%	102%	80%	120%	86%	70%	130%
Selenium	1268816	1268816	1.7	1.8	NA	< 0.4	117%	70%	130%	94%	80%	120%	97%	70%	130%
Silver	1268816	1268816	0.4	0.4	NA	< 0.2	95%	70%	130%	98%	80%	120%	97%	70%	130%
Thallium	1268816	1268816	<0.4	<0.4	NA	< 0.4	110%	70%	130%	101%	80%	120%	91%	70%	130%
Uranium	1268816	1268816	<0.5	<0.5	NA	< 0.5	106%	70%	130%	100%	80%	120%	97%	70%	130%
Vanadium	1268816	1268816	20	21	4.9%	< 1	98%	70%	130%	99%	80%	120%	94%	70%	130%
Zinc	1268816	1268816	581	603	3.7%	< 5	98%	70%	130%	103%	80%	120%	114%	70%	130%
Particle Size by Sieve (Wet)															
Sieve Analysis - 75 µm (retained)	1268960	1268960	82.88	82.12	0.9%		107%	70%	130%						
Sieve Analysis - 75 µm (passing)	1268960	1268960	17.12	17.88	4.3%										
Comments: NA - Not Applicable															
O. Reg. 153(511) - ORPs (Soil) - FOC, pH															
pH, 2:1 CaCl2 Extraction	1267979		7.61	7.64	0.4%	NA	100%	80%	120%						
O. Reg. 558 Metals															
Arsenic Leachate	1267220		<0.010	<0.010	NA	< 0.010	100%	70%	130%	105%	80%	120%	113%	70%	130%
Barium Leachate	1267220		0.332	0.415	NA	< 0.100	99%	70%	130%	104%	80%	120%	124%	70%	130%
Boron Leachate	1267220		<0.050	0.236	NA	< 0.050	101%	70%	130%	99%	80%	120%	251%	70%	130%
Cadmium Leachate	1267220		<0.010	<0.010	NA	< 0.010	100%	70%	130%	99%	80%	120%	107%	70%	130%
Chromium Leachate	1267220		<0.010	<0.010	NA	< 0.010	100%	70%	130%	108%	80%	120%	126%	70%	130%
Lead Leachate	1267220		<0.010	<0.010	NA	< 0.010	100%	70%	130%	103%	80%	120%	83%	70%	130%
Mercury Leachate	1267220		<0.01	<0.01	NA	< 0.01	105%	70%	130%	93%	80%	120%	85%	70%	130%
Selenium Leachate	1267220		<0.010	<0.010	NA	< 0.010	96%	70%	130%	106%	80%	120%	111%	70%	130%
Silver Leachate	1267220		<0.010	<0.010	NA	< 0.010	99%	70%	130%	97%	80%	120%	97%	70%	130%
Uranium Leachate	1267220		<0.050	<0.050	NA	< 0.050	95%	70%	130%	99%	80%	120%	73%	70%	130%

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Quality Assurance

CLIENT NAME: CIMA+ S.E.N.C.
AGAT WORK ORDER: 20Z624254
PROJECT: A001049
ATTENTION TO: Karen Greer
SAMPLING SITE:Ottawa
SAMPLED BY:JL

Soil Analysis (Continued)

RPT Date: Aug 04, 2020			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals (Including Hydrides) (Soil)															
Antimony	1302928		<0.8	<0.8	NA	< 0.8	127%	70%	130%	101%	80%	120%	87%	70%	130%
Arsenic	1302928		<1	<1	NA	< 1	107%	70%	130%	99%	80%	120%	100%	70%	130%
Barium	1302928		6	6	NA	< 2	100%	70%	130%	95%	80%	120%	96%	70%	130%
Beryllium	1302928		<0.5	<0.5	NA	< 0.5	102%	70%	130%	116%	80%	120%	110%	70%	130%
Boron	1302928		NA	NA	0.0%	< 5	81%	70%	130%	102%	80%	120%	103%	70%	130%
Cadmium	1302928		<0.5	<0.5	NA	< 0.5	104%	70%	130%	102%	80%	120%	101%	70%	130%
Chromium	1302928		8	8	NA	< 5	96%	70%	130%	97%	80%	120%	94%	70%	130%
Cobalt	1302928		1.7	1.8	NA	< 0.5	93%	70%	130%	99%	80%	120%	97%	70%	130%
Copper	1302928		2	2	NA	< 1	87%	70%	130%	100%	80%	120%	94%	70%	130%
Lead	1302928		1	1	NA	< 1	99%	70%	130%	100%	80%	120%	97%	70%	130%
Molybdenum	1302928		<0.5	<0.5	NA	< 0.5	107%	70%	130%	101%	80%	120%	107%	70%	130%
Nickel	1302928		3	3	NA	< 1	92%	70%	130%	100%	80%	120%	97%	70%	130%
Selenium	1302928		<0.4	<0.4	NA	< 0.4	130%	70%	130%	101%	80%	120%	104%	70%	130%
Silver	1302928		<0.2	<0.2	NA	< 0.2	97%	70%	130%	102%	80%	120%	99%	70%	130%
Thallium	1302928		<0.4	<0.4	NA	< 0.4	107%	70%	130%	103%	80%	120%	101%	70%	130%
Uranium	1302928		0.5	0.5	NA	< 0.5	107%	70%	130%	100%	80%	120%	101%	70%	130%
Vanadium	1302928		27	26	3.8%	< 1	104%	70%	130%	96%	80%	120%	97%	70%	130%
Zinc	1302928		7	7	NA	< 5	99%	70%	130%	104%	80%	120%	113%	70%	130%

Comments: NA signifies Not Applicable.
pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Certified By:

AGAT Laboratories

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Quality Assurance

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PROJECT: A001049
SAMPLING SITE:Ottawa

AGAT WORK ORDER: 20Z624254
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SAMPLED BY:JL

Trace Organics Analysis

RPT Date: Aug 04, 2020			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)															
Benzene	1270641		< 0.02	< 0.02	NA	< 0.02	82%	50%	140%	85%	60%	130%	95%	50%	140%
Toluene	1270641		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	112%	60%	130%	90%	50%	140%
Ethylbenzene	1270641		< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	90%	60%	130%	95%	50%	140%
Xylenes (Total)	1270641		< 0.05	< 0.05	NA	< 0.05	92%	50%	140%	88%	60%	130%	97%	50%	140%
F1 (C6 to C10)	1270641		< 5	< 5	NA	< 5	108%	60%	140%	99%	60%	140%	82%	60%	140%
F2 (C10 to C16)	1269586		< 10	< 10	NA	< 10	119%	60%	140%	98%	60%	140%	79%	60%	140%
F3 (C16 to C34)	1269586		< 50	< 50	NA	< 50	109%	60%	140%	123%	60%	140%	83%	60%	140%
F4 (C34 to C50)	1269586		< 50	< 50	NA	< 50	103%	60%	140%	103%	60%	140%	101%	60%	140%
O. Reg. 153(511) - PAHs (Soil)															
Naphthalene	1264827		< 0.05	< 0.05	NA	< 0.05	103%	50%	140%	88%	50%	140%	95%	50%	140%
Acenaphthylene	1264827		< 0.05	< 0.05	NA	< 0.05	105%	50%	140%	99%	50%	140%	107%	50%	140%
Acenaphthene	1264827		< 0.05	< 0.05	NA	< 0.05	115%	50%	140%	95%	50%	140%	106%	50%	140%
Fluorene	1264827		< 0.05	< 0.05	NA	< 0.05	117%	50%	140%	96%	50%	140%	106%	50%	140%
Phenanthrene	1264827		< 0.05	< 0.05	NA	< 0.05	119%	50%	140%	103%	50%	140%	112%	50%	140%
Anthracene	1264827		< 0.05	< 0.05	NA	< 0.05	106%	50%	140%	113%	50%	140%	107%	50%	140%
Fluoranthene	1264827		< 0.05	< 0.05	NA	< 0.05	111%	50%	140%	103%	50%	140%	108%	50%	140%
Pyrene	1264827		< 0.05	< 0.05	NA	< 0.05	113%	50%	140%	108%	50%	140%	109%	50%	140%
Benz(a)anthracene	1264827		< 0.05	< 0.05	NA	< 0.05	107%	50%	140%	116%	50%	140%	110%	50%	140%
Chrysene	1264827		< 0.05	< 0.05	NA	< 0.05	114%	50%	140%	99%	50%	140%	96%	50%	140%
Benzo(b)fluoranthene	1264827		< 0.05	< 0.05	NA	< 0.05	100%	50%	140%	106%	50%	140%	80%	50%	140%
Benzo(k)fluoranthene	1264827		< 0.05	< 0.05	NA	< 0.05	112%	50%	140%	118%	50%	140%	77%	50%	140%
Benzo(a)pyrene	1264827		< 0.05	< 0.05	NA	< 0.05	109%	50%	140%	89%	50%	140%	79%	50%	140%
Indeno(1,2,3-cd)pyrene	1264827		< 0.05	< 0.05	NA	< 0.05	83%	50%	140%	119%	50%	140%	88%	50%	140%
Dibenz(a,h)anthracene	1264827		< 0.05	< 0.05	NA	< 0.05	76%	50%	140%	77%	50%	140%	90%	50%	140%
Benzo(g,h,i)perylene	1264827		< 0.05	< 0.05	NA	< 0.05	75%	50%	140%	74%	50%	140%	79%	50%	140%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

O. Reg. 558 - VOCs															
Vinyl Chloride	1274168		<0.030	<0.030	NA	< 0.030	114%	50%	140%	94%	50%	140%	91%	50%	140%
1,1 Dichloroethene	1274168		<0.020	<0.020	NA	< 0.020	102%	50%	140%	103%	60%	130%	112%	50%	140%
Dichloromethane	1274168		<0.030	<0.030	NA	< 0.030	93%	50%	140%	107%	60%	130%	108%	50%	140%
Methyl Ethyl Ketone	1274168		<0.090	<0.090	NA	< 0.090	84%	50%	140%	84%	50%	140%	82%	50%	140%
Chloroform	1274168		<0.020	<0.020	NA	< 0.020	100%	50%	140%	109%	60%	130%	90%	50%	140%
1,2-Dichloroethane	1274168		<0.020	<0.020	NA	< 0.020	81%	50%	140%	110%	60%	130%	104%	50%	140%
Carbon Tetrachloride	1274168		<0.020	<0.020	NA	< 0.020	108%	50%	140%	117%	60%	130%	94%	50%	140%
Benzene	1274168		<0.020	<0.020	NA	< 0.020	117%	50%	140%	90%	60%	130%	67%	50%	140%
Trichloroethene	1274168		<0.020	<0.020	NA	< 0.020	110%	50%	140%	94%	60%	130%	118%	50%	140%
Tetrachloroethene	1274168		<0.050	<0.050	NA	< 0.050	100%	50%	140%	100%	60%	130%	112%	50%	140%

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Trace Organics Analysis (Continued)

RPT Date: Aug 04, 2020			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Chlorobenzene	1274168		<0.010	<0.010	NA	< 0.010	84%	50%	140%	102%	60%	130%	95%	50%	140%
1,2-Dichlorobenzene	1274168		<0.010	<0.010	NA	< 0.010	86%	50%	140%	109%	60%	130%	95%	50%	140%
1,4-Dichlorobenzene	1274168		<0.010	<0.010	NA	< 0.010	94%	50%	140%	101%	60%	130%	105%	50%	140%
O. Reg. 558 - SVOCs															
Pyridine	1268976	1268976	< 0.010	< 0.010	NA	< 0.010	78%	30%	140%	75%	30%	140%	75%	30%	140%
Ortho-Cresol	1268976	1268976	< 0.004	< 0.004	NA	< 0.004	63%	50%	140%	77%	50%	140%	69%	50%	140%
Meta & Para-Cresol	1268976	1268976	< 0.008	< 0.008	NA	< 0.008	75%	50%	140%	68%	50%	140%	78%	50%	140%
Hexachloroethane	1268976	1268976	< 0.004	< 0.004	NA	< 0.004	106%	50%	140%	86%	50%	140%	71%	50%	140%
Nitrobenzene	1268976	1268976	< 0.004	< 0.004	NA	< 0.004	82%	50%	140%	93%	50%	140%	87%	50%	140%
Hexachlorobutadiene	1268976	1268976	< 0.004	< 0.004	NA	< 0.004	94%	50%	140%	77%	50%	140%	86%	50%	140%
2,4,6-Trichlorophenol	1268976	1268976	< 0.05	< 0.05	NA	< 0.05	88%	50%	140%	67%	50%	140%	84%	50%	140%
2,4,5-Trichlorophenol	1268976	1268976	< 0.004	< 0.004	NA	< 0.004	89%	50%	140%	69%	50%	140%	86%	50%	140%
2,4-Dinitrotoluene	1268976	1268976	< 0.004	< 0.004	NA	< 0.004	106%	50%	140%	77%	50%	140%	86%	50%	140%
2,3,4,6-Tetrachlorophenol	1268976	1268976	< 0.004	< 0.004	NA	< 0.004	92%	50%	140%	71%	50%	140%	71%	50%	140%
Hexachlorobenzene	1268976	1268976	< 0.004	< 0.004	NA	< 0.004	99%	50%	140%	106%	50%	140%	74%	50%	140%
Dinoseb	1268976	1268976	< 0.004	< 0.004	NA	< 0.004	91%	50%	140%	69%	50%	140%	69%	50%	140%
Benzo(a)pyrene	1268976	1268976	< 0.001	< 0.001	NA	< 0.001	103%	50%	140%	99%	50%	140%	92%	50%	140%
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)															
F2 (C10 to C16)	1303960		< 10	< 10	NA	< 10	89%	60%	140%	114%	60%	140%	96%	60%	140%
F3 (C16 to C34)	1303960		< 50	< 50	NA	< 50	100%	60%	140%	102%	60%	140%	106%	60%	140%
F4 (C34 to C50)	1303960		< 50	< 50	NA	< 50	84%	60%	140%	95%	60%	140%	114%	60%	140%
O. Reg. 153(511) - PAHs (Soil)															
Naphthalene	1303893		< 0.05	< 0.05	NA	< 0.05	112%	50%	140%	102%	50%	140%	96%	50%	140%
Acenaphthylene	1303893		< 0.05	< 0.05	NA	< 0.05	115%	50%	140%	100%	50%	140%	94%	50%	140%
Acenaphthene	1303893		< 0.05	< 0.05	NA	< 0.05	118%	50%	140%	115%	50%	140%	97%	50%	140%
Fluorene	1303893		< 0.05	< 0.05	NA	< 0.05	114%	50%	140%	85%	50%	140%	74%	50%	140%
Phenanthrene	1303893		< 0.05	< 0.05	NA	< 0.05	100%	50%	140%	88%	50%	140%	75%	50%	140%
Anthracene	1303893		< 0.05	< 0.05	NA	< 0.05	96%	50%	140%	88%	50%	140%	70%	50%	140%
Fluoranthene	1303893		< 0.05	< 0.05	NA	< 0.05	95%	50%	140%	74%	50%	140%	80%	50%	140%
Pyrene	1303893		< 0.05	< 0.05	NA	< 0.05	98%	50%	140%	71%	50%	140%	81%	50%	140%
Benz(a)anthracene	1303893		< 0.05	< 0.05	NA	< 0.05	98%	50%	140%	70%	50%	140%	96%	50%	140%
Chrysene	1303893		< 0.05	< 0.05	NA	< 0.05	88%	50%	140%	75%	50%	140%	85%	50%	140%
Benzo(b)fluoranthene	1303893		< 0.05	< 0.05	NA	< 0.05	80%	50%	140%	79%	50%	140%	84%	50%	140%
Benzo(k)fluoranthene	1303893		< 0.05	< 0.05	NA	< 0.05	81%	50%	140%	96%	50%	140%	83%	50%	140%
Benzo(a)pyrene	1303893		< 0.05	< 0.05	NA	< 0.05	87%	50%	140%	99%	50%	140%	96%	50%	140%
Indeno(1,2,3-cd)pyrene	1303893		< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	92%	50%	140%	95%	50%	140%
Dibenz(a,h)anthracene	1303893		< 0.05	< 0.05	NA	< 0.05	84%	50%	140%	85%	50%	140%	85%	50%	140%
Benzo(g,h,i)perylene	1303893		< 0.05	< 0.05	NA	< 0.05	82%	50%	140%	84%	50%	140%	84%	50%	140%

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Quality Assurance

CLIENT NAME: CIMA+ S.E.N.C.
PROJECT: A001049
SAMPLING SITE:Ottawa

AGAT WORK ORDER: 20Z624254
ATTENTION TO: Karen Greer
SAMPLED BY:JL

Trace Organics Analysis (Continued)

RPT Date: Aug 04, 2020			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Certified By:

AGAT Laboratories

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QA Violation

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20Z624254

PROJECT: A001049

ATTENTION TO: Karen Greer

RPT Date: Aug 04, 2020

PARAMETER	Sample Id	Sample Description	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
				Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 558 Metals											
Boron Leachate		TCLP	101%	70%	130%	99%	80%	120%	251%	70%	130%

Comments: NA signifies Not Applicable.
pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

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Method Summary

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20Z624254

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:Ottawa

SAMPLED BY:JL

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Zinc	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Fraction Organic Carbon-1	INOR-93-6062	Skjemstad & Baldock, 2008 & Walkley & Black 1934	SPECTROPHOTOMETER
Fraction Organic Carbon-2	INOR-93-6062	Skjemstad & Baldock, 2008 & Walkley & Black 1934	SPECTROPHOTOMETER
Fraction Organic Carbon-3	INOR-93-6062	Skjemstad & Baldock, 2008 & Walkley & Black 1934	SPECTROPHOTOMETER
Fraction Organic Carbon-Avg	INOR-93-6062	Skjemstad & Baldock, 2008 & Walkley & Black 1934	SPECTROPHOTOMETER
pH, 2:1 CaCl2 Extraction	INOR-93-6031	modified from EPA 9045D and MCKEAGUE 3.11	PH METER
Arsenic Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Barium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Boron Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Cadmium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Chromium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Lead Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Mercury Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Selenium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS

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Method Summary

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20Z624254

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:Ottawa

SAMPLED BY:JL

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Silver Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Uranium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Sieve Analysis - 75 µm (retained)	INOR-93-6065	ASTM D1140	SIEVE
Sieve Analysis - 75 µm (passing)	INOR-93-6065	ASTM D1140	SIEVE

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Method Summary

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20Z624254

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:Ottawa

SAMPLED BY:JL

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Acenaphthylene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Acenaphthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Fluorene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Phenanthrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Anthracene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Fluoranthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Pyrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benz(a)anthracene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Chrysene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(b)fluoranthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(k)fluoranthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(a)pyrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Dibenz(a,h)anthracene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(g,h,i)perylene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
1 and 2 Methlynaphthalene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Moisture Content	ORG-91-5106	Tier 1 Method	BALANCE
Naphthalene-d8	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Acenaphthene-d10	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Chrysene-d12	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzene	VOL-91-5009	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Toluene	VOL-91-5009	modified from EPA SW-846 5035C & 8260D	P&T GC/MS
Ethylbenzene	VOL-91-5009	modified from EPA SW-846 5035C & 8260D	P&T GC/MS
Xylenes (Total)	VOL-91-5009	modified from EPA SW-846 5035C & 8260D	P&T GC/MS
F1 (C6 to C10)	VOL-91-5009	modified from CCME Tier 1 Method	P&T GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	modified from CCME Tier 1 Method	P&T GC/FID
F2 (C10 to C16)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F2 (C10 to C16) minus Naphthalene	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F3 (C16 to C34)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID

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Method Summary

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20Z624254

PROJECT: A001049

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SAMPLING SITE:Ottawa

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
F3 (C16 to C34) minus PAHs	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F4 (C34 to C50)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE
Moisture Content	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
Pyridine	ORG-91-5114	modified from EPA SW846 3510C & 8270E	GC/MS
Cresols	ORG-91-5114	modified from EPA SW846 3510C & 8270E	GC/MS
Ortho-Cresol	ORG-91-5114	modified from EPA SW846 3510C & 8270E	GC/MS
Meta & Para-Cresol	ORG-91-5114	modified from EPA SW846 3510C & 8270E	GC/MS
Hexachloroethane	ORG-91-5114	modified from EPA SW846 3510C & 8270E	GC/MS
Nitrobenzene	ORG-91-5114	modified from EPA SW846 3510C & 8270E	GC/MS
Hexachlorobutadiene	ORG-91-5114	modified from EPA SW846 3510C & 8270E	GC/MS
2,4,6-Trichlorophenol	ORG-91-5114	modified from EPA SW846 3510C & 8270E	GC/MS
2,4,5-Trichlorophenol	ORG-91-5114	modified from EPA SW846 3510C & 8270E	GC/MS
2,4-Dinitrotoluene	ORG-91-5114	modified from EPA SW846 3510C & 8270E	GC/MS
2,3,4,6-Tetrachlorophenol	ORG-91-5114	modified from EPA SW846 3510C & 8270E	GC/MS
Hexachlorobenzene	ORG-91-5114	modified from EPA SW846 3510C & 8270E	GC/MS
Dinoseb	ORG-91-5114	modified from EPA SW846 3510C & 8270E	GC/MS
Benzo(a)pyrene	ORG-91-5114	modified from EPA SW846 3510C & 8270E	GC/MS
2-Fluorophenol	ORG-91-5114	modified from EPA SW846 3510C & 8270E	GC/MS
Phenol-d6	ORG-91-5114	modified from EPA SW846 3510C & 8270E	GC/MS
2,4,6-Tribromophenol	ORG-91-5114	modified from EPA 3510C, 8270E & ON MOECC E3265	GC/MS
Chrysene-d12	ORG-91-5114	modified from EPA SW846 3510C & 8270E	GC/MS
BNA Extr	ORG-91-5114	modified from EPA SW846 3510C & 8270E	N/A
Vinyl Chloride	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
1,1 Dichloroethene	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
Dichloromethane	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
Chloroform	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS

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Method Summary

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PROJECT: A001049

ATTENTION TO: Karen Greer

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Carbon Tetrachloride	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
Benzene	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
Trichloroethene	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
Tetrachloroethene	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
Chlorobenzene	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
Toluene-d8	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS

AGAT Laboratories

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2 bk

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only

Work Order #: 2076242 54

Cooler Quantity: 3 Hand - ICE

Arrival Temperatures: 24.0 | 24.1 | 23.9
21.3 | 21.4 | 20.9

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes: @ 9.6/9.0/8.8 @ 9.6/9.2/9.4 (on ice)

Report Information:

Company: CIMA +
Contact: Karen Greer
Address: 240 Catherine St. Ottawa
Phone: 613 996 9656 Fax:
Reports to be sent to:
1. Email: Karen.Greer@cima.ca
2. Email: Luc.Roberts@cima.ca

Project Information:

Project: A001049
Site Location: Ottawa
Sampled By: JL
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Regulatory Requirements:

(Please check all applicable boxes)

☐ No Regulatory Requirement

☒ Regulation 153/04
Table 3 (Indicate One)
☒ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture (Check One)
☒ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region (Indicate One)
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
(Indicate One)

Is this submission for a **Record of Site Condition?** ☐ Yes ☒ No

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics	All Metals ☐ 153 Metals (excl. Hydrides)	Hydride Metals ☒ 153 Metals (Incl. Hydrides)	ORPs: ☐ B-HWS ☐ Cl ☐ CN ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	PHCs F1 - F4	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use	Potentially Hazardous or High Concentration (Y/N)
BH 20-2 SS1	6/07/20		3	S	Hold																	
BH 20-2 SS4	"		4	"				X							X		X					
BH 20-2 SS6	"		4	"	Hold																	
BH 20-2 SS8	"		4	"	Hold																	
BH 20-2 SS10	"		4	"	Hold.																	
BH 20-2 SS12	"		4	"	Hold																	
BH 20-2 SS14	"		4	"	Hold																	
BH 20-2 SS16	"		4	"				X							X		X					
BH 20-2 SS18	"		4	"	Hold.																	
BH 20-2 SS20	"		4	"																		

Samples Relinquished By (Print Name and Sign): James Gonzalez	Date: 20-07-10	Time: 1605	Samples Received By (Print Name and Sign): L Berthelet/Dell	Date: 2020/07/10	Time: 16h30
Samples Relinquished By (Print Name and Sign): UPS to Fedex Scott Jamieson	Date: 2020-07-13	Time: 16h00	Samples Received By (Print Name and Sign):	Date:	Time:
Samples Relinquished By (Print Name and Sign):	Date:	Time:	Samples Received By (Print Name and Sign): Shannon S	Date: July 14/2020	Time: 10AM

Page 1 of 5

N°: T101242

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Laboratory Use Only

Work Order #: 20Z624254

Cooler Quantity: two

Arrival Temperatures: 24.0 | 24.1 | 23.9 ; 21.3 | 21.4 | 20.9

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes:

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: CIMA+
Contact: Karen Greer
Address: 240 Catherine St Ottawa
Phone: 343 996 9656 Fax:
Reports to be sent to:
1. Email: karen.greer@cima.ca
2. Email: Luc.Robert@cima.ca

Regulatory Requirements:

☐ No Regulatory Requirement
(Please check all applicable boxes)

☒ Regulation 153/04
Table 3 (Indicate One)
☒ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture (Check One)
☒ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region ________ (Indicate One)
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
________ (Indicate One)

Is this submission for a **Record of Site Condition?** ☐ Yes ☒ No

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: A001049
Site Location: uOttawa
Sampled By: JL
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Analysis columns: Field Filtered - Metals, Hg, CrVI (Y/N); O. Reg 153: Metals and Inorganics; ☐ All Metals (excl. Hydrides) / ☒ Hydride Metals 153 Metals (incl. Hydrides); ORPs: ☐ B-HWS ☐ Cl ☐ CN ☐ Cr6+ ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR; Full Metals Scan; Regulation/Custom Metals; Nutrients: ☐ TP ☐ NH3 ☐ TKN ☐ NO3 ☐ NO2 ☐ NO3+NO2; Volatiles: ☐ VOC ☐ BTEX ☐ THM; PHCs F1 - F4; ABNs; PAHs; PCBs: ☐ Total ☐ Aroclors; Organochlorine Pesticides; TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs; Sewer Use; Potentially Hazardous or High Concentration (Y/N)

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered (Y/N)	Metals and Inorganics	153 Metals (incl. Hydrides)	ORPs	Full Metals Scan	Regulation/Custom Metals	Nutrients	Volatiles	PHCs F1 - F4	ABNs	PAHs	PCBs	Organochlorine Pesticides	TCLP	Sewer Use	Potentially Hazardous (Y/N)
BH 20-3 SS2	10/07/20		3	S	Hold																
BH 20-3 SS4	"		"	"				X						X		X					
BH 20-3 SS6	"		"	"	Hold																
BH 20-3 SS8	"		"	"	Hold																
BH 20-3 SS10	"		"	"	Hold																
BH 20-3 SS12	"		"	"	Hold																
BH 20-3 SS14	"		"	"	Hold																
BH 20-3 SS16	"		"	"				X						X		X					

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Jamieson-lee Scott	20-07-10	16:04	Berthe [illegible]	2020/07/10	16h36
[illegible] TOFCDEK	2020/07/13	16h00			
			[illegible]		

Page 2 of 5

Nº: T 101243

AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only

Work Order #: 20762425 4

Cooler Quantity: two - ice

Arrival Temperatures: 21.3 | 21.4 | 20.9
24.0 | 24.1 | 23.9

Custody Seal Intact: ☐Yes ☐No ☐N/A

Notes:

Report Information:

Company: CIMA +
Contact: Karen Greer
Address: 240 Catherine St. Ottawa
Phone: 343 996 9656 Fax:
Reports to be sent to:
1. Email: karen.Greer@cima.ca
2. Email: Luc.Robert@cima.ca

Regulatory Requirements:

☐ No Regulatory Requirement

(Please check all applicable boxes)

☒ Regulation 153/04
Table 3 (Indicate One)
☒ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture (Check One)
☒ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region (Indicate One)
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
(Indicate One)

Is this submission for a **Record of Site Condition?** ☐ Yes ☒ No

Report Guideline on Certificate of Analysis ☒ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: A001849
Site Location: uOttawa
Sampled By: L. Robert
AGAT Quote #: 335-768 PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics (All Metals ☐ 153 Metals (excl Hydrides) ☐ Hydride Metals ☒ 153 Metals (Incl. Hydrides))	O. Reg 153: ORPs: ☐ B-HWS ☐ Cl ☐ CN ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	PHCs F1 - F4	ABNs	PAHs	PCBs: ☐ Total ☐ Arocolors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use	FOC	PH	Grain Size		Potentially Hazardous or High Concentration (Y/N)
~~BH-20-4 SS1~~	10/07/20		3	S	—																				
BH 20-4 SS2	"		3	"	Hold																				
BH 20-4 SS3	"		3	"	Hold																				
BH 20-4 SS4	"		3	"	Hold																				
BH 20-4 SS5	"		4	"			X						X		X					X	X	X			
BH 20-4 SS6	"		3	"	Hold																				
BH 20-4 SS7	"		3	"	Hold																				
BH 20-4 SS8	"		3	"	Hold																				
BH 20-4 SS9	"		3	"	Hold																				
BH 20-5 SS10	"		3	"	Hold																				
BH 20-6 SS11	"		3	"	Hold.																				

All sampled on the 10th and not the 9th.

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Luc Robert	09-07-2020	3:40	CBerthelet	2020/07/10	16h30
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
MMS to FedEx 2020/07/13 16h00					
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time

Page 3 of 5

N°: T 101240

Document ID: DIV-78-1511-016

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AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only

Work Order #: 2076242 54

Cooler Quantity: two - ice

Arrival Temperatures: 21.3 | 21.4 | 20.9 | 24.0 | 24.1 | 23.9

Custody Seal Intact: ☐Yes ☐No ☐N/A

Notes:

Report Information:

Company: CIMA +
Contact: Karen Greer
Address: 240 Catherine St. Ottawa
Phone: 343-996-9656 Fax:
Reports to be sent to:
1. Email: karen.greer@cima.ca
2. Email: Luc.Robert@cima.ca

Regulatory Requirements:

☐ No Regulatory Requirement

(Please check all applicable boxes)

☒ Regulation 153/04
Table 3 (Indicate One)
☒ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture (Check One)
☒ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region (Indicate One)
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
(Indicate One)

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: A001049
Site Location: Ottawa
Sampled By: LR
AGAT Quote #: 335-768 PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company: See above
Contact:
Address:
Email:

Is this submission for a **Record of Site Condition?** ☐ Yes ☒ No

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y / N	Metals and Inorganics: ☐ All Metals ☐ 153 Metals (excl Hydrides) ☐ Hydride Metals ☒ 153 Metals (Incl. Hydrides)	ORPs: ☐ B-HWS ☐ Cl ☐ CN ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	PHCs F1 - F4	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use	Potentially Hazardous or High Concentration (Y/N)
~~BH 20-5 SS1~~	10/07/20		3	S	Hold														
BH 20-5 SS2	"		3	S	Hold														
BH 20-5 SS3	"		3	S	Hold														
BH 20-5 SS4	"		3	S	Hold														
BH 20-5 SS5	"		3	S			X						X	X					
BH 20-5 SS6	"		3	S	Hold														
BH 20-5 SS7	"		3	S	Hold														
BH 20-5 SS8	"		3	S	Hold		~~X~~						~~X~~	~~X~~					
BH 20-5 SS9	"		3	S			X						X	X					
BH 20-5 SS10	"		3	S	Hold														
				~~S~~															

All samples taken on the 10th

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Luc Robert	9-07-2020	3h40	Gberthelet	2020/07/10	16h40
LR/D to FedEx	2020/07/13	16h00			

Page 4 of 5

N°: T 093994

Document ID: DIV-78-1011-010

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AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only

Work Order #: 2076 24254-

Cooler Quantity: TWO - ONICE

Arrival Temperatures: 21.3 | 21.4 | 20.9
24.0 | 24.1 | 23.9

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes:

Report Information:

Company: CIMA +
Contact: Karen Greer
Address: 240 Catherine St Ottawa
Phone: 343 996 9656 Fax:
Reports to be sent to:
1. Email: karen.greer@cima.ca
2. Email: Luc Robert@cima.ca

Regulatory Requirements:

☐ No Regulatory Requirement
(Please check all applicable boxes)

☒ Regulation 153/04
Table 3 (Indicate One)
☒ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture (Check One)
☒ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region (Indicate One)
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
(Indicate One)

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: A001049
Site Location: Ottawa
Sampled By: L Robert
AGAT Quote #: 335-768 PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Is this submission for a **Record of Site Condition?** ☐ Yes ☒ No

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI Y/N	O. Reg 153: Metals and Inorganics	All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals ☒ 153 Metals (Incl. Hydrides)	ORPs: ☐ B-HWS ☐ Cl ☐ CN ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	PHCs F1 - F4	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use	FOC	Grain Size				Potentially Hazardous or High Concentration (Y/N)
BH20-4 SS12	10/07/20		5	S			X	X						X		X					X	X				
Dup1	"		3	S	~~Hold~~			X						X		X										
Dup2	"		3	S	~~Hold~~			X						X		X										
TCLP	"		1	S	~~Also See Quote~~														X							

(1) All samples taken on the 10th ~~9th~~

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Luc Robert	07-10-2020	3:40		2020/10/10	16h40
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
~~Fed Ex~~	2020/10/13	16h00			
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time

Page 5 of 5

N°: T 101241

Document ID: DIV-78-1511-010

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AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: CIMA+ S.E.N.C.
240 CATHERINE STREET, SUITE 110
OTTAWA, ON K2P2G8
(613) 860-2462

ATTENTION TO: Karen Greer

PROJECT: A001049

AGAT WORK ORDER: 20Z628864

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

WATER ANALYSIS REVIEWED BY: Jacky Zhu, Spectroscopy Technician

DATE REPORTED: Aug 05, 2020

PAGES (INCLUDING COVER): 14

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*Notes

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories
5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 20Z628864

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PAHs (Water)

DATE RECEIVED: 2020-07-22

DATE REPORTED: 2020-08-05

		SAMPLE DESCRIPTION:		BH20-3-GW01	BH20-2-GW01	MW05-12-GW01	MW04-12-GW01	BH20-5-GW01	MW03-12-GW01	MW12-11	DUP-1
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2020-07-22	2020-07-22	2020-07-22	2020-07-22	2020-07-22	2020-07-22	2020-07-22	2020-07-22
Parameter	Unit	G / S	RDL	1298296	1298311	1298312	1298313	1298314	1298315	1298316	1298317
Naphthalene	µg/L	1400	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Acenaphthylene	µg/L	1.8	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	3.5	<0.20
Acenaphthene	µg/L	600	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.64	<0.20
Fluorene	µg/L	400	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	1.2	<0.20
Phenanthrene	µg/L	580	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.65	<0.10
Anthracene	µg/L	2.4	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.21	<0.10
Fluoranthene	µg/L	130	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.23	<0.20
Pyrene	µg/L	68	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.34	<0.20
Benzo(a)anthracene	µg/L	4.7	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chrysene	µg/L	1	0.10	0.11	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(b)fluoranthene	µg/L	0.75	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(k)fluoranthene	µg/L	0.4	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(a)pyrene	µg/L	0.81	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	µg/L	0.2	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibenz(a,h)anthracene	µg/L	0.52	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(g,h,i)perylene	µg/L	0.2	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2-and 1-methyl Naphthalene	µg/L	1800	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	3.00	<0.20
Sediment				No	No	No	No	No	No	No	No
Surrogate	Unit	Acceptable Limits									
Naphthalene-d8	%	50-140		89	93	83	86	90	86	81	91
Acenaphthene-d10	%	50-140		78	84	83	79	78	74	74	84
Chrysene-d12	%	50-140		106	101	109	104	109	100	94	115

Certified By: NPopowkoff

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 20Z628864

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PAHs (Water)

DATE RECEIVED: 2020-07-22

DATE REPORTED: 2020-08-05

		SAMPLE DESCRIPTION:		DUP-2
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2020-07-22
Parameter	Unit	G / S	RDL	1298318
Naphthalene	µg/L	1400	0.20	<0.20
Acenaphthylene	µg/L	1.8	0.20	<0.20
Acenaphthene	µg/L	600	0.20	<0.20
Fluorene	µg/L	400	0.20	<0.20
Phenanthrene	µg/L	580	0.10	<0.10
Anthracene	µg/L	2.4	0.10	<0.10
Fluoranthene	µg/L	130	0.20	<0.20
Pyrene	µg/L	68	0.20	<0.20
Benzo(a)anthracene	µg/L	4.7	0.20	<0.20
Chrysene	µg/L	1	0.10	<0.10
Benzo(b)fluoranthene	µg/L	0.75	0.10	<0.10
Benzo(k)fluoranthene	µg/L	0.4	0.10	<0.10
Benzo(a)pyrene	µg/L	0.81	0.01	<0.01
Indeno(1,2,3-cd)pyrene	µg/L	0.2	0.20	<0.20
Dibenz(a,h)anthracene	µg/L	0.52	0.20	<0.20
Benzo(g,h,i)perylene	µg/L	0.2	0.20	<0.20
2-and 1-methyl Naphthalene	µg/L	1800	0.20	<0.20
Sediment				No
Surrogate	Unit	Acceptable Limits		
Naphthalene-d8	%	50-140		86
Acenaphthene-d10	%	50-140		76
Chrysene-d12	%	50-140		106

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

1298296-1298318 Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&(j)Fluoranthene isomers because the isomers co-elute on the GC column.
2- and 1-Methyl Naphthalene is a calculated parameter. The calculated value is the sum of 2-Methyl Naphthalene and 1-Methyl Naphthalene. The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.
Sediment parameter is comment only based on visual inspection of the sample prior to extraction and is not an accredited test.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By: N Popnikolof

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Certificate of Analysis

AGAT WORK ORDER: 20Z628864

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Water)

DATE RECEIVED: 2020-07-22

DATE REPORTED: 2020-08-05

SAMPLE DESCRIPTION:				BH20-3-GW01	BH20-2-GW01	MW05-12-GW01	MW04-12-GW01	BH20-5-GW01	MW03-12-GW01	MW12-11	DUP-1
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2020-07-22	2020-07-22	2020-07-22	2020-07-22	2020-07-22	2020-07-22	2020-07-22	2020-07-22
Parameter	Unit	G / S	RDL	1298296	1298311	1298312	1298313	1298314	1298315	1298316	1298317
Benzene	µg/L	44	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.84	<0.20
Toluene	µg/L	18000	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	µg/L	2300	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	6.9	<0.10
Xylenes (Total)	µg/L	4200	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
F1 (C6-C10)	µg/L	750	25	<25	<25	<25	<25	<25	<25	<25	<25
F1 (C6 to C10) minus BTEX	µg/L	750	25	<25	<25	<25	<25	<25	<25	<25	<25
F2 (C10 to C16)	µg/L	150	100	<100	<100	<100	<100	<100	<100	<100	<100
F2 (C10 to C16) minus Naphthalene	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
F3 (C16 to C34)	µg/L	500	100	<100	<100	<100	<100	<100	<100	<100	<100
F3 (C16 to C34) minus PAHs	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
F4 (C34 to C50)	µg/L	500	100	<100	<100	<100	<100	<100	<100	<100	<100
Gravimetric Heavy Hydrocarbons	µg/L		500	NA	NA	NA	NA	NA	NA	NA	NA
Sediment				No	No	No	No	No	No	No	No
Surrogate	Unit	Acceptable Limits									
Terphenyl	%	60-140		75	70	86	63	65	82	76	76

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Certificate of Analysis

AGAT WORK ORDER: 20Z628864

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Water)

DATE RECEIVED: 2020-07-22

DATE REPORTED: 2020-08-05

		SAMPLE DESCRIPTION:		DUP-2
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2020-07-22
Parameter	Unit	G / S	RDL	1298318
Benzene	µg/L	44	0.20	<0.20
Toluene	µg/L	18000	0.20	<0.20
Ethylbenzene	µg/L	2300	0.10	<0.10
Xylenes (Total)	µg/L	4200	0.20	<0.20
F1 (C6-C10)	µg/L	750	25	<25
F1 (C6 to C10) minus BTEX	µg/L	750	25	<25
F2 (C10 to C16)	µg/L	150	100	<100
F2 (C10 to C16) minus Naphthalene	µg/L		100	<100
F3 (C16 to C34)	µg/L	500	100	<100
F3 (C16 to C34) minus PAHs	µg/L		100	<100
F4 (C34 to C50)	µg/L	500	100	<100
Gravimetric Heavy Hydrocarbons	µg/L		500	NA
Sediment				No
Surrogate	Unit	Acceptable Limits		
Terphenyl	%	60-140		82

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AGAT WORK ORDER: 20Z628864

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Water)

DATE RECEIVED: 2020-07-22

DATE REPORTED: 2020-08-05

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

1298296-1298318 The C6-C10 fraction is calculated using toluene response factor.
Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.
C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX.
The calculated parameters are non-accredited. The parameters that are components of the calculation are accredited.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
C>10 – C16 (F2- Naphthalene) is a calculated parameter. The calculated value is F2 - Naphthalene.
C>16 - C34 (F3-PAH) is a calculated parameter. The calculated value is F3-PAH (PAH: sum of Phenanthrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-c,d)pyrene and Pyrene).
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Sediment parameter is comment only based on visual inspection of the sample prior to extraction and is not an accredited test.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By: N Popnikolof

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AGAT WORK ORDER: 20Z628864

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - Metals (Including Hydrides) (Water)

DATE RECEIVED: 2020-07-22

DATE REPORTED: 2020-08-05

SAMPLE DESCRIPTION:				BH20-3-GW01	BH20-2-GW01	MW05-12-GW01	MW04-12-GW01	BH20-5-GW01	MW03-12-GW01	MW12-11	DUP-1
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2020-07-22	2020-07-22	2020-07-22	2020-07-22	2020-07-22	2020-07-22	2020-07-22	2020-07-22
Parameter	Unit	G / S	RDL	1298296	1298311	1298312	1298313	1298314	1298315	1298316	1298317
Dissolved Antimony	µg/L	20000	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dissolved Arsenic	µg/L	1900	1.0	28.1	31.5	46.8	27.0	30.6	27.1	37.7	27.6
Dissolved Barium	µg/L	29000	2.0	163	282	62.1	116	112	145	51.8	285
Dissolved Beryllium	µg/L	67	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dissolved Boron	µg/L	45000	10.0	512	813	929	559	446	317	158	767
Dissolved Cadmium	µg/L	2.7	0.20	<0.20	<0.20	<0.20	<0.20	0.43	<0.20	<0.20	<0.20
Dissolved Chromium	µg/L	810	2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Dissolved Cobalt	µg/L	66	0.50	0.85	0.58	4.91	1.44	3.82	<0.50	<0.50	<0.50
Dissolved Copper	µg/L	87	1.0	<1.0	<1.0	2.3	13.7	4.2	5.8	1.0	<1.0
Dissolved Lead	µg/L	25	0.50	0.88	0.95	1.51	0.90	0.74	0.63	<0.50	0.76
Dissolved Molybdenum	µg/L	9200	0.50	3.76	<0.50	<0.50	2.23	0.75	0.88	<0.50	<0.50
Dissolved Nickel	µg/L	490	3.0	<3.0	<3.0	3.3	5.5	9.4	<3.0	<3.0	<3.0
Dissolved Selenium	µg/L	63	1.0	1.9	1.3	4.1	1.6	48.5	19.7	1.7	2.6
Dissolved Silver	µg/L	1.5	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Thallium	µg/L	510	0.30	0.76	0.56	0.42	0.53	0.41	0.40	0.34	0.48
Dissolved Uranium	µg/L	420	0.50	<0.50	<0.50	<0.50	1.40	2.04	2.26	1.29	<0.50
Dissolved Vanadium	µg/L	250	0.40	<0.40	0.50	<0.40	<0.40	<0.40	<0.40	0.53	<0.40
Dissolved Zinc	µg/L	1100	5.0	39.5	<5.0	<5.0	15.3	8.2	<5.0	7.8	<5.0

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Certificate of Analysis

AGAT WORK ORDER: 20Z628864

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - Metals (Including Hydrides) (Water)

DATE RECEIVED: 2020-07-22

DATE REPORTED: 2020-08-05

		SAMPLE DESCRIPTION:		DUP-2
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2020-07-22
Parameter	Unit	G / S	RDL	1298318
Dissolved Antimony	µg/L	20000	1.0	<1.0
Dissolved Arsenic	µg/L	1900	1.0	39.9
Dissolved Barium	µg/L	29000	2.0	117
Dissolved Beryllium	µg/L	67	0.50	<0.50
Dissolved Boron	µg/L	45000	10.0	421
Dissolved Cadmium	µg/L	2.7	0.20	0.49
Dissolved Chromium	µg/L	810	2.0	<2.0
Dissolved Cobalt	µg/L	66	0.50	3.58
Dissolved Copper	µg/L	87	1.0	2.7
Dissolved Lead	µg/L	25	0.50	0.78
Dissolved Molybdenum	µg/L	9200	0.50	<0.50
Dissolved Nickel	µg/L	490	3.0	9.2
Dissolved Selenium	µg/L	63	1.0	39.5
Dissolved Silver	µg/L	1.5	0.20	<0.20
Dissolved Thallium	µg/L	510	0.30	0.33
Dissolved Uranium	µg/L	420	0.50	2.01
Dissolved Vanadium	µg/L	250	0.40	<0.40
Dissolved Zinc	µg/L	1100	5.0	6.2

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

1298296-1298318 Metals analysis completed on a filtered sample.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

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Guideline Violation

AGAT WORK ORDER: 20Z628864

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
1298316	MW12-11	ON T3 NPGW CT	O. Reg. 153(511) - PAHs (Water)	Acenaphthylene	µg/L	1.8	3.5

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Quality Assurance

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20Z628864

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date: Aug 05, 2020			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Water)															
Benzene	1299166		< 0.20	< 0.20	NA	< 0.20	101%	50%	140%	108%	60%	130%	108%	50%	140%
Toluene	1299166		< 0.20	< 0.20	NA	< 0.20	90%	50%	140%	105%	60%	130%	118%	50%	140%
Ethylbenzene	1299166		< 0.10	< 0.10	NA	< 0.10	113%	50%	140%	109%	60%	130%	115%	50%	140%
Xylenes (Total)	1299166		< 0.20	< 0.20	NA	< 0.20	106%	50%	140%	113%	60%	130%	103%	50%	140%
F1 (C6-C10)	1299166		< 25	< 25	NA	< 25	103%	60%	140%	100%	60%	140%	104%	60%	140%
F2 (C10 to C16)	1298317	1298317	< 100	< 100	NA	< 100	93%	60%	140%	86%	60%	140%	91%	60%	140%
F3 (C16 to C34)	1298317	1298317	< 100	< 100	NA	< 100	94%	60%	140%	78%	60%	140%	88%	60%	140%
F4 (C34 to C50)	1298317	1298317	< 100	< 100	NA	< 100	88%	60%	140%	91%	60%	140%	101%	60%	140%
O. Reg. 153(511) - PAHs (Water)															
Naphthalene	1298256		< 0.20	< 0.20	NA	< 0.20	96%	50%	140%	87%	50%	140%	96%	50%	140%
Acenaphthylene	1298256		< 0.20	< 0.20	NA	< 0.20	75%	50%	140%	77%	50%	140%	95%	50%	140%
Acenaphthene	1298256		< 0.20	< 0.20	NA	< 0.20	80%	50%	140%	74%	50%	140%	85%	50%	140%
Fluorene	1298256		< 0.20	< 0.20	NA	< 0.20	81%	50%	140%	72%	50%	140%	75%	50%	140%
Phenanthrene	1298256		< 0.10	< 0.10	NA	< 0.10	77%	50%	140%	70%	50%	140%	70%	50%	140%
Anthracene	1298256		< 0.10	< 0.10	NA	< 0.10	72%	50%	140%	70%	50%	140%	73%	50%	140%
Fluoranthene	1298256		< 0.20	< 0.20	NA	< 0.20	77%	50%	140%	90%	50%	140%	85%	50%	140%
Pyrene	1298256		< 0.20	< 0.20	NA	< 0.20	78%	50%	140%	95%	50%	140%	80%	50%	140%
Benzo(a)anthracene	1298256		< 0.20	< 0.20	NA	< 0.20	88%	50%	140%	88%	50%	140%	87%	50%	140%
Chrysene	1298256		< 0.10	< 0.10	NA	< 0.10	84%	50%	140%	81%	50%	140%	83%	50%	140%
Benzo(b)fluoranthene	1298256		< 0.10	< 0.10	NA	< 0.10	80%	50%	140%	86%	50%	140%	96%	50%	140%
Benzo(k)fluoranthene	1298256		< 0.10	< 0.10	NA	< 0.10	81%	50%	140%	87%	50%	140%	99%	50%	140%
Benzo(a)pyrene	1298256		< 0.01	< 0.01	NA	< 0.01	82%	50%	140%	75%	50%	140%	85%	50%	140%
Indeno(1,2,3-cd)pyrene	1298256		< 0.20	< 0.20	NA	< 0.20	88%	50%	140%	72%	50%	140%	84%	50%	140%
Dibenz(a,h)anthracene	1298256		< 0.20	< 0.20	NA	< 0.20	84%	50%	140%	70%	50%	140%	74%	50%	140%
Benzo(g,h,i)perylene	1298256		< 0.20	< 0.20	NA	< 0.20	75%	50%	140%	73%	50%	140%	72%	50%	140%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By: N Popowkolof

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Quality Assurance

CLIENT NAME: CIMA+ S.E.N.C.
AGAT WORK ORDER: 20Z628864
PROJECT: A001049
ATTENTION TO: Karen Greer
SAMPLING SITE:
SAMPLED BY:

Water Analysis

RPT Date: Aug 05, 2020			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals (Including Hydrides) (Water)															
Dissolved Antimony	1300094		<1.0	<1.0	NA	< 1.0	102%	70%	130%	104%	80%	120%	97%	70%	130%
Dissolved Arsenic	1300094		36.9	38.8	5.0%	2.4	107%	70%	130%	113%	80%	120%	106%	70%	130%
Dissolved Barium	1300094		128	133	3.8%	< 2.0	99%	70%	130%	104%	80%	120%	114%	70%	130%
Dissolved Beryllium	1300094		<0.50	<0.50	NA	< 0.50	100%	70%	130%	107%	80%	120%	115%	70%	130%
Dissolved Boron	1300094		90.0	93.3	3.6%	< 10.0	114%	70%	130%	115%	80%	120%	119%	70%	130%
Dissolved Cadmium	1300094		<0.20	<0.20	NA	< 0.20	103%	70%	130%	100%	80%	120%	103%	70%	130%
Dissolved Chromium	1300094		<2.0	<2.0	NA	< 2.0	99%	70%	130%	100%	80%	120%	107%	70%	130%
Dissolved Cobalt	1300094		0.95	1.16	NA	< 0.50	102%	70%	130%	97%	80%	120%	103%	70%	130%
Dissolved Copper	1300094		2.4	2.5	NA	< 1.0	100%	70%	130%	100%	80%	120%	100%	70%	130%
Dissolved Lead	1300094		0.99	3.81	NA	< 0.50	100%	70%	130%	104%	80%	120%	97%	70%	130%
Dissolved Molybdenum	1300094		0.99	0.82	NA	< 0.50	98%	70%	130%	101%	80%	120%	99%	70%	130%
Dissolved Nickel	1300094		<3.0	3.7	NA	< 3.0	99%	70%	130%	96%	80%	120%	99%	70%	130%
Dissolved Selenium	1300094		<10	<10	NA	< 1.0	95%	70%	130%	102%	80%	120%	94%	70%	130%
Dissolved Silver	1300094		<0.20	<0.20	NA	< 0.20	97%	70%	130%	97%	80%	120%	94%	70%	130%
Dissolved Thallium	1300094		0.64	0.48	NA	< 0.30	98%	70%	130%	103%	80%	120%	96%	70%	130%
Dissolved Uranium	1300094		<0.50	<0.50	NA	< 0.50	101%	70%	130%	115%	80%	120%	108%	70%	130%
Dissolved Vanadium	1300094		<0.40	<0.40	NA	< 0.40	100%	70%	130%	100%	80%	120%	108%	70%	130%
Dissolved Zinc	1300094		<5.0	8.3	NA	< 5.0	100%	70%	130%	100%	80%	120%	98%	70%	130%

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Certified By:

AGAT Laboratories

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Method Summary

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20Z628864

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Acenaphthylene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Acenaphthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Fluorene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Phenanthrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Anthracene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Fluoranthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Pyrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(a)anthracene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Chrysene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(b)fluoranthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(k)fluoranthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(a)pyrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Dibenz(a,h)anthracene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(g,h,i)perylene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
2-and 1-methyl Naphthalene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Naphthalene-d8	ORG-91-5105	modified from EPA SW-846 3510C & 8270E	GC/MS
Acenaphthene-d10	ORG-91-5105	modified from EPA SW-846 3510C & 8270E	GC/MS
Chrysene-d12	ORG-91-5105	modified from EPA SW-846 3510C & 8270E	GC/MS
Sediment			
Benzene	VOL-91-5010	modified from EPA SW-846 5230B & 8260	(P&T)GC/MS
Toluene	VOL-91-5010	modified from EPA SW-846 5030C & 8260D	P&T GC/MS
Ethylbenzene	VOL-91-5010	modified from EPA SW-846 5030C & 8260D	P&T GC/MS
Xylenes (Total)	VOL-91-5010	modified from EPA SW-846 5030C & 8260D	P&T GC/MS
F1 (C6-C10)	VOL-91- 5010	MOE PHC-E3421	P&T GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	MOE PHC E3421	P&T GC/FID
F2 (C10 to C16)	VOL-91-5010	MOE PHC E3421	GC/FID
F2 (C10 to C16) minus Naphthalene	VOL-91-5010	MOE PHC E3421	GC/FID
F3 (C16 to C34)	VOL-91-5010	MOE PHC E3421	GC/FID

AGAT Laboratories

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Method Summary

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20Z628864

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
F3 (C16 to C34) minus PAHs	VOL-91-5010	MOE PHC E3421	GC/FID
F4 (C34 to C50)	VOL-91-5010	MOE PHC E3421	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5010	MOE PHC E3421	BALANCE
Terphenyl	VOL-91-5010		GC/FID
Water Analysis			
Dissolved Antimony	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Arsenic	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Barium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Beryllium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Boron	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Cadmium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Chromium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Cobalt	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Copper	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Lead	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Molybdenum	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Nickel	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Selenium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Silver	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Thallium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Uranium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Vanadium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Zinc	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS

AGAT Laboratories

2 large bk

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
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webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: CIMAT
Contact: Karen Greer + Kai Markvoorsen
Address:
Phone: Fax:
Reports to be sent to:
1. Email: karen.greer@cima.ca
2. Email: kai.markvoorsen@cima.ca

Project Information:

Project: A001049
Site Location: 200 Lees
Sampled By: Lee Robert T Jamieson Lee-Scott + Kai Markvoorsen
AGAT Quote #: 335768 PO:
Please note: if quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☑ No ☐
Company:
Contact:
Address:
Email:

Regulatory Requirements:

(Please check all applicable boxes)

☑ Regulation 153/04
Table ___ *Indicate One*
☐ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture *(Check One)*
☐ Coarse
☐ Fine

☐ Excess Soils R406
Table ___ *Indicate One*
Sample from APEC?
☐ Yes
☐ No
☐ Stockpile ☐ In-situ

☐ Regulation 558

☐ Sewer Use
☐ Sanitary ☐ Storm
___ *Region*
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
___ *Indicate One*

Is this submission for a Record of Site Condition? ☐ Yes ☒ No

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Laboratory Use Only

Work Order #: 2076288864
Cooler Quantity: two - ice
Arrival Temperatures: 9.0 | 9.5 | 9.2 / 9.0 | 8.4 | 9.0
Custody Seal Intact: ☐ Yes ☐ No ☐ N/A
Notes: 6.9 | 8.0 | 6.2 @ 7.4 | 7.7 | 7.1

Turnaround Time (TAT) Required: (can we)

Regular TAT ☒ 5 to 7 Business Days
Rush TAT (Rush Surcharges Apply)
☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day
OR Date Required (Rush Surcharges May Apply):
Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*
For 'Same Day' analysis, please contact your AGAT CPM

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI, DOC	O. Reg 153: Metals & Inorganics, inc. EC/SAR	Metals - ICPMS, ☐ CrVI, ☐ Hg, ☐ HWSB	BTEX, F1-F4 PHCs Analyze F4G if required ☐ Yes ☐ No	PAHs	PCBs	VOC	Landfill Disposal Characterization TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Excess Soils SPLP Rainwater Leach ☐ VOCs ☐ SVOCs	Excess Soils Characterization Package pH, ICPMS Metals, BTEX, F1-F4	Salt - EC/SAR	Potentially Hazardous or High Concentration (Y/N)
BH20-3-GW01	22-07-2020	AM/PM	13	GW		Y	✓	✓	✓	✓						
BH20-2-GW01		AM/PM					✓	✓	✓	✓						
MW05-12-GW01		AM/PM					✓	✓	✓	✓						
MW04-12-GW01		AM/PM					✓	✓	✓	✓						
BH20-5-GW01		11:02 AM/PM					✓	✓	✓	✓						
MW03-12-GW01		14:35 AM/PM					✓	✓	✓	✓						
A122887		AM/PM					✓	✓	✓	✓						
DUP-1		— AM/PM					✓	✓	✓	✓						
DUP-2		— AM/PM					✓	✓	✓	✓						
		AM/PM														
		AM/PM														

Only take filtered only

Samples Relinquished By (Print Name and Sign): Kai Markvoorsen	Date: 2020-07-22	Samples Received By (Print Name and Sign): Wertheleft Fedex	Date: 2020/07/22 Time: 16h54
Samples Relinquished By (Print Name and Sign): Wertheleft to fedex 2020/07/23	Date: 2020/07/23 Time: 16h00	Samples Received By (Print Name and Sign):	Date: Time:
Samples Relinquished By (Print Name and Sign):	Date: Time:	Samples Received By (Print Name and Sign): Shawn S July 24/2020	Date: 10AM Time:

Page 1 of 1

Nº: T 106646

Pink Copy - Client | Yellow Copy - AGAT | White Copy- AGAT

Document ID: DIV 78 1511.017

Date Issued: July 23, 2020

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CLIENT NAME: CIMA+ S.E.N.C.
240 CATHERINE STREET, SUITE 110
OTTAWA, ON K2P2G8
(613) 860-2462

ATTENTION TO: Karen Greer

PROJECT: A001049

AGAT WORK ORDER: 20Z629176

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

WATER ANALYSIS REVIEWED BY: Jacky Zhu, Spectroscopy Technician

DATE REPORTED: Aug 05, 2020

PAGES (INCLUDING COVER): 10

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*Notes

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

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Certificate of Analysis

AGAT WORK ORDER: 20Z629176

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PAHs (Water)

DATE RECEIVED: 2020-07-23

DATE REPORTED: 2020-08-05

					SAMPLE DESCRIPTION:	BH20-4-GW01	BH20-1-GW01	OW506B-GW01	OW506C-GW01
					SAMPLE TYPE:	Water	Water	Water	Water
					DATE SAMPLED:	2020-07-23	2020-07-23	2020-07-23	2020-07-23
Parameter	Unit	G / S: A	G / S: B	RDL		1298256	1298263	1298264	1298265
Naphthalene	µg/L	1400	6400	0.20		<0.20[<A]	<0.20[<A]	<0.20[<A]	<0.20[<A]
Acenaphthylene	µg/L	1.8	1.8	0.20		<0.20[<A]	<0.20[<A]	<0.20[<A]	<0.20[<A]
Acenaphthene	µg/L	600	1700	0.20		<0.20[<A]	<0.20[<A]	<0.20[<A]	<0.20[<A]
Fluorene	µg/L	400	400	0.20		<0.20[<A]	<0.20[<A]	<0.20[<A]	<0.20[<A]
Phenanthrene	µg/L	580	580	0.10		<0.10[<A]	<0.10[<A]	<0.10[<A]	<0.10[<A]
Anthracene	µg/L	2.4	2.4	0.10		<0.10[<A]	<0.10[<A]	<0.10[<A]	<0.10[<A]
Fluoranthene	µg/L	130	130	0.20		<0.20[<A]	<0.20[<A]	<0.20[<A]	<0.20[<A]
Pyrene	µg/L	68	68	0.20		<0.20[<A]	<0.20[<A]	<0.20[<A]	<0.20[<A]
Benzo(a)anthracene	µg/L	4.7	4.7	0.20		<0.20[<A]	<0.20[<A]	<0.20[<A]	<0.20[<A]
Chrysene	µg/L	1	1	0.10		<0.10[<A]	<0.10[<A]	<0.10[<A]	<0.10[<A]
Benzo(b)fluoranthene	µg/L	0.75	0.75	0.10		<0.10[<A]	<0.10[<A]	<0.10[<A]	<0.10[<A]
Benzo(k)fluoranthene	µg/L	0.4	0.4	0.10		<0.10[<A]	<0.10[<A]	<0.10[<A]	<0.10[<A]
Benzo(a)pyrene	µg/L	0.81	0.81	0.01		<0.01[<A]	<0.01[<A]	<0.01[<A]	<0.01[<A]
Indeno(1,2,3-cd)pyrene	µg/L	0.2	0.2	0.20		<0.20[<A]	<0.20[<A]	<0.20[<A]	<0.20[<A]
Dibenz(a,h)anthracene	µg/L	0.52	0.52	0.20		<0.20[<A]	<0.20[<A]	<0.20[<A]	<0.20[<A]
Benzo(g,h,i)perylene	µg/L	0.2	0.2	0.20		<0.20[<A]	<0.20[<A]	<0.20[<A]	<0.20[<A]
2-and 1-methyl Naphthalene	µg/L	1800	1800	0.20		<0.20[<A]	<0.20[<A]	<0.20[<A]	<0.20[<A]
Sediment						No	No	No	No
Surrogate	Unit		Acceptable Limits						
Naphthalene-d8	%		50-140			91	86	86	90
Acenaphthene-d10	%		50-140			79	75	76	79
Chrysene-d12	%		50-140			114	111	106	110

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Medium and Fine Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

1298256-1298265 Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&(j)Fluoranthene isomers because the isomers co-elute on the GC column.
2- and 1-Methyl Naphthalene is a calculated parameter. The calculated value is the sum of 2-Methyl Naphthalene and 1-Methyl Naphthalene. The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.
Sediment parameter is comment only based on visual inspection of the sample prior to extraction and is not an accredited test.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By: N Popowkolof

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Certificate of Analysis

AGAT WORK ORDER: 20Z629176

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Water)

DATE RECEIVED: 2020-07-23

DATE REPORTED: 2020-08-05

					SAMPLE DESCRIPTION:	BH20-4-GW01	BH20-1-GW01	OW506B-GW01	OW506C-GW01
					SAMPLE TYPE:	Water	Water	Water	Water
					DATE SAMPLED:	2020-07-23	2020-07-23	2020-07-23	2020-07-23
Parameter	Unit	G / S: A	G / S: B	RDL		1298256	1298263	1298264	1298265
Benzene	µg/L	44	430	0.20		<0.20[<A]	<0.20[<A]	<0.20[<A]	<0.20[<A]
Toluene	µg/L	18000	18000	0.20		<0.20[<A]	<0.20[<A]	<0.20[<A]	<0.20[<A]
Ethylbenzene	µg/L	2300	2300	0.10		<0.10[<A]	<0.10[<A]	<0.10[<A]	<0.10[<A]
Xylenes (Total)	µg/L	4200	4200	0.20		<0.20[<A]	<0.20[<A]	<0.20[<A]	<0.20[<A]
F1 (C6-C10)	µg/L	750	750	25		<25[<A]	<25[<A]	<25[<A]	<25[<A]
F1 (C6 to C10) minus BTEX	µg/L	750	750	25		<25[<A]	<25[<A]	<25[<A]	<25[<A]
F2 (C10 to C16)	µg/L	150	150	100		<100[<A]	<100[<A]	<100[<A]	<100[<A]
F2 (C10 to C16) minus Naphthalene	µg/L			100		<100	<100	<100	<100
F3 (C16 to C34)	µg/L	500	500	100		<100[<A]	<100[<A]	<100[<A]	<100[<A]
F3 (C16 to C34) minus PAHs	µg/L			100		<100	<100	<100	<100
F4 (C34 to C50)	µg/L	500	500	100		<100[<A]	<100[<A]	<100[<A]	<100[<A]
Gravimetric Heavy Hydrocarbons	µg/L			500		NA	NA	NA	NA
Sediment						No	No	No	No
Surrogate	Unit	Acceptable Limits							
Terphenyl	%	60-140				65	102	71	82

Certified By:

AGAT Laboratories

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FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 20Z629176

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Water)

DATE RECEIVED: 2020-07-23

DATE REPORTED: 2020-08-05

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Medium and Fine Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

1298256-1298265 The C6-C10 fraction is calculated using toluene response factor.
Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.
C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX.
The calculated parameters are non-accredited. The parameters that are components of the calculation are accredited.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
C>10 – C16 (F2- Naphthalene) is a calculated parameter. The calculated value is F2 - Naphthalene.
C>16 - C34 (F3-PAH) is a calculated parameter. The calculated value is F3-PAH (PAH: sum of Phenanthrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-c,d)pyrene and Pyrene).
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Sediment parameter is comment only based on visual inspection of the sample prior to extraction and is not an accredited test.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By: N Popowkolof

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 20Z629176

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - Metals (Including Hydrides) (Water)

DATE RECEIVED: 2020-07-23

DATE REPORTED: 2020-08-05

					SAMPLE DESCRIPTION:	BH20-4-GW01	BH20-1-GW01	OW506B-GW01	OW506C-GW01
					SAMPLE TYPE:	Water	Water	Water	Water
					DATE SAMPLED:	2020-07-23	2020-07-23	2020-07-23	2020-07-23
Parameter	Unit	G / S: A	G / S: B	RDL		1298256	1298263	1298264	1298265
Dissolved Antimony	µg/L	20000	20000	1.0		<1.0[<A]	<1.0[<A]	<1.0[<A]	<1.0[<A]
Dissolved Arsenic	µg/L	1900	1900	1.0		<1.0[<A]	<1.0[<A]	1.6[<A]	<1.0[<A]
Dissolved Barium	µg/L	29000	29000	2.0		35.2[<A]	76.2[<A]	52.9[<A]	2.7[<A]
Dissolved Beryllium	µg/L	67	67	0.50		<0.50[<A]	<0.50[<A]	<0.50[<A]	<0.50[<A]
Dissolved Boron	µg/L	45000	45000	10.0		814[<A]	478[<A]	288[<A]	323[<A]
Dissolved Cadmium	µg/L	2.7	2.7	0.20		<0.20[<A]	<0.20[<A]	<0.20[<A]	<0.20[<A]
Dissolved Chromium	µg/L	810	810	2.0		<2.0[<A]	<2.0[<A]	3.2[<A]	2.3[<A]
Dissolved Cobalt	µg/L	66	66	0.50		1.36[<A]	<0.50[<A]	19.0[<A]	<0.50[<A]
Dissolved Copper	µg/L	87	87	1.0		3.4[<A]	2.0[<A]	3.9[<A]	4.0[<A]
Dissolved Lead	µg/L	25	25	0.50		<0.50[<A]	<0.50[<A]	<0.50[<A]	<0.50[<A]
Dissolved Molybdenum	µg/L	9200	9200	0.50		0.96[<A]	<0.50[<A]	0.59[<A]	2.88[<A]
Dissolved Nickel	µg/L	490	490	3.0		<3.0[<A]	<3.0[<A]	79.6[<A]	7.8[<A]
Dissolved Selenium	µg/L	63	63	1.0		<1.0[<A]	<1.0[<A]	2.5[<A]	1.4[<A]
Dissolved Silver	µg/L	1.5	1.5	0.20		<0.20[<A]	<0.20[<A]	<0.20[<A]	<0.20[<A]
Dissolved Thallium	µg/L	510	510	0.30		<0.30[<A]	<0.30[<A]	<0.30[<A]	<0.30[<A]
Dissolved Uranium	µg/L	420	420	0.50		<0.50[<A]	<0.50[<A]	<0.50[<A]	<0.50[<A]
Dissolved Vanadium	µg/L	250	250	0.40		0.69[<A]	<0.40[<A]	8.93[<A]	1.07[<A]
Dissolved Zinc	µg/L	1100	1100	5.0		7.2[<A]	<5.0[<A]	10.1[<A]	<5.0[<A]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Medium and Fine Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

1298256-1298265 Metals analysis completed on a filtered sample.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

AGAT Laboratories

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Quality Assurance

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20Z629176

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date: Aug 05, 2020			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Water)															
Benzene	1294598		< 0.20	< 0.20	NA	< 0.20	101%	50%	140%	108%	60%	130%	107%	50%	140%
Toluene	1294598		< 0.20	< 0.20	NA	< 0.20	90%	50%	140%	105%	60%	130%	101%	50%	140%
Ethylbenzene	1294598		< 0.10	< 0.10	NA	< 0.10	113%	50%	140%	109%	60%	130%	84%	50%	140%
Xylenes (Total)	1294598		< 0.20	< 0.20	NA	< 0.20	106%	50%	140%	113%	60%	130%	106%	50%	140%
F1 (C6-C10)	1294598		< 25	< 25	NA	< 25	103%	60%	140%	100%	60%	140%	104%	60%	140%
F2 (C10 to C16)	1294599		< 100	< 100	0.0%	< 100	109%	60%	140%	73%	60%	140%	82%	60%	140%
F3 (C16 to C34)	1294599		< 100	< 100	0.0%	< 100	96%	60%	140%	70%	60%	140%	75%	60%	140%
F4 (C34 to C50)	1294599		< 100	< 100	0.0%	< 100	93%	60%	140%	81%	60%	140%	106%	60%	140%
O. Reg. 153(511) - PAHs (Water)															
Naphthalene	1298256	1298256	< 0.20	< 0.20	NA	< 0.20	96%	50%	140%	87%	50%	140%	96%	50%	140%
Acenaphthylene	1298256	1298256	< 0.20	< 0.20	NA	< 0.20	75%	50%	140%	77%	50%	140%	95%	50%	140%
Acenaphthene	1298256	1298256	< 0.20	< 0.20	NA	< 0.20	80%	50%	140%	74%	50%	140%	85%	50%	140%
Fluorene	1298256	1298256	< 0.20	< 0.20	NA	< 0.20	81%	50%	140%	72%	50%	140%	75%	50%	140%
Phenanthrene	1298256	1298256	< 0.10	< 0.10	NA	< 0.10	77%	50%	140%	70%	50%	140%	70%	50%	140%
Anthracene	1298256	1298256	< 0.10	< 0.10	NA	< 0.10	72%	50%	140%	70%	50%	140%	73%	50%	140%
Fluoranthene	1298256	1298256	< 0.20	< 0.20	NA	< 0.20	77%	50%	140%	90%	50%	140%	85%	50%	140%
Pyrene	1298256	1298256	< 0.20	< 0.20	NA	< 0.20	78%	50%	140%	95%	50%	140%	80%	50%	140%
Benzo(a)anthracene	1298256	1298256	< 0.20	< 0.20	NA	< 0.20	88%	50%	140%	88%	50%	140%	87%	50%	140%
Chrysene	1298256	1298256	< 0.10	< 0.10	NA	< 0.10	84%	50%	140%	81%	50%	140%	83%	50%	140%
Benzo(b)fluoranthene	1298256	1298256	< 0.10	< 0.10	NA	< 0.10	80%	50%	140%	86%	50%	140%	96%	50%	140%
Benzo(k)fluoranthene	1298256	1298256	< 0.10	< 0.10	NA	< 0.10	81%	50%	140%	87%	50%	140%	99%	50%	140%
Benzo(a)pyrene	1298256	1298256	< 0.01	< 0.01	NA	< 0.01	82%	50%	140%	75%	50%	140%	85%	50%	140%
Indeno(1,2,3-cd)pyrene	1298256	1298256	< 0.20	< 0.20	NA	< 0.20	88%	50%	140%	72%	50%	140%	84%	50%	140%
Dibenz(a,h)anthracene	1298256	1298256	< 0.20	< 0.20	NA	< 0.20	84%	50%	140%	70%	50%	140%	74%	50%	140%
Benzo(g,h,i)perylene	1298256	1298256	< 0.20	< 0.20	NA	< 0.20	75%	50%	140%	73%	50%	140%	72%	50%	140%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By: N Popowkolof

AGAT Laboratories

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Quality Assurance

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20Z629176

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

Water Analysis

RPT Date: Aug 05, 2020			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals (Including Hydrides) (Water)															
Dissolved Antimony	1298256	1298256	<1.0	<1.0	NA	< 1.0	101%	70%	130%	100%	80%	120%	105%	70%	130%
Dissolved Arsenic	1298256	1298256	<1.0	<1.0	NA	< 1.0	100%	70%	130%	102%	80%	120%	112%	70%	130%
Dissolved Barium	1298256	1298256	35.2	35.4	0.6%	< 2.0	98%	70%	130%	99%	80%	120%	101%	70%	130%
Dissolved Beryllium	1298256	1298256	<0.50	<0.50	NA	< 0.50	94%	70%	130%	94%	80%	120%	110%	70%	130%
Dissolved Boron	1298256	1298256	814	841	3.3%	< 10.0	93%	70%	130%	91%	80%	120%	110%	70%	130%
Dissolved Cadmium	1298256	1298256	<0.20	<0.20	NA	< 0.20	99%	70%	130%	103%	80%	120%	105%	70%	130%
Dissolved Chromium	1298256	1298256	<2.0	<2.0	NA	< 2.0	103%	70%	130%	100%	80%	120%	110%	70%	130%
Dissolved Cobalt	1298256	1298256	1.36	1.26	NA	< 0.50	103%	70%	130%	101%	80%	120%	110%	70%	130%
Dissolved Copper	1298256	1298256	3.4	3.5	NA	< 1.0	100%	70%	130%	100%	80%	120%	105%	70%	130%
Dissolved Lead	1298256	1298256	<0.50	<0.50	NA	< 0.50	99%	70%	130%	101%	80%	120%	98%	70%	130%
Dissolved Molybdenum	1298256	1298256	0.96	1.01	NA	< 0.50	99%	70%	130%	99%	80%	120%	103%	70%	130%
Dissolved Nickel	1298256	1298256	<3.0	<3.0	NA	< 3.0	105%	70%	130%	103%	80%	120%	108%	70%	130%
Dissolved Selenium	1298256	1298256	<1.0	<1.0	NA	< 1.0	103%	70%	130%	106%	80%	120%	112%	70%	130%
Dissolved Silver	1298256	1298256	<0.20	<0.20	NA	< 0.20	100%	70%	130%	100%	80%	120%	88%	70%	130%
Dissolved Thallium	1298256	1298256	<0.30	<0.30	NA	< 0.30	101%	70%	130%	103%	80%	120%	100%	70%	130%
Dissolved Uranium	1298256	1298256	<0.50	<0.50	NA	< 0.50	94%	70%	130%	97%	80%	120%	99%	70%	130%
Dissolved Vanadium	1298256	1298256	0.69	0.61	NA	< 0.40	100%	70%	130%	99%	80%	120%	114%	70%	130%
Dissolved Zinc	1298256	1298256	7.2	6.6	NA	< 5.0	103%	70%	130%	102%	80%	120%	113%	70%	130%

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Certified By:

AGAT Laboratories

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http://www.agatlabs.com

Method Summary

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20Z629176

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Acenaphthylene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Acenaphthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Fluorene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Phenanthrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Anthracene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Fluoranthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Pyrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(a)anthracene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Chrysene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(b)fluoranthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(k)fluoranthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(a)pyrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Dibenz(a,h)anthracene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(g,h,i)perylene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
2-and 1-methyl Naphthalene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Naphthalene-d8	ORG-91-5105	modified from EPA SW-846 3510C & 8270E	GC/MS
Acenaphthene-d10	ORG-91-5105	modified from EPA SW-846 3510C & 8270E	GC/MS
Chrysene-d12	ORG-91-5105	modified from EPA SW-846 3510C & 8270E	GC/MS
Sediment			
Benzene	VOL-91-5010	modified from EPA SW-846 5230B & 8260	(P&T)GC/MS
Toluene	VOL-91-5010	modified from EPA SW-846 5030C & 8260D	P&T GC/MS
Ethylbenzene	VOL-91-5010	modified from EPA SW-846 5030C & 8260D	P&T GC/MS
Xylenes (Total)	VOL-91-5010	modified from EPA SW-846 5030C & 8260D	P&T GC/MS
F1 (C6-C10)	VOL-91- 5010	MOE PHC-E3421	P&T GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	MOE PHC E3421	P&T GC/FID
F2 (C10 to C16)	VOL-91-5010	MOE PHC E3421	GC/FID
F2 (C10 to C16) minus Naphthalene	VOL-91-5010	MOE PHC E3421	GC/FID
F3 (C16 to C34)	VOL-91-5010	MOE PHC E3421	GC/FID

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Method Summary

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20Z629176

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
F3 (C16 to C34) minus PAHs	VOL-91-5010	MOE PHC E3421	GC/FID
F4 (C34 to C50)	VOL-91-5010	MOE PHC E3421	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5010	MOE PHC E3421	BALANCE
Terphenyl	VOL-91-5010		GC/FID
Water Analysis			
Dissolved Antimony	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Arsenic	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Barium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Beryllium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Boron	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Cadmium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Chromium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Cobalt	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Copper	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Lead	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Molybdenum	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Nickel	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Selenium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Silver	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Thallium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Uranium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Vanadium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Zinc	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS

AGAT Laboratories
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webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: CIMA+
Contact: Karen Greer + Kai Markvoort
Address:
Phone: 343-996-9656 Fax:
Reports to be sent to:
1. Email: karen.greer@cima.ca
2. Email: kai.markvoort@cima.ca

Project Information:

Project: A001049
Site Location: 200 Lees Ottawa
Sampled By: Lucas Robert + Jamieson Lee-Scott
AGAT Quote #: 335264 PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☑ No ☐
Company:
Contact:
Address:
Email:

Regulatory Requirements:

(Please check all applicable boxes)

☐ Regulation 558

☑ Regulation 153/04
Table 3 (Indicate One)
☐ Ind/Com
☑ Res/Park
☐ Agriculture
Soil Texture *(Check One)*
☐ Coarse
☐ Fine

☐ Excess Soils R406
Table _____ (Indicate One)
Sample from APEC?
☐ Yes
☐ No
☐ Stockpile ☐ In-situ

☐ Sewer Use
☐ Sanitary ☐ Storm
_____ (Region)
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
_____ (Indicate One)

Is this submission for a **Record of Site Condition?** ☐ Yes ☒ No

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Laboratory Use Only

Work Order #: 20762917 6
Cooler Quantity: one on ice.
Arrival Temperatures: 6.9 7.0 6.5
LT- 6.0 5.4 5.7
Custody Seal Intact: ☐ Yes ☐ No ☐ N/A
Notes: (on ice)

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI, DOC (Y/N)	O. Reg 153: Metals & Inorganics, inc. EC/SAR	O. Reg 153: Metals - ICPMS, ☐ CrVI, ☐ Hg, ☐ HWSB	O. Reg 153: BTEX, F1-F4 PHCs, Analyze F4G if required ☐ Yes ☑ No	PAHs	PCBs	VOC	Landfill Disposal Characterization TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Excess Soils SPLP Rainwater Leach ☐ Metals ☐ VOCs ☐ SVOCs	Excess Soils Characterization Package pH, ICPMS Metals, BTEX, F1-F4	Salt - EC/SAR	Potentially Hazardous or High Concentration (Y/N)
BH20-4-GW01	23-07-2020	AM	13	GW		Y	X	X	X	X						X	
BH20-1-GW01						Y	X	X	X	X						X	
DW120B-GW01						Y	X	X	X	X						X	
DW120C-GW01						Y	X	X	X	X						X	
					1 metals + hydrides												

Hg + CrVI on hold

Samples Relinquished By (Print Name and Sign): Lucas Robert	Date 23-07-2020	Time 12:45	Samples Received By (Print Name and Sign): [illegible]	Date 2020/07/23	Time 1455
Samples Relinquished By (Print Name and Sign): UPS to FedEx	Date 2020/07/23	Time 16h00	Samples Received By (Print Name and Sign):	Date	Time
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign): Shaumin	Date July 24/2020	Time 10AM

Page 1 of ____
Nº: T 106647

Geosyntec consultants

engineers | scientists | innovators

HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

Proposed Site Redevelopment - 200 Lees Avenue, Ottawa, Ontario

Prepared by

Geosyntec Consultants International, Inc.
Suite 424 -135 Laurier Ave W

Ottawa, Ontario, K1P 5J2

Prepared for:
CIMA+

Geosyntec Reference No. TR0885B

December 15, 2020

HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT PROPOSED REDEVELOPMENT 200 LEES AVENUE, OTTAWA, ONTARIO

Prepared by
Geosyntec Consultants International, Inc.
PO Box 47054
Ottawa, Ontario, K1B 5P9

Geosyntec Ref: TR0885B

November 27, 2020

Prepared for:
CIMA+

Ref No. RFP 2020-403356

December 15, 2020

SIGNATURES

Prepared by:

Karen Bechard, M.Sc.

Karen Berry-Spark, M.Sc.
P.Geo. (ON), QP_{RA} QP_{ESA}

EXECUTIVE SUMMARY

Geosyntec Consultants International, Inc. (Geosyntec) has prepared this *Human Health and Ecological Risk Assessment* (HHERA) for the western portion of the property at 200 Lees Avenue in the City of Ottawa, Ontario (the Site), which is owned and managed by the University of Ottawa (uOttawa). The Site is approximately 20,500 square metres (m^2) and currently facilitates both administrative and academic services for uOttawa.

uOttawa proposes to redevelop the Site, which is comprised of two areas based on current zoning and proposed land use. The majority of the Site is the northern portion (approximately 18,800 m^2) that contains the current buildings; this northern portion is referred to herein as "the Community Use Area". The southern portion of the Site is a strip (approximately 1,700 m^2) of landscaped property along the north side of the multi-use trail; this portion of the Site is referred to herein as "the Parkland Area". Although the property along the south of the multi-use trail is owned by uOttawa, it is not part of the redevelopment plan and is not included as part of the Site for this HHERA.

uOttawa is proposing to redevelop the Site by constructing a new building in the Community Use Area following the demolition of three buildings (Buildings B, C, and D). The new building will be located within the approximate footprint of existing Buildings C and D. uOttawa is also proposing to re-landscape the Site around the new building including into the Parkland Area south to the paved multi-use trail (no work will occur south of the multi-use trail).

The Site was used as a landfill between 1906 and 1947 for incinerator waste generated from the burning of domestic and commercial waste. The Site is underlain by a layer of cinder and ash fill containing elevated concentrations of metals and polyaromatic hydrocarbons (PAHs). No groundwater impacts have been found related to the fill.

The Site is adjacent to a historical coal gasification plant at 169 Lees Avenue that has been redeveloped by the City of Ottawa as the Lees Transitway Station. Soil and groundwater in the northeast corner of the Site are impacted by coal tar related constituents (primarily PAHs and petroleum hydrocarbons [PHCs]). A groundwater collection system was installed at the Lees Transitway Station and is operated by the City of Ottawa to control the migration of contaminants from the former coal gasification plant property. Operation of the groundwater pumping system appears to be preventing migration of the impacted groundwater further onto the Site.

This HHERA is intended for Site redevelopment planning purposes and is not intended to support the filing of a Record of Site Condition (RSC), as defined by Ontario Regulation 153/04, as amended (O. Reg. 153/04). A change in land use is not planned; therefore, an RSC is not required. This HHERA was conducted in the spirit of O. Reg. 153/04 and the risk assessment procedures provided by the Ontario Ministry of the Environment, Conservation and Parks.

The objectives of this HHERA are to:

- Evaluate using screening level techniques, the potential human health and ecological risks associated with the presence of contaminants of concern (COCs) in the subsurface considering the planned Site redevelopment; and

- Identify if remediation or engineering or administrative controls (together referred to as risk management measures or "RMMs") may be necessary to protect human health and ecological receptors that may be present at the Site based on the planned Site redevelopment.

The COCs selected for evaluation in this HHERA for the Community Use Area are:

- For soil, a total of 12 PAHs, one volatile organic compound (benzene), and nine metals; and
- For groundwater, only acenaphthylene, which is a PAH.

COCs for the Parkland Area of the Site are:

- For soil, a total of 16 PAHs and 12 metals; and
- For groundwater, no COCs were selected.

Five scenarios were considered to evaluate potential human health risks associated with exposure to COCs originating from soil and groundwater on-Site:

- A full-time long-term worker within the new building;
- A long-term maintenance worker working indoors and outdoors;
- A short-term construction worker conducting subsurface activities;
- A student who visits the Site periodically for educational purposes; and
- A recreational visitor (of any age) who uses the multi-use trail to access the Site, the river, or the wooded and riparian areas adjacent to the river.

Pathways related to indoor air and outdoor air were determined to be unlikely to pose unacceptable risk to people using the new building or the redeveloped Site. For people using the redeveloped Site, direct contact with PAHs and metals in soil may pose an unacceptable risk and RMMs to prevent contact with soils are recommended. For construction workers, risk related to encountering vapours and groundwater in excavations were determined to be unlikely to pose unacceptable risk. However, there is significant uncertainty in quantifying potential worker exposures related to non-aqueous phase liquid (NAPL) that may be encountered in the northwestern portion of the Site where coal tar is likely to be present. As a conservative measure, a worker health and safety plan is recommended as an RMM to guide excavations in areas that may encounter NAPL.

Five scenarios were considered to evaluate potential ecological risks associated with exposure to COCs originating from soil and groundwater on-site:

- terrestrial plants - root uptake of COCs from soils, foliar deposition of COCs in soil as dust, and uptake of COC vapours in outdoor air that originated from soil and groundwater;
- soil organisms – direct contact with COCs in soil, including soil ingestion and dermal contact;

- terrestrial mammals, birds, and reptiles - direct contact with COCs in soil, consumption of impacted plants and prey, inhalation of vapours and dust in outdoor air (including air in burrows);
- off-site aquatic plants – plant uptake of COCs in soil that has washed off-site into surface water via overland flow; and
- off-site reptiles, amphibians, benthic organisms and fish – off-site overland flow of soil into surface water where there may be direct contact with and consumption of prey that may be impacted by COCs in the soil.

Potentially unacceptable risks were identified related to direct contact with PAHs and metals in soils for all ecological receptors considered, except for terrestrial mammals and birds within the Community Use Area of the Site. For the Community Use Area, the ecological assessment considers maintaining natural habitat that is not comparable in quality to an uncontaminated setting but instead allowing habitat for species that are adapted or less sensitive to the COCs at the property. For the Parkland Area, more consideration was given to protecting ecological receptors because of proximity to the Rideau River.

Below are the RMMs recommended as an outcome of this HHERA for both human and ecological receptors during anticipated construction and operation of the redeveloped Site.

- Develop and implement RMMs that involve construction of a cover over affected soils or remediation/removal to reduce soil COC concentrations in both the Community Use Area and the Parkland Area to address potential risks associated with future long-term contact with PAHs and metals in fill materials and soil by workers, students, and recreational visitors and by plants and soil organisms and to address potential risks to mammals and birds in the Parkland Area.
- Develop and implement a worker health and safety plan to guide all excavations at the Site and to prevent dermal contact and dust inhalation. When excavating in the coal tar area of the Site, the plan should include measures to prevent vapour inhalation and direct contact with NAPL.
- Develop and implement a soil and groundwater management plan for intrusive activities potentially in contact with or exposing soils or groundwater at the Site to: (i) prevent the re-use of soil at locations where they can be contacted by people using the Site and by ecological receptors; and (ii) prevent the uncontrolled movement or discharge of NAPL and COCs in soil or groundwater at the Site.
- Groundwater monitoring is recommended to confirm that operation of the groundwater recovery system at the Transitway Station continues to maintain hydraulic control of the coal tar impacted area of the Site. Expansion of the groundwater monitoring network to include installation of wells within the Parkland Area and monitoring water levels are recommended to evaluate uncertainties regarding groundwater flow directions and groundwater – surface water interactions. Sampling is recommended to evaluate the potential for COC discharge to the river if water levels suggest that groundwater is

discharging to the river. A contingency plan should be developed should these results indicate groundwater COCs may be discharging to the Rideau River.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS

µg/g	microgram per gram
µg/m^3	microgram per cubic metre
µg/L	micrograms per litre
BTEX	benzene, toluene, ethylbenzene and xylenes
cm/s	centimetres per second
COCs	contaminants of concern
CSM	conceptual site model
EPC	exposure point concentration
HHERA	human health and ecological risk assessment
HHRA	human health risk assessment
HQ	hazard quotient
ILCR	incremental lifetime carcinogenic risk
m	metre
m^2	square metres
m asl	meters above sea level
m bgs	metres below ground surface
mg/m^3	milligram per cubic meter
m/s	metres per second
MEP	modified ecological protection
MGRA	modified generic risk assessment
NAPL	non-aqueous phase liquid
PAHs	polyaromatic hydrocarbons
PCBs	polychlorinated biphenyls
PHCs	petroleum hydrocarbons
PSO	plants and soil organisms
RL	reporting limit
RMM	risk management measure
RSC	Record of Site Condition
SaR	species at risk
SCS	Site Condition Standard
SQC	sediment quality criteria
TRV	toxicity reference value
VEC	valued ecosystem component
VI	vapour intrusion
VOC	volatile organic compound

1 INTRODUCTION

Geosyntec Consultants International, Inc. (Geosyntec) has prepared this Human Health and Ecological Risk Assessment (HHERA) for the western portion of the property located at 200 Lees Avenue in the City of Ottawa, Ontario (the Site), which is owned and managed by the University of Ottawa (uOttawa). The Site is approximately 20,500 square metres (m^2) and currently facilitates both administrative and academic services for uOttawa. A Site location and Site plan is provided as **Figure 1.1.**

1.1 Risk Assessment Scope and Objectives

This HHERA is intended for Site redevelopment planning purposes and is not intended to support the filing of a Record of Site Condition (RSC), as defined by Ontario Regulation 153/04, as amended (O. Reg. 153/04). The Site is currently used as a university campus and it is understood that a change in land use is not planned; therefore, an RSC is not required. This HHERA was conducted in the spirit of O. Reg. 153/04 and the risk assessment procedures provided by the Ontario Ministry of the Environment, Conservation and Parks[1] (Ministry 2017).

The objectives of this HHERA are to:

- Evaluate using screening level techniques, the potential human health and ecological risks associated with the presence of contaminants of concern (COCs) in the subsurface considering the planned Site redevelopment; and
- Identify if remediation or engineering or administrative controls (together referred to as risk management measures or RMMs) may be necessary to protect human health and ecological receptors that may be present at the Site based on the planned Site redevelopment.

1.2 Previous and Current Site Investigations and Reports

Extensive soil and groundwater investigations have taken place on the Site and the surrounding properties since the mid-1980s when an oily tar-like substance (coal tar) was discovered at the pumphouse of the Lees Transitway Station and in the Rideau River (Franz 2013). The source of the coal tar was linked to historical operations on properties located northwest of the Site. A number of soil and groundwater investigations have been conducted at the Site and surrounding area and have resulted in an overall understanding of the subsurface conditions. This HHERA relies on historical information and sampling results contained in the following historic reports:

[1] The Ministry of the Environment, Conservation and Parks has undergone several name changes and prior names have included the Ministry of the Environment and the Ministry of the Environment and Climate Change. 'Ministry' is used to describe all of these within this HHERA report.

- Characterization of Subsurface Materials/Conditions – Geotechnical and Environmental Considerations. Algonquin College Rideau Campus, Ottawa Ontario. Golder Associates Ltd. August 2000 (Golder 2000);
- Final Report for MOE Submittal – Human-Health and Ecological Site-Specific Risk Assessment Algonquin College, Rideau Campus. CH2M Hill, July 2002 (CH2M 2002);
- Phase Two Environmental Site Assessment University of Ottawa 200 Lees Avenue Ottawa, Ontario. Franz Environmental Inc. December 9, 2011 (Franz 2011);
- Supplementary Phase 2 Environmental Site Assessment and Remedial Options Assessment 191 and 193 Lees Ave Ottawa, Ontario. Geofirma Engineering Ltd. February 4, 2013 (Geofirma 2013);
- Supplementary Environmental Site Assessment Coal Tar Impacts 200 Lees Avenue Ottawa, Ontario. Franz Environmental Inc. April 5, 2013 (Franz 2013);
- Groundwater Monitoring Report 200 Lees Groundwater Monitoring Program – Sabrina Dussault, Environmental Risk Management Specialist, Office of Risk Management, uOttawa. November 2019 (Dussault 2019); and
- Geotechnical Report Proposed New Building, Lees Campus, 200 Lees Avenue, Ottawa, Ontario. Golder Associates Ltd. September 8, 2020 (Golder 2020).

Appendix A contains excerpted copies of the data from these historic reports, which are used in this HHERA.

Subsequent to these investigations, CIMA Canada Inc. (CIMA+) and Geosyntec were retained by uOttawa to conduct additional investigations to support the planned redevelopment, including Phase One and Two Environmental Site Assessments (ESAs), as well as a this HHERA and a Remedial Action Plan (RAP). The history and environmental concerns for the Site are described in the Phase One ESA (CIMA+ 2020a). The Phase Two ESA (CIMA+ 2020b) provides a summary of the historical reports and describes sampling activities conducted in 2020. A supplemental Subsurface Investigation was conducted by CIMA+ in conjunction with Geosyntec to provide additional data to support this HHERA (CIMA+ 2020c). Copies of the soil and groundwater sampling results from the Phase Two ESA (CIMA+ 2020b) and Supplemental Subsurface Investigation (CIMA+ 2020c) are provided in **Appendix A**. An Environmental Impact Statement with Tree Conservation Report (EIS with TCR Report) has also been prepared (CIMA+ 2020d) to consider potential environmental impacts and propose mitigation measures. This HHERA relies on information and sampling results in the CIMA+ (with Geosyntec) documents.

1.3 Report Organization

The remainder of this HHERA report provides the following:

- Background information and property description, including physical setting, property uses, summary of historical releases, geology, hydrogeology and contaminant distribution (Section 2);

- Description of the data used in this HHERA and selection of the COCs for the human health and ecological risk assessments (Section 3);
- Human health risk assessment (HHRA), including the problem formulation, pathway analysis, risk characterization evaluation, and a qualitative assessment of NAPL (Section 4);
- Ecological risk assessment (ERA), including the problem formulation, pathway analysis and screening (Section 5);
- Uncertainties that affect the HHRA or ERA (Section 6);
- Summary of the recommended RMMs and monitoring (Section 7); and
- References (Section 8).

2 BACKGROUND AND PROPERTY INFORMATION

This section provides a summary of the Site conditions including descriptions of the physical setting, surface water bodies, current and future land uses, relevant Site history, geology and hydrogeology, selection of applicable Site Condition Standards, and sampling programs.

2.1 Site Description

The Site is shown in **Figure 1.1** as the area outlined in green (landscaping boundary line). The Site is bounded by the paved multi-use trail that runs along the Rideau River to the south, a paved access road to the north, the Lees Transitway Station to the west, and the remainder of the 200 Lees Avenue property (eastern portion) to the east (Building A, Building E, and the sports field). Most of the Site is occupied by three buildings (Building B, C, and D). Adjacent to the buildings are a storage yard (south of Building B), parking lots to the north and west, and landscaping in much of the remaining open space.

The Site topography is relatively flat with an elevation of approximately 61 meters above sea level (m asl) (AOV 2020).

2.2 Surface Water

The Rideau River is located south of the Site and flows north, discharging to the Ottawa River at a location approximately 1.8 kilometres northwest of the Site (Google Earth 2018).

The water level at the uOttawa property was estimated at an average elevation of 56 m asl with information from two sources. A permanent station on the Rideau near Billings Bridge, Ottawa (station 2LA004) had a water level ranging from approximately 57.4 to 59.5 m asl in 2019 (Government of Canada 2020). This location is located just upstream of an area of minor rapids, some 3 km upstream of the Site. The topographic contour of the shoreline from this area to the outfall of Rideau River in the Ottawa River is mapped as 56 m asl (City of Ottawa 2020) and is controlled by the locks near the Ottawa River. These locks are a main level control on the river. The uOttawa Site is approximately half-way between the Rideau River locks on the Ottawa and the gauge location.

No surface water features are located on-Site. Surface drainage is managed by a system of storm drains located throughout the 200 Lees Avenue property (including the Site) that are connected to an outfall located on the western limit of the property (CIMA+ 2020a).

2.3 Current and Proposed Future Uses

The 200 Lees Avenue property currently facilitates administrative and academic services for uOttawa. The Site was developed as its current use in the early 1960s for Algonquin College, and was subsequently transferred to uOttawa. Most of the main campus construction was completed in 1964 and included Buildings A to D. Building E was constructed in 1979 (Franz 2011).

The Site is comprised of two areas based on current zoning and proposed land use (**Figure 1.1**). The majority of the Site is the northern portion (approximately 18,800 m^2) that is zoned Transit

Oriented Development Zone (TD2 (2077) and TD 3 (2029)) (City of Ottawa 2020). This portion contains the current buildings consistent with its use as a university campus and is considered a community use under O. Reg. 153/04; this northern portion is referred to herein as "the Community Use Area". The southern portion of the Site is the strip (approximately 1,700 m^2) of landscaped property along the north side of the multi-use trail that is zoned Parks and Open Space (O1H (2088)) (City of Ottawa 2020). This portion is considered a parkland use under O. Reg. 153/04; this southern portion of the Site is referred to herein as "the Parkland Area". Although the property along the south of the multi-use trail is owned by uOttawa, it is not part of the redevelopment plan and is not included as part of the Site for this HHERA.

uOttawa is proposing to redevelop the Site by constructing a new multi-story "C"-shaped building in the Community Use Area following the demolition of Buildings B, C, and D. A copy of the redevelopment plan showing the proposed building and landscape architecture is provided in **Appendix B**. The new building will be located within the approximate footprint of existing Buildings C and D and will be constructed without a basement except for a small mechanical room. The southern portion of Building D extends into the parkland zoning. Once Building D is demolished, the portion that extended will be filled and landscaped so that the new land use is consistent with the current zoning. uOttawa is also proposing to re-landscape the Site around the new building, including the area where Building D extends into the Parkland Area. The new landscaping will extend into the Parkland Area south to the paved multi-use trail (no work will occur south of the multi-use trail). No redevelopment is planned for the multi-use trail or the portion of the Site that is between the river and the multi-use trail (see **Appendix B**).

Geotechnical studies were recently completed to aid in selecting the type of foundation for the new building (Golder 2020). Driven pile and caisson foundations are both under consideration. This HHRA assumes that a caisson foundation will be used as the construction technique, which is assumed to involve drilling caisson holes to at least the bedrock surface. This technique has the potential for more opportunity to encounter COCs in soil and groundwater than does the pile driving technique. Shallow trench excavations for underground utilities are also assumed to be part of the planned redevelopment activities.

2.4 Site History

The Site was used as a landfill between 1906 and 1947 for incinerator waste generated from the burning of domestic and commercial waste. The Site also received un-burned waste for several years early in the 20th century (Franz 2013). The Site also included a railway yard and an incinerator. The Site is underlain by a layer of cinder and ash fill containing elevated concentrations of metals and polyaromatic hydrocarbons (PAHs). No groundwater impacts have been found related to the fill.

The Site is adjacent to a historical coal gasification plant at 169 Lees Avenue that has been redeveloped by the City of Ottawa as the Lees Transitway Station. Soil and groundwater in the northeast corner of the Site are impacted by coal tar related constituents (primarily PAHs and petroleum hydrocarbons [PHCs]). A groundwater collection system was installed at the Lees Transitway Station and is operated by the City of Ottawa to control the migration of contaminants

from the former coal gasification plant property. Operation of the groundwater pumping system appears to be preventing migration of the impacted groundwater further onto the Site. However, should the groundwater pumping system cease operation, it is possible that the coal-tar related groundwater constituents could migrate southward across the Site toward the adjacent Rideau River.

2.5 Geology and Hydrogeology

The geology on-Site has been detailed extensively by others (Franz 2013) and confirmed during the recent Phase Two ESA (CIMA+ 2020b) to consist of four units:

- Fill Unit - comprised of ash, sand, bricks, coal, cinder, wood, glass, concrete, fabric, and plastic that is found across the entire Site and is a source of metals and PAHs. The fill is also referred to as a "cinder and ash" layer and is of variable thickness, extending from near ground surface to as deep as about 6 metres below ground surface (m bgs);
- Alluvium Unit – comprised of silty and fine sand interbedded with silty clays and coarse sand and gravels, generally coarser with depth. The unit is reworked fluvial deposits of the former Ottawa River drainage channel. The unit is found at depths of about 5 to 10 m bgs. The unit is permeable and saturated and is the main transmissive groundwater-bearing unit at the Site;
- Basal Glacial Till - comprised of dense, sandy silt with some clay and gravel. The unit is reported to be discontinuous, up to about 4 metres (m) thick, and is found at depths of about 10 m bgs and extends to the bedrock surface; and
- Shale Bedrock – comprised of black shale of the Billings Formation. The top few metres are weathered and fractured. Bedrock was encountered by CIMA+ (2020b) at depths of about 13 to 14 m bgs.

The water table at the Site has been encountered at depths ranging from about 6.8 to 9.3 m bgs in October 2012 (Franz 2013) and 5.8 and 9.1 m bgs in July 2020 (CIMA+ 2020b). These depths indicate that the water table is located near the base of the fill or top of the alluvium.

The lateral hydraulic gradient during the October 2012 (Franz 2013) and July 2020 (CIMA+ 2020b) events was directed to the northwest across the Community Use Area of the Site. Previous investigations have identified the presence of a groundwater divide across the 200 Lees Avenue property, with lateral hydraulic gradients in the north part directed northwesterly, and in the southern part directed southeasterly toward the Rideau River (Franz 2013). Groundwater pumping at the recovery system and drainage systems for the Transitway, underpass, and nearby apartment buildings were identified as reasons for the northwesterly gradient (Franz 2013). Groundwater discharge to the Rideau River was attributed to be the reason for the southeasterly gradient (Franz 2013). Although a groundwater divide has been identified at the 200 Lees Avenue property, the divide is not evident on the Site portion of the property for the October 2012 and July 2020 water level gauging events. However, there are no monitoring wells located within the Parkland Area, so groundwater levels adjacent to the Rideau River are uncertain.

The groundwater elevation in the closest monitoring well to the river (BH20-03) is 55.14 m asl (CIMA+ 2020b)), which is lower than that of the adjacent Rideau River (56 m asl at base flow, see Section 2.2). This relationship provides evidence that the Rideau River is losing water in this area and the river is a groundwater recharge zone, rather than a discharge zone.

Previous consultants have estimated the groundwater velocity at the 200 Lees Avenue property to range from 0.21 to 210 m/yr, depending on the type of overburden material encountered (Franz 2013). Groundwater flow in the fill is expected to be in the top end of this range and flow in the alluvium to be less.

2.6 Applicable Site Condition Standards

As a first step in identifying the COCs in this HHERA, concentrations of constituents in soil and groundwater samples are compared to numerical values, or site condition standards (SCS), provided by the Ministry in the document Soil, Ground Water and Sediment Standards for Use under Part XV.I of the Environmental Protection Act (Ministry, 2011). The SCS are divided into a series of tables based on land use type, groundwater use, and site-specific conditions.

For the Community Use Area, the Phase Two ESA (CIMA+ 2020b) identifies the applicable generic SCS to be the Table 3: Full-Depth Site Condition Standards in a Non-Potable Ground Water Condition for industrial, commercial, and community property use and coarse textured soils (Table 3 SCS), based on the following rationale:

- The current and future land use of the Community Use Area is a university (Section 2.3) which is considered community property use, pursuant to Section 3 of the Post-secondary Education Choice and Excellence Act, 2000 and O. Reg. 153/04, thus meeting the O. Reg. 153/04 definition of community use.
- Potable water for the Site is obtained from the City of Ottawa municipal system which primarily derives its water from the Ottawa River. There are no drinking water wells located on the Site or within 250 m of the Site (CIMA+ 2020b); therefore, a non-potable groundwater condition exists at the Site.
- The Community Use Area is not considered environmentally sensitive as per Section 41 of O. Reg. 153/04.
    - CIMA+ identified that the Site is not located within or adjacent to an area of natural significance, as defined in O. Reg 153/04. **Table 2.1** provides additional rationale for this conclusion.
    - Soil pH values were confirmed to be between 7.0 and 8.0 for all samples analyzed (BH20-4-SS5).
- There are no surface water bodies present in the Community Use Area or within 30 m of it; therefore, Section 43.1 (1)(b) of O. Reg. 153/04 is not applicable.
- Laboratory results for grain size analysis indicate that the Site soils are coarse textured.

- Bedrock is located at a depth greater than 2 m bgs at the Site; therefore, the Site is not considered a shallow soil property as per Section 43.1(1)(a) of O. Reg. 153/04.

For the Parkland Area, the applicable generic SCS are the Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition for all types of property use and soil textures (Table 9 SCS), based on the following rationale:

- The current and future land use of the Parkland Area is a landscaped area (with the exception of the small portion of Building D, which will be demolished), thus meeting the O. Reg. 153/04 definition of parkland use;
- As described above, a non-potable groundwater condition exists at the Site and the Site is not a shallow soil property; and
- The Parkland Area is not considered environmentally sensitive as per Section 41 of O. Reg. 153/04 for the reasons described in **Table 2.1**.

2.7 Site Sampling Programs

This section describes the relevant sampling programs conducted at the Site. Copies of sampling results and maps showing sampling locations are provided in **Appendix A**.

2.7.1 Golder Associates Ltd. Geotechnical Report - August 2000

While considering the purchase of the 200 Lees Avenue property, uOttawa retained Golder Associates Ltd. (Golder) to assess the environmental and geotechnical conditions of the Site. Golder advanced test pits and boreholes, installed monitoring wells, sampled the new and previously existing monitoring wells, and submitted soil and groundwater samples for laboratory analysis. Three of the boreholes were advanced at the Site (BH00-1 to BH00-3) and completed as monitoring wells. PAHs in soils were reported to be isolated; however, metals (copper, lead, arsenic, zinc, boron, and mercury) concentrations above the standards applicable at the time were found to be widespread within the cinder and ash fill. Groundwater samples were analyzed for PAHs, metals and volatile organic compounds (VOCs) and no concentrations were found above applicable standards. Free product layers were detected in previously existing wells 120A-86 (0.79 m) and 122B-86 (0.58 m). These wells are located near current wells MW11-12 and BH20-05. The monitoring well headspace on each of the new wells was checked for organic vapour and combustible gas. On March 31, 2000, organic vapour readings ranged from 0 to 55.2 ppm and combustible gas readings ranged from 362 ppm to 17.2% LEL for BH00-1 to BH00-3. On April 5, 2000, organic vapour readings ranged from 0.7 to 66.2 ppm and combustible gas readings ranged from 480 ppm to 576 for BH00-1 to BH00-3. Golder mapped the water table showing groundwater flow to be directed northwesterly towards the Transitway Station and southerly towards the river in the southeastern portion of the property.

2.7.2 CH2M Hill, Site-Specific Risk Assessment - July 2002

Algonquin College retained CH2MHill Canada Limited (CH2M) to conduct a Human Health and Ecological Site-Specific Risk Assessment (SSRA) for the 200 Lees Avenue property. As part of

the SSRA, CH2M conducted a site investigation that included surface soil sampling, installing two monitoring wells (north and south of Building A), measuring groundwater elevations, and collecting samples of groundwater, vapour, and soil from crawl spaces. This included analysis of soil and groundwater samples for PAH, metals, sulphate, ammonia, and free cyanide, as well as methane and organic vapour monitoring. As part of the soil sampling, composite soil samples were collected and analyzed for metals. Soil results were consistent with those historical reported with concentration of metals (lead, barium, antimony) and PAH above the applicable criteria at the time. Groundwater was found to be unimpacted. No methane or organic vapours were detected within the building crawl spaces and accessible groundwater monitoring wells. CH2M mapped the water table showing similar flow directions to those mapped by Golder.

2.7.3 Geofirma Engineering Ltd. Supplementary Phase Two ESA - February 4, 2013

Geofirma was retained by the City of Ottawa to complete a Supplementary Phase 2 ESA and Remedial Options Assessment for 191 and 193 Lees Avenue, Ottawa, Ontario (Geofirma 2013). 191 Lees Avenue is the Lees Avenue Transitway Station property and 193 Lees Avenue is vacant and located immediately north of the uOttawa property. Relevant to the Site are the findings at borehole and monitoring well location MW12-11 which is located on 200 Lees Avenue close to the northern boundary of the Site. In general, the results showed soil and groundwater concentrations that exceed the applicable SCS for PAH in soil and groundwater; PHC Fraction 1 and benzene, toluene, ethylbenzene and xylenes (BTEX) in soil and groundwater; and metals in soil. The patterns of groundwater flow in the alluvium showed the continued significant drawdown due in the area of 191 and 193 Lees Avenue and extending onto the 200 Lees Avenue property with groundwater flow in the northwestern portion of the Site towards northwest and the Transitway Station groundwater collection system.

The results of the drilling confirmed areas previously reported to have coal tar present at several locations on the 191 and 193 Lees properties and at MW12-11. This coal tar appears to be pooled on top of the basal till unit. The occurrence of coal tar at MW12-11 (and historically at OW120B) is consistent with historical movement of coal tar within the fill and deep alluvium and down the sloping till surface.

2.7.4 Franz Environmental Inc. Supplemental Phase Two ESA - April 2013

In 2011, Franz Environmental Inc. (Franz) was retained to complete a Phase I and II ESA on the eastern portion of the 200 Lees Avenue property (not inclusive of the Site). After the 2011 investigation, Franz completed a supplemental Phase II ESA on the western portion of the 200 Lees Avenue property (Franz 2013). The supplemental Phase Two ESA included collecting eight groundwater samples (and one duplicate) in May 2012. Samples from two wells had PAH concentrations greater than the current Table 3 SCS. Five boreholes were then advanced at the Site and soil and groundwater samples collected for laboratory analysis. Samples of soil from the fill unit had concentrations of PAH and metals (arsenic, cadmium, chromium, copper, lead, selenium, and zinc) above the current Table 3 SCS. Soils were also analyzed for PHC and polychlorinated biphenyls (PCBs) and were found to have concentrations below the Table 3 SCS. Groundwater samples analyzed for PAH, metals, PHC and PCBs were all below the applicable

SCS except for the sample collected from MW12-11 located in the northwestern portion of the Site. This sample had PAH (acenaphthylene) and PHC (Fraction 2) concentrations above the Table 3 SCS. Groundwater flow at the Site was reported to be northwesterly. Franz notes there is limited data on hydraulic gradients for the area closest to the Rideau River and that interaction between groundwater and the surface water is expected. Franz notes that groundwater PAH concentrations indicate the presence of free phase product in the westernmost portion of the Site at monitoring wells MW12-11 and OW-12B-86 (and in BH00-1 during the first sampling but not the second sampling). They estimated the total area estimated to be impacted by coal tar at the Site to be 3,200 m^2. A copy of the Franz map (Figure 6) showing the interpreted extent is provided in **Appendix A**.

2.7.5 Dussault Groundwater Monitoring Report – November 2019

uOttawa has been implementing a groundwater monitoring program to "track the potential migration and concentrations of contaminated groundwater from surrounding properties onto 200 Lees avenue and to monitor the migration and concentration of contaminants currently existing on the property." In November 2019, groundwater samples were collected from six monitoring wells (MW12-11, MW03-12, MW04-12, MW05-12, OW506A and OW506-B) for analysis of PAHs. Samples from MW12-11 and MW03-12 were also analyzed for PHCs and BTEX. Water levels were also measured in the six wells and reported to range from 53.09 to 55.78 m relative to an arbitrary site datum. The sample from MW12-11 was the only sample with PAH concentrations above Table 3 SCS. No other constituents had concentrations above Table 3 SCS. The report concludes that the contaminant plume remains relatively steady and has not migrated.

2.7.6 CIMA Canada Inc. Phase Two ESA – October 30, 2020

CIMA Canada Inc. (CIMA+) was retained by uOttawa to conduct Phase One and Two ESAs to support the planned redevelopment of the Site. The history and environmental concerns for the Site are described in the Phase One ESA (CIMA+ 2020a). PAH, metals and PHCs were identified as the predominant contaminants of concern (COCs) for the Site. Although cyanide, sulphur and nitrogen may also be associated with coal tar, previous sampling results were reviewed and CIMA+ concluded that these constituents were not COCs for the Site. The Phase Two ESA (CIMA+ 2020b) describes sampling activities conducted in 2020 that involved the following:

- drilling five boreholes and logging the subsurface;
- collecting at least two soil samples from each borehole for laboratory analysis;
- installing a monitoring well in each of the five boreholes;
- sampling the five new monitoring wells and six existing monitoring wells;
- laboratory analysis of the soil and groundwater samples for PAHs, PHCs, and metals; and
- surveying the newly installed and existing monitoring wells.

Soil samples from the fill unit were found to have PAH and metals concentrations greater than Table 3 SCS. Only the groundwater sample from monitoring well MW12-11 in the northwest portion of the Site had concentrations above the Table 3 SCS (acenaphthylene, a PAH).

Groundwater gradients were directed to the northwest and were attributable to operation of the groundwater control system at the Transitway Station.

2.7.7 CIMA Canada Inc. Supplemental Subsurface Investigation – November 19, 2020

Subsequent to the Phase Two ESA (CIMA+ 2020b) and during the preliminary data evaluation for this HHERA, Geosyntec noted during review of the SSRA data (CH2M 2002) that CH2M's risk characterization for mercury was based on the previously applicable soil criterion (10 microgram per gram [µg/g] in the Table B Residential/Commercial - Ministry, 1997). With the introduction of new soil standards in 2011 (referred to herein as the Table 3 SCS, see Section 2.6 for details), the standard for mercury is now 0.27 µg/g. The mercury concentration of one composite soil sample from the grassy area west of Building D collected by CH2M in 2001 (5.5 µg/g), although below the criteria applicable at the time of sampling (10 µg/g), is above the Table 3 SCS (0.27 µg/g). Upon further review the sample was noted not to have been collected in accordance with best practices (composite sample blended from four boreholes and not discreet samples from each borehole) and as a result the concentrations could be up to four times higher than reported. This raised the concern that the mercury concentrations in soil within the southern portion of the Site had not been adequately characterized.

During the preliminary review of data available for the Site, Geosyntec also noted that concentrations of benzene and naphthalene in soil in the northwest corner of the Site (location MW12-11) were above human health criteria developed by the Ministry to be protective of soil vapour migration into indoor air (also referred to as the vapour intrusion, or "VI" pathway).

In response to these findings, uOttawa authorized CIMA+ in conjunction with Geosyntec to undertake a supplemental investigation that included drilling and sampling at six boreholes as follows:

- three boreholes were used to install three soil vapour probes: one near monitoring well MW12-11 (BH20-6/SGP-06) and two approximately 30 m from the proposed building (BH20-7/SGP-07 and BH-20-8/SGP-08). One soil sample and one soil vapour sample were collected from each of these locations and analyzed for benzene and naphthalene;
- three boreholes were drilled in the southwestern portion of the Site to evaluate soil mercury concentrations (BH20-9, BH20-10, BH20-11). One soil sample from each location was analyzed for mercury; and
- all of the soil samples were also analyzed for lead using the toxicity leachate characteristics procedure for waste characterization purposes.

2.7.8 CIMA Canada Inc. Environmental Impact Statement with Tree Conservation Report– September 17, 2020

An Environmental Impact Statement with Tree Conservation Report has also been prepared (CIMA+ 2020d) to consider potential impacts and propose mitigation measures for the redevelopment. This report does not contain any soil or groundwater sampling data but information concerning areas of natural significance and species at risk is used to develop this HHERA.

3 CONTAMINANTS OF CONCERN

3.1 Data Used for HHERA

This HHERA uses environmental data for soil, groundwater and soil vapour samples collected from the Site to establish current Site conditions. The sampling programs that are relied upon are described in Section 2.7. The following subsections identify the sampling data used and applicability of the data for use in this HHERA.

3.1.1 Soil Data

The soil data used in this HHERA for the Community Use Area are listed in the following chart.

Consultant and Report	Year of Sampling	Sample Locations	Laboratory Analyses Conducted
CIMA+ (2020b)	2020	Boreholes BH20-01 to BH20-05	PAH, PHC, BTEX, Metals
CIMA+ (2020c)	2020	Boreholes BH20-06 to BH20-08 Boreholes BH20-09 to BH20-11	Benzene and Naphthalene Mercury
Franz (2013)	2012	Boreholes BH01-12 to BH05-12 (also referred to as MW01-12 to MW05-12)	PAH, PHC, BTEX, Metals, PCBs
CH2M (2002)	2001	Composite soils samples from drive point sample locations PS-A1 to PS-A3 and from Crawl Spaces beneath Buildings B, C and D (locations CSS-B to CSS-D)	PAH, BTEX, Metals, VOCs
Golder	2000	Boreholes BH00-1 to BH00-3	PAH, BTEX, Metals, VOCs

The soil data used in this HHERA for the Parkland Area are listed in the following chart.

Consultant and Report	Year of Sampling	Sample Locations	Laboratory Analyses Conducted
CH2M (2002)	2001	Composite soils samples from drive point sample locations PS-A1 and PS-A2 Riverbank soil samples from locations HS-1 to HS-4 and B-2 and B-3	PAH, BTEX, Metals, VOCs PAH, Metals

Some of the data listed above are for samples collected over a decade ago. It is possible that these sample results no longer represent current site conditions. Some constituents, particularly PHCs, attenuate over time through processes such as biodegradation and volatilization, which would serve to lower their concentrations with time. Other constituents, such as metals, are subject to redox reactions that may also affect their concentrations. Additionally, analytical best practices and methods have evolved over time. Changes in analytical methods do not invalidate previous data, but they do add some uncertainty to the interpretation of site data. Formerly applied sample

hold times and preservatives could produce a low bias in historical data, although this is not necessarily the case. In addition, changes in analytical practices can lead to changes in detection limits; thus, the maximum detection limits observed in historical data can differ from those observed in current data. While all of these data are considered in this HHERA, preference has been given to the most recent soil data.

The soil data sets listed above include composite soil samples from drive point sample locations in grassy areas at the Site (CH2M 2002). Each composite sample was comprised of subsamples from three to five locations at a consistent depth. The subsamples were collected from surficial soils (10 cm depth) to form a composite of surficial soil (labelled with suffix of -10) or from 10 to 60 cm deep to form a composite of deeper soil (labelled with a suffix of -60). The soil data set listed above also includes composite surficial soil samples collected from the crawl spaces beneath buildings B, C and D at the Site (one composite sample per building). Composite soil samples are generally not used in risk assessments because they provide an average concentration while risk assessments conducted for O. Reg. 153/04 generally use maximum concentrations. The composite soil data are considered in this HHERA as they were collected from areas of the Site not sampled otherwise; however, consideration is given to the fact that composite samples are averages and may mask maximum concentrations. Additional soil sampling was conducted in 2020 (CIMA+ 2020c) as a result.

The lists above include locations MW12-11, BH20-6 and BH20-8 which are located just north of the Site boundary in or near areas of coal tar impact. As coal tar extends onto the Site (see Section 2.7.4), data from these locations was assumed to represent conditions in the northwestern corner of the Site.

Boreholes were drilled at the Site as part of investigations conducted on adjacent properties by CRA in 1986 and Intera in 1987 (Franz 2013). Soil data from these investigations are not available and were not used in this HHERA.

3.1.2 Groundwater Data

The groundwater data used in this HHERA for Community Use Area are listed in the following chart.

Consultant and Report	Year of Sampling	Sample Locations	Laboratory Analyses Conducted
CIMA+ (2020b)	2020	Monitoring Wells BH20-01 to BH20-05 and MW05-12	PAH, PHC, BTEX, Metals
Dussault (2019)	2019	Monitoring Wells MW03-12, MW04-12, MW05-12, and MW12-11	PAH, PHC, BTEX

No monitoring wells are present in the Parkland Area. The groundwater data used in this HHERA for Parkland Area are for wells located near the Parkland and are listed in the following chart.

Consultant and Report	Year of Sampling	Sample Locations	Laboratory Analyses Conducted
CIMA+ (2020b)	2020	Monitoring Wells BH20-03 to BH20-05 and MW05-12	PAH, PHC, BTEX, Metals
Dussault (2019)	2019	Monitoring MW05-12	PAH

Groundwater monitoring has been conducted annually since 2012 at the wells listed above for Dussault. Results for the wells show consistent trace or non-detectable concentrations, with the exception of MW12-11 which shows PAH and PHC concentrations that have decreased with time and currently only acenaphthylene, a PAH concentration above the Table 3 SCS. At the time of this HHERA, monitoring wells sampled as part of the CIMA+ (2020) program have only been sampled once since their installation in 2020. This HHERA assumes that COC concentrations measured in 2019 and 2020 will be representative of future conditions; this may be an over-estimate for the area at MW12-11 as monitoring of this well shows declining concentrations with time.

3.1.3 Soil Vapour Data

No soil vapour data were used to assess the Parkland Area. The soil vapour data used in this HHERA for the Community Use Area are listed in the following chart.

Consultant and Report	Year of Sampling	Sample Locations	Laboratory Analyses Conducted
CIMA+ (2020c)	2020	SGP-06 through SGP-08	Benzene and Naphthalene

Three soil vapour samples and one duplicate were collected in October 2020 by Geosyntec, on behalf of CIMA+. Quality assurance and quality control measures included leak checks of the sampling train using shut-in tests and helium tracers prior to sample collection and Summa® canister samples vacuum checks. Soil vapour concentrations for naphthalene and benzene did not exceed the applicable provincial screening level (CIMA+ 2020c).

3.2 COC Selection

COCs for this HHERA were selected by comparing the maximum measured concentrations of the soil and groundwater samples considered in Section 3.1 to the applicable SCS. **Tables 3.1 and 3.2** list the analytical parameters, maximum measured soil concentrations and applicable SCS for the Community Use Area and Parkland Area, respectively. Similarly, **Tables 3.3 and 3.4** list the analytical parameters, maximum measured groundwater concentrations and applicable SCS for the Community Use Area and Parkland Area, respectively. Constituents with maximum measured concentrations that exceed the corresponding SCS were selected as COCs for the HHERA.

For constituents that were not detected in one or more of the samples, the maximum analytical reporting limits (RLs) as shown in **Tables 3.1 through 3.4** were compared to the SCS. For the Community Use Area, thallium in soil (**Table 3.1**) is the only constituent having an RL greater than the Table 3 SCS. The Golder (2000) sample set had a maximum RL of 4 µg/g compared to the Table 3 SCS of 3.3 µg/g, while all other sample sets had thallium maximum concentrations and maximum RLs below the SCS. For this reason, thallium was not selected as a COC for the HHERA. For the Parkland Area, several PAHs in the CH2M river bank data set have RLs above the Table 9 SCS (**Table 3.2**). The maximum concentration of these same PAHs is above the Table 9 SCS for the drive point samples. These PAHs will therefore be carried forward for further evaluation in this HHERA. No groundwater parameters had a maximum RL above the Table 3 SCS (**Table 3.3**) or Table 9 SCS (**Table 3.4**).

The COCs selected for evaluation in this HHERA are listed in **Table 3.5** by media and by Site area. COCs for the Community Use Area of the Site are:

- For soil, a total of 12 PAHs, one VOC (benzene), and nine metals were selected as COCs; and
- For groundwater, only a single COC was selected (acenaphthylene, which is a PAH).

COCs for the Parkland Area of the Site are:

- For soil, a total of 16 PAHs and 12 metals were selected as COCs; and
- For groundwater, no COCs were selected.

4 HUMAN HEALTH RISK ASSESSMENT

4.1 Problem Formulation

In the problem formulation stage, environmental investigations are reviewed with the goals of describing the area(s) where impacts are found, the nature and extent of the impacts, and identifying the COCs that need to be assessed further. The conceptual site model (CSM) brings together the information gathered during the problem formulation phase and describes the exposure pathways that may be complete (i.e., those where receptors may contact COCs). The human health CSM is summarized in **Figure 4.1** for the Community Use and Parkland Areas.

Based on the Site information contained in Section 2, the human receptors considered for the Community Use Area of the Site are the people that would work at the Site during redevelopment and work in or visit the new building once it is constructed (see **Figure 4.1)**:

- Construction Worker - This receptor is assumed to be an adult who conducts indoor and outdoor construction activities during redevelopment of the Site. This receptor is assumed to have direct contact with soil and groundwater while conducting excavations and handling excavation dewatering equipment. This receptor could also be exposed to COC vapours in air at an excavation, in outdoor air, and indoor air;
- Indoor Worker - This receptor is assumed to be an adult who spends the majority of their career working in the new Site building, where they could inhale COC vapours. This receptor could also have some minimal contact with soils outdoors while they are on work breaks and/or traversing the outdoor area to and from the Site building;
- Maintenance Worker – This receptor is assumed to be an adult who spends the majority of their career performing maintenance activities both indoors and outdoors at the Site on a daily basis. This receptor is assumed to be in direct contact with soil while performing simple landscape maintenance. This receptor could also be exposed to COC vapours in indoor and outdoor air; and
- Student – This receptor is assumed to be an adult who visits the Site periodically for educational purposes for a few years. Like the Indoor Worker, this receptor is assumed to spend the majority of their time in the new Site building where they could inhale COC vapours. This receptor could also have some minimal contact with soils outdoors while they are on breaks and/or traversing the outdoor area to and from the Site building. This receptor would have similar routes of exposure as the Indoor Workers, but the frequency and duration of exposure would be significantly less than that of the long-term workers.

Based on the Site information contained in Section 2, the human receptors considered for the Parkland Area of the Site are (see **Figure 4.1**):

- Construction Worker - This receptor is similar to that described above, but would only be involved in the re-landscaping activities as no buildings will be constructed in the Parkland Area;

- Maintenance Worker – This receptor is similar to that described above, but work activities would only be outdoors in the Parkland Area as no buildings will be constructed in the Parkland Area; and
- Recreational Visitor – This receptor could be a person (of any age) that uses the multi-use trail on a regular basis to access the Site. This receptor could have some minimal contact with soil while they are traveling on the trail or if they leave the trail and travel onto the landscaped areas. They may also canoe, fish or wade in the river adjacent to the Site, where they could contact soil that flows overland from the Parkland Area into the wooded or riparian areas or the river.

This HHRA examines the possibility that subsurface soils may be excavated and re-used anywhere on the Site during the redevelopment process where they may be accessible to workers and students using the new building and to recreational visitors. It also assumes that these soils could flow overland from the Parkland Area into the adjacent wooded area south of the multi-use trail or discharge to the riparian area or river.

For the Community Use Area, this HHRA examines the possibility that volatile constituents could form vapours in the subsurface, which could migrate to air that is indoors at the new building, outdoors anywhere at the Site, and within excavations or below ground utilities.

Potable use of groundwater is not considered a complete pathway as the Site and surrounding land is or will be connected to the public water supply. It is assumed that new landscaping will not include any fruit or nut trees that may be a human food supply.

This HHRA does not include pathways related to groundwater discharge to the Rideau River. As described in Section 2.5, groundwater contour maps and comparison of groundwater elevations to baseflow levels in the river provide evidence that groundwater is not discharging to the river. This is an uncertainty that is discussed further in Section 6 and for which monitoring is proposed in Section 7.4.

Extensive soil and groundwater investigations have been conducted at the Site since 1986. This HHRA uses laboratory analytical results for soil samples collected between 2000 and 2020 and groundwater samples collected in 2019 and 2020 as described in Section 3.1. This HHRA assumes that the off-site groundwater pumping system will continue to control the migration of coal-tar constituents in groundwater at the Site such that these results will represent (or over-estimate) future conditions at the Site. This is also an area of uncertainty that is discussed further in Section 6 and for which monitoring is proposed in Section 7.4.

4.2 Pathway Analysis and Screening

For the receptors described in Section 4.1, the following subsections evaluate potential receptor exposures by exposure pathway. The evaluation uses a comparison of measured soil and groundwater concentrations to applicable pathway-specific human health component values provided by the Ministry, where available. Where COC concentrations are less than component values, risks are concluded to be acceptable and no RMM are needed. Where COC concentrations

are greater than component values (or where no component values are available), the need for RMM is identified or further detailed evaluation is conducted in Section 4.3.

4.2.1 Direct Contact with Soil

COCs are in the fill at the Site that is currently beneath landscaping, paved areas, and buildings. Future construction could result in removal of these covers and redistribution of soils so that they may become accessible. This HHRA conservatively assumes that all human receptors could potentially contact COCs in soils.

The Ministry's S-2 and S-3 component values are intended to be protective of human health exposures including industrial, commercial and community settings without children present (Ministry 2011). The Ministry calculates the S-2 and S-3 values using toxicity reference values (TRVs) and a soil ingestion and dermal exposure model. The Ministry also includes particulate inhalation for the S-3 component value. The S-2 component value is for a lower-frequency and lower-intensity exposure scenario and typical receptors would include long-term workers. The S-3 component value is for a low-frequency but high-intensity exposure scenario such as a construction worker digging into soils.

For the Parkland Area, recreational visitors may include children that could contact soil. Soil may also wash into the adjoining riparian area along the river where it could hypothetically be contacted by recreational users of the river. The Ministry's S-1 component value is based on a high-frequency, high-intensity, exposure scenario equivalent to that of a surface soil at a residential, parkland, institutional, or agricultural site where children and pregnant women are present. The soil value is calculated using TRVs and a soil ingestion and dermal exposure model.

The S-1, S-2, and S-3 component values are based on the assumptions of regular exposures to soils that are likely to be more frequent and/or of longer duration than the actual soil exposures at the Site. Therefore, both S-1, S-2 and S-3 component values are conservative values to screen this pathway.

The maximum soil concentrations for the Community Use Area are compared to the S-2 and S-3 component values in **Table 4.1**. Eight of the PAHs and three metals (arsenic, cadmium and lead) have maximum concentrations that are greater than the S-2 component values. Two PAHs (benz(a)anthracene and benzo(a)pyrene or B[a]P]) and two metals (cadmium and lead) have maximum concentrations greater than the S-3 component values.

The maximum soil concentrations for the Parkland Area are compared to the S-1, S-2 and S-3 component values in **Table 4.2**. Seven of the PAHs and three metals (arsenic, cadmium and lead) have maximum concentrations that are greater than the S-1 and S-2 component values. One PAH (B[a]P) and two metals (cadmium and lead) have maximum concentrations greater than the S-3 component values.

Based on these findings, RMMs are recommended for both the Community Use Area and the Parkland Area to address potential risks associated with future long-term contact with COCs in fill materials and soil by workers, students, and recreational visitors. RMMs are also recommended to address potential risks during the short-term redevelopment phase when construction workers

may contact soils or during subsurface activities after the redevelopment is complete. The RMMs are discussed in Sections 7.1 and 7.2.

4.2.2 Vapours in Indoor Air

Volatile constituents in the subsurface may form vapours that could potentially migrate into indoor air at a Site building, a pathway referred to as the VI pathway. Some PAHs and metals (elemental mercury) are considered sufficiently volatile by the Ministry to warrant examination in this context. The Ministry's industrial SIA (for soil) and GW2 (for groundwater) component values are intended to be protective of adult receptors in an industrial, commercial and community building that are breathing the indoor air over the long-term (Ministry 2011).

Soil Comparison to SIA – VOCs, PAHs and PHCs

For the Community Use Area, COCs in soil were considered in this HHRA by screening soil concentrations against industrial SIA component values for coarse-grained soils in **Table 4.1**. The maximum concentrations of naphthalene, benzene and mercury (15.6, 0.52 and 5.5 µg/g, respectively) are slightly above the SIA component values (10, 0.32 and 3.9 µg/g, respectively).

Only soil samples from borehole MW12-11 collected by Geofirma in 2012 from the area of coal tar impact north of the Site have benzene and naphthalene concentrations above the SIA component value. Soils collected from depths as shallow as about 4 m bgs have concentrations above the SIA component values; these samples are above the water table. Based upon the soil sampling conducted by Franz (2013) and CIMA+ (2020), this area of soil impact is limited to the northwestern corner of the Site. While the area of soil impact is limited, it is possible for soil vapours to migrate laterally within the vadose zone beyond the limit of the soil impact. The rate and direction of migration will be controlled by several factors, including atmospheric pressure fluctuations, moisture content of the soil and fill material, and the availability of oxygen in the subsurface to promote aerobic biodegradation.

Soil Vapour Comparison to Screening Criteria

Where volatile COCs are present in soils above the water table, the COCs will volatilize to form soil vapours that may migrate in the subsurface to the building. Typically, soil gas data are better suited to assess this pathway then soil data because modeling is needed to predict soil vapour concentrations from soil in order to conduct the assessment. The modeling assumes instantaneous phase partitioning and requires soil (and physical property) parameters as inputs, which may not accurately describe site-specific conditions (or may contain uncertainty). Soil vapour measurements represent the actual partitioning of contaminants from soil, so the use of soil vapour sampling data reduces the uncertainty by eliminating the need for phase-partitioning models. There is considerable uncertainty in using soil data to assess the indoor air pathway due to the potential for vapour losses during soil sampling and uncertainty in soil partitioning calculations (US EPA 2015).

Soil vapour sampling was undertaken in October 2020 to evaluate the potential for benzene and naphthalene in soil in the northwest portion of the Site to be source of vapours for indoor air at the

new building (Section 2.7.7.). The new building will be constructed on the approximate footprint of existing buildings C and D, southwest of the coal tar impacted area. Therefore, one soil vapour probe was installed near monitoring well MW12-11 where previously collected soil samples had concentrations of benzene and naphthalene above SIA component values and two soil vapour probes were installed to evaluate soil vapour concentrations within approximately 30 m of the proposed building. The sampling locations and results are provided in **Appendix A**.

To assess the soil vapour concentration data, soil vapour screening levels (SVSLs) for benzene and naphthalene were calculated using methodology consistent with O. Reg. 153/04 for industrial/commercial /community use properties. SVSLs were calculated using the industrial health-based indoor air criteria provided in the Modified Generic Risk Assessment 'Approved Model' (Ministry 2016b), divided by the Ministry's default soil vapour to indoor air attenuation factor for industrial/commercial buildings (0.004) provided in the Draft Technical Guidance: Soil Vapour Intrusion Assessment (Ministry 2013). A bioattenuation adjustment factor of 100 was applied to the SVSLs to account for biodegradation of the benzene and naphthalene vapours. The bioattenuation factor is consistent with the Ministry's approach for a separation distance from sample depths greater than 3 m (Ministry 2011). Bioattenuation is also supported by the presence of oxygen in the soil vapour probes at concentrations greater than 2%. The SVSLs are compiled in **Appendix A** along with the sampling results.

Samples from all three soil vapour probes had benzene concentrations that ranged from 1.9 micrograms per cubic metre (µg/m^3) (SGP-06) to 32.7 µg/m^3 (SGP-08), with the maximum concentration corresponding to the duplicate sample from SGP-08. All benzene sample concentrations are more than three orders of magnitude below the SVSL of 40,700 µg/m^3.

None of the soil vapour samples had naphthalene concentrations greater than the analytical RL of 5.2 µg/m^3. The RL for naphthalene is more than four orders of magnitude below the SVSL of 66,200 µg/m^3.

Therefore, none of the soil vapour sampling results indicate a potential source of VI in the area of the Site where previous soil sampling results showed the potential presence of benzene and naphthalene in soil at concentrations above SIA. On the basis of the soil vapour sampling results, no RMMs for indoor air are recommended for VOCs, PHCs or PAHs in soil.

Soil Comparison to SIA - Mercury

Two of the soil samples for the Site have mercury concentrations that are above the SIA component value: a sample of the fill at MW12-11 collected by Geofirma in 2012 in the northwestern corner of the Site (4.4 µg/g) and a composite sample of the fill from area PS-A2 (grassy area west of Building D) collected by CH2M in 2001 (5.5 µg/g). The composite sample was from four sub-sampling locations so the concentration of mercury in one of the sub-sample locations may be up to four times higher. The Ministry has developed the SIA component value (3.9 µg/g) for mercury because of the potential for vapours to form from elemental mercury. The borehole logs for these samples do not indicate the presence of elemental mercury. While the mercury concentrations of some of the fill may be above the SIA component value, it is likely that the mercury is not in a form that is volatile, in which case it would not pose a risk to indoor air.

To evaluate the potential for mercury concentrations to be higher in the area of PS-A2, three boreholes were drilled in the southwestern portion of the Site (BH20-9, BH20-10, BH20-11) and one sample of the fill was collected from each location and analyzed for mercury (see Section 2.7.7). The sampling locations and results are provided in **Appendix A**.

The mercury concentrations ranged from 0.15 to 3.32 µg/g, all below the Table 3 SCS and S-IA component value of 3.9 µg/g.

There is no evidence of elemental mercury at the Site based on the results of sampling and observations recorded on the borehole logs. Mercury, along with other metals, are present in the fill due to its origination as incinerator waste. On the basis of these findings, no RMMs for mercury vapours in indoor air are recommended.

Groundwater Comparison to GW2

COCs in groundwater were screened using the industrial GW2 component values in **Table 4.3**. There is only one groundwater COC (acenaphthylene) and its maximum concentration in groundwater is over two orders of magnitude lower than the GW2 component value. Therefore, no unacceptable human health risks are indicated for the VI pathway associated with groundwater at the Site. No RMMs for groundwater-related vapours in indoor air are recommended.

Summary of Indoor Air Pathway

The indoor air pathway related to the presence of COCs in soil and groundwater has been evaluated using sampling data for the Site and no RMMs for indoor air are recommended.

4.2.3 Vapours in Outdoor Air

Vapours originating from volatile COCs in soil and groundwater may migrate into outdoor air, where they may be inhaled and contact skin. This potential pathway is applicable to all receptors assessed in this HHRA.

The Ministry's soil to outdoor air component values are based on outdoor air inhalation by a human receptor standing on the downwind edge of a soil source zone (Ministry, 2011). The soil to outdoor air component values are based on several assumptions including that the Site is used within twelve months of soil samples collection, soil COCs volatilize freely to the atmosphere, and that soil vapour is diluted with clean outdoor air moving at 410 centimetres per second (cm/s) in a 200 cm high atmospheric mixing cell before inhalation by a human receptor. This HHRA assumes that these component values will also be protective of dermal contact with outdoor air vapours, as dermal exposures to vapours tend to be less than inhalation.

The soil concentrations are compared to the soil to outdoor air component values in **Tables 4.1 and 4.2** for the Community Use Area and Parkland Area, respectively. The maximum measured soil concentrations are less than the soil to outdoor air component values for both areas. Therefore, no unacceptable human health risks are indicated for vapours in outdoor air at the Site.

The CSM (**Figure 4.1**) also identifies that on-Site receptors in the Community Use Area could inhale vapours in outdoor air that volatilize from groundwater. Groundwater volatilization to

outdoor air is generally not considered by the Ministry to be a significant pathway due to the dilution that occurs in outdoor air (Ministry 2013) and therefore the Ministry does not provide component values for groundwater volatilization to outdoor air. Dilution results because the flux of volatile COCs from the water table is very slow relative to ambient wind speeds. The flux of volatile COCs from the water table is controlled by the rate of diffusion of COCs in groundwater to the water table (a function of the COC's diffusivity in water which typically range from 10^{-5} to 10^{-6} cm^2/sec where they can volatilize and migrate via advection and diffusion through the vadose zone to outdoor air. Advection of soil gas to outdoor air can occur as a result of barometric changes and is typically much faster than diffusion. Diffusion through the vadose zone occurs as a result of concentration gradients and is typically faster than diffusion through the saturated zone because air diffusivity coefficients are typically several orders of magnitude higher than water diffusivity coefficients. However, because the flux of VOCs into the vadose zone is controlled by diffusion from the water table, this becomes the rate-limiting step for VOC flux to outdoor air. Diffusion rates in water are many orders of magnitude lower than typical ambient wind speeds (upwards of several cm/s to 100s of cm/s). Therefore, it is reasonable to conclude that vapours originating from groundwater would not pose a risk in outdoor air to any of the human receptors considered by this HHRA.

4.2.4 Vapours in Outdoor Air Beside an Excavation

Vapours originating from volatile COCs in soil and groundwater may migrate into air within an excavation, where construction workers conducting subsurface activities may be exposed to vapours via inhalation and dermal contact. While the dermal contact pathway is considered complete, it is typically insignificant compared to the inhalation route of exposure. Concentrations of vapours in excavations may be higher than what would be found in outdoor air. Many factors, such as excavation depth, size and orientation, wind speed and direction, and air exchange rate, affect excavation air vapour concentrations and many assumptions are required to estimate these. Due to the many variables, the Ministry does not provide human health component values for excavation air inhalation or dermal contact potential exposure pathway (Ministry, 2011). All soil and groundwater COCs will be carried forward for quantitative assessment of trench air inhalation exposures for the Construction Worker in Section 4.3.

4.2.5 Contact with Groundwater in an Excavation

Construction workers may contact groundwater while constructing the caisson foundation for the new building in the Community Use Area. It is possible that construction of the foundation could involve excavation dewatering activities during which there is the possibility that they could contact groundwater with their skin. There is also the possibility that construction workers may incidentally ingest groundwater by hand-to-mouth contact or splashing, although ingestion exposures are expected to be minimal.

Groundwater is too deep (about 6 to 9 m bgs, see Section 2.5) to be contacted during routine landscaping or other outdoor activities at the Site.

There are no Ministry component values by which to screen contact with groundwater in an excavation, although the industrial drinking water component value (GW1) can be used as a conservative screen as it incorporates larger ingestion volumes and longer exposure durations than would be typical of a construction scenario. There is only one groundwater COC (acenaphthylene) and its maximum concentration in groundwater is over an order of magnitude higher than the industrial GW1 component value (**Table 4.3**). Therefore, this COC will be carried forward for quantitative assessment of contact with groundwater from an excavation in Section 4.3.

4.3 Risk Characterization - Construction Worker Scenario

4.3.1 Introduction

The pathway screening process (Sections 4.2.4 and 4.2.5) identified that evaluation using quantitative techniques was needed to assess the potential risks in more detail for potential excavation air and dewatering exposures during construction. Receptor-pathway combinations that will be examined quantitatively in this section are:

- Construction Worker exposure to COC vapours in excavation air via inhalation while conducting shallow excavations that may encounter COCs in soil in the Community Use or Parkland Area; and
- Construction Worker exposure to COCs in groundwater via vapour inhalation, dermal contact and incidental ingestion while conducting deep excavations for the new building foundation in the Community Use Area.

In this section, risks for these receptor-pathway combinations are quantified using exposure estimates. Risk assessments conducted for O. Reg. 153/04 typically set the exposure point concentrations (EPCs) equal to the maximum concentration measured, while in many other jurisdictions, risks are evaluated using site average concentrations (e.g., the 95th upper confidence limit of the mean). This HHRA follows the O. Reg. 153/04 approach and EPCs for soil and groundwater are set to the maximum concentrations. EPCs for the Construction Worker scenarios in the Community Use and Parkland Areas are summarized in **Table 4.4**.

EPCs, in conjunction with the receptor parameters and toxicity information compiled in **Tables 4.5 and 4.6** respectively, are used to calculate daily inhalation exposures concentrations (milligram per cubic meter [mg/m^3]) and daily average dose exposures (mg chemical/kg body weight/day). The equations used, along with the calculated values of the exposures are included in **Appendix C**.

Risk characterization for chemicals with a threshold-type dose-response consists of a comparison between the toxicological criteria (*i.e.*, the rate of exposure that would not produce adverse effects) against the total estimated exposure. This comparison is expressed as a Hazard Quotient (HQ) and is equal to the estimated daily average dose divided by the TRV for all pathways except inhalation. For inhalation, the HQ is equal to the estimated daily exposure concentration divided by the TRV, which is also in the form of a concentration.

Risk characterization for chemicals with a non-threshold-type dose response (*i.e.*, carcinogens) consists of a calculation of the Incremental Lifetime Carcinogenic Risk (ILCR), which is defined

as the predicted risk of an individual in a population of a given size developing cancer over a lifetime. An ILCR is equal to the estimated average daily dose or daily exposure concentration times the TRV.

4.3.2 Acceptable Risk Thresholds

ILCRs are evaluated by comparison to a benchmark risk level that is considered to be acceptable. O. Reg. 153/04 considers $1x10^{-6}$ (one person out of one million people) an acceptable risk level. In cases where the estimated exposures or risks are less than the acceptable level, it can be concluded that no observable adverse health effects would be expected to occur.

For human exposures to non-carcinogens, an acceptable HQ level would be 1.0 in cases where total exposure has been estimated from both background and site sources. However, the Ministry has apportioned 20% of the total exposure to any one environmental medium to account for multiple exposure pathways. HQ values for non-carcinogens that are less than 0.20 are considered to represent a situation in which media-related exposures account for less than 20% of the toxicological criterion, and no adverse effects are expected to be associated with the estimated level of exposure. HQ estimates above 0.2 are not necessarily indicative of potential risks associated with a given medium, as they may reflect over-estimation of risk due to the use of overly conservative estimates (*e.g.*, over-estimating exposures through the use of maximum soil ingestion rates). This procedure is followed to ensure that the predicted potential impacts on human health are not under-estimated, but also recognizes the potential magnitude of the conservatism built into the risk estimate.

In this HHRA, the acceptable risk thresholds are:

- an HQ of 0.2 per component value based on non-cancer effect; and
- an ILCR of 1×10^{-6} per component value based on cancer effects.

4.3.3 Approach for PAHs

The Ministry guidance indicates that when it is possible for exposure to a PAH mixture to occur at a site, the combined carcinogenic risk from all PAHs with the same mode of action must be assessed, even if an individual PAH is present below its individual SCS. The Ministry uses a Toxicity Equivalence Factor (TEF) approach to assess risks related to mixtures of carcinogenic PAHs. The TEF approach is based on evaluating the relative toxicity of carcinogenic PAHs to benzo[a]pyrene (B[a]P). The Ministry's (2019) TEF values are considered appropriate for this HHRA and are as follows:

Polycyclic Aromatic Hydrocarbon	**TEF**
Acenaphthene	0.001
Acenaphthylene	0.01
Anthracene	0.01
Benzo(a)anthracene	0.1
Benzo(a)pyrene	1

Polycyclic Aromatic Hydrocarbon	TEF
Benzo(b)fluoranthene	0.1
Benzo(g,h,i)perylene	0.01
Benzo(k)fluoranthene	0.1
Chrysene	0.01
Dibenzo(ah)anthracene	1
Fluoranthene	0.01
Fluorene	0
Indeno(1,2,3-cd)pyrene	0.1
Methylnaphthalene, 2-(1-)	0
Naphthalene	0
Phenanthrene	0
Pyrene	0.001

To assess the combined carcinogenic risk from all PAHs, a B[a]P equivalent (B[a]PE) was developed as follows:

$$B[a]PE = \Sigma(C_i \times TEF_i)$$

Where:

C_i = Concentration of the individual carcinogenic PAH in the mixture (micrograms per gram [µg/g] for soil and micrograms per litre [µg/L] for groundwater); and

TEF_i = Toxic equivalency factor of the individual carcinogenic PAH in the mixture.

To calculate EPCs for use in risk calculations, the B[a]PE concentration was calculated using the maximum individual PAH concentration from all samples in **Table 3.1**.

4.3.4 Construction Worker Inhalation Exposures Beside a Shallow Excavation

For the Construction Worker working in the Community Use Area and Parkland Area, shallow excavations may encounter volatile COCs in soil. Inhalation exposures were modeled using soil concentrations, together with the trench model method developed by Virginia Department of Environmental Quality (VDEQ 2020). The Jury equation was used to estimate migration of volatile COCs in the soil into the air of a trench. Then a box model was used to estimate dispersion of the COCs from inside the trench to the breathing zone where a Construction Worker could be situated. The scenario considered was a Construction Worker working beside a shallow trench for the new building foundation, underground utility, or landscaping. The Construction Worker was assumed to breathe air from this trench 100% of the time, every day they are on-site for a 1.5-year construction project. The trench was assumed to be 13 m long by 1 m wide and 2 m deep based on trench dimensions used in the model described by Meridian (2011). The local 20-year minimum average monthly wind speed (3.06 metres per second [m/s]) from the Ottawa MacDonald-Cartier International Airport, Station ID 6106000 (Government of Canada 2017), was used in the modeling. The Ministry's (2011) generic default physical properties for coarse-grained

soil located above the capillary fringe were used. Further information including model descriptions, inputs, calculations and modeled trench air concentrations is provided in **Tables C2 and C3** of **Appendix C**.

The potential risks are presented in **Table 4.7** for shallow excavations in the Community Use and Parkland Areas. For both areas, none of the HQ exceed the non-cancer threshold of 0.2. None of the ILCR exceed the cancer risk threshold of 1.0×10^{-6}.

4.3.5 Construction Worker Inhalation Exposures Beside a Deep Excavation

For the Construction Worker in the Community Use Area, a deep excavation into the subsurface may be used to construct the foundation of the new building. Inhalation exposures were modeled using measured groundwater concentrations together with the VDEQ trench model for cases where groundwater can pool in the bottom of an excavation. The VDEQ model uses a simple fate and transport equation to estimate volatilization from contaminated groundwater into the air of a trench. Then a box model is used to estimate dispersion of contaminants from the air inside the trench to the breathing zone where a Construction Worker could be situated. The excavation was assumed to be a caisson drilled hole 1 m long by 1 m wide and 6 m deep. As described in Section 4.3.4, the local 20-year minimum monthly wind speed was used in the modeling. Further information including model descriptions, inputs, calculations and modeled trench air concentrations is provided in **Table C1** of **Appendix C**.

The potential risks are presented in **Table 4.7** for deep excavations in the Community Use Area. The ILCR does not exceed the cancer risk threshold of 1.0×10^{-6}.

4.3.6 Construction Worker Dermal Exposures to Groundwater

The Construction Worker in the Community Use Area may contact COCs in groundwater while handling excavation dewatering equipment, during which the water may contact their skin. The hands and forearms (surface area of 2,145 cm^2 for generic adult and 1,955 cm^2 for adult female) (Ministry 2011) of this receptor were assumed to be exposed and subject to dermal absorption through direct contact with COCs in groundwater while working with dewatering equipment in the trench twice daily. Based on professional judgment, dermal exposure is assumed to occur as a result of continuous submersion of the hands and forearms in groundwater for two 30-minute events per day, 195 days per year, for 1.5 years. A 30-minute event is assumed because it is unlikely that unprotected hands and forearms could be submerged in groundwater at the Site for this duration due to the cold temperature of the groundwater (typically <10°C based upon groundwater sampling measurements) and due to the nature of common construction practices. It was assumed that dewatering equipment would be adjusted twice daily during construction work. Professional judgment was used to assess these exposures because default exposure assumptions are not available in Ministry guidance. Other jurisdictions use values that are also based upon professional judgment (e.g., Virginia DEQ). The groundwater EPC (**Table 4.4**) was used in the modeling for the Construction Worker to evaluate the potential that subsurface work could draw groundwater from anywhere at the Site, including the area impacted by coal tar.

The method used to predict dermal absorption was taken from the US EPA Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E: Supplemental Guidance for Dermal Risk Assessment) (US EPA 2004) In this method, the absorption of chemicals from water is a function of the thickness of the stratum corneum and the duration of the exposure event. This model assumes that absorption continues after the exposure event has ended. Details regarding the estimation of exposure through this route are provided in **Appendix C**.

The potential risks are presented in **Table 4.8** for dermal contact with groundwater from deep excavations in the Community Use Area. None of the HQ exceed the non-cancer threshold of 0.2. None of the ILCR exceed the cancer risk threshold of 1.0×10^{-6}.

4.3.7 Construction Worker Ingestion Exposures to Groundwater

The Construction Worker in the Community Use Area may contact COCs in groundwater while handling excavation dewatering equipment, during which small amounts of groundwater may be incidentally ingested during splashing or hand-to-mouth transfer.

Default exposure assumptions for incidental ingestion of groundwater during construction activities are not available in Ministry (or US EPA) guidance. Exposure concentrations via ingestion were estimated using the Ministry equations for drinking water (GW1) component values (Ministry, 2011). The Construction Worker is assumed to have a drinking water (groundwater) intake rate of 0.02 litre per day (VDEQ 2020) with an exposure rate of 5 days per week and an exposure duration of 39 weeks per year for 1.5 years. The groundwater EPCs used for direct contact (Section 4.3.1.2) were also used to assess incidental ingestion. Details regarding the estimation of exposure through this route are provided in **Tables C5 and C6** of **Appendix C**.

The potential risks are presented in **Table 4.8** for incidental ingestion of groundwater from deep excavations in the Community Use Area. None of the HQ exceed the non-cancer threshold of 0.2. None of the ILCR exceed the cancer risk threshold of 1.0×10^{-6}.

4.3.8 Summary of Construction Worker Quantitative Risk Evaluation

In the preceding sections, the potential for Construction Worker exposures to exceed risk thresholds were examined quantitatively for:

- COC vapours in excavation air via inhalation while conducting shallow excavations that may encounter COCs in soil in the Community Use or Parkland Area; and
- COCs in groundwater via vapour inhalation, dermal contact and incidental ingestion while conducting deep excavations for the new building foundation in the Community Use Area.

The potential risks associated with these exposures were calculated to be below acceptable risk thresholds. Potential risks associated with COC vapours in outdoor air were also assessed to be below acceptable risk thresholds (Section 4.2.3). Therefore, no RMMs are recommended for COCs vapours in outdoor air or excavation air or for contact with groundwater. However, RMMs are recommended for direct contact with soil during construction activities (see Section 4.2.1) and for excavations in areas with NAPL (see Section 4.4). RMMs for the Construction Worker scenario are discussed in Section 7.

4.4 Qualitative Assessment of NAPL

As discussed in Section 2.7.3 and 2.7.4, free-phase NAPL related to coal tar was identified in the northwestern portion of the Site in an area of about 3,200 m^2. Groundwater monitoring conducted by uOttawa shows that the dissolved-phase contaminant plume remains relatively steady, which provides evidence that the NAPL is not mobile. The groundwater control system operating at the Transitway Station appears to maintain hydraulic control over this area, so provided this system continues to operate, further migration is not expected.

The potential need for additional RMMs is evaluated because NAPL is expected to remain in place at the Site. The Table 3 SCS and component values considered in the evaluation of COCs and the equations applied in the calculations of risk and hazard are based on the assumption that the coal tar related COCs are distributed between the dissolved, vapour, and sorbed phases (i.e. three phases are considered). With NAPL present, nonaqueous-phase COCs are also present (i.e. four phases are present). The presence of NAPL could have implications for the risk evaluations that rely on the application of partitioning equations (that is, movement to indoor air, trench air, and outdoor air). Direct contact exposure to NAPL itself could also be possible where NAPL is present. The assessment of risks due to COCs in soil and groundwater has already indicated unacceptable risks are present for direct contact with soil. The RMMs proposed for soil direct contact pathways will also need to be effective for NAPL-impacted soils.

The assessment of risks did not identify any unacceptable risks for the following pathways:

- Inhalation of indoor air in the new building;
- Inhalation of outdoor air at the Site;
- Inhalation of air near an excavation; and
- Groundwater dermal contact and incidental ingestion.

For the indoor air pathway, soil vapour sampling data were collected in the NAPL area and did not show the presence of benzene or naphthalene at concentrations above SVSLs. For the outdoor air pathway, comparison to component values was relied upon. The depth of the NAPL in the subsurface, slow rates of diffusion from the subsurface to outdoor air, and low soil vapour concentrations support the conclusion that NAPL does not adversely affect the outdoor air. As such, no additional RMMs are recommended to address NAPL for these pathways.

There is significant uncertainty in quantifying potential worker exposures related to NAPLs that may be encountered in the northwestern portion of the Site where coal tar is likely to be present. For deep excavations that may encounter NAPL, inhalation near an excavation and groundwater contact and incidental ingestion cannot be ruled out as potentially unacceptable risks to a Construction Worker. As a conservative measure, this HHERA recommends that a worker health and safety plan be used as an RMM to guide excavations in areas that may encounter NAPL.

5 ECOLOGICAL RISK ASSESSMENT

5.1 Problem Formulation

The problem formulation for the ecological risk assessment includes an ecological CSM and the risk assessment objectives. The ecological CSM provides an outline of the general exposure scenarios to be evaluated by bringing together the COCs, receptors and exposure pathways into one overall conceptual framework. The ecological CSM is summarized in **Figure 5.1** for the Community Use Area and Parkland Area.

As shown in **Figure 5.1**, the ecological receptors considered for this ERA are the plants and animals that could live at or visit the Community Use Area both during redevelopment and once the new building is constructed. As part of the EIS with TCR Report (CIMA+, 2020d), CIMA+ reviewed available information, consulted with particular stakeholders, conducted Site surveys in July 2020 to identify valued ecosystem component (VECs) that may be present on the Site or adjacent (within approximately 120 metres) to the Site, and analyzed their interaction during the anticipated construction and operation of the proposed development. Most of the Community Use Area of the Site is currently covered by human-made structures or landscaped areas. As a result, the vegetation is primarily lawn and common horticultural species including small-leaved linden, silver maple, and to a lesser degree Gingko, Freeman's Maple, hackberry and Staghorn Sumac (CIMA+ 2020d). It is likely that conditions following redevelopment will result in similar species in this area. South of the Parkland Area, there is a small woodland within a band of riparian vegetation along the Rideau River. The woodland is dominated by Black Willow, Manitoba Maple, and a dominant undergrowth of the invasive European Buckthorn (CIMA+ 2020d). There are also invasive species including Dame's Rocket, Japanese knotweed, garlic mustard and bull thistle in this area (CIMA+ 2020d). Wildlife habitat was noted to be typical of an urban setting with common species. Birds identified during the July 2020 site visit were American Redstart, American Robin, Cedar Waxwing, Red Cardinal, Song Sparrow and European Starling. No species at risk (SAR) under the Ontario *Endangered Species Act* were observed in either the Community Use or Parkland Area of the Site. Potential habitat for barn swallow (a threatened bird) was identified due to the presence of buildings where they like to build nests on covered ledges. Potential habitat for Butternut trees (Endangered) was identified because of the vegetative community in the riparian area. There is also the potential habitat for several SAR turtle species (e.g., snapping, spotted, Blandings) and fish species (Lake Sturgeon, American Eel) associated with the presence of the Rideau River adjacent to the Site. Therefore, the VECs selected for evaluation in this ERA are:

- terrestrial vegetation (e.g., native and horticultural grasses and trees);
- soil organisms (e.g., beetles, collembolans, earthworm);
- bird populations (as represented by the American robin, red-winged blackbird, red-tailed hawk);
- reptile populations (e.g., turtles, snakes);

- small mammal populations (as represented by the red fox, deer mouse and the short-tailed shrew); and
- off-site amphibians, aquatic plants and animals (e.g., fish, benthic organisms).

The assessment endpoints selected for evaluation in this ERA include the survival, growth, and reproduction of these VECs. SAR were not specifically selected as VECs because none were documented during the site-specific biological inventories conducted (CIMA+ 2020d). The potential for SAR habitat south of the Parkland Area has, however, been considered in this ERA and protective measures are also included in the EIS with TCR Report (CIMA+ 2020d).

This ERA examines the possibility that subsurface soils may be excavated and re-used anywhere on the Site during the redevelopment process where they may be accessible to ecological receptors living on or visiting the Site. There is the possibility that volatile constituents could form vapours in the subsurface, so this ERA considers the potential for inhalation of vapours in outdoor air by wildlife and inhalation of subsurface vapours by burrowing mammals. The water table is located near the base of the fill and generally occurs at depths of about 6 to 9 m bgs at the Site, which is beyond typical rooting or burrow depths so there is little potential for terrestrial plants or animals to contact groundwater.

Coal tar related NAPL has been identified in the northwestern portion of the Site. It is primarily located at the base of the fill layer. As such, ecological receptors are not expected to have contact with NAPL in the Community Use Area since it will be below the rooting depths of plants expected to be present post-construction.

The Parkland Area includes land within 30 m of the Rideau River, so overland flow of upland soil to the river is considered in this ERA (see **Figure 5.1**). However, as discussed in Section 4.1, there is no evidence that groundwater discharges to the river and in fact, evidence supports that the river is a groundwater recharge zone in the area adjacent to the Site. Therefore, no pathways involving groundwater discharge to surface water are included.

The exposure pathways included in this ERA for both the Community Use Area and Parkland Area are (see **Figure 5.1**):

- terrestrial plants - root uptake of COCs from soils, foliar deposition of COCs in soil as dust, and uptake of COC vapours in outdoor air that originated from soil and groundwater;
- soil organisms – direct contact with COCs in soil, including soil ingestion and dermal contact; and
- terrestrial mammals, birds, and reptiles - direct contact with COCs in soil, consumption of impacted plants and prey, inhalation of vapours and dust in outdoor air (including air in burrows).

In addition, the following exposure pathways are also included for the Parkland Area (see **Figure 5.1**):

- off-site aquatic plants – plant uptake of COCs in soil that has washed off-site into surface water via overland flow; and
- off-site reptiles, amphibians, benthic organisms and fish – off-site overland flow of soil into surface water where there may be direct contact with and consumption of prey that may be impacted by COCs in the soil.

5.2 Pathway Analysis and Screening

5.2.1 Soil Exposure Pathways for Plants and Soil Organisms

To assess exposure and potential risk to terrestrial plants and soil organisms (PSO), soil COC concentrations were compared to concentrations that the Ministry has determined to be acceptable for these populations (i.e., PSO component values). PSO component values (Ministry, 2011 and 2016b) are protective of direct contact with soil by soil invertebrate populations and root uptake of COCs from soils. Although foliar deposition of COCs in soil as dust and uptake of COC vapours in outdoor air that originated from soil or groundwater are also potential exposure pathways for plants, they represent a much smaller exposure and therefore, the PSO component values are also considered protective of these pathways.

The Ministry *"recognizes that maintaining natural environments on remediated brownfield sites should be encouraged*" and that "*soil standards at a brownfield site can often be driven by ecological risks to soil-dwelling invertebrates, plants and wildlife*" (Ministry 2016a). The Ministry (2016a and b) allows application of modified ecological protection (MEP) option that is intended to be used when paving an area is being considered to eliminate habitat and therefore eliminate ecological risks associated with exposures to the underlying soil. MEP is an option that uses less stringent ecotoxity values to allow for maintenance or establishing natural habitat that is not comparable in quality to an uncontaminated setting but instead allowing habitat for species that are adapted or less sensitive to the COCs at the property. For plants and soil organisms, the MEP option allows the default PSO component values to be increased by a factor of 1.9.

There is no indication of sensitive plant or soil organisms species currently present at the Site (CIMA+ 2020d and Section 5.1). Habitat for Butternut trees, an endangered tree species, was identified along the tree slope along the river. This area is not slated for redevelopment and the EIS with TCR Report (CIMA+ 2020d) has identified measures to be taken during redevelopment to protect this area, including controls for dust, drainage and erosion. For these reasons, this ERA applies the MEP option to the PSO component values for the Community Use Area. However, due to proximity of the Parkland Area to the river, the MEP option is not applied to the Parkland Area.

For the Community Use Area, **Table 5.1** shows the PSO component values that have been adjusted by the MEP option (PSO-MEP) and compares these to the maximum soil COC concentrations. Four PAHs (benzo(a)anthracene, chrysene, indeno(1,2,3-cd)pyrene and phenanthrene) and three metals (copper, lead and zinc) have maximum concentrations greater than the PSO-MEP values. The soil samples having PAH and metals concentrations greater than the PSO-MEP values were collected from both the coal-tar impacted area and from the fill material located across the Site.

The presence of concentrations above the PSO-MEP values indicates there may be a risk to plants and soil organisms via direct contact and root uptake of COCs in soils. RMMs are recommended to address this pathway.

For the Parkland Area, **Table 5.2** shows the PSO component values (without the MEP option) and compares these to the maximum soil COC concentrations. Two PAHs (benzo(a)anthracene and indeno(1,2,3-cd)pyrene) and three metals (copper, lead and zinc) have maximum concentrations greater than the PSO values. The soil samples having PAH and metals concentrations greater than the PSO values were collected from the fill material in or near the Parkland Area. The presence of concentrations above the PSO component values indicates there may be a risk to plants and soil organisms via direct contact with and root uptake of COCs in soils. RMMs are recommended to address this pathway.

5.2.2 Soil Exposure Pathways for Mammals, Birds, and Reptiles

To assess exposure and potential risk to terrestrial mammals, birds and reptiles, soil COC concentrations were compared to concentrations that the Ministry has determined to be acceptable for these populations (i.e., MB component values). The Ministry developed the MB component values by including data from insectivores (short-tailed shrew), herbivores (red-winged blackbird, meadow vole, deer mouse), omnivores (American woodcock) and carnivores (red fox, red-tailed hawk). They also considered data for a reptile (garter snake) and amphibian (spring peeper). These VECs encompass the range of VECs considered by this ERA.

The Ministry (2011) indicates that there is a lack of information to evaluate reptiles and amphibians, particularly in the food web model that they use to develop the MB component values. This uncertainty is discussed further in Section 6.

The Ministry (2016a and b) allows application of the MEP option to mammals and birds, similar to that described in Section 5.2.1 for plants and soil organisms. For mammals and birds, the MEP option allows the default MB component values to be increased by a factor of 1,000, which effectively removes these receptors from consideration in the ERA.

There is no indication of sensitive mammal, bird, reptile or amphibian species currently present at the Site (CIMA+ 2020d and Section 5.1). However, there is the potential for habitat for several at-risk turtle species (e.g., snapping, spotted, Blandings) in or along the river. These species would be expected to predominantly remain within the wooded and riparian area along the river as it is more favorable habitat than the Site. This ERA applies the MEP option to the Community Use Area. However, due to proximity of the Parkland Area to the river, the MEP option is not applied the Parkland Area.

For the Community Use Area, **Table 5.1** shows the MB component values that have been adjusted by this MEP option (MB-MEP) and compares these to the maximum soil concentrations for the Community Use Area. None of the maximum soil COC concentrations are greater than the MB-MEP values.

For the Parkland Area, **Table 5.2** shows the MB component values (without the MEP option) and compares these to the maximum soil COC concentrations. Three metals (cadmium, lead and zinc)

have maximum concentrations greater than the MB values. The soil samples having PAH and metals concentrations greater than the MB values were collected from the fill material in or near the Parkland Area. The presence of concentrations above the MB component values indicates there may be a risk to terrestrial mammals, birds and reptiles via direct contact with COCs in soils or ingestion of prey that contacted the soils. RMMs are recommended to address this pathway.

5.2.3 Groundwater Exposure Pathways for Terrestrial Wildlife, Plants and Soil Organisms

Groundwater at the Site is inaccessible as a water source for wildlife at the Site. It is possible, however, that volatile COCs in groundwater could form vapours in the subsurface where they could be encountered by burrowing animals. Groundwater at the Site is also beyond typical rooting depths. It is possible, however, that volatile COCs in groundwater could form vapours that could migrate into the root zone of plants at the Site. The Ministry developed the GW3 component values specifically for the groundwater discharge to surface water pathway but the GW3 component values are also "*assumed to provide a sufficient degree of protection to plants, soil organisms, mammals and birds*" from exposure to shallow groundwater (Ministry 2011). Therefore, the GW3 component values are considered to be protective of the groundwater-related pathway considered for terrestrial wildlife, plants and soil organisms in this ERA.

For the Community Use Area, **Table 5.3** compares the maximum measured groundwater COC concentrations to the GW3 component values (Ministry 2016b). The maximum concentration of acenaphthylene (the only groundwater COC) is greater than the GW3 value by less than a factor of 3.3. The GW3 value is based upon an aquatic protection value and is considered overly conservative as a screen for volatilization pathways given that acenaphthylene is not particularly volatile. Furthermore, the area of the Site underlain by groundwater having an acenaphthylene concentration over the GW3 value is very small and limited to the northwestern corner where horticultural grasses and trees are present. The groundwater is at a depth of more than 6 m bgs and it is very likely that vapours, if any, would attenuate prior to reaching an animal's burrow. For these reasons, no RMM are identified as necessary to reduce potential risks, if any, to terrestrial plants, wildlife and soil organisms related to acenaphthylene in groundwater in the Community Use Area.

For the Parkland Area, there are no groundwater COCs identified and no groundwater related pathways.

5.2.4 Off-Site Aquatic Plants, Benthic Organisms, Amphibians, and Fish

Aquatic plants may be exposed via root or foliar uptake of COCs in sediment where soil from the Parkland Area has washed off-site overland into the river. Off-site amphibians, benthic organisms and fish may be exposed to chemicals in the environment via direct contact with the sediment where they may ingest or contact COCs. To assess exposure and potential risk to off-site aquatic plants, benthic organisms, amphibians and fish, COC concentrations were compared to concentrations that the Ministry has determined to be acceptable for these receptors. As the Parkland Area is within 30 m of the river, the Ministry uses sediment quality criteria (SQC) in the Table 9 SCS for direct comparison to the soil.

For the Parkland Area, **Table 5.2** compares the maximum measured soil concentrations for the Site to the SQC. Where SQC are available, the maximum soil concentrations are greater than the SQC. The presence of concentrations above the SQC indicates there may be a risk to off-site aquatic plants, benthic organisms, amphibians and fish if soil were to wash from the Parkland Area off-site into the adjacent river or riparian area. RMMs are recommended to address this pathway.

6 UNCERTAINTIES

Uncertainty is inherent in the risk assessment process and is the result of assumptions made during the process and in selecting representative characteristics describing receptor behaviour. In order to provide a risk assessment that is protective of human health, it is necessary to make conservative assumptions that tend to over-estimate exposure, toxicity and risk, rather than under-estimate these parameters. Therefore, it is likely that the overall risk characterization may have over-estimated potential risks by a considerable degree. The following are uncertainties that may lead to under-estimation of risks at the Site as they pertain to the HHRA.

- There are no human health component values for phenanthrene (a PAH). Phenanthrene occurs with other PAHs for which RMMs are recommended to address potentially unacceptable direct contact risks. These RMM are also expected to address risks associated with phenanthrene so the absence of component values is not expected to affect the outcome of this HHERA.
- As discussed in Section 2.5, although previous investigations have identified the presence of a groundwater divide across the 200 Lees Avenue property, the divide is not evident on the Site portion of the property. Since those previous investigations, hydraulic gradients appear directed to the northwest beneath the Site. However, there are no monitoring wells located within the Parkland Area, so groundwater levels adjacent to the Rideau River are uncertain. Water level relationships provide evidence that the Rideau River is losing water in this area and the river is a groundwater recharge zone, rather than a groundwater discharge zone. Groundwater pumping at the recovery system at the Transitway Station, in addition to drainage systems for the Transitway, underpass, and nearby apartment buildings, were identified as reasons for the northwesterly gradient. The quality of groundwater and direction of hydraulic gradients within the Parkland Area have not been investigated. This HHERA assumes that the northwesterly gradient prevails within the Parkland area and that no contaminants occur at concentrations above Table 9 SCS, consistent with groundwater quality at the nearest monitoring wells within the Community Use Area. Groundwater monitoring within the Parkland Area is recommended to reduce this uncertainty.
- For the Construction Worker, quantitative evaluation of pathways related to encountering vapours and groundwater in excavations (Section 4.3) identified that potential risks were well below acceptance limits of 0.2 for threshold toxicants (non-carcinogens) and 1 in a million for non-threshold toxicants (carcinogens). However, there is significant uncertainty in quantifying potential worker exposures related to NAPLs that may be encountered in the northwestern portion of the Site where coal tar is likely to be present, as discussed in Section 4.4. As a conservative measure, this HHERA recommends that a worker health and safety plan be used as an RMM to guide excavations in areas that may encounter NAPL.

Uncertainty is also inherent in the ERA process and the result is that the overall risk characterization may have over-estimated actual risks by a considerable degree. Uncertainties in the ecological HHERA are as follows:

- As indicated in Section 5.2.2, the Ministry (2011) indicates that there is a lack of information to evaluate reptiles and amphibians, particularly in the food web model that they use to develop the MB component values. The RMM recommended for soil-related exposures for other ecological receptors are assumed to be equally protective for reptiles and amphibians.
- There are no PSO or MB component values for several of the PAHs and no SQV for several metals and PAHs (see **Tables 5.1 and 5.2**). However, these COCs occur with other PAHs and metals that have been identified for RMMs to address direct contact with PAHs in soils and control run-off of soils to off-site areas, so the absence of these values is not expected to affect the outcome of this ERA.

7 SUMMARY OF RECOMMENDED RMM AND MONITORING

Below are the RMM recommended as an outcome of this HHERA.

7.1 Soil Covers or Remediation

RMM are recommended for both the Community Use Area and the Parkland Area to address potential risks associated with future long-term contact with COCs in fill materials and soil by workers, students, and recreational visitors and by plants and soil organisms. RMM are also recommended to address potential risks to mammals and birds in the Parkland Area, due to the adjacent river. RMM may involve construction of a cover over affected soils or remediation or removal to reduce COC concentrations. The cover design should be consistent with those described by the Ministry (2016a) for industrial/commercial/community use properties for the Community Use Area and for other property uses for the Parkland Area.

RMM are recommended where soil concentrations exceed the intervention concentrations developed in **Tables 7.1 and 7.2** for the Community Use Area and Parkland Area, respectively. For the Community Use Area, the intervention concentrations are the lower of the S-2 component values, which are protective of soil direct contact risks for students and maintenance workers that do not conduct subsurface activities and the PSO-MEP values, which are protective of plants and soil organisms but give consideration to a brownfield environment. For the Parkland Area, the intervention concentrations are the lower of the S-1 component values, which are protective of recreational visitors of all ages that may use the multi-use trail or access the adjacent newly landscaped area and the PSO component values, which are protective of plants and soil organisms. In some cases, component values may be lower than analytical detection limits or concentrations that occur naturally. If the selected value is lower than the applicable SCS (Table 3 SCS for Community Use Area and Table 9 SCS for Parkland Area), then the SCS is selected instead to avoid setting the intervention concentrations at levels lower than typical background concentrations or analytical detection limits.

7.2 Health and Safety Plan for Construction

RMMs are recommended to address potential risks during the short-term redevelopment phase when construction workers may contact soils or during subsurface activities after the redevelopment is complete. The RMM are required in the Community Use Area as two PAHs (benz(a)anthracene and B[a]P) and two metals (cadmium and lead) have maximum concentrations greater than the S-3 component values. RMM are also recommended when conducting excavations within the coal-tar impacted area of the Site.

A worker health and safety plan should be developed and implemented as the RMM to guide all excavations at the Site. The plan should incorporate engineering controls to control dust generation, and personal protective equipment to prevent dermal contact and dust inhalation. When excavating in the coal tar area of the Site, the plan should include ventilation to remove vapours, air monitoring for VOCs, and personal protective equipment for NAPL and vapours, if needed. The HASP should be prepared and overseen by an appropriately qualified person in accordance

with applicable Ministry of Labour health and safety regulations and take into consideration potential risks as described in this HHERA. Ventilation and air monitoring should be conducted consistent with the requirements of the Occupational Health and Safety Act including regulations for confined space (O. Reg. 632.05), at a minimum.

7.3 Soil and Groundwater Management Plan

RMM are also recommended to manage and control soil runoff during and after construction. A soil and groundwater management plan will be developed and implemented during any intrusive activities potentially in contact with or exposing soils or groundwater at the Site. The plan will be developed to:

- Prevent the re-use of soil at locations where they can be contacted by people using the Site and by ecological receptors; and

- Prevent the uncontrolled movement or discharge of NAPL and COCs in soil or groundwater at the Site.

7.4 Groundwater Monitoring

Coal tar source material is present in the northwest portion of the Site and in the off-site area adjacent to the Site. Operation of the groundwater recovery system at the Transitway Station appears to maintain hydraulic control of this material and there is no evidence of contaminant migration in groundwater. Groundwater monitoring is recommended to confirm this condition prevails into the future.

The hydraulic effects of the groundwater recovery system appear to extend across the Site, preventing Site groundwater from discharging to the Rideau River. However, there are no monitoring wells located within the Parkland Area, so the groundwater levels adjacent to the Rideau River and groundwater quality in this area are uncertain. Expansion of the groundwater monitoring network to include installation of wells within the Parkland Area and monitoring water levels are recommended to evaluate uncertainties regarding groundwater flow directions and groundwater – surface water hydraulic interactions. Sampling is recommended to evaluate the potential for COC discharge to the river if water levels suggest that groundwater is discharging to the river. A contingency plan should be developed should these results indicate groundwater COCs may be discharging to the Rideau River.

8 LIMITATIONS OF USE

The findings and conclusions presented in this report are the result of Geosyntec's professional interpretation of the information collected at the time of the above-described field work. We cannot "certify" or guarantee that any property is free of environmental impairment. No warranties regarding the environmental quality of the property are expressed or implied. We are not responsible for independent conclusions, opinions, or recommendations made by others or otherwise based on the findings presented in this report.

This report has been prepared solely for the benefit of Geosyntec's client, CIMA + and the University of Ottawa. Geosyntec grants CIMA+ and the University of Ottawa the right-to-rely on the report contents. CIMA+ engaged Geosyntec to perform this assessment in accordance with an agreement governing the nature, scope, and purpose of the work as well as other matters critical to the engagement. All reports prepared by Geosyntec both verbal and written, are for the sole use and benefit of CIMA+ and the University of Ottawa. CIMA+ and the University of Ottawa may assign this report, without the consent of Geosyntec, to any of its corporate affiliates, subsidiaries, partnerships, and joint ventures, who may each rely on this report and get the full benefits therefrom. No other assignment of this report may be made without the written permission of CIMA+, the University of Ottawa and Geosyntec.

Either verbally or in writing, third parties may come into possession of this report or all or part of the information generated as a result of this work. A third party shall have the right to rely on Geosyntec opinions rendered in connection with this assessment only with Geosyntec's written consent which may be conditioned on the third party's agreement to be bound to acceptable conditions and limitations similar to those agreed to by the Client. Please note that Geosyntec's consent to provide a right-to-rely on the HHERA is subject to Client's approval and to agreement to Geosyntec's terms and conditions associated with Geosyntec's performance of the HHERA.

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TABLES

TABLE 2.1
ASSESSMENT OF AREAS OF NATURAL SIGNIFICANCE
200 Lees Avenue, Ottawa, Ontario

Natural Significance Criterion per O. Reg. 153/04 [(1)]	***Applicable to Community Use Area of Site***	***Applicable to Parkland Area of Site***
An area reserved or set apart as a provincial park or conservation reserve under the *Provincial Parks and Conservation Reserves Act, 2006*	No: According to Ontario's Crown Land Use Policy, there are no Provincial Parks, Recommended Provincial Parks, Conservation Reserves, or Recommended Conservation Reserves at, adjacent, or within 30 m of the Site. The closest to the Site is the Greens Creek Conservation Area, approximately 5 kilometres east (Google Earth 2018).	
An area of natural and scientific interest (life science or earth science) identified by the Ministry of Natural Resources as having provincial significance	No: The Community Use Area and Parkland Area of the Site are not in, adjacent to, or within 30 m of an area of natural and scientific interest (CIMA+ 2020d)	
A wetland identified by the Ministry of Natural Resources as having provincial significance	No: There are no Provincially Significant Wetlands on or adjacent to the Site (CIMA+ 2020d).	
An area designated by a municipality in its official plan as environmentally significant, however expressed, including designations of areas as environmentally sensitive, as being of environmental concern and as being ecologically significant	No: The Community Use Area and Parkland Area are not designed as environmentally significant within the City of Ottawa's official plan (CIMA+ 2020d).	
An area designated as an escarpment natural area or an escarpment protection area by the Niagara Escarpment Plan under the *Niagara Escarpment Planning and Development Act*	No: The Site is not within the Niagara Escarpment Area.	
An area identified by the Ministry of Natural Resources as significant habitat of a threatened or endangered species	No: The Community Use Area and Parkland Area were not found to contain significant habitat of threatened or endangered species (CIMA+ 2020d).	
An area which is habitat of a species that is classified under section 7 of the *Endangered Species Act, 2007* as a threatened or endangered species	No: The Community Use area had potential habitat for Barn Swallow (i.e. presence of building), although no nests were observed (CIMA+ 2020d).	No: The Parkland Area had potential habitat for Butternut tress (i.e. presence of a certain vegetation community type), although no trees were observed (CIMA+ 2020d)
Property within an area designated as a natural core area or natural linkage area within the area to which the Oak Ridges Moraine Conservation Plan under the *Oak Ridges Moraine Conservation Act, 2001* applies.	No: The Site is not within the Oak Ridges Moraine area.	
An area set apart as a wilderness area under the *Wilderness Areas Act*	No: The Site is not within, adjacent to or within 30 m of a Wilderness Area listed in O. Reg. 1098 Wilderness Areas.	

Notes:

(1) – Per Section 41 (1) of O. Reg. 153/04, the property is: (i) within an area of natural significance,
(ii) includes or is adjacent to an area of natural significance or part of such an area, or (iii) includes land that is within 30 metres of an area of natural significance or part of such an area;

TABLE 3.1
SUMMARY OF SOIL COC SCREENING - COMMUNITY USE AREA
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Parameter	Table 3 SCS	Maximum Soil Concentration (µg/g) by Sampling Program [4]						Selected as a COC?
		CIMA 2020	Geofirma 2012	Franz 2012	CH2MHill 2001 Drive Points	CH2MHill 2001 Crawl Space	Golder 2000	
Polyaromatic Hydrocarbons (PAH)								
(1-) 2-Methylnaphthalene	76	0.13	13.3	<0.35	NA	<0.10	NA	No (<SCS)
1,1-Biphenyl	52	NA	0.66	NA	NA	<0.1	NA	No (<SCS)
Acenaphthene	96	0.13	4.37	<0.25	0.651	<0.05	0.5	No (<SCS)
Acenaphthylene	0.15	0.14	**3.06**	**0.31**	**1.78**	<0.05	0.1	**YES**
Anthracene	0.67	0.43	**10.8**	**1.4**	**4.3**	<0.05	**6.3**	**YES**
Benz[a]anthracene	0.96	**0.99**	**38.4**	**5.2**	**6**	0.067	**8.8**	**YES**
Benzo[a]pyrene	0.3	**0.69**	**28.3**	**3.7**	**2.49**	0.026	**3.4**	**YES**
Benzo[b]fluoranthene	0.96	**0.99**	**27.5**	**5.5**	**2.48**	<0.05	**4.4**	**YES**
Benzo[ghi]perylene	9.6	0.26	7.23	2.1	1.07	0.028	0.6	No (<SCS)
Benzo[k]fluoranthene	0.96	0.65	**18.2**	**1.7**	**1.59**	0.021	**2.3**	**YES**
Chrysene	9.6	0.99	**32.9**	5.6	4.05	0.057	7.4	**YES**
Dibenz[a h]anthracene	0.10	0.06	**2.28**	**0.6**	**0.498**	<0.1	**0.4**	**YES**
Fluoranthene	9.6	1.90	**70.8**	**9.7**	**9.85**	0.11	**19.1**	**YES**
Fluorene	62	0.18	3.71	0.34	4.07	<0.05	7.9	No (<SCS)
Indeno[1 2 3-cd]pyrene	0.76	0.28	**7.76**	**2.2**	**1.11**	<0.1	**1.0**	**YES**
Naphthalene	9.6	0.10	**15.6**	<0.25	1.29	0.016	2.3	**YES**
Phenanthrene	12	1.30	**35.3**	4.7	**14.5**	0.07	**22.7**	**YES**
Pyrene	96	1.70	56.4	8.1	7.31	0.085	21.2	No (<SCS)
Petroleum Hydrocarbons (PHC)								
Benzene	0.32	<0.02	**0.52**	<0.02	<0.005	<0.005	<0.002	**YES**
Toluene	68	<0.05	0.26	0.04	<0.005	<0.005	0.006	No (<SCS)
Ethylbenzene	9.5	<0.05	1.09	<0.02	<0.005	<0.005	0.016	No (<SCS)
Xylene Mixture	26	<0.05	1.36	0.09	<0.010	<0.010	0.015	No (<SCS)
F1 (C6 to C10) [1]	55	16	<7	<10	NA	NA	NA	No (<SCS)
F2 (C10 to C16) [2]	230	15	NA	<10	NA	NA	NA	No (<SCS)
F3 (C16 to C34) [3]	1700	160	NA	630	NA	NA	NA	No (<SCS)
F4 (C34 to C50)	3300	65	NA	230	NA	NA	NA	No (<SCS)
Metals								
Antimony	40	16	3	12	3.1	<1	8	No (<SCS)
Arsenic	18	**36**	5	**38**	12	5	**27**	**YES**
Barium	670	**779**	182	510	380	74.8	579	**YES**
Beryllium	8	1.4	<0.5	0.69	0.67	0.4	<1	No (<SCS)
Boron	120	17	8.1	23	0.29	1.06	1.9	No (<SCS)
Cadmium	1.9	**9.8**	<0.5	**13**	**11**	0.4	**4.2**	**YES**
Chromium Total	160	56	23	**800**	44	10.6	50	**YES**
Chromium VI	8	NA	NA	NA	<1	<0.05	<1	No (<SCS)

TABLE 3.1
SUMMARY OF SOIL COC SCREENING - COMMUNITY USE AREA
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Parameter	Table 3 SCS	Maximum Soil Concentration (µg/g) by Sampling Program [4]						Selected as a COC?
		CIMA 2020	Geofirma 2012	Franz 2012	CH2MHill 2001 Drive Points	CH2MHill 2001 Crawl Space	Golder 2000	
Cobalt	80	19.3	8	10	10	7.5	3	No (<SCS)
Copper	230	**2,930**	81	**3,100**	**260**	28.9	**2,470**	**YES**
Lead	120	**954**	**168**	**26,000**	**790**	29.2	**2,180**	**YES**
Mercury	3.9	NA	**4.4**	NA	**5.5**	0.14	1.2	**YES**
Molybdenum	40	10	8	6.6	3.9	1	3	No (<SCS)
Nickel	270	47	16	44	31	20.4	37	No (<SCS)
Selenium	5.5	5.3	1	**6.6**	<1	<1	**6**	**YES**
Silver	40	9.1	0.5	2.2	1.9	<0.7	3	No (<SCS)
Thallium	3.3	0.5	<1	0.27	<1	<1	<4	No [5]
Uranium	33	1.5	1	1.7	NA	NA	NA	No (<SCS)
Vanadium	86	46	30	28	45	13.9	54	No (<SCS)
Zinc	340	**1,540**	128	**1,500**	**790**	56.5	**3,090**	**YES**

Notes:
COC - Contaminant of Concern
NA - not analyzed
Table 3 SCS - The values found in Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Groundwater Condition for Community Property Use and Coarse Grained Soil (Ministry, 2011)
< - analyte is not detected. Value is the analytical reporting limit.

123 Concentration is greater than the applicable SCS

<4 Analytical reporting limit is greater than the applicable SCS

(1) - Maximums of F1 (C6 to C10) and F1 (C6 to C10) minus BTEX
(2) - Maximums of F2 (C10 to C16) and F2 (C10 to C16) minus Naphthalene
(3) - Maximums of F3 (C16 to C34) and F3 (C16 to C34) minus PAHs
(4) - See Section 3.1.1 of the Screening Level Risk Assessment for a listing of the soil sampling programs considered
(5) - No detected concentrations greater than Table 3 SCS and most RLs are less than Table 3 SCS.

TABLE 3.2
SUMMARY OF SOIL COC SCREENING - PARKLAND AREA
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Parameter	Table 9 SCS	Maximum Soil Concentration (µg/g) by Sampling Program (4)		Selected as a COC?
		CH2MHill 2001 Drive Points	CH2MHill 2001 River Bank & Borrow	
Polyaromatic Hydrocarbons (PAH)				
(1-) 2-Methylnaphthalene	0.59	NA	NA	No (not analyzed)
1,1-Biphenyl	0.050	NA	NA	No (not analyzed)
Acenaphthene	0.072	**0.383**	<0.5	**YES**
Acenaphthylene	0.093	**0.73**	<0.5	**YES**
Anthracene	0.22	**1.6**	**1.8**	**YES**
Benz[a]anthracene	0.36	**4**	**5.1**	**YES**
Benzo[a]pyrene	0.30	**2.05**	**6.2**	**YES**
Benzo[b]fluoranthene	0.47	**2.38**	**11.7**	**YES**
Benzo[ghi]perylene	0.68	**1.1**	**4.1**	**YES**
Benzo[k]fluoranthene	0.48	**1.34**	<0.5	**YES**
Chrysene	2.8	**3.28**	**4.9**	**YES**
Dibenz[a h]anthracene	0.10	**0.434**	**1.3**	**YES**
Fluoranthene	0.69	**6.86**	**10.6**	**YES**
Fluorene	0.19	**0.572**	<0.5	**YES**
Indeno[1 2 3-cd]pyrene	0.23	**1.07**	**3.7**	**YES**
Naphthalene	0.090	**0.162**	<0.5	**YES**
Phenanthrene	0.69	**5.32**	**7.09**	**YES**
Pyrene	1.0	**5.57**	**8.4**	**YES**
Petroleum Hydrocarbons (PHC)				
Benzene	0.02	<0.005	NA	No (<SCS)
Toluene	0.20	<0.005	NA	No (<SCS)
Ethylbenzene	0.05	<0.005	NA	No (<SCS)
Xylene Mixture	0.05	<0.010	NA	No (<SCS)
F1 (C6 to C10) (1)	25	NA	NA	No (not analyzed)
F2 (C10 to C16) (2)	10	NA	NA	No (not analyzed)
F3 (C16 to C34) (3)	240	NA	NA	No (not analyzed)
F4 (C34 to C50)	120	NA	NA	No (not analyzed)
Metals				
Antimony	1.3	**3.1**	**3**	**YES**
Arsenic	18	12	**26**	**YES**
Barium	220	**380**	**497**	**YES**
Beryllium	2.5	0.67	0.6	No (<SCS)
Boron	36	0.29	<0.25	No (<SCS)
Cadmium	1.2	**11**	**2**	**YES**
Chromium Total	70	44	**88**	**YES**
Chromium VI	0.66	<1	NA	No (<SCS)
Cobalt	22	10	9	No (<SCS)
Copper	92	**260**	**226**	**YES**
Lead	120	**790**	**2,610**	**YES**
Mercury	0.27	**5.5**	**1.15**	**YES**
Molybdenum	2	**3.9**	**5**	**YES**
Nickel	82	31	37	No (<SCS)
Selenium	1.5	<1	**3**	**YES**
Silver	0.5	**1.9**	**3**	**YES**
Thallium	1.0	<1	<0.5	No (<SCS)
Vanadium	86	45	37	No (<SCS)
Zinc	290	**790**	**839**	**YES**

Notes:
COC - Contaminant of Concern
NA - not analyzed
Table 9 SCS - The values found in Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition for all Property Use and Soil Types (Ministry, 2011)
< - analyte is not detected. Value is the analytical reporting limit.

123 Concentration is greater than the applicable SCS

<4 Analytical reporting limit is greater than the applicable SCS

(1) - Maximums of F1 (C6 to C10) and F1 (C6 to C10) minus BTEX
(2) - Maximums of F2 (C10 to C16) and F2 (C10 to C16) minus Naphthalene
(3) - Maximums of F3 (C16 to C34) and F3 (C16 to C34) minus PAHs
(4) - See Section 3.1.1 of the Screening Level Risk Assessment for a listing of the soil sampling programs considered

TABLE 3.3
SUMMARY OF GROUNDWATER COC SCREENING - COMMUNITY USE AREA
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Parameter	CAS Number	Table 3 SCS	Maximum Groundwater Concentration (µg/L) by Sampling Program [4]		Selected as a COC?
			CIMA 2020	UOttawa 2019	
Polyaromatic Hydrocarbons (PAH)					
Naphthalene	91203	1400	<0.20	0.243	No (<SCS)
Acenaphthylene	208968	1.8	**3.5**	**5.88**	**YES**
Acenaphthene	83329	600	0.64	1.08	No (<SCS)
Fluorene	86737	400	1.2	2.31	No (<SCS)
Phenanthrene	85018	580	0.65	2.75	No (<SCS)
Anthracene	120127	2.4	0.21	0.563	No (<SCS)
Fluoranthene	206440	130	0.23	0.531	No (<SCS)
Pyrene	129000	68	0.34	0.804	No (<SCS)
Benz[a]anthracene	56553	4.7	<0.20	0.274	No (<SCS)
Chrysene	218019	1	0.11	0.242	No (<SCS)
Benzo[b]fluoranthene	205992	0.75	<0.10	0.090	No (<SCS)
Benzo[k]fluoranthene	207089	0.4	<0.10	0.040	No (<SCS)
Benzo[a]pyrene	50328	0.81	<0.01	0.118	No (<SCS)
Indeno[1 2 3-cd]pyrene	193395	0.2	<0.20	0.037	No (<SCS)
Dibenz[a h]anthracene	53703	0.52	<0.20	<0.020	No (<SCS)
Benzo[ghi]perylene	191242	0.2	<0.20	0.035	No (<SCS)
(1-) 2-Methylnaphthalene	91576	1800	3	13.87	No (<SCS)
Petroleum Hydrocarbons (PHC)					
Benzene	71432	44	0.84	1.17	No (<SCS)
Toluene	108883	18000	<0.20	11.7	No (<SCS)
Ethylbenzene	100414	2300	6.9	<0.5	No (<SCS)
Xylene Mixture	1330207	4200	<0.20	0.83	No (<SCS)
F1 (C6 to C10) [1]	PHCF1	750	<25	<25	No (<SCS)
F2 (C10 to C16) [2]	PHCF2	150	<100	<100	No (<SCS)
F3 (C16 to C34) [3]	PHCF3	500	<100	<250	No (<SCS)
F4 (C34 to C50)	PHCF4	500	<100	<250	No (<SCS)
Metals					
Antimony	7440360	20000	<1.0	NA	No (<SCS)
Arsenic	7440382	1900	46.8	NA	No (<SCS)
Barium	7440393	29000	285	NA	No (<SCS)
Beryllium	7440417	67	<0.50	NA	No (<SCS)
Boron	7440428	45000	929	NA	No (<SCS)
Cadmium	7440439	2.7	0.49	NA	No (<SCS)
Chromium Total	16065831	810	3.2	NA	No (<SCS)
Cobalt	7440484	66	19	NA	No (<SCS)
Copper	7440508	87	13.7	NA	No (<SCS)
Lead	7439921	25	1.51	NA	No (<SCS)
Molybdenum	7439987	9200	3.76	NA	No (<SCS)
Nickel	7440020	490	79.6	NA	No (<SCS)
Selenium	7782492	63	48.5	NA	No (<SCS)
Silver	7440224	1.5	<0.20	NA	No (<SCS)
Thallium	7440280	510	0.76	NA	No (<SCS)
Uranium	7440611	420	2.26	NA	No (<SCS)
Vanadium	7440622	250	8.93	NA	No (<SCS)
Zinc	7440666	1100	39.5	NA	No (<SCS)

Notes:
COC - Contaminant of Concern
NA - not analyzed
< - analyte is not detected. Value is the analytical reporting limit.
123 Concentration is greater than the applicable SCS
Table 3 SCS - The values found in Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Groundwater Condition for Community Property Use and Coarse Grained Soil (Ministry, 2011)
(1) - Maximums of F1 (C6 to C10) and F1 (C6 to C10) minus BTEX
(2) - Maximums of F2 (C10 to C16) and F2 (C10 to C16) minus Naphthalene
(3) - Maximums of F3 (C16 to C34) and F3 (C16 to C34) minus PAHs
(4) - Groundwater sampling programs considered are those conducted in 2019 and 2020.

TABLE 3.4
SUMMARY OF GROUNDWATER COC SCREENING - PARKLAND AREA
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Parameter	CAS Number	Table 9 SCS	Maximum Groundwater Concentration (µg/L) by Sampling Program		Selected as a COC?
			CIMA 2020 (4)	UOttawa 2019 (5)	
Polyaromatic Hydrocarbons (PAH)					
Naphthalene	91203	1,400	<0.20	<0.050	No (<SCS)
Acenaphthylene	208968	1.4	<0.20	<0.020	No (<SCS)
Acenaphthene	83329	600	<0.20	<0.020	No (<SCS)
Fluorene	86737	290	<0.20	<0.020	No (<SCS)
Phenanthrene	85018	380	<0.10	<0.020	No (<SCS)
Anthracene	120127	1	<0.10	<0.020	No (<SCS)
Fluoranthene	206440	73	<0.20	<0.020	No (<SCS)
Pyrene	129000	5.7	<0.20	<0.020	No (<SCS)
Benz[a]anthracene	56553	1.8	<0.20	<0.020	No (<SCS)
Chrysene	218019	0.7	0.11	<0.020	No (<SCS)
Benzo[b]fluoranthene	205992	0.75	<0.10	<0.020	No (<SCS)
Benzo[k]fluoranthene	207089	0.4	<0.10	<0.020	No (<SCS)
Benzo[a]pyrene	50328	0.81	<0.01	<0.010	No (<SCS)
Indeno[1 2 3-cd]pyrene	193395	0.2	<0.20	<0.020	No (<SCS)
Dibenz[a h]anthracene	53703	0.4	<0.20	<0.020	No (<SCS)
Benzo[ghi]perylene	191242	0.2	<0.20	<0.020	No (<SCS)
(1-) 2-Methylnaphthalene	91576	1,500	<0.20	<0.028	No (<SCS)
Petroleum Hydrocarbons (PHC)					
Benzene	71432	44	<0.20	NA	No (<SCS)
Toluene	108883	14,000	<0.20	NA	No (<SCS)
Ethylbenzene	100414	1,800	<0.10	NA	No (<SCS)
Xylene Mixture	1330207	3,300	<0.20	NA	No (<SCS)
F1 (C6 to C10) (1)	PHCF1	420	<25	NA	No (<SCS)
F2 (C10 to C16) (2)	PHCF2	150	<100	NA	No (<SCS)
F3 (C16 to C34) (3)	PHCF3	500	<100	NA	No (<SCS)
F4 (C34 to C50)	PHCF4	500	<100	NA	No (<SCS)
Metals					
Antimony	7440360	16,000	<1.0	NA	No (<SCS)
Arsenic	7440382	1,500	46.8	NA	No (<SCS)
Barium	7440393	23,000	163	NA	No (<SCS)
Beryllium	7440417	53	<0.50	NA	No (<SCS)
Boron	7440428	36,000	929	NA	No (<SCS)
Cadmium	7440439	2.1	<0.20	NA	No (<SCS)
Chromium Total	16065831	640	<2.0	NA	No (<SCS)
Cobalt	7440484	52	4.91	NA	No (<SCS)
Copper	7440508	69	3.4	NA	No (<SCS)
Lead	7439921	20	1.51	NA	No (<SCS)
Molybdenum	7439987	7,300	3.76	NA	No (<SCS)
Nickel	7440020	390	3.3	NA	No (<SCS)
Selenium	7782492	50	4.1	NA	No (<SCS)
Silver	7440224	1.2	<0.20	NA	No (<SCS)
Thallium	7440280	400	0.76	NA	No (<SCS)
Uranium	7440611	330	<0.50	NA	No (<SCS)
Vanadium	7440622	200	0.69	NA	No (<SCS)
Zinc	7440666	890	39.5	NA	No (<SCS)

Notes:
COC - Contaminant of Concern
NA - not analyzed
123 Concentration is greater than the applicable SCS
< - analyte is not detected. Value is the analytical reporting limit.
Table 9 SCS - The values found in Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition for all Property Use and Soil Types (Ministry, 2011)
(1) - Maximums of F1 (C6 to C10) and F1 (C6 to C10) minus BTEX
(2) - Maximums of F2 (C10 to C16) and F2 (C10 to C16) minus Naphthalene
(3) - Maximums of F3 (C16 to C34) and F3 (C16 to C34) minus PAHs
(4) - Groundwater sampling data for wells BH20-3, BH20-4 and MW05-12 sampled in 2020
(5) - Groundwater sampling data for well MW05-12 sampled in November 2019

TABLE 3.5
SUMMARY OF COCS BY MEDIA
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Parameter	Community Use Area		Parkland Area	
	Soil COC	Groundwater COC	Soil COC	Groundwater COC
Polyaromatic Hydrocarbons (PAH)				
Acenaphthene			X	
Acenaphthylene	X	X	X	
Anthracene	X		X	
Benz[a]anthracene	X		X	
Benzo[a]pyrene	X		X	
Benzo[b]fluoranthene	X		X	
Benzo[ghi]perylene			X	
Benzo[k]fluoranthene	X		X	
Chrysene	X		X	
Dibenz[a h]anthracene	X		X	
Fluoranthene	X		X	
Fluorene			X	
Indeno[1 2 3-cd]pyrene	X		X	
Naphthalene	X		X	
Phenanthrene	X		X	
Pyrene			X	
Petroleum Hydrocarbons (PHC)				
Benzene	X			
Metals				
Antimony			X	
Arsenic	X		X	
Barium	X		X	
Cadmium	X		X	
Chromium Total	X		X	
Copper	X		X	
Lead	X		X	
Mercury	X		X	
Molybdenum			X	
Selenium	X		X	
Silver			X	
Zinc	X		X	

Notes:
COC - Contaminant of Concern
X - Selected as a COC for the media indicated. See Tables 3.1 through 3.3 for COC screening.

TABLE 4.1
COMPARISON OF SOIL CONCENTRATIONS TO COMPONENT VALUES - COMMUNITY USE AREA
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Contaminant of Concern	*CAS Number*	*Maximum Soil Concentration* [1]	*Table 3 Site Condition Standard* [2]	*S2*	*S3*	*Industrial S-IA*	*Soil to Outdoor Air*	*Free-Phase Threshold*
Polyaromatic Hydrocarbons (PAH)								
Acenaphthylene	208968	3.06	0.15	9.6	360	6.6	96	2,900
Anthracene	120127	10.8	0.67	42,000	420,000	NV	NV	2,700
Benz[a]anthracene	56553	38.4	0.96	**0.96**	**36**	970	330	7,600
Benzo[a]pyrene	50328	28.3	0.3	**0.10**	**3.6**	12,000	170	7,600
Benzo[b]fluoranthene	205992	27.5	0.96	**0.96**	36	81,000	2,000	7,600
Benzo[k]fluoranthene	207089	18.2	0.96	**0.96**	36	99,000	2,100	7,600
Chrysene	218019	32.9	9.6	**9.6**	360	28,000	6,600	7,700
Dibenz[a h]anthracene	53703	2.28	0.1	**0.10**	3.6	480,000	430	7,600
Fluoranthene	206440	70.8	9.6	**9.6**	360	3,700	2,500	7,600
Indeno[1 2 3-cd]pyrene	193395	7.76	0.76	**0.96**	36	670,000	4,000	7,600
Naphthalene	91203	15.6	9.6	2,800	28,000	**10**	270	2,800
Phenanthrene	85018	35.3	12	NV	NV	NV	NV	2,300
Petroleum Hydrocarbons (PHC)								
Benzene	71432	0.52	0.32	13	480	**0.32**	17	5,000
Metals								
Arsenic	7440382	38	18	**1.3**	47	NV	NV	12,000
Barium	7440393	779	670	32,000	8,600	NV	NV	7,700
Cadmium	7440439	13	1.9	**7.9**	**7.9**	NV	NV	18,000
Chromium Total	16065831	800	160	240,000	240,000	NV	NV	11,000
Copper	7440508	3100	230	5,600	5,600	NV	NV	NV
Lead	7439921	26,000	120	**1,000**	**1,000**	NV	NV	**24,000**
Mercury	7439976	5.5	3.9	67	670	**3.9**	36	34,000
Selenium	7782492	6.6	5.5	1,200	1,200	NV	NV	NV
Zinc	7440666	3,090	340	47,000	47,000	NV	NV	15,000

TABLE 4.1
COMPARISON OF SOIL CONCENTRATIONS TO COMPONENT VALUES - COMMUNITY USE AREA
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Notes:

All concentrations are in units of micrograms per gram (µg/g)
1) Maximum soil concentrations from Table 3.1.
2) Table 3 SCS - The values found in Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Groundwater Condition for Community Property Use and Coarse Grained Soil (Ministry, 2011)

Component values obtained from the November 1, 2016 update to the Ministry MGRA Model.
NV - no component value available
S2 value is protective of long term workers with direct contact with soil
S3 value is intended to be protective of subsurface workers (construction workers)
S-IA is the migration of soil vapour to indoor air component value
- indicates the component value is exceeded by the maximum measured concentration or maximum reporting limit.

Ontario Ministry of the Environment (Ministry) Rationale for the Development of Soil and Ground Water Standards for use at Contminated Sites in Ontario. April 15, 2011 (Ministry, 2011).
Ontario Ministry of the Environment Conservation and Parks (Ministry) Modified Generic Risk Assessment Model (MGRA). November 1, 2016 (Ministry, 2016).

TABLE 4.2
COMPARISON OF SOIL CONCENTRATIONS TO COMPONENT VALUES - PARKLAND AREA
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Contaminant of Concern	*CAS Number*	*Maximum Soil Concentration* [1]	*Table 9 Site Condition Standard* [2]	*S1*	*S2*	*S3*	*Soil to Outdoor Air*	*Free-Phase Threshold*
Polyaromatic Hydrocarbons (PAH)								
Acenaphthene	83329	<0.5	0.072	78.0	96.0	3,600	1,300	2,800
Acenaphthylene	208968	0.732	0.093	7.8	9.6	360	96	2,900
Anthracene	120127	1.84	0.22	5,400	42,000	420,000	NV	2,700
Benz[a]anthracene	56553	5.13	0.36	**0.78**	**0.96**	36	330	7,600
Benzo[a]pyrene	50328	6.17	0.3	**0.08**	**0.10**	**3.6**	170	7,600
Benzo[b]fluoranthene	205992	11.7	0.47	**0.78**	**0.96**	36	2,000	7,600
Benzo[ghi]perylene	191242	4.07	0.68	7.80	9.60	360	NV	7,600
Benzo[k]fluoranthene	207089	1.34	0.48	**0.78**	**0.96**	36	2,100	7,600
Chrysene	218019	4.9	2.8	7.8	9.6	360	6,600	7,700
Dibenz[a h]anthracene	53703	1.28	0.1	**0.08**	**0.10**	3.6	430	7,600
Fluoranthene	206440	10.6	0.69	**7.8**	**9.6**	360	2,500	7,600
Fluorene	86737	0.572	0.19	720	5,600	56,000	NV	2,800
Indeno[1 2 3-cd]pyrene	193395	3.69	0.23	**0.78**	**0.96**	36	4,000	7,600
Naphthalene	91203	<0.5	0.09	360	2,800	28,000	270	2,800
Phenanthrene	85018	7.09	0.69	NV	NV	NV	NV	2,300
Pyrene	129000	8.4	1	78	96	3,600	23,000	7,700
Metals								
Antimony	7440360	3.1	1.3	7.5	63	63	NV	8,000
Arsenic	7440382	26	18	**0.95**	**1.3**	47	NV	12,000
Barium	7440393	497	220	3,800	32,000	8,600	NV	7,700
Cadmium	7440439	11	1.2	**0.69**	**7.9**	**7.9**	NV	18,000
Chromium Total	16065831	88	70	28,000	240,000	240,000	NV	11,000
Copper	7440508	260	92	600	5,600	5,600	NV	NV
Lead	7439921	2,610	120	**120**	**1,000**	**1,000**	NV	24,000
Mercury	7439976	5.5	0.27	9.8	67	670	36	34,000
Molybdenum	7439987	5	2	110	1,200	1,200	NV	22,000
Selenium	7782492	3	1.5	110	1,200	1,200	NV	NV
Silver	7440224	3	0.5	77	490	490	NV	22,000
Zinc	7440666	839	290	5,600	47,000	47,000	NV	15,000

TABLE 4.2
COMPARISON OF SOIL CONCENTRATIONS TO COMPONENT VALUES - PARKLAND AREA
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Notes:

All concentrations are in units of micrograms per gram (µg/g)
1) Maximum soil concentrations from Table 3.2.
Table 9 SCS - The values found in Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition for all Property Use and Soil Types (Ministry, 2011)

Component values obtained from the November 1, 2016 update to the Ministry MGRA Model.

NV - no component value available

S1 value is protective of residents, including sensitive receptors (i.e. children and pregnant women) with direct contact to soil
S2 value is protective of long term workers with direct contact to soil
S3 value is intended to be protective of subsurface workers (construction workers)
- indicates the component value is exceeded by the maximum measured concentration or maximum reporting limit.

Ontario Ministry of the Environment (Ministry) Rationale for the Development of Soil and Ground Water Standards for use at Contminated Sites in Ontario. April 15, 2011 (Ministry, 2011).
Ontario Ministry of the Environment Conservation and Parks (Ministry) Modified Generic Risk Assessment Model (MGRA). November 1, 2016 (Ministry, 2016).

TABLE 4.3
COMPARISON OF GROUNDWATER CONCENTRATIONS TO COMPONENT VALUES - COMMUNITY USE
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Contaminant of Concern	CAS Number	Maximum Groundwater Concentration (µg/L) [1]	Table 3 SCS (µg/L) [2]	Component Values (µg/L) [3]		
				Industrial GW1	Industrial GW2	1/2 Solubility
Acenaphthylene	208968	5.88	1.8	0.45	750	8050

Notes:

- Maximum concentration exceeds standard or component value

GW1 - protective of drinking water
GW2 - protective of indoor air from vapours originating from groundwater
µg/L - microgram per litre

1) Maximum groundwater concentrations from Table 3.3.
2) Table 3 SCS - The values found in Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Groundwater Condition for Community Property Use and Coarse Grained Soil (Ministry, 2011)[a].
3) The Component Value for coarse-textured soil is shown (Ministry, 2016) [b]

a Ontario Ministry of the Environment (Ministry) Rationale for the Development of Soil and Ground Water Standards for use at Contaminated Sites in Ontario. April 15, 2011 (Ministry, 2011).
b Ontario Ministry of the Environment Conservation and Parks (Ministry) Modified Generic Risk Assessment Model (MGRA). November 1, 2016 (Ministry, 2016).

TABLE 4.4
SOIL AND GROUNDWATER EXPOSURE POINT CONCENTRATIONS
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Contaminant of Concern [1]	*CAS Number*	Community Use Area		Parkland Area
		Soil Exposure Point Concentration (µg/g) [2]	***Groundwater Exposure Point Concentration (µg/L)*** [3]	***Soil Exposure Point Concentration (µg/g)*** [2]
Polyaromatic Hydrocarbons (PAH)				
B[a]P Equivalents [4]	B[a]PE	41.1	--	9.91
Acenaphthene	83329	--	--	<0.5
Acenaphthylene	208968	3.06	5.88	0.732
Anthracene	120127	10.8	--	1.84
Benz[a]anthracene	56553	38.4	--	5.13
Benzo[a]pyrene	50328	28.3	--	6.17
Benzo[b]fluoranthene	205992	27.5	--	11.7
Benzo[ghi]perylene	191242	--	--	4.07
Benzo[k]fluoranthene	207089	18.2	--	1.34
Chrysene	218019	32.9	--	4.9
Dibenz[a h]anthracene	53703	2.28	--	1.28
Fluoranthene	206440	70.8	--	10.6
Fluorene	86737	--	--	0.572
Indeno[1 2 3-cd]pyrene	193395	7.76	--	3.69
Naphthalene	91203	15.6	--	<0.5
Phenanthrene	85018	35.3	--	7.09
Pyrene	129000	--	--	8.4
Petroleum Hydrocarbons (PHC)				
Benzene	71432	0.52	--	--

Notes:

-- indicates that the constituent is not a COC, or is not carried forward for further evaluation in the RA for the environmental medium indicated.

COC - contaminant of concern

1) All volatile and semi-volatile COCs as identified in Table 3.5.

2) Maximum soil concentrations as defined in Table 3.1 for Community Use Area and Table 3.2 for Parkland Area.

3) Maximum groundwater concentration as defined in Table 3.3.

4) Benzo(a)pyrene equivalent concentrations were calculated by conservatively applying the toxicity equivalent factors defined by the Ministry (Ministry, 2020) to the maximum measured concentration for each PAH analyte and summing the resulting values. See text Section 4.3.3.

TABLE 4.5
RECEPTOR CHARACTERISTICS
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Receptor Parameter	***Value***	***Description***	***Reference***
Body Weight (kg)	70.7	Arithmetic mean for male and female adults combined	Ministry, 2011
Skin Surface Area Exposed (cm^2)	2,145	Hands and forearms for Construction Workers (for groundwater pathways)	Ministry, 2011
Duration of Exposure (years)	1.5	Construction Worker	Ministry, 2011
Averaging Period for Threshold Toxicants (years)	1.5	Construction Worker	Ministry, 2011
Averaging Period for Non-threshold Toxicants (years)	56	Construction Worker	Ministry, 2011
Exposure Frequency (outdoors) (weeks/year)	39	Construction Worker exposure to groundwater (Ground assumed frozen or snow covered 13 weeks of the year)	Ministry, 2011
(indoors and outdoors) (days per week)	5	Construction Worker	Ministry, 2011
(indoors and outdoors) (hours per day)	9.8	Construction Worker	Ministry, 2011
Duration of Event (water contact) (h/event)	0.5	Construction Worker groundwater contact - Professional judgement	
Number of Events (events/day)	2	Construction Worker contact 2 times every working day - Professional judgement	
Incidental Ingestion Rate of water (L/d)	0.02	Construction Worker	Virginia Unified Risk Assessment Model – VURAM User Guide (updated June 2020)

Notes:
kg - kilogram
Ministry - Ontario Ministry of the Environment
cm^2 - square centimetre
h/event - hours per event
L/d - litres per day

TABLE 4.6
TOXICITY INFORMATION FOR HUMAN RECEPTORS
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Chemical	*CAS*	*Route*	*Exposure limit*			*Reference*
			Type	*TRV* [1]	*Units*	
Benzene	71432	Inhalation	RfC	3.00E-02	mg/m3	U.S. EPA IRIS, 2003 (Ministry, 2016)
	71432	Inhalation	IUR	2.20E-03	$(mg/m^3)^{-1}$	U.S. EPA IRIS, 2000 (Ministry, 2016)
Acenaphthene	83329	Inhalation	IUR	6.00E-04	$(mg/m^3)^{-1}$	US EPA IRIS 2017; Kalberlah et al 1995 (Ministry, 2019)
Acenaphthylene	208968	Oral	RfD	6.00E-02	mg/kg/day	IRIS 1994 (proxy) (Ministry, 2016)
	208968	Oral- subchronic	RfD-sub	6.00E-01	mg/kg/day	ATSDR 1995 (proxy) (Ministry, 2016)
	208968	Oral	Oral CSF	1.00E-02	$(mg/kg/day)^{-1}$	US EPA IRIS 2017; Kalberlah et al 1995 (Ministry, 2019)
	208968	Inhalation	IUR	6.00E-03	$(mg/m^3)^{-1}$	US EPA IRIS 2017; Kalberlah et al 1995 (Ministry, 2019)
Benzo(a)anthracene	56553	Inhalation	IUR	6.00E-02	$(mg/m^3)^{-1}$	US EPA IRIS 2017; Kalberlah et al 1995 (Ministry, 2019)
Benzo(a)pyrene	50328	Inhalation	RfC	2.00E-06	mg/m^3	US EPA IRIS 2017 (Ministry, 2019)
	50328	Inhalation	IUR	6.00E-01	$(mg/m^3)^{-1}$	US EPA IRIS 2017; Kalberlah et al 1995 (Ministry, 2019)
Benzo(b/j)fluoranthene	205992	Inhalation	IUR	6.00E-02	$(mg/m^3)^{-1}$	US EPA IRIS 2017; Kalberlah et al 1995 (Ministry, 2019)
Benzo(k)fluoranthene	207089	Inhalation	IUR	6.00E-02	$(mg/m^3)^{-1}$	US EPA IRIS 2017; Kalberlah et al 1995 (Ministry, 2019)
Chrysene	218019	Inhalation	IUR	6.00E-03	$(mg/m^3)^{-1}$	US EPA IRIS 2017; Kalberlah et al 1995 (Ministry, 2019)
Dibenz(a,h)anthracene	53703	Inhalation	IUR	6.00E-01	$(mg/m^3)^{-1}$	US EPA IRIS 2017; Kalberlah et al 1995 (Ministry, 2019)
Fluoranthene	206440	Inhalation	IUR	6.00E-03	$(mg/m^3)^{-1}$	US EPA IRIS 2017; Kalberlah et al 1995 (Ministry, 2019)
Fluorene	86737	Inhalation	IUR	0E+00	$(mg/m^3)^{-1}$	US EPA IRIS 2017; Kalberlah et al 1995 (Ministry, 2019)
Indeno(1,2,3-cd)pyrene	193395	Inhalation	IUR	6.00E-02	$(mg/m^3)^{-1}$	US EPA IRIS 2017; Kalberlah et al 1995 (Ministry, 2019)
Naphthalene	91203	Inhalation	RfC	3.70E-03	mg/m^3	ATSDR 2005 (Ministry, 2016)
	91203	Inhalation	IUR	0E+00	$(mg/m^3)^{-1}$	US EPA IRIS 2017; Kalberlah et al 1995 (Ministry, 2019)
Phenanthrene	85018	Inhalation	IUR	0E+00	$(mg/m^3)^{-1}$	US EPA IRIS 2017; Kalberlah et al 1995 (Ministry, 2019)
Pyrene	129000	Inhalation	IUR	6.00E-04	$(mg/m^3)^{-1}$	US EPA IRIS 2017; Kalberlah et al 1995 (Ministry, 2019)

Notes:

(1) - Where the TRV refers to an RfC or RfD, the corresponding constituent is a threshold toxicant; where the TRV refers to an IUR or CSF, the corresponding constituent is a non-threshold toxicant.

mg/kg/day - milligrams per kilogram per day
mg/m^3 - milligrams per cubic metre
sub - denotes the TRV is specific to a subchronic exposure.
TRV - Toxicity reference values
CSF - cancer slope factor (non-threshold toxicant TRV)
IUR - inhalation unit risk (non-threshold toxicant TRV)
RfC - Reference concentration (threshold toxicant TRV)
RfD - Reference dose (threshold toxicant TRV)

TABLE 4.7
ESTIMATED EXCAVATION AIR RISKS FOR THE CONSTRUCTION WORKER
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Contaminant of Concern	*CAS*	*Trench Air - Community Use Area*		*Trench Air - Parkland Area*	
		Inhalation HQ	*Inhalation ILCR*	*Inhalation HQ*	*Inhalation ILCR*
Shallow Excavation Scenario - Soil Source					
B[a]P Equivalents	B[a]PE	--	6.9E-17	--	1.7E-17
Acenaphthene	83329	NA	NA	--	3.4E-16
Acenaphthylene	208968	--	1.3E-14	--	3.1E-15
Anthracene	120127	--	1.5E-15	--	2.6E-16
Benz[a]anthracene	56553	--	3.6E-16	--	4.8E-17
Benzo[a]pyrene	50328	1.5E-09	4.7E-17	3.2E-10	1.0E-17
Benzo[b]fluoranthene	205992	--	2.2E-18	--	9.6E-19
Benzo[ghi]perylene	191242	NA	NA	--	4.6E-21
Benzo[k]fluoranthene	207089	--	1.5E-18	--	1.1E-19
Chrysene	218019	--	5.1E-18	--	7.7E-19
Dibenz[a h]anthracene	53703	--	2.4E-19	--	1.3E-19
Fluoranthene	206440	--	1.3E-16	--	2.0E-17
Fluorene	86737	NA	NA	--	--
Indeno[1 2 3-cd]pyrene	193395	--	9.5E-20	--	4.5E-20
Naphthalene	91203	6.6E-06	--	2.1E-07	--
Phenanthrene	85018	--	--	--	--
Pyrene	129000	NA	NA	--	2.1E-18
Benzene	71432	6.9E-05	1.2E-10	NA	NA
Deep Excavation Scenario - Groundwater Source					
Acenaphthylene	208968	--	9.8E-11	NA	NA

Notes:
HQ - hazard quotient.
NA - Not applicable; not a contaminant of concern in the given Area.
-- - Toxicity Reference Value was unavailable.

TABLE 4.8
ESTIMATED GROUNDWATER DERMAL AND INGESTION RISKS FOR THE CONSTRUCTION WORKER
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Contaminant of Concern	*CAS Number*	*Trench Dermal HQ*	*Trench Dermal ILCR*	*Incidental Ingestion HQ*	*Incidental Ingestion ILCR*
Acenaphthylene	208968	1.0E-04	1.7E-08	1.3E-06	2.2E-10

Notes:
HQ - hazard quotient.
ILCR - incremental lifetime cancer risk

TABLE 5.1

COMPARISON OF COMMUNITY USE AREA SOIL CONCENTRATIONS WITH TABLE 3 SCS AND ECOLOGICAL COMPONENT VALUES

Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Contaminant of Concern	*CAS Number*	*Maximum Soil Concentration* [1]	*Table 3 Site Condition Standard* [2]	*Plants and soil organisms with MEP* [3]	*Mammals and birds with MEP* [3]	*S GW3*
Polyaromatic Hydrocarbons (PAH)						
Acenaphthylene	208968	3.06	0.15	NV	NV	**0.15**
Anthracene	120127	10.8	0.67	61	473,000,000	**0.67**
Benz[a]anthracene	56553	38.4	0.96	**1.9**	NV	5.1E+11
Benzo[a]pyrene	50328	28.3	0.3	137	46,300,000	3.8E+13
Benzo[b]fluoranthene	205992	27.5	0.96	NV	NV	7.7E+13
Benzo[k]fluoranthene	207089	18.2	0.96	29	NV	2.5E+13
Chrysene	218019	32.9	9.6	**27**	NV	3.6E+11
Dibenz[a h]anthracene	53703	2.28	0.1	NV	NV	2.39E+13
Fluoranthene	206440	70.8	9.6	342	115,000,000	4.0E+04
Indeno[1 2 3-cd]pyrene	193395	7.76	0.76	**1.4**	NV	8.57E+13
Phenanthrene	85018	35.3	12	**23.6**	36,000,000	267
Naphthalene	91203	15.6	9.6	41.8	1,260,000	201
Petroleum Hydrocarbons (PHC)						
Benzene	71432	0.52	0.32	342	6,800,000	14.1
Metals						
Arsenic	7440382	38	18	76	333,000	NV
Barium	7440393	779	670	2,850	672,000	NV
Cadmium	7440439	13	1.9	45.6	1,900	NV
Chromium Total	16065831	800	160	950	161,000	NV
Copper	7440508	3100	230	**428**	3,060,000	NV
Lead	7439921	26,000	120	**2,090**	32,000	NV
Mercury	7439976	5.5	3.9	95	20,000	1.2E+14
Selenium	7782492	6.6	5.5	19	5,500	NV
Zinc	7440666	3,090	340	**1,140**	337,000	NV

All concentrations are in units of micrograms per gram (ug/g) unless otherwise noted.

1) Maximum soil concentrations for all depths from Table 3.1.

2) Table 3 SCS - The values found in Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Groundwater Condition for Community Property Use and Coarse Grained Soil (Ministry, 2011)a.

3) Component values obtained from the November 1, 2016 update to the Ministry MGRA Model for potable groundwater with coarse soil. Benchmarks are MOE component values adjusted using the "Modified Ecological Protection" factor of 1.9 for Plants and Soil Organisms, and a factor of 1000 for Mammals and Birds. See text section 5.2.1 and 5.2.2 for more information.

NV - No value available

- indicates the component value is exceeded by the maximum measured concentration.

a Ontario Ministry of the Environment (Ministry) Rationale for the Development of Soil and Ground Water Standards for use at Contminated Sites in Ontario. April 15, 2011 (Ministry, 2011).

TABLE 5.2
COMPARISON OF PARKLAND AREA SOIL CONCENTRATIONS WITH TABLE 9 SCS AND ECOLOGICAL COMPONENT VALUES
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Contaminant of Concern	*CAS Number*	*Maximum Soil Concentration* [1]	*Table 9 Site Condition Standard* [2]	*Plants and Soil Organisms*	*Mammals and Birds*	*Sediment Values* [2]
Polyaromatic Hydrocarbons (PAH)						
Acenaphthene	83329	<0.5	0.072	NV	46000	NV
Acenaphthylene	208968	0.732	0.093	NV	NV	NV
Anthracene	120127	1.84	0.22	32	473000	**0.22**
Benz[a]anthracene	56553	5.13	0.36	**1.0**	NV	**0.32**
Benzo[a]pyrene	50328	6.17	0.3	72	46300	**0.37**
Benzo[b]fluoranthene	205992	11.7	0.47	NV	NV	NV
Benzo[ghi]perylene	191242	4.07	0.68	13	NV	**0.17**
Benzo[k]fluoranthene	207089	1.34	0.48	15	NV	**0.24**
Chrysene	218019	4.9	2.8	14	NV	**0.34**
Dibenz[a h]anthracene	53703	1.28	0.1	NV	NV	**0.060**
Fluoranthene	206440	10.6	0.69	180	115000	**0.75**
Fluorene	86737	0.572	0.19	NV	NV	**0.19**
Indeno[1 2 3-cd]pyrene	193395	3.69	0.23	**0.76**	NV	**0.20**
Naphthalene	91203	<0.5	0.09	22	1260	NV
Phenanthrene	85018	7.09	0.69	12	36000	**0.56**
Pyrene	129000	8.4	1	NV	99100	**0.49**
Metals						
Antimony	7440360	3.1	1.3	40	1470	NV
Arsenic	7440382	26	18	40	333	**6.0**
Barium	7440393	497	220	1500	672	NV
Cadmium	7440439	11	1.2	24	**2**	**0.600**
Chromium Total	16065831	88	70	500	161	**26**
Copper	7440508	260	92	**225**	3060	**16**
Lead	7439921	2610	120	**1100**	**32**	**31**
Mercury	7439976	5.5	0.27	50	20	**0.20**
Molybdenum	7439987	5	2	40	74	NV
Selenium	7782492	3	1.5	10	6	NV
Silver	7440224	3	0.5	40	NV	**0.50**
Zinc	7440666	839	290	**600**	**337**	**120**

Notes:

All concentrations are in units of micrograms per gram (ug/g).

1) Maximum soil concentrations from the Parkland Area (Table 3.2).

2) Table 9 SCS - The values found in Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition for all Property Use and Soil Types (Ministry, 2011)

3) Background values are for 'Other Land Uses' (rather than agricultural).

Component values obtained from the November 1, 2016 update to the Ministry MGRA Model for potable groundwater with coarse soil.

NV - No value available

bold - indicates the component value is exceeded by the maximum measured concentration.

Ontario Ministry of the Environment (Ministry) Rationale for the Development of Soil and Ground Water Standards for use at Contminated Sites in Ontario. April 15, 2011 (Ministry, 2011).

TABLE 5.3
COMPARISON OF COMMUNITY USE AREA GROUNDWATER CONCENTRATIONS WITH TABLE 3 SCS AND ECOLOGICAL COMPONENT VALUES
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Contaminant of Concern	*CAS Number*	*Maximum Post-Remediation Groundwater Concentration* [1]	*Table 3 Site Condition Standard* [2]	*GW3 Component Value* [3]
Acenaphthylene	208968	5.88	1.8	**1.77**

Notes:

All concentrations are in units of micrograms per litre (µg/L) unless otherwise noted.
1) Groundwater concentration is the maximum groundwater concentration from Table 3.3.
2) Table 3 SCS - The values found in Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Groundwater Condition for Community Property Use and Coarse Grained Soil (Ministry, 2011)a.
3) Component values are obtained from the November 1, 2016 update to the Ministry MGRA Model for potable groundwater with coarse soil.

ERA - Ecological Risk Assessment
- indicates the component value is exceeded by the maximum measured concentration.

a Ontario Ministry of the Environment (Ministry) Rationale for the Development of Soil and Ground Water Standards for use at Contminated Sites in Ontario. April 15, 2011 (Ministry, 2011).

TABLE 7.1

SOIL INTERVENTION CONCENTRATIONS - COMMUNITY USE AREA

Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Contaminant of Concern	*CAS Number*	*Maximum Soil Concentration* [1]	*Table 3 Site Condition Standard* [2]	*S2*	*Plants and Soil Organisms with MEP*	*Final Soil Intervention Concentration* [3]
Polyaromatic Hydrocarbons (PAH)						
Acenaphthylene	208968	3.06	0.15	9.6	NV	9.6
Anthracene	120127	10.8	0.67	42,000	61	61
Benz[a]anthracene	56553	38.4	0.96	0.96	1.9	1.0
Benzo[a]pyrene	50328	28.3	0.3	0.10	137	0.3
Benzo[b]fluoranthene	205992	27.5	0.96	0.96	NV	0.96
Benzo[k]fluoranthene	207089	18.2	0.96	0.96	29	0.96
Chrysene	218019	32.9	9.6	9.6	27	9.6
Dibenz[a h]anthracene	53703	2.28	0.1	0.10	NV	0.1
Fluoranthene	206440	70.8	9.6	9.6	342	9.6
Indeno[1 2 3-cd]pyrene	193395	7.76	0.76	0.96	1.4	0.96
Phenanthrene	85018	35.3	12	2,800	24	24
Naphthalene	91203	15.6	9.6	NV	42	42
Petroleum Hydrocarbons (PHC)						
Benzene	71432	0.52	0.32	13	342	13
Metals						
Arsenic	7440382	38	18	1.3	76	18
Barium	7440393	779	670	32,000	2,850	2,850
Cadmium	7440439	13	1.9	7.9	46	7.9
Chromium Total	16065831	800	160	240,000	950	950
Copper	7440508	3100	230	5,600	428	428
Lead	7439921	26,000	120	1,000	2,090	1,000
Mercury	7439976	5.5	3.9	67	95	67
Selenium	7782492	6.6	5.5	1,200	19	19
Zinc	7440666	3,090	340	47,000	1,140	1,140

All concentrations are in units of micrograms per gram (ug/g)

1) Maximum soil concentrations for all depths from Table 3.1.

2) Table 3 SCS - The values found in Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Groundwater Condition for Community Property Use and Coarse Grained Soil (Ministry, 2011)a.

3) Final soil intervention concentration is the lower of the S2 and Plants and Soil Organisms with MEP component values, unless that value is less than the Table 3 SCS in which case the Table 3 SCS is selected instead.

Component values obtained from the November 1, 2016 update to the Ministry MGRA Model for potable groundwater
S2 value is protective of long term workers with direct contact with soil
MEP - modified ecological protection option
NV - No value available

a Ontario Ministry of the Environment (Ministry) Rationale for the Development of Soil and Ground Water Standards for use at Contminated Sites in Ontario. April 15, 2011 (Ministry, 2011).

TABLE 7.2

SOIL INTERVENTION CONCENTRATIONS - PARKLAND AREA

Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Contaminant of Concern	*CAS Number*	*Maximum Soil Concentration* [1]	*Table 9 Site Condition Standard* [2]	*Plants and soil Organisms*	*Mammals and Birds*	*S1*	*S2*	*Final Soil Intervention Concentration* [3]
Polyaromatic Hydrocarbons (PAH)								
Acenaphthene	83329	<0.5	0.072	NV	46,000	78	96	78
Acenaphthylene	208968	0.732	0.093	NV	NV	7.8	9.6	7.8
Anthracene	120127	1.84	0.22	32	473,000	5,400	42,000	32
Benz[a]anthracene	56553	5.13	0.36	1.0	NV	0.78	0.96	0.78
Benzo[a]pyrene	50328	6.17	0.3	72	46,300	0.08	0.10	0.30
Benzo[b]fluoranthene	205992	11.7	0.47	NV	NV	0.78	0.96	0.78
Benzo[ghi]perylene	191242	4.07	0.68	13	NV	7.8	9.6	7.8
Benzo[k]fluoranthene	207089	1.34	0.48	15	NV	0.78	0.96	0.78
Chrysene	218019	4.9	2.8	14	NV	7.8	9.6	7.8
Dibenz[a h]anthracene	53703	1.28	0.1	NV	NV	0.08	0.10	0.1
Fluoranthene	206440	10.6	0.69	180	115,000	7.8	9.6	7.8
Fluorene	86737	0.572	0.19	NV	NV	720	5,600	720
Indeno[1 2 3-cd]pyrene	193395	3.69	0.23	0.76	NV	0.78	0.96	0.76
Naphthalene	91203	<0.5	0.09	22	1,260	360	2,800	22
Phenanthrene	85018	7.09	0.69	12	36,000	NV	NV	12
Pyrene	129000	8.4	1	NV	99,100	78	96	78
Metals								
Antimony	7440360	3.1	1.3	40	1,470	7.5	63	7.5
Arsenic	7440382	26	18	40	333	0.95	1.3	18
Barium	7440393	497	220	1500	672	3,800	32,000	672
Cadmium	7440439	11	1.2	24	2	0.69	7.9	1.2
Chromium Total	16065831	88	70	500	161	28,000	240,000	161
Copper	7440508	260	92	225	3,060	600	5,600	225
Lead	7439921	2610	120	1100	32	120	1,000	120
Mercury	7439976	5.5	0.27	50	20	9.8	67	9.8
Molybdenum	7439987	5	2	40	74	110	1,200	40

TABLE 7.2

SOIL INTERVENTION CONCENTRATIONS - PARKLAND AREA

Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Contaminant of Concern	*CAS Number*	*Maximum Soil Concentration* [1]	*Table 9 Site Condition Standard* [2]	*Plants and soil Organisms*	*Mammals and Birds*	*S1*	*S2*	*Final Soil Intervention Concentration* [3]
Selenium	7782492	3	1.5	10	5.5	110	1,200	5.5
Silver	7440224	3	0.5	40	NV	77	490	40
Zinc	7440666	839	290	600	337	5,600	47,000	337

Notes:

All concentrations are in units of micrograms per gram (ug/g).

1) Maximum soil concentrations from the Parkland Area (Table 3.2).

2) Table 9 SCS - The values found in Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition for all Property Use and Soil Types (Ministry, 2011)

3) Final soil intervention concentration is the lower of the S1, S2, Plants and Soil Organisms, and Mammals and Birds, unless that value is less than the Table 9 SCS in which case the Table 9 SCS is selected instead.

Component values obtained from the November 1, 2016 update to the Ministry MGRA Model for potable groundwater with coarse soil.

NV - No value available

S1 value is protective of residents, including sensitive receptors (i.e. children and pregnant women) with direct contact to soil

S2 value is protective of long term workers with direct contact to soil

Ontario Ministry of the Environment (Ministry) Rationale for the Development of Soil and Ground Water Standards for use at Contminated Sites in Ontario. April 15, 2011 (Ministry, 2011).

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FIGURES

Property parcel
Landscaping boundary
Zoning Boundary

Parkland Area
Community Use Area

Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

Sources:
- Landscaping boundary, IBI Group, 2020
- Zoning boundary, City of Ottawa, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : City of Ottawa Imagery, 2017

General Notes:
Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Survey by: -
Figure by: J. Scott
Concept by: K. Greer
Verified by: K. Greer
Revision 00 -- Issued for rport - 02 December 2020

Source: Figure base provided by CIMA+ on December 2, 2020.

Site Location Map and Site Plan
Supplemental Subsurface Investigation
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Geosyntec consultants | CIMA+ | Figure **1.1**

Guelph | December 2020

Site Location Map and Site Plan_190805.ai

Primary Contaminant Source	Contaminant Release Mechanism	Exposure Point	Exposure Route	COMMUNITY USE AREA: Construction Worker	COMMUNITY USE AREA: Maintenance Worker	COMMUNITY USE AREA: Indoor Worker	COMMUNITY USE AREA: Student or Visitor	PARKLAND AREA: Construction Worker	PARKLAND AREA: Maintenance Worker	PARKLAND AREA: Recreational Visitor
Soil		Soil	Direct Contact (incidental ingestion, dermal contact, inhalation)	●	●	●	●	●	●	●
Soil	Volatilization	Indoor Air	Inhalation	●	●	●	●	○	○	○
Soil	Volatilization	Outdoor Air	Inhalation	●	●	●	●	●	●	●
Soil	Volatilization	Excavation Air	Inhalation	●	○	○	○	●	○	○
Soil	Leaching → Groundwater									
Groundwater		Excavation Water	Direct Contact (incidental ingestion, dermal contact)	●	○	○	○	○	○	○
Groundwater	Volatilization	Excavation Air	Inhalation	●	○	○	○	○	○	○
Groundwater	Volatilization	Outdoor Air	Inhalation	●	●	●	●	○	○	○
Groundwater	Volatilization	Indoor Air	Inhalation	●	●	●	●	○	○	○

Notes

○ Pathway is not complete

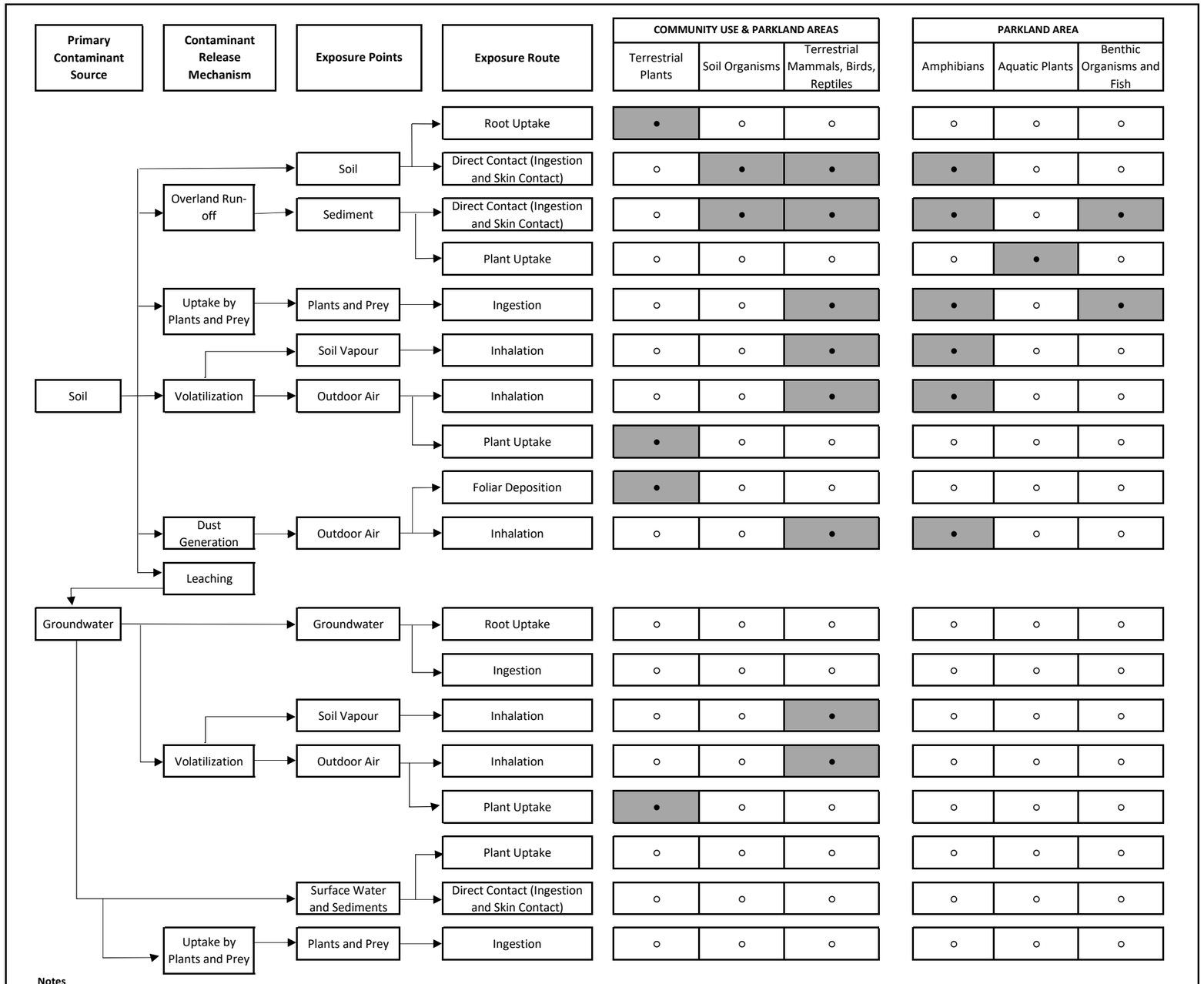
● Pathway is or might be complete

Human Health Risk Assessment
Conceptual Site Model
200 Lees Campus, University of Ottawa, Ottawa, Ontario

Geosyntec consultants

Figure 4.1

Rev 0 | December 2020


Primary Contaminant Source
Contaminant Release Mechanism
Exposure Points
Exposure Route
COMMUNITY USE & PARKLAND AREAS
Terrestrial Plants
Soil Organisms
Terrestrial Mammals, Birds, Reptiles
PARKLAND AREA
Amphibians
Aquatic Plants
Benthic Organisms and Fish
Soil
Overland Run-off
Uptake by Plants and Prey
Volatilization
Dust Generation
Leaching
Groundwater
Soil
Sediment
Plants and Prey
Soil Vapour
Outdoor Air
Groundwater
Surface Water and Sediments
Root Uptake
Direct Contact (Ingestion and Skin Contact)
Plant Uptake
Ingestion
Inhalation
Foliar Deposition
Notes
Pathway is not complete or not applicable
Pathway is or might be complete
Ecological Risk Assessment
Conceptual Site Model
200 Lees Campus, University of Ottawa, Ottawa, Ontario
Geosyntec consultants
Figure 5.1
Rev 0
December 2020

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APPENDICES

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APPENDIX A

Copies of Sample Data and Maps

APPENDIX A
LIST OF ATTACHMENTS
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Attachment	Excerpts from Report	Year of Sampling	Part of Report	Description
A1	CIMA+ (2020b)	2020	Table 4	Soil data used to evaluate Community Use Area
			Table 5	Groundwater data used to evaluate Community Use Area
			Table 5	Groundwater data used to evaluate Parkland Area
			Figures 3 and 4	Map showing sample locations
A2	CIMA+ (2020c)	2020	Table 1	Soil data used to evaluate Community Use Area
			Table 1	Soil data used to evaluate Community Use Area
			Appendix C	Soil Vapour data used to evaluate Community Use Area
			Figure 2	Map showing sample locations
A3	uOttawa (2019)	2019	Appendix B	Groundwater data used to evaluate Community Use Area
			Appendix B	Groundwater data used to evaluate Parkland Area
			Figure 7	Map showing sample locations
A4	Franz (2013)	2012	Tables B5-B8	Soil data used to evaluate Community Use Area
			Figure 5	Map showing sample locations and soil vapour locations
			Figure 6	Interpreted extent of coal tar impacted area
A5	CH2MHill (2002)	2001	Table B1 and B3	Soil data used to evaluate Community Use Area
			Table B1	Soil data used to evaluate Parkland Area
			Table B7	Soil data used to evaluate Parkland Area
			Figure 3-2 and 3-3	Map showing sample locations
A6	Golder	2000	Table 2	Soil data used to evaluate Community Use Area
			Figure 4	Map showing sample locations

A001049 - uOttawa
Table 4 - Soil Analytical Results (2020)

Parameter	Units	Standards[1] Table 3 SCS	RDL	Sample ID/Sampling Depth (m)/Unit/Sampling Date										
				BH-20-1_SS4 2.1 to 2.7 m Fill 07/06/2020	BH20-2 SS4 2.3 to 2.9 m Fill 07/10/2020	BH20-2 SS16 11.4 to 12.0 m Alluvium 07/10/2020	BH20-3 SS4 2.3 to 2.9 m Fill 07/10/2020	BH20-4 SS4 2.3 to 2.9 m Fill 07/10/2020	DUP1 07/10/2020	BH20-4 SS5 3.0 to 3.7 m Fill 07/10/2020	BH20-4 SS12 8.2 to 8.8 m Alluvium 07/10/2020	DUP2 07/10/2020	BH20-5 SS5 3.0 to 3.7 m Fill 07/10/2020	BH20-5 SS9 6.1 to 6.7 m Alluvium 07/10/2020
Polyaromatic Hydrocarbons (PAH)														
Naphthalene	µg/g	9.6	0.05	<0.05	0.08	<0.05	0.10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	µg/g	0.15	0.05	<0.05	0.14	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	µg/g	96	0.05	<0.05	0.11	<0.05	0.13	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	µg/g	62	0.05	<0.05	0.16	<0.05	0.18	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	µg/g	12	0.05	0.10	1.3	0.28	1.3	0.05	0.30	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	µg/g	0.67	0.05	<0.05	0.41	0.08	0.43	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/g	9.6	0.05	0.21	1.9	0.49	1.7	0.15	0.52	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	µg/g	96	0.05	0.17	1.7	0.42	1.4	0.12	0.46	<0.05	<0.05	<0.05	<0.05	<0.05
Benz(a)anthracene	µg/g	0.96	0.05	0.09	**0.99**	0.30	0.94	0.05	0.30	<0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	µg/g	9.6	0.05	0.10	0.94	0.27	0.99	0.07	0.29	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	µg/g	0.96	0.05	0.07	**0.99**	0.25	0.74	0.10	0.26	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g	0.96	0.05	<0.05	0.65	0.16	0.46	0.05	0.17	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g	0.3	0.05	<0.05	**0.69**	0.19	**0.56**	0.05	0.20	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-cd)pyrene	µg/g	0.76	0.05	<0.05	0.28	0.07	0.19	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenz(a,h)anthracene	µg/g	0.1	0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/g	9.6	0.05	<0.05	0.26	0.06	0.16	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05
1 and 2 Methlynaphthalene (Calculated)	µg/g	76	0.05	<0.05	0.10	<0.05	0.13	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Petroleum Hydrocarbons (PHC)														
Benzene	µg/g	0.32	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g	68	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g	9.5	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylenes (Total)	µg/g	26	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g	55	5	<5	<5	16	<5	<5	<5	<5	<5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	55	5	<5	<5	16	<5	<5	<5	<5	<5	<5	<5	<5
F2 (C10 to C16)	µg/g	230	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	15	<10
F2 (C10 to C16) minus Naphthalene	µg/g		10	<10	<10	<10	<10	<10	<10	<10	<10	<10	15	<10
F3 (C16 to C34)	µg/g	1700	50	63	160	<50	130	<50	<50	<50	<50	<50	<50	<50
F3 (C16 to C34) minus PAHs	µg/g		50	62	150	<50	120	<50	<50	<50	<50	<50	<50	<50
F4 (C34 to C50)	µg/g	3300	50	<50	51	<50	65	<50	<50	<50	<50	<50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g	3300	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals														
Antimony (Sb)	µg/g	40	0.8	6.5	5.0	<0.8	5.3	1.30	2.7	10.8	<0.8	<0.8	15.5	<0.8
Arsenic (As)	µg/g	18	1	**29**	**19**	4	**29**	15	18	**31**	2	2	**36**	4
Barium (Ba)	µg/g	670	2	664	413	116	625	362	282	**779**	90	113	328	126
Beryllium (Be)	µg/g	8	0.5	0.7	<0.5	0.5	0.8	0.50	0.8	0.8	<0.5	<0.5	1.4	<0.5
Boron (B)	µg/g	120	5	12	17	11	16	<5	8	8	7	7	13	7
Cadmium (Cd)	µg/g	1.9	0.5	1.7	1.1	<0.5	**9.8**	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium (Cr)	µg/g	160	5	56	34	23	50	21	24	21	12	11	32	15
Cobalt (Co)	µg/g	80	0.5	7.0	6.2	8.9	10.7	8.9	12.1	18.0	5.0	5.0	19.3	6.1
Copper (Cu)	µg/g	230	1	**2930**	156	24	176	40	81	**566**	11	10	175	31
Lead (Pb)	µg/g	120	1	**753**	**609**	11	**954**	**755**	**349**	**625**	4	4	**485**	58
Molybdenum (Mo)	µg/g	40	0.5	4.2	2.7	2.6	3.6	3.8	3.9	10.0	1.2	1.0	8.5	2.0
Nickel (Ni)	µg/g	270	1	23	31	26	39	21	29	44	12	11	47	17
Selenium (Se)	µg/g	5.5	0.4	2.6	1.7	0.5	5.3	3.5	3.3	2.1	<0.4	<0.4	3.2	0.6
Silver (Ag)	µg/g	40	0.2	9.1	0.4	<0.2	1.8	0.30	0.4	1.0	<0.2	<0.2	1.0	<0.2
Thallium (Tl)	µg/g	3.3	0.4	<0.4	<0.4	<0.4	0.5	<0.4	<0.4	<0.4	<0.4	<0.4	0.4	<0.4
Uranium (U)	µg/g	33	0.5	1.0	<0.5	1.4	0.6	0.6	0.8	0.9	1.0	1.0	1.5	1.1
Vanadium (V)	µg/g	86	1	24	20	33	34	29	36	31	21	20	46	24
Zinc (Zn)	µg/g	340	5	**792**	**581**	53	**1540**	280	**468**	**546**	21	24	258	96
Other regulated parameters														
Fraction Organic Carbon (FCO)														
Fraction Organic Carbon-1	NA		0.003							0.024	0.019			
Fraction Organic Carbon-2	NA		0.003							0.024	0.019			
Fraction Organic Carbon-3	NA		0.003							0.024	0.019			
Fraction Organic Carbon-Avg	NA		0.003							0.024	0.019			
Potential of Hydrogen (pH)														
pH, 2:1 CaCl2 Extraction	pH Units	5.0-9.0	NA							7.75				
Particle Size by Sieve (Wet)														
Sieve Analysis - 75 µm (retained)	%		NA							79.10	82.88			
Sieve Analysis - 75 µm (passing)	%		NA							20.90	17.12			
Soil Texture										Coarse	Coarse			

Ontario Regulation 153/04 (Amended April 15, 2011)
Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Ground Water Condition
Community Property Use - Coarse Grained Soils
RDL Reportable Detection Limit
123 Concentrations above applicable SCS

A001049 - uOttawa
Table 5 - Groundwater Analytical Results (2020)

Parameter	Units	Standard[1] Table 3 SCS	RDL	Sample ID/Sampling Date BH20-1-GW01 07/23/2020	BH20-2-GW01 07/22/2020	DUP-1 07/22/2020	BH20-3-GW01 07/22/2020	BH20-4-GW01 07/23/2020	BH20-5-GW01 07/22/2020	DUP-2 07/22/2020	MW03-12-GW01 07/22/2020	MW04-12-GW01 07/22/2020	MW05-12-GW01 07/22/2020	MW12-11 07/22/2020	OW506A-GW01 07/23/2020	OW506B-GW01 07/23/2020
Polyaromatic Hydrocarbons (PAH)																
Naphthalene	µg/L	1400	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Acenaphthylene	µg/L	1.8	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**3.5**	<0.20	<0.20
Acenaphthene	µg/L	600	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.64	<0.20	<0.20
Fluorene	µg/L	400	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	1.2	<0.20	<0.20
Phenanthrene	µg/L	580	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.65	<0.10	<0.10
Anthracene	µg/L	2.4	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.21	<0.10	<0.10
Fluoranthene	µg/L	130	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.23	<0.20	<0.20
Pyrene	µg/L	68	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.34	<0.20	<0.20
Benzo(a)anthracene	µg/L	4.7	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chrysene	µg/L	1	0.1	<0.10	<0.10	<0.10	0.11	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(b)fluoranthene	µg/L	0.75	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(k)fluoranthene	µg/L	0.4	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(a)pyrene	µg/L	0.81	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	µg/L	0.2	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibenz(a,h)anthracene	µg/L	0.52	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(g,h,i)perylene	µg/L	0.2	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2-and 1-methyl Naphthalene	µg/L	1800	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	3.0	<0.20	<0.20
Petroleum Hydrocarbons (PHC)																
Benzene	µg/L	44	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.84	<0.20	<0.20
Toluene	µg/L	18000	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	µg/L	2300	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	6.9	<0.10	<0.10
Xylenes (Total)	µg/L	4200	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
F1 (C6-C10)	µg/L	750	25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
F1 (C6 to C10) minus BTEX	µg/L	750	25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
F2 (C10 to C16)	µg/L	150	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
F2 (C10 to C16) minus Naphthalene	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
F3 (C16 to C34)	µg/L	500	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
F3 (C16 to C34) minus PAHs	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
F4 (C34 to C50)	µg/L	500	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Gravimetric Heavy Hydrocarbons	µg/L		500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals																
Dissolved Antimony	µg/L	20000	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dissolved Arsenic	µg/L	1900	1	<1.0	31.5	27.6	28.1	<1.0	30.6	39.9	27.10	27	46.8	37.7	<1.0	1.6
Dissolved Barium	µg/L	29000	2	76.2	282	285	163	35.2	112	117	145	116	62.1	51.8	2.7	52.9
Dissolved Beryllium	µg/L	67	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dissolved Boron	µg/L	45000	10	478	813	767	512	814	446	421	317	559	929	158	323	288
Dissolved Cadmium	µg/L	2.7	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	0.43	0.49	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Chromium	µg/L	810	2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.3	3.2
Dissolved Cobalt	µg/L	66	0.5	<0.50	0.58	<0.50	0.85	1.36	3.82	3.58	<0.50	1.44	4.91	<0.50	<0.50	19
Dissolved Copper	µg/L	87	1	2	<1.0	<1.0	<1.0	3.4	4.2	2.7	5.80	13.7	2.3	1	4	3.9
Dissolved Lead	µg/L	25	0.5	<0.50	0.95	0.76	0.88	<0.50	0.74	0.78	0.63	0.9	1.51	<0.50	<0.50	<0.50
Dissolved Molybdenum	µg/L	9200	0.5	<0.50	<0.50	<0.50	3.76	0.96	0.75	<0.50	0.88	2.23	<0.50	<0.50	2.88	0.59
Dissolved Nickel	µg/L	490	3	<3.0	<3.0	<3.0	<3.0	<3.0	9.4	9.2	<3.0	5.5	3.3	<3.0	7.8	79.6
Dissolved Selenium	µg/L	63	1	<1.0	1.3	2.6	1.9	<1.0	48.5	39.5	19.7	1.6	4.1	1.7	1.4	2.5
Dissolved Silver	µg/L	1.5	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Thallium	µg/L	510	0.3	<0.30	0.56	0.48	0.76	<0.30	0.41	0.33	0.4	0.53	0.42	0.34	<0.30	<0.30
Dissolved Uranium	µg/L	420	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	2.04	2.01	2.26	1.4	<0.50	1.29	<0.50	<0.50
Dissolved Vanadium	µg/L	250	0.4	<0.40	0.5	<0.40	<0.40	0.69	<0.40	<0.40	<0.40	<0.40	<0.40	0.53	1.07	8.93
Dissolved Zinc	µg/L	1100	5	<5.0	<5.0	<5.0	39.5	7.2	8.2	6.2	<5.0	15.3	<5.0	7.8	<5.0	10.1

1 Ontario Regulation 153/04 (Amended April 15, 2011)
Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Ground Water Condition
All Types of Property Use - Coarse Grained Soils
RDL Recordable Detection Limits
123 Concentrations above applicable SCS

- Phase Two Study Area
- Property Parcel
- Previous Investigation Locations (Geofirma, 2013; Franz, 2013)
- Investigation Locations (CIMA+, 2020)
- Investigation Locations (Golder, 2020)

1:1,500

10 5 0 10 20 30 40

Meters

Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

Sources:
- Terrestrial Survey, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : GeoEye, Maxar

General Notes:

Figures are to be reviewed and interpreted with the associated report.
Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 3 - Summary of Sub-surface Investigation Locations (2012 - 2020)

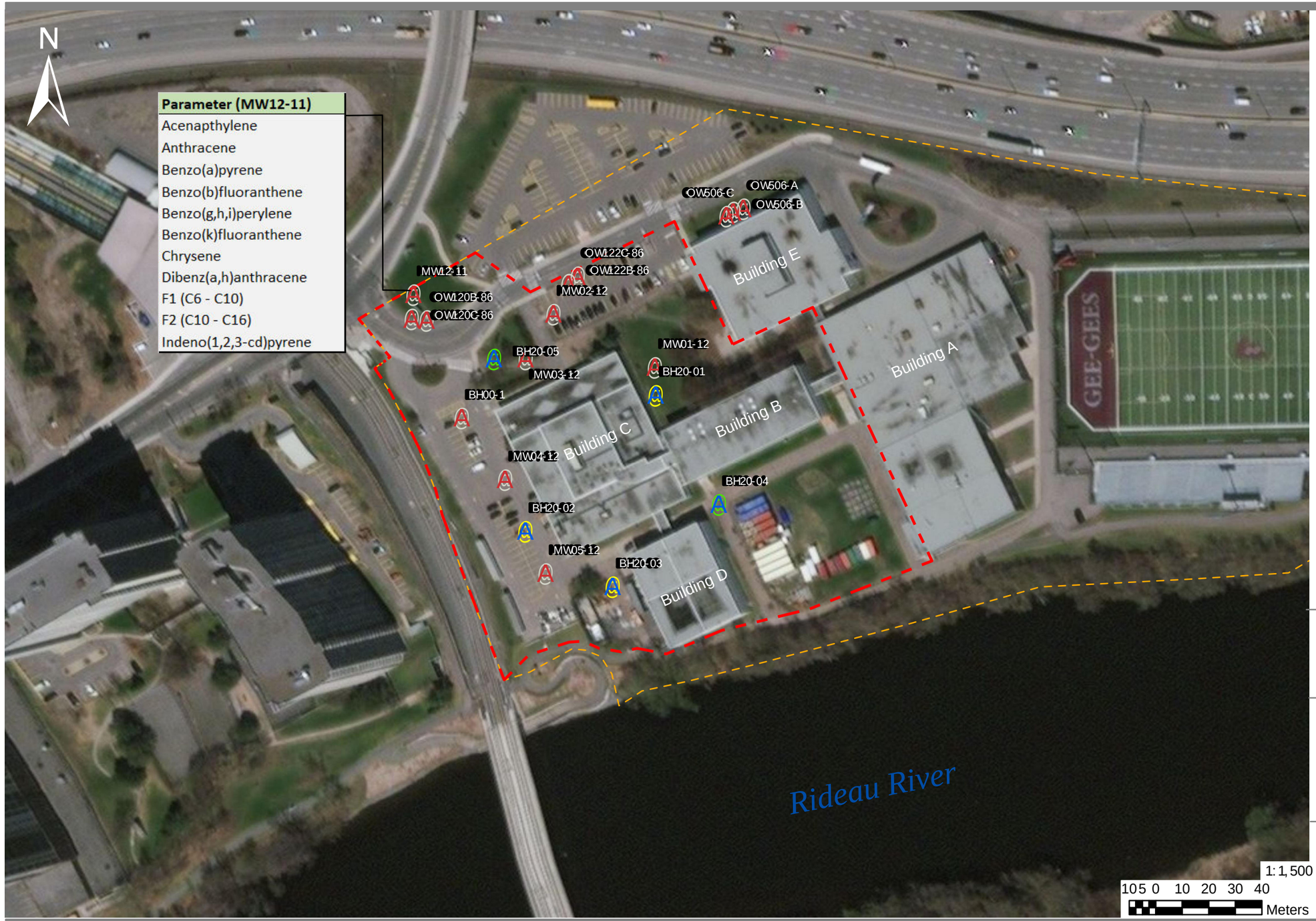
Phase Two Environmental Site Assessement
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Attachment A1 - Excerpts from CIMA+ (2020b)

Survey by : J. Scott
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer

Revision 00 - - Issued for report - 09 October 2020

Ref # : C10-A001049-080-111



Phase Two Study Area
Property Parcel
Monitoring well locations (Geofirma, 2013; Franz, 2013; uOttawa, 2019)
Monitoring Well Locations (CIMA, 2020)
Monitoring Well Locations (Golder, 2020)

Indicates compounds with maximum concentrations above Table 3 SCS at well location.

Parameter (MW12-11)
Acenaphthene

Standards[1] - Table 3 SCS		MW12-11 Max
Parameter	µg/L	Concentrations (µg/L)
Acenaphthylene	1.8	**73.1**
Anthracene	2.4	**5.02**
Benzo(a)pyrene	0.81	**3.1**
Benzo(b)fluoranthene	0.75	**3.24**
Benzo(g,h,i)perylene	0.2	**1.3**
Benzo(k)fluoranthene	0.4	**1.25**
Chrysene	1	**3.24**
Dibenz(a,h)anthracene	0.52	**0.57**
F1 (C6-C10)	750	**1770**
F2 (C10 to C16)	150	**760**
Indeno(1,2,3-cd)pyrene	0.2	**1.32**

Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

Sources:
- Terrestrial Survey, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : USDA FSA, GeoEye, Maxar

General Notes:

Figures are to be reviewed and interpreted with the associated report.
Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 4 - Summary of Groundwater Investigation Locations with Maximum Concentrations

Phase Two Environmental Site Assessement
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Attachment A1 - Excerpts from CIMA+ (2020b)

Survey by : J. Scott/L. Robert
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer
Revision 00 - - Issued for report - 29 October 2020

Ref # : C10-A001049-080-111

A001049 - uOttawa
Table 1 - Soil Analytical Results

Parameter	Units	Standards[1] Table 3 SCS	RDL	BH-20-6_SS3 2.44 to 3.05 m Fill 2020-10-19	DUP-1 2.44 to 3.05 m Fill 2020-10-19	BH-20-7_SS4 3.66 to 4.23 m Fill 2020-10-19	BH-20-8_SS4 3.66 to 4.23 m Fill 2020-10-19	BH-20-9_SS2 0.76 to 1.22 m Fill 2020-10-19	BH-20-10_SS2 0.76 to 1.22 m Fill 2020-10-19	BH-20-11_SS3 2.1 to 2.7 m Fill 2020-10-19
Polyaromatic Hydrocarbons (PAH)										
Naphthalene	µg/g	9.6	0.05	<0.05	0.14	0.39	<0.05	-	-	-
Acenaphthylene	µg/g	0.15	0.05	-	-	-	-	-	-	-
Acenaphthene	µg/g	96	0.05	-	-	-	-	-	-	-
Fluorene	µg/g	62	0.05	-	-	-	-	-	-	-
Phenanthrene	µg/g	12	0.05	-	-	-	-	-	-	-
Anthracene	µg/g	0.67	0.05	-	-	-	-	-	-	-
Fluoranthene	µg/g	9.6	0.05	-	-	-	-	-	-	-
Pyrene	µg/g	96	0.05	-	-	-	-	-	-	-
Benz(a)anthracene	µg/g	0.96	0.05	-	-	-	-	-	-	-
Chrysene	µg/g	9.6	0.05	-	-	-	-	-	-	-
Benzo(b)fluoranthene	µg/g	0.96	0.05	-	-	-	-	-	-	-
Benzo(k)fluoranthene	µg/g	0.96	0.05	-	-	-	-	-	-	-
Benzo(a)pyrene	µg/g	0.3	0.05	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	µg/g	0.76	0.05	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	µg/g	0.1	0.05	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	µg/g	9.6	0.05	-	-	-	-	-	-	-
1 and 2 Methlynaphthalene (Calculated)	µg/g	76	0.05	-	-	-	-	-	-	-
Petroleum Hydrocarbons (PHC)										
Benzene	µg/g	0.32	0.02	<0.02	<0.02	<0.02	<0.02	-	-	-
Toluene	µg/g	68	0.05	-	-	-	-	-	-	-
Ethylbenzene	µg/g	9.5	0.05	-	-	-	-	-	-	-
Xylenes (Total)	µg/g	26	0.05	-	-	-	-	-	-	-
F1 (C6 to C10)	µg/g	55	5	-	-	-	-	-	-	-
F1 (C6 to C10) minus BTEX	µg/g	55	5	-	-	-	-	-	-	-
F2 (C10 to C16)	µg/g	230	10	-	-	-	-	-	-	-
F2 (C10 to C16) minus Naphthalene	µg/g		10	-	-	-	-	-	-	-
F3 (C16 to C34)	µg/g	1700	50	-	-	-	-	-	-	-
F3 (C16 to C34) minus PAHs	µg/g		50	-	-	-	-	-	-	-
F4 (C34 to C50)	µg/g	3300	50	-	-	-	-	-	-	-
Gravimetric Heavy Hydrocarbons	µg/g	3300	50	-	-	-	-	-	-	-
Metals										
Antimony (Sb)	µg/g	40	0.8	-	-	-	-	-	-	-
Arsenic (As)	µg/g	18	1	-	-	-	-	-	-	-
Barium (Ba)	µg/g	670	2	-	-	-	-	-	-	-
Beryllium (Be)	µg/g	8	0.5	-	-	-	-	-	-	-
Boron (B)	µg/g	120	5	-	-	-	-	-	-	-
Cadmium (Cd)	µg/g	1.9	0.5	-	-	-	-	-	-	-
Chromium (Cr)	µg/g	160	5	-	-	-	-	-	-	-
Cobalt (Co)	µg/g	80	0.5	-	-	-	-	-	-	-
Copper (Cu)	µg/g	230	1	-	-	-	-	-	-	-
Lead (Pb)	µg/g	120	1	-	-	-	-	-	-	-
Mercury (Hg)	µg/g	3.9	0.10	-	-	-	-	0.49	0.15	3.32
Molybdenum (Mo)	µg/g	40	0.5	-	-	-	-	-	-	-
Nickel (Ni)	µg/g	270	1	-	-	-	-	-	-	-
Selenium (Se)	µg/g	5.5	0.4	-	-	-	-	-	-	-
Silver (Ag)	µg/g	40	0.2	-	-	-	-	-	-	-
Thallium (Tl)	µg/g	3.3	0.4	-	-	-	-	-	-	-
Uranium (U)	µg/g	33	0.5	-	-	-	-	-	-	-
Vanadium (V)	µg/g	86	1	-	-	-	-	-	-	-
Zinc (Zn)	µg/g	340	5	-	-	-	-	-	-	-

Ontario Regulation 153/04 (Amended April 15, 2011)
Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Ground Water Condition
Community Property Use - Coarse Grained Soils
RDL Reportable Detection Limit
123 Concentrations above applicable SCS
- Not Analysed

TABLE 2
SOIL VAPOUR ANALYTICAL RESULTS
200 Lees Avenue, Ottawa, Ontario

Location: Date Sampled: Laboratory ID: Sample ID: Pressure on Receipt (in. Hg):	Soil Vapour Screening Level (Industrial/ Commercial)[1,2,3]	SGP-06 19-Oct-20 SGP-06-10192020 -9	SVP-07 20-Oct-20 SGP-07-10202020 -7	SVP-08 20-Oct-20 SGP-08-10202020 -6	SVP-100 20-Oct-20 SGP-100 -6
Volatile Organic Compounds (µg/m^3)					
Benzene	40,700	**2.4**	**1.9**	**18.8**	**32.7**
Naphthalene	66,200	5.2 U	5.2 U	5.2 U	5.2 U

Notes:

[1] Soil vapour screening level calculated using the following equation: $C_{sv} = C_{air}^{T} / \alpha_v$ from *"Draft Technical Guidance: Soil Vapour Intrusion Assessment September 2013", MOECC (PIBS # 8477).*

Where: C_{sv} = soil vapour screening level

C_{air}^{T} = HBIAC (residential or industrial/commercial)

α_v = air criteria divided by the MOECC default industrial/commercial attenuation factor (0.004).

[2] All HBIAC values used in the calculation of the soil vapour screening levels were from *"Modified Generic Risk Assessment 'Approved Model' November 2016", MOECC (PIBS # 8450e)* .

[3] Factor of 100 applied to the soil vapour screening level to account for biodegradation for soil at depths greater than 3 m bgs. *"Rationale for the Development of Soil and Groundwater Standards for Use at Contaminated Sites in Ontario", MOE, 2011 (PIBS 7386e01)*

Acronyms:

-- - screening level not available

Bold - associated value is detected

HBIAC - health-based indoor air criteria

ID - identifier

m bgs - metres below ground surface

in. Hg - inches of mercury

µg/m^3 - micrograms per cubic metre

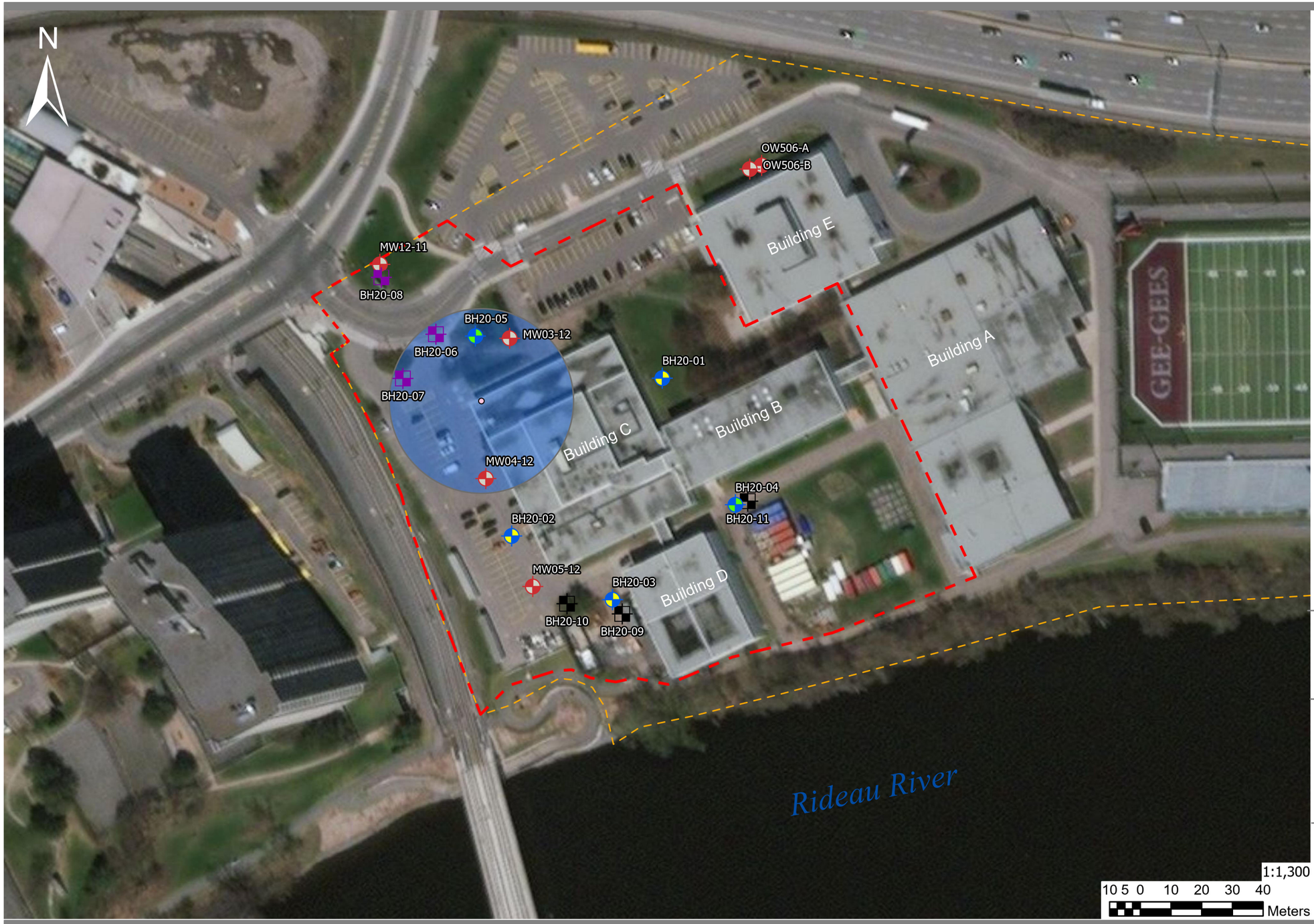
MGRA - Modified Generic Risk Assessment

MOECC - Ontario Ministry of the Environment and Climate Change

MOE - Ontario Ministry of the Environment (now MOECC)

SGP - soil vapour probe

U - analyte not detected; associated value is reporting limit



Phase Two Study Area
Property Parcel
Borehole & Vapour Monitoring Location (CIMA+, October 2020)
Borehole Location (CIMA+, October 2020)
Monitoring well locations (Geofirma, 2013; Franz, 2013; uOttawa, 2019)
Monitoring Well Locations (CIMA, 2020)
Monitoring Well Locations (Golder, 2020)
Reference Point
30 m buffer (reference point)

1:1,300
10 5 0 10 20 30 40
Meters

Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

Sources:
- Terrestrial Survey, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : City of Ottawa Imagery, 2017

General Notes:
Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 2 - Supplemental Subsurface Investigation Locations

Supplemental Subsurface Investigation
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Attachment A2 - Excerpts from CIMA+ (2020c)

Survey by : -
Figure by : J. Scott
Concept by : K. Greer
Verified by : K. Greer

Revision 00 - - Issued for report - 12 November 2020

Ref # : C10-A001049-080-111

MW05-12	MOECC Table 3	UOM	12-Oct	14-Oct	15-Oct	15-Jun	15-Jun	16-Oct	17-Oct	18-Oct	19-Nov
Acenaphthene	600	ug/L	<0.05	<0.05	<0.05	<0.05	1.4	<0.05	<0.05	ND	<0.020
Acenaphthylene	1.8	ug/L	<0.05	<0.05	<0.05	<0.05	13	<0.05	<0.05	ND	<0.020
Anthracene	2.4	ug/L	<0.05	<0.05	<0.05	<0.05	0.72	<0.05	<0.05	ND	<0.020
Benzo[a]anthracene	4.7	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Benzo[a]pyrene	0.81	ug/L	<0.01	0.017	<0.05	0.021	0.027	<0.05	<0.05	ND	<0.010
Benzo[b]fluoranthene	0.75	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Benzo[g,h,i]perylene	0.2	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Benzo[k]fluoranthene	0.4	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Chrysene	1	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Dibenzo[a,h]anthracene	0.52	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Fluoranthene	130	ug/L	<0.05	<0.05	<0.05	0.055	0.31	<0.05	<0.05	ND	<0.020
Fluorene	400	ug/L	<0.05	<0.05	<0.05	<0.05	5.3	<0.05	<0.05	ND	<0.020
Indeno[1,2,3-cd]pyrene	0.2	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Methylnaphthalene, 1-	NV	ug/L	<0.05	<0.05	<0.05	<0.05	33	<0.05	<0.05	ND	<0.020
Methylnaphthalene, 2-	NV	ug/L	<0.05	<0.05	<0.05	<0.05	0.055	<0.05	<0.05	ND	<0.020
Methylnaphthalene,2-(1-)-	1800	ug/L	<0.071	-	<0.071	-	-	-	-	ND	<0.028
Naphthalene	1400	ug/L	<0.05	<0.05	0.1	<0.05	6.5	<0.05	<0.05	ND	<0.050
Phenanthrene	580	ug/L	<0.03	0.05	<0.03	0.045	4	<0.03	<0.03	ND	<0.020
Pyrene	68	ug/L	<0.05	0.06	<0.05	0.05	0.47	<0.05	<0.05	ND	<0.020

ND = Not Detected

Results highlighted in red exceed Table 3 from the MOECC. Data extracted from the analytical report submitted by Maxxam Analytics

MW04-12	MOECC Table 3	UOM	12-Oct	14-Oct	15-Jun	15-Oct	16-Oct	17-Oct	18-Oct	19-Nov
Acenaphthene	600	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Acenaphthylene	1.8	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Anthracene	2.4	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Benzo[a]anthracene	4.7	ug/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Benzo[a]pyrene	0.81	ug/L	0.042	<0.01	0.011	<0.01	<0.01	<0.01	ND	<0.010
Benzo[b]fluoranthene	0.75	ug/L	0.059	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Benzo[g,h,i]perylene	0.2	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Benzo[k]fluoranthene	0.4	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Chrysene	1	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Dibenzo[a,h]anthracene	0.52	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Fluoranthene	130	ug/L	0.13	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Fluorene	400	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Indeno[1,2,3-cd]pyrene	0.2	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Methylnaphthalene, 1-	NV	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020
Methylnaphthalene, 2-	NV	ug/L	<0.05	<0.05	<0.05	0.061	<0.05	<0.05	ND	<0.020
Methylnaphthalene,2-(1-)-	1800	ug/L	<0.071	-	<0.05	<0.071	-	-	ND	<0.028
Naphthalene	1400	ug/L	0.061	<0.05	<0.05	0.14	<0.05	<0.05	ND	<0.050
Phenanthrene	580	ug/L	0.1	0.03	<0.03	<0.03	<0.03	<0.03	ND	<0.020
Pyrene	68	ug/L	0.11	<0.05	<0.05	<0.05	<0.05	<0.05	ND	<0.020

ND = Not Detected

Results highlighted in red exceed Table 3 from the MOECC. Data extracted from the analytical report submitted by Maxxam Analytics

MW03-12	MOECC Table 3	UOM	12-Oct	14-Oct	15-Oct	15-Oct	15-Jun	16-Oct	17-Oct	18-Oct	19-Nov
Acenaphthene	600	ug/L	<0.05	ND	<0.05	<0.05	<0.05	<0.05	ND	ND	<0.020
Acenaphthylene	1.8	ug/L	<0.05	0.25	<0.05	<0.05	0.14	<0.05	ND	ND	<0.020
Anthracene	2.4	ug/L	<0.05	ND	<0.05	<0.05	<0.05	<0.05	ND	ND	<0.020
Benzo[a]anthracene	4.7	ug/L	<0.05	ND	<0.05	<0.05	<0.05	<0.05	ND	ND	<0.020
Benzo[a]pyrene	0.81	ug/L	<0.01	0.013	<0.01	<0.01	0.04	<0.01	<0.01	ND	<0.010
Benzo[b]fluoranthene	0.75	ug/L	<0.05	ND	<0.05	<0.05	<0.05	<0.05	ND	ND	<0.020
Benzo[g,h,i]perylene	0.2	ug/L	<0.05	ND	<0.05	<0.05	<0.05	<0.05	ND	ND	<0.020
Benzo[k]fluoranthene	0.4	ug/L	<0.05	ND	<0.05	<0.05	<0.05	<0.05	ND	ND	<0.020
Chrysene	1	ug/L	<0.05	ND	<0.05	<0.05	<0.05	<0.05	ND	ND	<0.020
Dibenzo[a,h]anthracene	0.52	ug/L	<0.05	ND	<0.05	<0.05	<0.05	<0.05	ND	ND	<0.020
Fluoranthene	130	ug/L	<0.05	0.08	<0.05	<0.05	0.075	<0.05	ND	ND	<0.020
Fluorene	400	ug/L	<0.05	0.095	<0.05	<0.05	0.065	<0.05	ND	ND	<0.020
Indeno[1,2,3-cd]pyrene	0.2	ug/L	<0.05	ND	<0.05	<0.05	<0.05	<0.05	ND	ND	<0.020
Methylnaphthalene, 1-	NV	ug/L	0.051	0.6	<0.05	<0.05	0.33	<0.05	ND	ND	<0.020
Methylnaphthalene, 2-	NV	ug/L	<0.05	ND	<0.05	<0.05	<0.05	<0.05	ND	ND	<0.020
Methylnaphthalene,2-(1-)-	1800	ug/L	<0.05	ND	<0.071	<0.071	-	-	ND	ND	<0.028
Naphthalene	1400	ug/L	0.12	ND	0.16	0.17	0.08	<0.05	ND	ND	<0.050
Phenanthrene	580	ug/L	0.038	0.13	<0.03	<0.03	0.11	<0.03	ND	ND	<0.020
Pyrene	68	ug/L	<0.05	0.09	<0.05	<0.05	0.11	<0.05	ND	ND	<0.020

ND = Not Detected

Results highlighted in red exceed Table 3 from the MOECC. Data extracted from the analytical report submitted by Maxxam Analytics

MW03-12	MOECC Table 3	UOM	2012	2014	2015	2016	2017	2018	2018	2019
F1 PHCs (C6-C10)***	750	ug/L	ND	ND	ND	ND	ND	ND	ND	<25
F1 PHCs (C6-C10)***BTEX	750	ug/L	ND	ND	-	-	-	-	-	<25
F2 PHCs (C10-C16)	150	ug/L	ND	ND	ND	270	ND	ND	ND	<100
F3 PHCs (C16-C34)	500	ug/L	ND	ND	ND	ND	ND	ND	ND	<100
F4 PHCs (C34-C50)	500	ug/L	ND	ND	ND	ND	ND	ND	ND	<250
Benzene	430	ug/L	ND	ND	ND	ND	ND	ND	ND	<0.50
Toluene	2300	ug/L	ND	ND	ND	ND	ND	ND	ND	<0.50
Ethybenzene	18000	ug/L	ND	ND	ND	ND	ND	ND	ND	<0.50
o-Xylene	-	ug/L	ND	ND	ND	ND	ND	ND	ND	<0.30
p+m Xylene	-	ug/L	ND	ND	ND	ND	ND	ND	ND	<0.40
Total Xylenes	4200	ug/L	ND	ND	ND	ND	ND	ND	ND	<0.50

ND = Not Detected

Results highlighted in red exceed Table 3 from the MOECC. Data extracted from the analytical report submitted by Maxxam Analytics

MW12-11	MOECC Table 3	UOM	12-Jan	12-Jan	14-Oct	15-Jun	15-Jun	15-Oct	16-Oct	17-Oct	17-Oct	18-Oct	19-Nov
Acenaphthene	600	ug/L	0.16	1.4	3.9	1.3	1.4	0.66	0.58	0.18	0.16	1.2	1.08
Acenaphthylene	1.8	ug/L	0.9	22	34	13	13	6.2	5.3	1.3	1.2	7.9	5.88
Anthracene	2.4	ug/L	0.02	0.66	2.3	0.7	0.72	0.29	0.34	ND	ND	0.28	0.563
Benzo[a]anthracene	4.7	ug/L	ND	0.27	0.075	<0.050	<0.050	<0.05	<0.05	ND	ND	ND	0.274
Benzo[a]pyrene	0.81	ug/L	ND	0.097	0.02	0.021	0.027	<0.01	<0.01	ND	ND	ND	0.118
Benzo[b]fluoranthene	0.75	ug/L	ND	0.11	ND	<0.050	<0.050	<0.05	<0.05	ND	ND	ND	0.090
Benzo[g,h,i]perylene	0.2	ug/L	ND	ND	ND	<0.050	<0.050	<0.05	<0.05	ND	ND	ND	0.035
Benzo[k]fluoranthene	0.4	ug/L	ND	ND	ND	<0.050	<0.050	<0.05	<0.05	ND	ND	ND	0.040
Chrysene	1	ug/L	ND	0.27	0.085	<0.050	<0.050	<0.05	<0.05	ND	ND	ND	0.242
Dibenzo[a,h]anthracene	0.52	ug/L	ND	ND	ND	<0.050	<0.050	<0.05	<0.05	ND	ND	ND	<0.020
Fluoranthene	130	ug/L	0.04	0.74	0.81	0.3	0.31	0.15	0.085	ND	ND	ND	0.531
Fluorene	400	ug/L	ND	4.8	13	5.1	5.3	2.1	1	0.36	0.29	0.11	2.31
Indeno[1,2,3-cd]pyrene	0.2	ug/L	ND	ND	ND	<0.050	<0.050	<0.05	<0.05	ND	ND	2.4	0.037
Methylnaphthalene, 1-	NV	ug/L	3.01	30	71	32	33	12	11	2.2	2	ND	6.95
Methylnaphthalene, 2-	NV	ug/L		1.3	0.065	0.055	0.055	<0.05	<0.05	ND	ND	11	6.92
Methylnaphthalene,2-(1-)-	1800	ug/L	3.01	31		32	33	12	-	2.2	ND	0.07	0.025
Naphthalene	1400	ug/L	1.96	57	9.3	6.1	6.5	1.1	1.2	0.22	0.19	0.43	0.243
Phenanthrene	580	ug/L	0.13	0.71	11	3.9	4	1.6	1.5	0.2	0.2	1.7	2.75
Pyrene	68	ug/L	0.05	1.2	1.2	0.45	0.47	0.23	0.12	ND	ND	0.13	0.804

ND = Not Detected

Results highlighted in red exceed Table 3 from the MOECC. Data extracted from the analytical report submitted by Maxxam Analytics

MW12-11	MOECC Table 3	UOM	2012	2014	2015	2016	2017	2017	2018	2019
F1 PHCs (C6-C10)***	750	ug/L	170	ND	31	150	ND	ND	ND	<25
F1 PHCs (C6-C10)***BTEX	750	ug/L	42	N/A	-	-	-	-	ND	<25
F2 PHCs (C10-C16)	150	ug/L	760	280	130	ND	ND	ND	110	<100
F3 PHCs (C16-C34)	500	ug/L	ND	ND	1400	ND	ND	ND	ND	<250
F4 PHCs (C34-C50)	500	ug/L	ND	ND	330	ND	ND	ND	ND	<250
Benzene	430	ug/L	7.5	2.5	16	2.3	1.2	1.1	2.8	1.17
Toluene	2300	ug/L	3.1	0.75	0.49	0.58	ND	ND	0.21	11.7
Ethylbenzene	18000	ug/L	76	31	22	19	13	12	29	<0.5
o-Xylene	-	ug/L	30	7.9	5.3	3.7	1.8	1.6	2.6	0.83
p+m Xylene	-	ug/L	15	0.79	0.43	0.59	ND	ND	ND	<0.43
Total Xylenes	4200	ug/L	45	8.7	5.8	4.3	1.8	1.6	ND	0.83

ND = Not Detected

Results highlighted in red exceed Table 3 from the MOECC. Data extracted from the analytical report submitted by Maxxam Analytics

FIGURE 7

Map identifying all well locations at 200 Lees Avenue

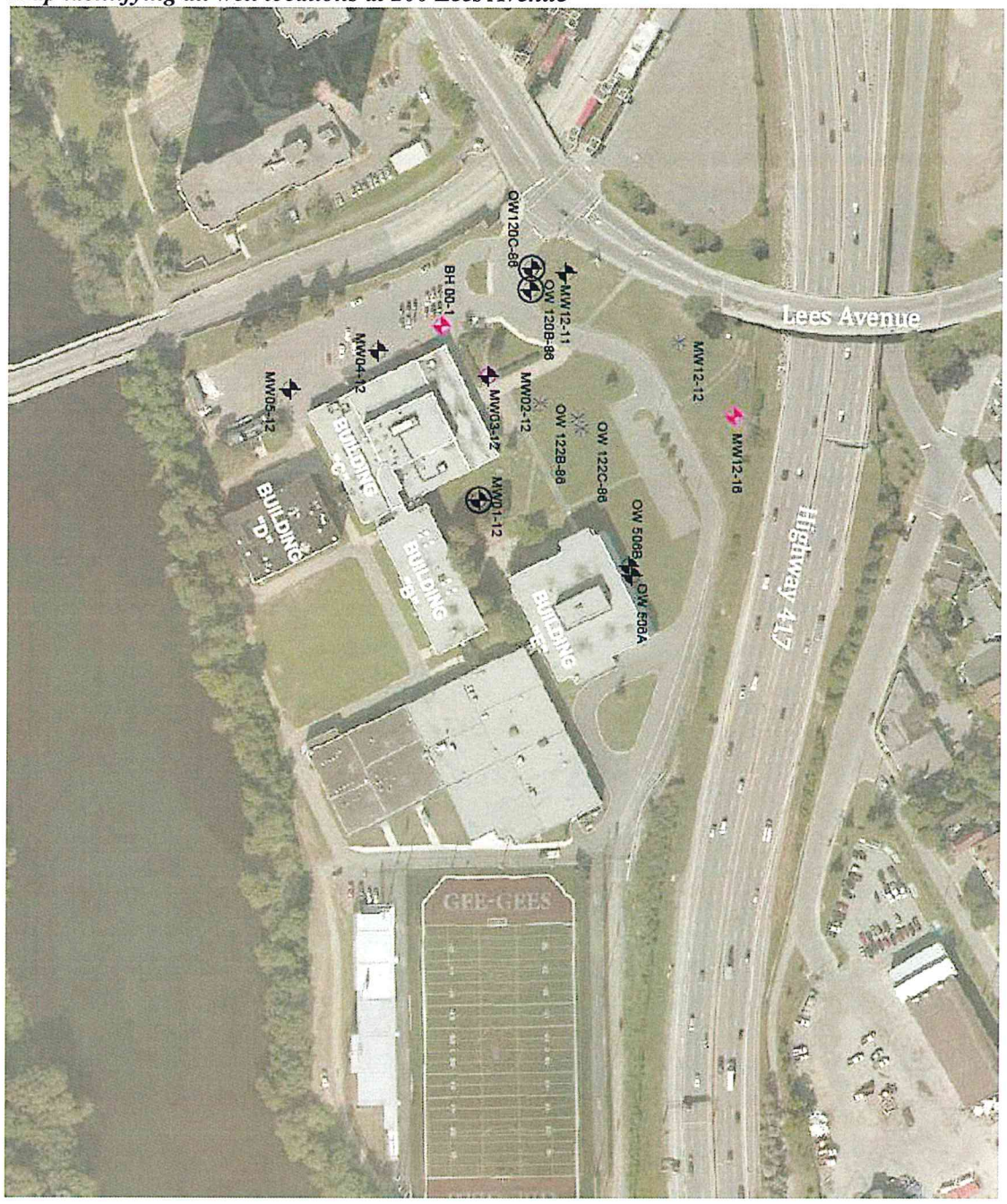


Table B-5
Soil Analytical Results, Polycyclic Aromatic Hydrocarbons

Soil Description			SAND and debris	Sand and gravel	ASH, brown, dry with thin topsoil cover	Sand and gravel	SAND and ash, with topsoil cover	SAND and ash, with topsoil cover	Duplicate Evaluation	Sand and gravel	Sand and gravel	Duplicate Evaluation	SAND, debris and ash
Borehole / Monitoring Well			BH1-12	BH1-12	BH2-12	BH2-12	BH3-12	BH3-12		BH3-12	BH3-12		BH4-12
Sample ID		**O.Reg. 153/04 Table 3[1]**	**BH1-12-1**	**BH1-12-2**	**BH2-12-1**	**BH2-12-2**	**BH3-12-1**	**BH-12-DUP1**		**BH3-12-2**	**BH-12-DUP2**		**BH4-12-1**
Sample Depth (m)			0 - 5.0	5.7 - 10.4	0 - 2.1	4.6 - 6.2	0 - 5.0	0 - 5.0		7.6 - 9.1	7.6 - 9.1		0 - 4.7
Sample Date			30/09/2012	30/09/2012	01/10/2012	01/10/2012	30/09/2012	30/09/2012		30/09/2012	30/09/2012		30/09/2012
Laboratory Sample ID			PB3325	PB3326	PB3328	PB3329	PB3331	PB3343		PB3332	PB3344		PB3334
% Moisture			19.0	11.0	18.0	7.4	19.0	18.0		10.0	9.6		21.0
Parameters (µg/g)	Acenaphthene	96	0.064	<0.0050	0.051	<0.0050	<0.050	0.068	0.043	<0.0050	<0.0050	Acceptable	<0.25
	Acenaphthylene	0.15	0.07	<0.0050	0.25	<0.0050	0.25	0.31	21%	0.0092	<0.0050	0.0067	<0.25
	Anthracene	0.67	0.21	<0.0050	0.27	<0.0050	0.22	0.32	37%	0.017	0.0054	0.0116	1.4
	Benzo(a)anthracene	0.96	0.94	<0.0050	1.1	<0.0050	0.8	1.1	32%	0.067	0.014	131%	5.2
	Benzo(a)pyrene	0.3	0.54	<0.0050	0.88	<0.0050	0.73	0.92	23%	0.061	0.014	125%	3.7
	Benzo(b/j)fluoranthene	0.96	0.98	<0.0050	1.2	<0.0050	0.96	1.2	22%	0.073	0.019	117%	5.5
	Benzo(g,h,i)perylene	9.6	0.35	<0.0050	0.5	<0.0050	0.52	0.56	7%	0.045	0.019	81%	2.1
	Benzo(k)fluoranthene	0.96	0.29	<0.0050	0.39	<0.0050	0.38	0.43	12%	0.023	0.0072	105%	1.7
	Chrysene	9.6	1	<0.0050	1.1	<0.0050	0.85	1.1	26%	0.077	0.024	105%	5.6
	Dibenz(a,h)anthracene	0.1	0.08	<0.0050	0.16	<0.0050	0.15	0.16	0.01	0.0092	<0.0050	0.0067	0.6
	Fluoranthene	9.6	2.5	<0.0050	2.2	<0.0050	1.3	1.8	32%	0.11	0.026	124%	9.7
	Fluorene	62	0.15	<0.0050	0.12	<0.0050	0.051	0.087	0.036	0.0099	<0.0050	0.0074	0.34
	Indeno(1,2,3-cd)pyrene	0.76	0.37	<0.0050	0.58	<0.0050	0.57	0.66	15%	0.045	0.015	100%	2.2
	1-Methylnaphthalene	---	<0.050	<0.0050	0.039	<0.0050	<0.050	<0.050	Acceptable	<0.0050	<0.0050	Acceptable	<0.25
	2-Methylnaphthalene	---	<0.050	<0.0050	0.044	<0.0050	<0.050	<0.050	Acceptable	<0.0050	<0.0050	Acceptable	<0.25
	Methylnaphthalene, 2-(1-)	76	<0.071	<0.0071	0.083	<0.0071	<0.071	<0.071	Acceptable	<0.0071	<0.0071	Acceptable	<0.35
	Naphthalene	9.6	0.069	<0.0050	0.066	<0.0050	<0.050	0.054	0.029	<0.0050	<0.0050	Acceptable	<0.25
	Phenanthrene	12	0.65	0.0052	1.3	<0.0050	0.56	0.91	48%	0.043	0.014	102%	4.7
	Pyrene	96	2.6	0.0052	1.7	<0.0050	1.1	1.5	31%	0.13	0.033	119%	8.1

Notes:

1 Soil, Ground Water and Sediment Standards for Use Under Section XV.1 of the *Ontario Environmental Protection Act* Table 3 Standards for sites with non-potable drinking water in a non-stratified condition with coarse grained soil and community land use (dated April 15, 2011).

RPD Relative percent difference (See report for RPD calculation details).

80% Denotes unacceptable RPD.

<20 Denotes Non-Detectable concentration (i.e., below RDL), in this case, RDL is 20

--- Not analysed or no criterion/guideline established.

20 Denotes exceedances MOE (2011) Standard - Table 3, Industrial/Commercial/Community Property Use, with coarse grain soil

20 Denotes a detection limit above MOE (2011) Standard - Table 3, Industrial/Commercial/Community Property Use, with coarse grain soil

Table B-5
Soil Analytical Results, Polycyclic Aromatic Hydrocarbons

Soil Description		**O.Reg. 153/04 Table 3[1]**	Sand and gravel	SAND, ash	Sand and gravel
Borehole / Monitoring Well			BH4-12	BH5-12	BH5-12
Sample ID			**BH4-12-2**	**BH5-12-1**	**BH5-12-2**
Sample Depth (m)			8.1 - 9.6	0 - 6.1	9-10.0
Sample Date			30/09/2012	01/10/2012	01/10/2012
Laboratory Sample ID			PB3338	PB3340	PB3341
% Moisture			8.0	21.0	10.0
Parameters (µg/g)	Acenaphthene	96	<0.0050	0.063	<0.0050
	Acenaphthylene	0.15	<0.0050	0.18	<0.0050
	Anthracene	0.67	0.0081	0.34	<0.0050
	Benzo(a)anthracene	0.96	0.015	1.1	<0.0050
	Benzo(a)pyrene	0.3	0.01	0.67	<0.0050
	Benzo(b/j)fluoranthene	0.96	0.012	0.84	<0.0050
	Benzo(g,h,i)perylene	9.6	0.0063	0.35	<0.0050
	Benzo(k)fluoranthene	0.96	<0.0050	0.29	<0.0050
	Chrysene	9.6	0.02	0.94	<0.0050
	Dibenz(a,h)anthracene	0.1	<0.0050	0.11	<0.0050
	Fluoranthene	9.6	0.038	2.2	<0.0050
	Fluorene	62	<0.0050	0.12	<0.0050
	Indeno(1,2,3-cd)pyrene	0.76	0.0058	0.42	<0.0050
	1-Methylnaphthalene	---	<0.0050	0.033	<0.0050
	2-Methylnaphthalene	---	<0.0050	0.055	<0.0050
	Methylnaphthalene, 2-(1-)	76	<0.0071	0.087	<0.0071
	Naphthalene	9.6	<0.0050	0.087	<0.0050
	Phenanthrene	12	0.022	1.3	0.0067
	Pyrene	96	0.031	1.7	<0.0050

Notes:

1 Soil, Ground Water and Sediment Standards for Use Under Section XV.1 of the *Ontario Environmental Protection Act* Table 3 Standards for sites with non-potable drinking water in a non-stratified condition with coarse grained soil and community land use (dated April 15, 2011).

RPD Relative percent difference (See report for RPD calculation details).

80% Denotes unacceptable RPD.

<20 Denotes Non-Detectable concentration (i.e., below RDL), in this case, RDL is 20

--- Not analysed or no criterion/guideline established.

20 Denotes exceedances MOE (2011) Standard - Table 3, Industrial/Commercial/Community Property Use, with coarse grain soil

20 Denotes a detection limit above MOE (2011) Standard - Table 3, Industrial/Commercial/Community Property Use, with coarse grain soil

Table B-6
Soil Analytical Results, Petroleum Hydrocarbons

Soil Description			SAND and debris	Sand and gravel	ASH, brown, dry with thin topsoil cover	Sand and gravel	SAND and ash, with topsoil cover	SAND and ash, with topsoil cover	Duplicate Evaluation	SAND and ash, with topsoil cover	SAND, debris and ash	Sand and gravel	SAND, ash	Sand and gravel	Sand and gravel
Borehole / Monitoring Well			BH1-12	BH1-12	BH2-12	BH2-12	BH3-12	BH3-12		BH3-12	BH4-12	BH4-12	BH5-12	BH5-12	BH5-12
Sample ID		**O.Reg. 153/04 Table 3[1]**	**BH1-12-1**	**BH1-12-2**	**BH2-12-1**	**BH2-12-2**	**BH3-12-1**	**BH-12-DUP1**		**BH-12-DUP1 Lab-Dup**	**BH4-12-1**	**BH4-12-2**	**BH5-12-1**	**BH5-12-2**	**BH5-12-2 Lab-Dup**
Sample Depth (m)			0 - 5.0	5.7 - 10.4	0 - 2.1	4.6 - 6.2	0 - 5.0	0 - 5.0		0 - 5.0	0 - 4.7	8.1 - 9.6	0 - 6.1	10.05 - 11.0	10.05 - 11.0
Sample Date			30/09/2012	30/09/2012	01/10/2012	01/10/2012	30/09/2012	30/09/2012		30/09/2012	30/09/2012	30/09/2012	01/10/2012	01/10/2012	01/10/2012
Laboratory Sample ID			PB3325	PB3326	PB3328	PB3329	PB3331	PB3343		PB3343	PB3334	PB3338	PB3340	PB3341	PB3341
% Moisture			19.0	11.0	18.0	7.4	19.0	18.0		18.0	21.0	8.0	21.0	10.0	
Parameters (µg/g)	Benzene	0.32	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	Acceptable	---	<0.02	<0.02	<0.02	<0.02	<0.02
	Toluene	68	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	Acceptable	---	<0.02	<0.02	<0.02	<0.02	<0.02
	Ethylbenzene	9.5	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	Acceptable	---	<0.02	<0.02	<0.02	<0.02	<0.02
	o-Xylenes	---	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	Acceptable	---	<0.02	<0.02	<0.02	<0.02	<0.02
	m,p-Xylenes	---	0.06	<0.04	<0.04	<0.04	<0.04	<0.04	Acceptable	---	<0.04	<0.04	<0.04	<0.04	<0.04
	Total Xylenes	26	0.09	<0.04	<0.04	<0.04	<0.04	<0.04	Acceptable	---	<0.04	<0.04	<0.04	<0.04	<0.04
	PHC fraction F1 (C6-C10)	---	<10	<10	<10	<10	<10	<10	Acceptable	---	<10	<10	<10	<10	<10
	PHC fraction F1 (C6-C10) - BTEX	55	<10	<10	<10	<10	<10	<10	Acceptable	---	<10	<10	<10	<10	<10
	PHC fraction F2 (C10-C16)	230	<10	<10	<10	<10	<10	<10	Acceptable	<10	<10	<10	<10	<10	---
	PHC fraction F3 (C16-C34)	1700	270	<10	59	<10	85	110	26%	120	630	<10	170	<10	---
	PHC fraction F4 (C34-C50)	3300	81	<10	37	<10	78	110	34%	190 (2)	230	<10	66	<10	---
	Chromatogram to baseline at nC50	---	Yes	Yes	Yes	Yes	Yes	No	NA	No	Yes	Yes	Yes	Yes	---

Notes:

1 Soil, Ground Water and Sediment Standards for Use Under Section XV.1 of the *Ontario Environmental Protection Act* Table 3 Standards for sites with non-potable drinking water in a non-stratified condition with coarse grained soil and community land use (dated April 15, 2011).

(2) According to the lab, Recovery or RPD for this parameter is outside control limits; however, the overall quality control for this analysis meets acceptability criteria.

RPD	Relative percent difference (See report for RPD calculation details)
80%	Denotes unacceptable RPD
<20	Denotes Non-Detectable concentration (i.e., below RDL), in this case, RDL is 20
---	Not analysed or no criterion/guideline established.
20	Denotes exceedances MOE (2011) Standard - Table 3, Industrial/Commercial/Community Property Use, with coarse grain soil
20	Denotes a detection limit above MOE (2011) Standard - Table 3, Industrial/Commercial/Community Property Use, with coarse grain soil

Table B-7
Soil Analytical Results, Metals

Soil Description		O.Reg. 153/04 Table 3[1]	SAND and debris	Sand and Gravel	ASH, brown, dry with thin topsoil cover	Sand and Gravel	SAND and ash, with topsoil cover	SAND and ash, with topsoil cover	Duplicate Evaluation	SAND and ash, with topsoil cover	SAND, debris and ash	Sand and Gravel	SAND, ash
Borehole / Monitoring Well			BH1-12	BH1-12	BH2-12	BH2-12	BH3-12	BH3-12		BH4-12	BH4-12	BH5-12	BH5-12
Sample ID			**BH1-12-1**	**BH1-12-2**	**BH2-12-1**	**BH2-12-2**	**BH3-12-1**	**BH-12-DUP1**		**BH4-12-1**	**BH4-12-2**	**BH5-12-1**	**BH5-12-2**
Sample Depth (m)			0 - 5.0	5.7 - 10.4	0 - 2.1	4.6 - 6.2	0 - 5.0	0 - 5.0		0 - 4.7	8.1 - 9.6	0 - 6.1	10.05 - 11.0
Sample Date			30/09/2012	30/09/2012	01/10/2012	01/10/2012	30/09/2012	30/09/2012		**30/09/2012**	30/09/2012	01/10/2012	01/10/2012
Laboratory Sample ID			PB3325	PB3326	PB3328	PB3329	PB3331	PB3343		PB3334	PB3338	PB3340	PB3341
Parameters (µg/g)	Acid Extractable Aluminum (Al)	---	5000	3600	5500	3000	6100	6100	0%	4000	5700	5200	4100
	Acid Extractable Antimony (Sb)	40	9.4	<0.20	12	<0.20	8.5	9.3	9%	11	0.21	11	<0.20
	Acid Extractable Arsenic (As)	18	28	2.1	16	1.6	17	15	13%	19	4.2	38	2.8
	Acid Extractable Barium (Ba)	670	510	62	320	69	290	260	11%	500	67	320	51
	Acid Extractable Beryllium (Be)	8	0.43	<0.20	0.69	<0.20	0.63	0.54	15%	0.32	0.24	0.56	0.21
	Acid Extractable Bismuth (Bi)	---	1.6	<1.0	<1.0	<1.0	<1.0	<1.0	Acceptable	<1.0	<1.0	<1.0	<1.0
	Acid Extractable Boron (B)	120	8.4	<5.0	5.8	<5.0	23	21	9%	6.6	<5.0	18	<5.0
	Acid Extractable Cadmium (Cd)	1.9	13	<0.10	0.85	<0.10	1.3	1.2	8%	0.84	<0.10	2	<0.10
	Acid Extractable Calcium (Ca)	---	16000	71000	25000	59000	33000	34000	3%	17000	46000	16000	86000
	Acid Extractable Chromium (Cr)	160	800	9.9	29	8.9	19	17	11%	30	13	24	10
	Acid Extractable Cobalt (Co)	80	9.6	4.8	8.7	4.5	10	9.7	3%	6.4	7.6	7.1	5.8
	Acid Extractable Copper (Cu)	230	1800	11	290	9.3	210	150	33%	3100	24	170	15
	Acid Extractable Iron (Fe)	---	46000	11000	41000	9900	21000	20000	5%	44000	17000	26000	13000
	Acid Extractable Lead (Pb)	120	26000	3.8	1100	3.3	610	500	20%	1700	12	1000	6.3
	Acid Extractable Magnesium (Mg)	---	880	6600	2100	6000	3200	3100	3%	2800	7900	1400	7400
	Acid Extractable Manganese (Mn)	---	360	170	300	160	270	260	4%	210	270	160	270
	Acid Extractable Molybdenum (Mo)	40	3.6	1	6.6	0.62	3.5	3	15%	2.9	2.3	6.3	1.1
	Acid Extractable Nickel (Ni)	270	17	11	28	8.6	23	22	4%	26	21	44	13
	Acid Extractable Phosphorus (P)	---	1000	900	1300	990	940	830	12%	740	810	1100	850
	Acid Extractable Potassium (K)	---	530	980	580	840	760	770	1%	610	1100	670	970
	Acid Extractable Selenium (Se)	5.5	6.6	<0.50	1.2	<0.50	1.5	1.3	14%	1.9	<0.50	3.6	<0.50
	Acid Extractable Silver (Ag)	40	1.3	<0.20	2.2	<0.20	0.43	0.41	5%	1.3	<0.20	0.61	<0.20
	Acid Extractable Sodium (Na)	---	240	260	250	190	960	990	3%	610	230	540	250
	Acid Extractable Strontium (Sr)	---	100	140	160	120	120	120	0%	88	99	83	150
	Acid Extractable Thallium (Tl)	3.3	0.27	0.067	0.14	0.074	0.19	0.18	5%	0.11	0.093	0.17	0.063
	Acid Extractable Tin (Sn)	---	470	<5.0	270	<5.0	140	180	25%	410	<5.0	170	<5.0
	Acid Extractable Uranium (U)	33	0.53	0.88	0.7	0.65	0.59	0.63	7%	0.68	1.1	1.7	0.8
	Acid Extractable Vanadium (V)	86	23	21	28	18	26	27	4%	21	20	25	19
	Acid Extractable Zinc (Zn)	340	1500	23	720	19	460	450	2%	1100	32	1000	19

Notes:

1 Soil, Ground Water and Sediment Standards for Use Under Section XV.1 of the *Ontario Environmental Protection Act* Table 3 Standards for sites with non-potable drinking water in a non-stratified condition with coarse grained soil and community land use (dated April 15, 2011).

(2) Detection Limit was raised due to matrix interferences.

RPD — Relative percent difference (See report for RPD calculation details)

80% — Denotes unacceptable RPD

<20 — Denotes Non-Detectable concentration (i.e., below RDL), in this case, RDL is 20

20 — Denotes exceedances MOE (2011) Standard - Table 3, Industrial/Commercial/Community Property Use, with coarse grain soil

20 — Denotes a detection limit above MOE (2011) Standard - Table 3, Industrial/Commercial/Community Property Use, with coarse grain soil

--- Not analysed or no criterion/guideline established.

Table B-8
Soil Analytical Results, Polychlorinated Biphenyls

Soil Description		O.Reg. 153/04 Table 3[1]	SAND and debris	ASH, brown, dry with thin topsoil cover	SAND and ash, with topsoil cover	SAND and ash, with topsoil cover	Sand and Gravel
Borehole / Monitoring Well			BH1-12	BH2-12	BH3-12	BH4-12	BH5-12
Sample ID			**BH1-12-1**	**BH2-12-1**	**BH3-12-1**	**BH4-12-1**	**BH5-12-1**
Sample Depth (m)			0 - 5.0	0 - 2.1	0 - 5.0	0 - 4.7	0 - 6.1
Sample Date			30/09/2012	01/10/2012	30/09/2012	30/09/2012	01/10/2012
Laboratory Certificate			PB3325	PB3328	PB3331	PB3334	PB3340
Parameters (µg/g)	Aroclor 1016	---	<0.010	<0.010	<0.010	<0.010	<0.010
	Aroclor 1221	---	<0.010	<0.010	<0.010	<0.010	<0.010
	Aroclor 1232	---	<0.010	<0.010	<0.010	<0.010	<0.010
	Aroclor 1242	---	<0.010	<0.010	<0.010	<0.010	<0.010
	Aroclor 1248	---	<0.010	<0.010	<0.010	<0.010	<0.010
	Aroclor 1254	---	<0.010	<0.010	<0.010	<0.010	<0.010
	Aroclor 1260	---	<0.010	<0.010	0.013	<0.010	<0.010
	Aroclor 1262	---	<0.010	<0.010	<0.010	<0.010	<0.010
	Aroclor 1268	---	<0.010	<0.010	<0.010	<0.010	<0.010
	Total PCB	1.1	<0.010	<0.010	0.013	<0.010	<0.010

Notes:

1 Soil, Ground Water and Sediment Standards for Use Under Section XV.1 of the Ontario Environmental Protection Act Table 3 Standards for sites with non-potable drinking water in a non-stratified condition with coarse grained soil and community land use (dated April 15, 2011).

RPD — Relative percent difference (See report for RPD calculation details).

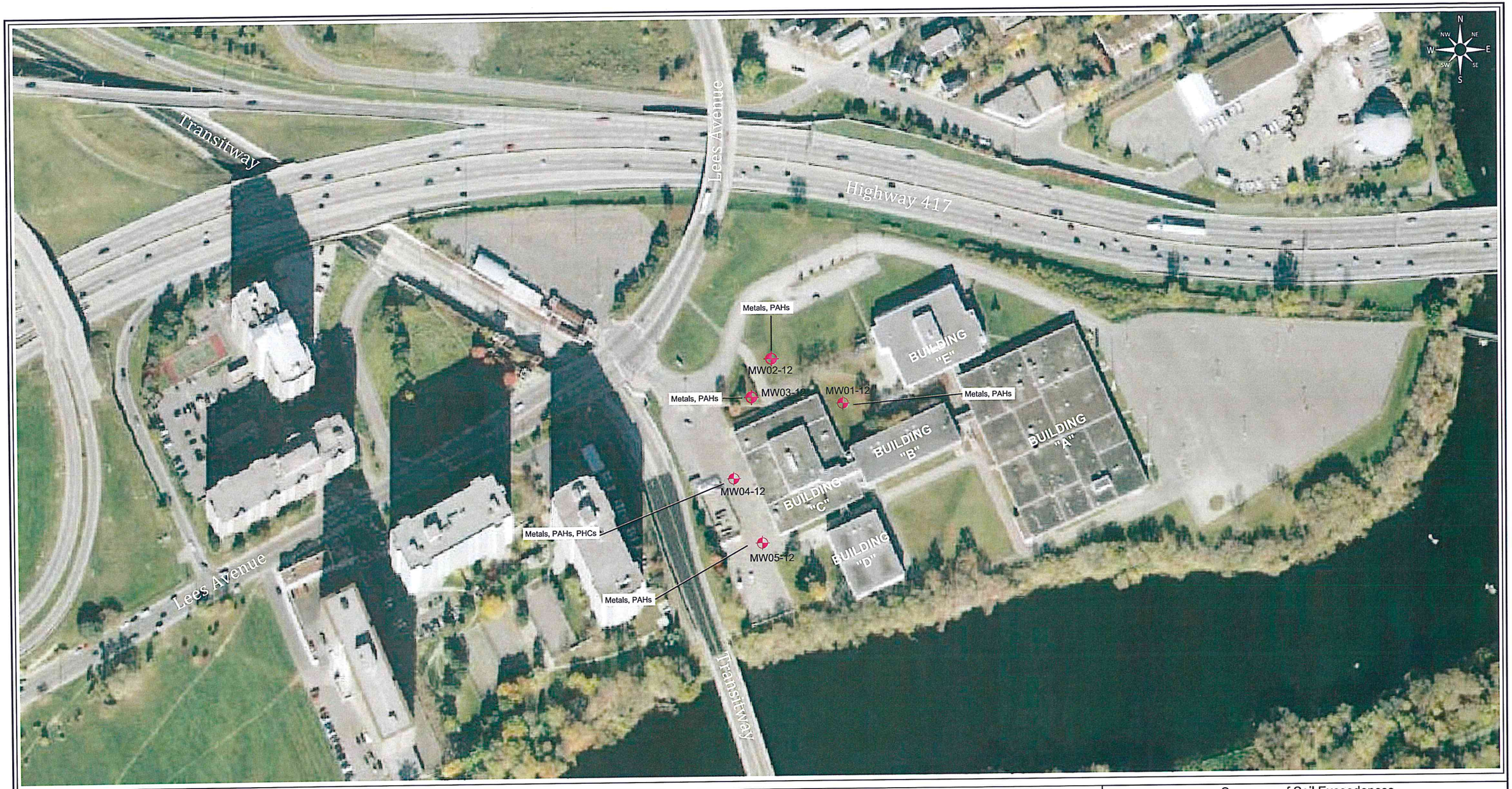
80% — Denotes unacceptable RPD.

<20 — Denotes Non-Detectable concentration (i.e., below RDL), in this case, RDL is 20

--- — Not analysed or no criterion/guideline established.

20 — Denotes exceedances MOE (2011) Standard - Table 3, Industrial/Commercial/Community Property Use, with coarse grain soil

20 — Denotes a detection limit above MOE (2011) Standard - Table 3, Industrial/Commercial/Community Property Use, with coarse grain soil



Legend

Monitoring Well Locations, installed 2012 by Franz

metals, PAHs — Indicates compounds exceeding soil standards

ND - Non Detected

updated on:4-Apr-13 by rfletcher

Attachment A4 - Excerpts from Franz (2013)

Title: Summary of Soil Exceedances
Stage II Investigation October 2012

FRANZ ENVIRONMENTAL INC.
♦ CONSULTING ♦ ENGINEERING ♦ TECHNOLOGIES ♦

Project: Environmental Site Assessment
Coal Tar Plume
200 Lees Ave, Ottawa, Ontario

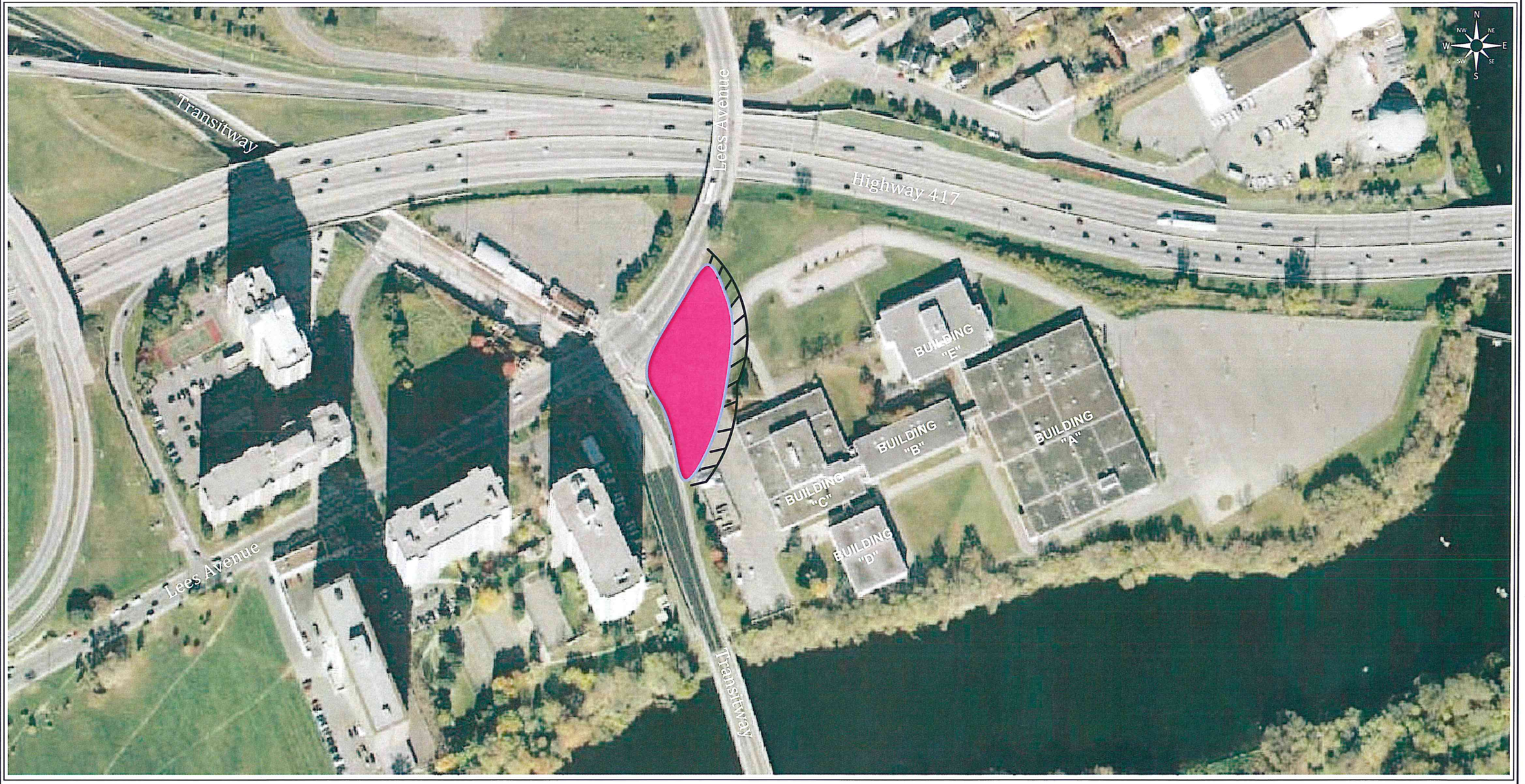
Date: April 2013

Client: University of Ottawa

Scale 1:2000
24 16 8 0 20 40 60
metres

Figure 5

Z:\Projects\2012\1329-1202 UoO Remedial Planning\ESA Coal Tar Drilling\Figures\1-CAD\April 2013\1329-1202 UofO - exceedances.dwg (layout)



Legend

Updated extent of subsurface contamination by dissolved PAHs area (Franz, 2012)

Coal/Oil/Tar impact at 191 and 200 Lees Ave

Attachment A4 - Excerpts from Franz (2013)

Title: Estimated Extent of Impacts at 193 and 200 Lees Avenue

FRANZ ENVIRONMENTAL INC.
♦ CONSULTING ♦ ENGINEERING ♦ TECHNOLOGIES ♦

Project: Environmental Site Assessment
Coal Tar Plume
200 Lees Ave, Ottawa, Ontario

Date: April 2013

Client: University of Ottawa

Scale 1:2000
24 16 8 0 20 40 60
metres

Figure 6

updated on:4-Apr-13 by rfletcher

Z:\Projects\2012\1329-1202 UoO Remedial Planning\ESA Coal Tar Drilling\Figures\1-CAD\April 2013\1329-1202 UofO - exceedances.dwg (layout)

Table B.1
Drive-Point Soil Sampling Results - February 2001
Algonquin College, Rideau Campus, Ottawa, Ontario

Parameter Name	GUCSO Table B - Res/Park	PS-A1-10 Result	PS-A1-10 MDL	PS-A1-60 Result	PS-A1-60 MDL	PS-A2-10 Result	PS-A2-10 MDL	PS-A2-60 Result	PS-A2-60 MDL	PS-A3-10 Result	PS-A3-10 MDL	PS-A3-60 Result	PS-A3-60 MDL	PS-A4-10 Result	PS-A4-10 MDL	PS-A4-60 Result	PS-A4-60 MDL	PS-A1-E Result	PS-A1-E MDL	PS-A2-C Result	PS-A2-C MDL	PS-A4-60 (dup) Result	PS-A4-60 (dup) MDL
Antimony	13	<1	1	<1	1	<1	1	3.1	1	<1	1	<1	1	<1	1	7.7	1	-		-		3.6	1
Arsenic	20	5.6	1	3.8	1	6.4	1	12	1	3.4	1	7.5	1	1.6	1	10	1	-		-		8	1
Barium	750	170	0.1	250	0.1	150	0.1	380	0.1	78	0.1	160	0.1	63	0.1	220	0.1	-		-		230	0.1
Beryllium	1.2	0.38	0.1	0.67	0.1	0.42	0.1	0.42	0.1	0.35	0.1	0.47	0.1	0.39	0.1	0.52	0.1	-		-		0.51	0.1
Boron	1.5	0.16	0.01	0.075	0.01	0.34	0.01	0.29	0.01	0.076	0.01	0.061	0.01	0.071	0.01	0.072	0.01	-		-		0.12	0.01
Cadmium	12	0.88	0.3	0.32	0.3	0.99	0.3	11	0.3	0.51	0.3	0.61	0.3	0.46	0.3	3.9	0.3	-		-		1.5	0.3
Chromium	750	23	0.5	31	0.5	22	0.5	44	0.5	22	0.5	10	0.5	17	0.5	43	0.5	-		-		17	0.5
Chromium (VI)	8	<1	1	<0.5	0.5	<1	1	<1	1	<1	1	<0.5	0.5	<0.5	0.5	<1	1	-		-		<0.5	0.5
Cobalt	40	5	0.5	10	0.5	5.7	0.5	8.3	0.5	4.8	0.5	4.1	0.5	4.3	0.5	8.6	0.5	-		-		5.8	0.5
Copper	225	41	0.3	43	0.3	48	0.3	260	0.3	30	0.3	76	0.3	18	0.3	140	0.3	-		-		94	0.3
Lead	200	200	2.5	150	2.5	290	2.5	780	2.5	98	2.5	240	2.5	45	2.5	340	2.5	-		-		370	2.5
Mercury	10	0.18	0.05	0.11	0.05	0.29	0.05	5.5	0.05	0.1	0.05	0.2	0.05	0.05	0.05	0.5	0.05	-		-		0.48	0.05
Molybdenum	40	2.3	0.8	1.5	0.8	2.8	0.8	3.9	0.8	0.78	0.8	1.7	0.8	<0.8	0.8	8.3	0.8	-		-		2.9	0.8
Nickel	150	24	1	20	1	16	1	31	1	12	1	13	1	11	1	31	1	-		-		19	1
Selenium	10	<1	1	<1	1	<1	1	<1	1	<1	1	<1	1	<1	1	<1	1	-		-		<1	1
Silver	20	<0.7	0.7	<0.7	0.7	<0.7	0.7	1.9	0.7	<0.7	0.7	<0.7	0.7	<0.7	0.7	9.4	0.7	-		-		<0.7	0.7
Thallium	1	<1	1	<1	1	<1	1	<1	1	<1	1	<1	1	<1	1	<1	1	-		-		<1	1
Vanadium	200	19	0.3	45	0.3	25	0.3	21	0.3	25	0.3	16	0.3	27	0.3	23	0.3	-		-		19	0.3
Zinc	600	150	0.3	200	0.3	240	0.3	780	0.3	83	0.3	150	0.3	61	0.3	640	0.3	-		-		280	0.3
Cyanide																							
Free Cyanide	100	-	-	<0.1	0.1	-	-	<0.1	0.1	-	-	<0.1	0.1	-	-	<0.1	0.1	-	-	-	-	-	-
PAH																							
Acenaphthene	1000	0.028	0.01	0.338	0.1	0.076	0.01	0.383	0.1	0.014	0.01	0.651	0.1	0.013	0.01	0.101	0.01	<0.1	0.1	0.296	0.1	0.109	0.01
Acenaphthylene	100	0.09	0.005	0.651	0.05	0.272	0.005	0.732	0.05	0.1	0.005	1.78	0.05	0.0465	0.005	0.397	0.005	0.125	0.05	0.537	0.05	0.391	0.005
Anthracene	28	0.136	0.005	1.44	0.05	0.354	0.005	1.57	0.05	0.09	0.005	4.3	0.05	0.053	0.005	0.518	0.005	0.137	0.05	1.21	0.05	0.481	0.005
Benzo(a)anthracene	40	0.543	0.01	3.17	0.1	1.13	0.01	4.28	0.1	0.433	0.01	8.4	0.1	0.188	0.01	1.56	0.01	0.453	0.1	3.21	0.1	1.41	0.01
Benzo(a)pyrene	1.2	0.516	0.005	1.5	0.05	1.07	0.005	2.06	0.05	0.278	0.005	2.49	0.05	0.133	0.005	1.04	0.005	0.276	0.05	1.45	0.05	0.839	0.005
Benzo(b)fluoranthene	12	0.467	0.01	1.88	0.1	1	0.01	2.38	0.1	0.325	0.01	2.46	0.1	0.14	0.01	1.14	0.01	0.445	0.1	1.79	0.1	0.921	0.01
Benzo(ghi)perylene	40	0.325	0.02	0.755	0.2	0.615	0.02	1.1	0.2	0.164	0.02	1.07	0.2	0.088	0.02	0.619	0.02	0.342	0.2	0.817	0.2	0.49	0.02
Benzo(k)fluoranthene	12	0.285	0.01	0.934	0.1	0.56	0.01	1.34	0.1	0.193	0.01	1.59	0.1	0.074	0.01	0.573	0.01	0.188	0.1	0.901	0.1	0.529	0.01
Chrysene	12	0.438	0.01	2.46	0.1	0.803	0.01	3.28	0.1	0.319	0.01	4.05	0.1	0.152	0.01	1.22	0.01	0.481	0.1	2.48	0.1	1.11	0.01
Dibenzo(a,h)anthracene	1.2	0.098	0.02	0.303	0.2	0.199	0.02	0.434	0.2	0.081	0.02	0.496	0.2	0.023	0.02	0.252	0.02	<0.2	0.2	0.311	0.2	0.201	0.02
Fluoranthene	40	0.808	0.005	4.9	0.05	1.58	0.005	6.86	0.05	0.554	0.005	9.85	0.05	0.298	0.005	2.27	0.005	0.518	0.05	5.22	0.05	2.05	0.005
Fluorene	350	0.038	0.005	0.548	0.05	0.121	0.005	0.572	0.05	0.025	0.005	4.07	0.05	0.0138	0.005	0.182	0.005	<0.05	0.05	0.398	0.05	0.168	0.005
Indeno(1,2,3-cd)pyrene	12	0.27	0.02	0.713	0.2	0.581	0.02	1.07	0.2	0.161	0.02	1.11	0.2	0.082	0.02	0.625	0.02	0.258	0.2	0.758	0.2	0.459	0.02
Naphthalene	40	0.016	0.005	0.113	0.05	0.047	0.005	0.162	0.05	0.011	0.005	1.29	0.05	<0.005	0.005	0.06	0.005	0.122	0.05	0.155	0.05	0.07	0.005
Phenanthrene	40	0.481	0.005	4.48	0.05	1.12	0.005	5.32	0.05	0.324	0.005	14.5	0.05	0.148	0.005	1.87	0.005	0.292	0.05	4.11	0.05	1.83	0.005
Pyrene	250	0.645	0.005	3.9	0.05	1.24	0.005	5.57	0.05	0.448	0.005	7.31	0.05	0.239	0.005	1.82	0.005	0.482	0.05	4.4	0.05	1.61	0.005

Shading indicates exceedance of GUCSO Table B

VOCs Parameter Name		PS-A2-A Result	PS-A2-A MDL	PS-A2-D Result	PS-A2-D MDL	PS-A3-A Result	PS-A3-A MDL
1,1,1,2-Tetrachloroethane	0.019	ND	0.01	ND	0.01	ND	0.01
1,1,1-Trichloroethane	26	ND	0.01	ND	0.01	ND	0.01
1,1,2,2-Tetrachloroethane	0.037	ND	0.01	ND	0.01	ND	0.01
1,1,2-Trichloroethane	2.3	ND	0.02	ND	0.02	ND	0.02
1,1-Dichloroethane	22	ND	0.01	ND	0.01	ND	0.01
1,1-Dichloroethylene	0.0024	ND	0.0024	ND	0.0024	ND	0.0024
1,2-Dibromoethane (EDB)	0.0056	ND	0.005	ND	0.005	ND	0.005
1,2-Dichlorobenzene	30	ND	0.01	ND	0.01	ND	0.01
1,2-Dichloroethane	0.022	ND	0.01	ND	0.01	ND	0.01
1,2-Dichloropropane	0.019	ND	0.01	ND	0.01	ND	0.01
1,3-Dichlorobenzene	30	ND	0.01	ND	0.01	ND	0.01
1,4-Dichlorobenzene	30	ND	0.01	ND	0.01	ND	0.01
Acetone	3.8	ND	0.15	ND	0.15	ND	0.15
Benzene	5.3	ND	0.005	ND	0.005	ND	0.005
Bromodichloromethane	14	ND	0.01	ND	0.01	ND	0.01
Bromoform	2.3	ND	0.02	ND	0.02	ND	0.02
Bromomethane	0.061	ND	0.02	ND	0.02	ND	0.02
Carbon Tetrachloride	0.1	ND	0.01	ND	0.01	ND	0.01
Chlorobenzene	8	ND	0.005	ND	0.005	ND	0.005
Chloroform	0.79	ND	0.01	ND	0.01	ND	0.01
cis-1,2-Dichloroethylene	2.3	ND	0.01	ND	0.01	ND	0.01
cis-1,3-Dichloropropene	0.088	ND	0.005	ND	0.005	ND	0.005
Dibromochloromethane	10	ND	0.01	ND	0.01	ND	0.01
Dichloromethane(Methyler	120	ND	0.01	ND	0.01	ND	0.01
Ethylbenzene	280	ND	0.005	ND	0.005	ND	0.005
Methyl isobutyl ketone - (M	58	ND	0.1	ND	0.1	ND	0.1
Methyl t-butyl ether (MTBE	100	ND	0.02	ND	0.02	ND	0.02
Methyl-ethyl ketone - (2-Bu	38	ND	0.15	ND	0.15	ND	0.15
o-Xylene	34	ND	0.005	ND	0.005	ND	0.005
p+m-Xylene	34	ND	0.005	ND	0.005	ND	0.005
Styrene	1.2	ND	0.01	ND	0.01	ND	0.01
Tetrachloroethylene	0.45	ND	0.01	ND	0.01	ND	0.01
Toluene	34	ND	0.005	ND	0.005	ND	0.005
trans-1,2-Dichloroethylene	4.1	ND	0.01	ND	0.01	ND	0.01
trans-1,3-Dichloropropene	0.088	ND	0.005	ND	0.005	ND	0.005
Trichloroethylene	1.1	ND	0.01	ND	0.01	ND	0.01
Vinyl Chloride	0.003	ND	0.003	ND	0.003	ND	0.003

Table B.3
Crawl Space Soil Sampling Results - February 2001
Algonquin College, Rideau Campus, Ottawa, Ontario

Parameter	Table B - Res/Park	CSS-A	CSS-B	CSS-C	CSS-C	CSS-D
Metals						
Antimony	13	**14.5**	<1	<1	-	<1
Arsenic	20	10.2	5	3	-	2
Barium	750	214	74.8	42.9	-	31
Beryllium	1.2	0.5	0.4	0.3	-	0.3
Boron	1.5	**9.82**	1.06	0.11	-	0.03
Cadmium	12	4.1	<0.3	0.4	-	0.3
Chromium	750	17.4	10.6	8.7	-	7.1
Chromium (VI)	8	<0.25	<0.05	<0.05	-	<0.05
Cobalt	40	8.6	7.5	3.7	-	3.6
Copper	225	62	28.9	16.7	-	12.4
Lead	200	**1360**	29.2	26.9	-	15.1
Mercury	10	1.11	0.09	0.14	-	<0.05
Molybdenum	40	2.5	1	<0.6	-	0.7
Nickel	150	23.4	20.4	8	-	8
Selenium	10	1	<1	<1	-	<1
Silver	20	<0.7	<0.7	<0.7	-	<0.7
Thallium	4.1	<1	<1	<1	-	<1
Vanadium	200	17.6	13.9	13.4	-	10.5
Zinc	600	264	56.5	44.9	-	26.2
Cyanide						
Free Cyanide	100	-	-	<0.1	-	-
PAH						
Acenaphthene	1000	0.033	<0.01	<0.01	<0.05	<0.01
Acenaphthylene	100	0.178	0.015	0.014	<0.05	0.014
Anthracene	28	0.247	0.017	0.011	<0.05	0.017
Benzo(a)anthracene	40	0.736	0.063	0.034	<0.05	0.067
Benzo(a)pyrene	1.2	0.337	0.016	0.015	<0.05	0.026
Benzo(b)fluoranthene	12	0.459	0.04	0.024	<0.05	0.039
Benzo(ghi)perylene	40	0.261	0.028	<0.02	<0.1	<0.02
Benzo(k)fluoranthene	12	0.26	0.021	0.013	<0.05	0.018
Chrysene	12	0.595	0.057	0.033	<0.05	0.055
Dibenzo(a,h)anthracene	1.2	0.107	<0.02	<0.02	<0.1	<0.02
Fluoranthene	40	1.07	0.11	0.068	0.064	0.099
Fluorene	350	0.057	<0.005	<0.005	<0.05	<0.005
Indeno(1,2,3-cd)pyrene	12	0.265	0.032	<0.02	<0.1	<0.02
Naphthalene	40	0.039	0.007	0.009	-	0.016
Phenanthrene	40	0.759	0.07	0.069	0.057	0.066
Pyrene	250	0.783	0.085	0.047	<0.05	0.08
Semi-Volatiles						
Biphenyl	4.3	-	-	<0.1	-	-
Bis(2-chloroethyl)ether	0.66	-	-	<0.2	-	-
Bis(2-chloroisopropyl)ether	0.82	-	-	<0.2	-	-
4-Chloroaniline	1.3	-	-	<1.3	-	-
Bis(2-ethylhexyl)phthalate	130	-	-	1.6	-	-
2-Chlorophenol	10	-	-	<0.1	-	-
1,2-Dichlorobenzene	30	-	-	<0.2	-	-
1,3-Dichlorobenzene	30	-	-	<0.2	-	-
1,4-Dichlorobenzene	30	-	-	<0.2	-	-
3,3'-Dichlorobenzidine	1.3	-	-	<1.3	-	-
2,4-Dichlorophenol	10	-	-	<0.2	-	-
2,4-Dimethylphenol	140	-	-	<0.2	-	-
2,4-Dinitrophenol	4.1	-	-	<0.2	-	-

Table B.3
Crawl Space Soil Sampling Results - February 2001
Algonquin College, Rideau Campus, Ottawa, Ontario

Parameter	Table B - Res/Park	CSS-A	CSS-B	CSS-C	CSS-C	CSS-D
2,4-Dinitrotoluene	1.1	-	-	<0.2	-	-
Diethyl phthalate	0.71	-	-	<0.2	-	-
Dimethyl phthalate	0.7	-	-	<0.2	-	-
Hexachlorobutadiene	0.38	-	-	<0.2	-	-
Hexachloroethane	3.8	-	-	<0.2	-	-
1-Methylnaphthalene	280	-	-	<0.05	-	-
2-Methylnaphthalene	280	-	-	<0.05	-	-
Pentachlorophenol	5	-	-	<0.2	-	-
Phenol	40	-	-	<0.2	-	-
1,2,4-Trichlorobenzene	30	-	-	<0.2	-	-
2,4,5-Trichlorophenol	10	-	-	<0.2	-	-
2,4,6-Trichlorophenol	10	-	-	<0.2	-	-
VOCs						
1,1-Dichloroethane	22	-	-	<0.01	-	-
1,1-Dichloroethylene	0.0024	-	-	<0.0024	-	-
1,1,1-Trichloroethane	26	-	-	<0.01	-	-
1,1,1,2-Tetrachloroethane	0.019	-	-	<0.01	-	-
1,1,2-Trichloroethane	2.3	-	-	<0.02	-	-
1,1,2,2-Tetrachloroethane	0.037	-	-	<0.01	-	-
1,2-Dibromoethane (EDB)	0.0056	-	-	<0.005	-	-
1,2-Dichlorobenzene	30	-	-	<0.01	-	-
1,2-Dichloroethane	0.022	-	-	<0.01	-	-
cis-1,2-Dichloroethylene	2.3	-	-	<0.01	-	-
trans-1,2-Dichloroethylene	4.1	-	-	<0.01	-	-
1,2-Dichloropropane	0.019	-	-	<0.01	-	-
1,3-Dichlorobenzene	30	-	-	<0.01	-	-
cis-1,3-Dichloropropene	0.066	-	-	<0.005	-	-
trans-1,3-Dichloropropene	0.066	-	-	<0.005	-	-
1,4-Dichlorobenzene	30	-	-	<0.01	-	-
Acetone	3.8	-	-	<0.15	-	-
Benzene	5.3	-	-	<0.005	-	-
Bromodichloromethane	14	-	-	<0.01	-	-
Bromoform	2.3	-	-	<0.02	-	-
Bromomethane	0.061	-	-	<0.02	-	-
Carbon Tetrachloride	0.1	-	-	<0.01	-	-
Chlorobenzene	8	-	-	<0.005	-	-
Chloroform	0.79	-	-	<0.01	-	-
Dibromochloromethane	10	-	-	<0.01	-	-
Dichloromethane(Methylene Chloride)	120	-	-	<0.01	-	-
Ethylbenzene	290	-	-	<0.005	-	-
Methyl-ethyl ketone - (2-Butanone)	38	-	-	<0.15	-	-
Methyl t-butyl ether (MTBE)	100	-	-	<0.02	-	-
Methyl isobutyl ketone - (MIBK)	58	-	-	<0.1	-	-
Styrene	1.2	-	-	<0.01	-	-
Tetrachloroethylene	0.45	-	-	<0.01	-	-
Toluene	34	-	-	<0.005	-	-
Trichloroethylene	1.1	-	-	<0.01	-	-
Vinyl Chloride	0.003	-	-	<0.003	-	-
o-Xylene	34	-	-	<0.005	-	-
p+m-Xylene	34	-	-	<0.005	-	-

Shading indicates exceedance of GUCSO Table B

Attachment A5 - Excerpts from CH2MHill (2002)

Table B.7
Riverbank Sampling Results - May 30, 2001
Algonquin College, Rideau Campus, Ottawa, Ontario

Parameter (µg/g)	GUCSO		HS-1A	HS-1B	HS-2A	HS-2B	HS-3A	HS-3B	HS-4A	HS-4B	HS-5A	HS-5B	HS-6A	HS-6B	HS-7A	HS-7B	HS-8A	HS-8B	HS-9A	HS-9B	HS-10A	HS-10B	B-1	B-2	B-3		Previous Site
Depth	Table B - Res/Park	RL	(0-10cm)	(10-30cm)	(0-10cm)	(10-30cm)	(0-10cm)	(10-30cm)	(0-10cm)	(0-10cm)	(0-10cm)	(10-30cm)	(0-10cm)	(10-30cm)	(0-10cm)	(10-30cm)	(0-10cm)	(10-30cm)	(0-10cm)	(10-30cm)	(0-10cm)	(10-30cm)	(0-10cm)	(0-10cm)	(0-10cm)	Average	Average Determined (Table 4.2 of SSRA)
pH	6-9		8.3	8.2	8.2	8.2	8	8.2	8.3	8.2	8.4	8.2	8.1	8.2	8	8.1	8.3	8	8.3	8.6	8.2	8.4	8.3	8.4	7.9	-	-
TOC (%)	-	0.1	2.3	2.4	2.9	1.8	3.5	3.7	3.2	2.3	2.1	3.6	4.9	2.9	4.1	3.1	2.6	1.8	1.2	1	1.8	1.2	3.4	2	2	-	-
Antimony	13	1	<0.5	<0.5	<0.5	<0.5	1	2	3	<0.5	<0.5	<0.5	3	<1	<0.5	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.85	4.04
Arsenic	20	1	7	11	4	4	14	25	18	16	4	13	14	16	5	13	9	6	5	4	4	3	11	6	17	9.96	9.43
Barium	750	1	259	322	168	155	358	497	352	321	100	448	394	446	174	327	326	242	202	163	127	248	311	258	543	293	311
Beryllium	1.2	0.5	<0.25	0.5	<0.25	<0.25	<0.25	0.6	0.5	<0.25	<0.25	1.1	0.6	0.6	<0.25	0.6	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0.7		nc
Boron	1.5	0.5	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0.25	0.647
Cadmium	12	1	<0.5	1	<0.5	<0.5	1	2	2	1	<0.5	2	1	2	<0.5	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	<0.5	2		nc
Chromium	750	1	39	50	29	28	33	43	88	45	19	36	30	39	28	37	42	41	26	19	14	16	30	39	35		nc
Cobalt	40	1	8.3	9	7	7	6	8	6	7	5	8	8	8	6	8	9	9	7	6	5	6	7	8	9		nc
Copper	225	1	97	134	61	53	141	228	111	123	61	166	138	207	73	197	134	95	65	51	81	60	134	94	218	118	315
Lead	200	5	569	888	229	198	749	1170	2610	1340	223	654	735	1000	436	787	682	400	862	227	230	3030	[illegible]	[illegible]	1070	816	1428
Mercury	10	0.01	0.34	0.42	0.22	0.19	0.86	1.08	0.83	1.15	0.2	0.45	0.57	0.68	0.42	0.51	0.52	0.52	0.2	0.15	0.46	0.22	0.58	0.44	0.91	0.52	1.15
Molybdenum	40	1	1.6	2	1	1	3	5	2	2	1	2	3	4	1	3	2	1	1.3	1	<0.5	1	3	1	4		nc
Nickel	150	1	28.3	36	19	20	27	37	22	24	15	29	29	36	20	36	34	30	20.1	22	14	26	35	27	29		nc
Selenium	10	1	1.6	2	<0.5	<0.5	1	2	3	3	<0.5	1	2	2	<0.5	1	1	1	<0.5	1	<0.5	<0.5	1	1	2		nc
Silver	20	1	<0.5	1	1	<0.5	3	3	<0.5	<0.5	<0.5	2	2	2	1	2	1	<0.5	<0.5	<0.5	<0.5	<0.5	2	<0.5	2		nc
Sodium	-	50	408	499	302	311	261	353	500	429	238	526	267	319	276	377	308	295	261	204	206	348	300	345	484		nc
Thallium	4.1	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		nc
Vanadium	200	1	33.2	37	28	32	25	33	27	28	17	34	26	27	24	30	35	36	20.3	18	15	21	24	30	29		nc
Zinc	600	1	357	488	297	245	578	839	474	496	186	648	551	762	346	690	632	315	292	182	259	1160	543	316	658	493	863
PAH																											
Acenaphthene	1000	0.05	<0.5						<0.5						<0.5										<1		nc
Acenaphthylene	100	0.05	<0.5						<0.5						<0.5										<1		nc
Anthracene	28	0.05	1.84						<0.5						1.54										4.78	2.17	2.37
Benzo(a)anthracene	40	0.05	5.13						1.38						2.54										2.82	2.98	4.27
Benzo(a)pyrene	1.2	0.02	6.17						1.18						2.5										2.5	2.85	3.43
Benzo(b)fluoranthene	12	0.05	11.7						3.55						5.59										5.82	6.67	7.36
Benzo(ghi)perylene	40	0.05	4.07						<0.5						1.61										<1		nc
Benzo(k)fluoranthene	12	0.05	<0.5						<0.5						<0.5										<1	0.63	1.73
Chrysene	12	0.05	4.9						1.31						2.52										2.75	2.87	4.45
Dibenzo(a,h)anthracene	1.2	0.05	1.28						<0.5						<0.5										<1	0.82	0.697
Fluoranthene	40	0.05	10.6						2.11						5.82										6.85	6.35	7.57
Fluorene	350	0.05	<0.5						<0.5						<0.5										<1		nc
Indeno(1,2,3-cd)pyrene	12	0.05	3.89						<0.5						1.46										<1	1.66	1.88
Naphthalene	40	0.05	<0.5						<0.5						<0.5										<1		nc
Phenanthrene	40	0.05	7.09						<0.5						5										2.29	3.72	6.97
Pyrene	250	0.05	8.4						1.73						4.68										5.61		nc

Shading indicates exceedance of GUCSO Table B
RL = reporting limit
nc = not calculated
All non-detects are shown as half of the actual reporting limits for calculation of the averages

ALGONQUIN COLLEGE
RIDEAU CAMPUS

HIGHWAY No. 417

LEES AVENUE

BUILDING "E"

BUILDING "C"

BUILDING "B"

BUILDING "A"

BLDG "D"

CSS-A

CSS-B

CSS-C

CSS-D

GSM 730252
ELEV. 62.149

ACCESS TO CRAWL SPACE VIA A HOLE IN THE WALL

TRANSITWAY

RIDEAU RIVER

GUCSO TABLE B RES/PARKLAND EXCEEDANCES	
CSS–A	LEAD, BORON, ANTIMONY
CSS–B	NONE
CSS–C	NONE
CSS–D	NONE

LEGEND

- CRAWL SPACE ACCESS POINTS
- BASEMENT
- COMPOSITE SOIL SAMPLE TAKEN FROM CRAWL SPACE

0 25 50m
SCALE

REFERENCE:
BASE PLAN BY GOLDER ASSOCIATES,
ORIGINAL PLAN BY TOTTEN SIMS HUBICKI ASSOCIATES
SITE DEVELOPMENT STUDY, RIDEAU CAMPUS
File No. OC158A-1, Dated 1998-04-24

CH2MHILL

ALGONQUIN COLLEGE
RIDEAU CAMPUS, OTTAWA, ONTARIO

FIGURE 3-3
CRAWL SPACE SAMPLING LOCATIONS

PROJECT No. *120209.TT.03*

120209F03

Attachment A5 - Excerpts from CH2MHill (2002)

ALGONQUIN COLLEGE
RIDEAU CAMPUS

LEES AVENUE

HIGHWAY No. 417

PS-A4-10 (NONE)
PS-A4-60 (LEAD, ZINC)

CH-MW01-1 (SS1 – 0-60cm: COPPER, LEAD, ZINC, BARIUM, BENZO[A]PYRENE)

PS-A4-A
PS-A4-B
PS-A4-C

BUILDING "E"
BUILDING "A"
BUILDING "B"
BUILDING "C"

PS-A3-A
PS-A3-B
PS-A3-C
PS-A3-D

GSM 73U252
ELEV. 82.148

PS-A3-10 (NONE)
PS-A3-60 (LEAD, BENZO[A]PYRENE)

PS-A1-A
PS-A1-B
PS-A1-C
PS-A1-D
PS-A1-E

CH-MW01-2 (SS2 – 1.49-2.1m: COPPER, LEAD, ARSENIC, ZINC, BARIUM, ANTIMONY)

PS-A2-A
PS-A2-B
BLDG "D"
PS-A2-C
PS-A2-D

RIDEAU RIVER

TRANSITWAY

PS-A1-10 (NONE)
PS-A1-60 (BENZO[A]PYRENE)

PS-A2-10 (LEAD)
PS-A2-60 (COPPER, LEAD, ZINC, BENZO[A]PYRENE)

(BENZO[A]PYRENE)

LEGEND

	COMPOSITE AREA SAMPLED PS-A1-10 – 0-10cm COMPOSITE SAMPLE PS-A1-60 – 10-60cm COMPOSITE SAMPLE EXCEEDANCES OF GUCSO TABLE B ARE INDICATED IN BRACKETS
CH-MW01-2	CH2M HILL MONITORING WELL LOCATION 2001
PS-A4	CH2M HILL SOIL DRIVE POINT LOCATION 2001

0 25 50m
SCALE

REFERENCE:
BASE PLAN BY GOLDER ASSOCIATES,
ORIGINAL PLAN BY TOTTEN SIMS HUBICKI ASSOCIATES
SITE DEVELOPMENT STUDY, RIDEAU CAMPUS
File No. OC158A-1, Dated 1998-04-24

CH2MHILL

ALGONQUIN COLLEGE
RIDEAU CAMPUS, OTTAWA, ONTARIO

FIGURE 3-2
2001 DRIVE POINT AND MONITORING WELL LOCATIONS

PROJECT No. 120209.TT.03

120209F02

Attachment A5 - Excerpts from CH2MHill (2002)

Attachment A6 - Excerpts from Golder

TABLE 2
SUMMARY OF SOIL QUALITY RESULTS
ALGONQUIN COLLEGE, RIDEAU CAMPUS
OTTAWA, ONTARIO

Parameters	Applicable Criteria Table B[1]	Applicable Criteria Table D[2]	MDL[3]	BH00-3 SA3 (fill)	TP00-3 SA3 (fill)	TP00-2 SA3 (fill)	BH00-5 SA7 (native)	BH00-4 SA2 (fill)	BH00-3 SA7 (native)	BH00-5 SA4 (fill)	BH00-1 SA3 (fill)	BH00-2 SA4 (fill)	BH00-2 SA5 (native)	BH00-1 SA6 (native)
Antimony	13	44	1	7	2	nd	2	8	8	3	3	3	2	nd
Arsenic	20	40	1	16	7	13	2	13	21	9	15	27	3	nd
Boron	1.5	2.0	0.5	0.7	nd	0.6	nd	nd	1.9	nd	nd	nd	nd	nd
Barium	750	2,500	1	2	6	115	112	213	77.5	84	216	579	76	80
Beryllium	1.2	1.2	1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Cadmium	12	41	0.5	nd	0.5	6.7	0.5	1.0	2	nd	4.2	2.7	nd	nd
Chromium (VI)	8.0	600	1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chromium (total)	750	2,500	1	22	14	44	36	51	49	26	36	50	14	18
Cobalt	40	2,500	1	nd	nd	nd	1	nd	3	nd	2	nd	nd	nd
Copper	225	2,500	1	324	62	741	82	536	207	41	421	2,470	46	18
Lead	200	1,000	3	1,130	157	3,150	485	2,970	2,180	150	557	2,130	76	14
Mercury	10	57	0.1	.8	0.5	13.1	1.8	0.5	0.1	nd	0.4	1.2	0.1	nd
Molybdenum	40	550	1	3	nd	1	nd	3	3	1	3	3	nd	nd
Nickel	150	710	1	2	6	26	19	26	31	19	37	37	15	11
Selenium	10	2,500	1	5	1	2	nd	4	6	1	3	5	1	nd
Silver	20	240	1	nd	nd	nd	nd	nd	3	nd	3	nd	nd	nd
Thallium	4.1	32	4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vanadium	200	910	1	30	25	34	38	28	54	20	30	32	16	34
Zinc	600	2,500	1	198	134	2,780	197	415	969	82	3,090	2,040	91	39
pH				2.4	6.5	6.7	6.6	7.0	7.3	7.6	7.4	7.4	8.1	8.1
Benzene	5.3	63	0.002	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromodichloromethane	14	25	0.002	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromoform	2.3	19	0.002	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromomethane	0.061	4.5	0.003	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon Tetrachloride	0.1	3.3	0.002	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chlorobenzene	8	40	0.002	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroethane	---	---	0.002	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

Attachment A6 - Excerpts from Golder

TABLE 2 (continued)

Parameters	Applicable Criteria Table B[1]	Applicable Criteria Table D[2]	MDL[3]	BH00-3 SA3 (fill)	TP00-3 SA3 (fill)	TP00-2 SA3 (fill)	BH00-5 SA7 (native)	BH00-4 SA2 (fill)	BH00-3 SA7 (native)	BH00-5 SA4 (fill)	BH00-1 SA3 (fill)	BH00-2 SA4 (fill)	BH00-2 SA5 (native)	BH00-1 SA6 (native)
Chloroform	0.79	11	0.002	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloromethane	---	---	0.003	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromochloromethane	10	18	0.003	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane	---	---	0.002	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	30	500	0.002	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	30	500	0.002	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	30	63	0.002	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	22	390	0.002	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.022	0.16	0.002	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethylene	0.0024	0.07	0.002	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
c-1,2-Dichloroethylene	2.3	2.3	0.003	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
t-1,2-Dichloroethylene	4.1	4.1	0.003	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloropropane	0.019	0.23	0.002	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
c-1,3-Dichloropropylene	---	---	0.002	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
t-1,3-Dichloropropylene	---	---	0.003	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	290	1,000	0.002	0.002	0.016	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methylene Chloride	120	200	0.003	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Styrene	1.2	16	0.002	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	0.037	0.22	0.004	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	0.019	0.46	0.004	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethylene	0.45	0.45	0.002	nd	0.006	nd	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	34	510	0.002	0.006	0.003	nd	nd	nd	nd	nd	nd	0.002	nd	nd
1,1,1-Trichloroethane	26	34	0.005	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	3.1	3.1	0.002	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethylene	1.1	3.9	0.004	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	---	---	0.012	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	---	---	0.002	nd	0.004	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl Chloride	0.003	0.094	0.003	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Xylenes	34	460	0.002	0.015	0.012	0.003	nd	0.009	nd	nd	nd	0.003	nd	nd
Acenaphthylene	100	840	0.1	nd	0.1	0.1	nd	0.5	nd	nd	nd	nd	nd	nd
Acenaphthene	1,000	1,300	0.1	0.2	0.5	nd	nd	2.9	nd	nd	nd	nd	nd	nd
Anthracene	28	28	0.1	2.2	6.3	0.2	nd	23.5	nd	nd	nd	nd	nd	nd
Benzo(a)anthracene	40	170	0.1	4.8	8.8	1.1	nd	43.2	0.5	nd	nd	0.1	0.1	nd

Attachment A6 - Excerpts from Golder

TABLE 2 (continued)

Parameters	Applicable Criteria Table B[1]	Applicable Criteria Table D[2]	MDL[3]	BH00-3 SA3 (fill)	TP00-3 SA3 (fill)	TP00-2 SA3 (fill)	BH00-5 SA7 (native)	BH00-4 SA2 (fill)	BH00-3 SA7 (native)	BH00-5 SA4 (fill)	BH00-1 SA3 (fill)	BH00-2 SA4 (fill)	BH00-2 SA5 (native)	BH00-1 SA6 (native)
Benzo(a)pyrene	1.2	1.9	0.1	0.6	3.4	0.9	nd	22.3	0.4	nd	nd	nd	nd	nd
Benzo(b)fluoranthene	12	19	0.1	0.7	4.4	1.2	nd	21.2	0.5	nd	0.1	0.2	0.1	nd
Benzo(k)fluoranthene	12	19	0.1	0.2	2.3	0.5	nd	17.5	0.2	nd	nd	nd	nd	nd
Benzo(g,h,i)perylene	40	53	0.1	nd	0.6	0.6	nd	10.8	0.2	nd	nd	nd	nd	nd
Chrysene	12	19	0.1	3.1	7.4	1.2	nd	47.0	0.5	0.1	nd	0.1	0.1	nd
Dibenzo(a,h)anthracene	1.2	1.9	0.1	nd	0.4	0.4	nd	5.3	nd	nd	nd	nd	nd	nd
Fluoranthene	40	840	0.1	19.0	19.1	2.0	nd	75.4	0.5	0.1	0.2	0.2	0.1	nd
Fluorene	350	350	0.1	1.3	7.9	0.1	nd	7.3	nd	nd	nd	nd	nd	nd
Indeno(1,2,3-c,d)pyrene	12	19	0.1	nd	1.0	1.0	nd	17.0	0.2	nd	nd	nd	nd	nd
Naphthalene	40	1,300	0.1	0.3	2.3	0.5	nd	0.6	nd	nd	nd	nd	nd	nd
Phenanthrene	40	150	0.1	17.2	22.7	1.4	nd	51.4	0.3	0.3	nd	nd	nd	nd
Pyrene	250	250	0.1	16.5	21.2	1.7	nd	174	0.3	nd	0.1	0.2	0.1	nd

Notes: (1) MOE Table B non-potable groundwater criteria for residential/parkland land use, coarse textured soils; surface soil
(2) MOE Table D non-potable groundwater criteria for residential/parkland land use, coarse textured soils; subsurface soil
(3) MDL = Method detection limit
(4) Units = µg/g = microgram per gram
--- Not Applicable or not analyzed

RIDEAU CAMPUS

HIGHWAY No. 417

INTERPRETED EXTENT OF SUBSURFACE CONTAMINATION BY COAL TAR / PAH's

BUILDING "A"

BUILDING "B"

BUILDING "C"

BUILDING "D"

BUILDING "E"

TRANSITWAY

RIDEAU RIVER

BH 00-1 BH 00-2 BH 00-3 BH 00-4 BH 00-4A BH 00-5

TP 00-1 TP 00-2 TP 00-3 TP 00-4

OW 112B-86 OW 112A-86 OW 123B-86 OW 123A-86 OW 111B-86 OW 111A-86 BH86-9 BH-5 BH-4 BH-3 OW 120A-86 OW 120B-86 OW 120C-86 OW 122C-86 OW 122A-86 OW 122B-86 OW 124C-86 (Destroyed) OW 124B-86 (Destroyed) OW 121B-86 OW 121C-86 OW 121A-86 OW 520 BH-2 BH-1 OW 506B OW 506A OW 506C OW 505B (Destroyed) OW 505A (Destroyed) OW 501C OW 501B OW 501A

No. 1 No. 2 No. 3 No. 4 No. 5 No. 6 No. 8 No. 10 No. 11 No. 12 No. 13 No. 14 No. 101 No. 200 No. 200A No. 201 No. 202 No. 203 No. 204 No. 205 No. 206 No. 207 No. 208

B-1 B-2 B-3 B-4 B-5 B-6

R-1 R-2 R-3 R-4 R-5 R-6

GBM 73U252 ELEV. 52.49

54.17

LEGEND

- BOREHOLE WITH MONITORING WELL LOCATION IN PLAN, INSTALLED BY GOLDER ASSOCIATES LTD., 2000
- TEST PIT LOCATION IN PLAN, INSTALLED BY GOLDER ASSOCIATES LTD., 2000
- BOREHOLE, INSTALLED BY CANVIRO CONSULTANTS
- GEOTECHNICAL BOREHOLE, INSTALLED BY GOLDER ASSOCIATES LTD.
- GEOTECHNICAL BOREHOLE, INSTALLED BY McROSTIE & ASSOCIATES
- OBSERVATION WELL LOCATION, INSTALLED BY INTERA
- OBSERVATION WELL LOCATION, INSTALLED BY CRA
- AREAS OF AQUEOUS (GROUNDWATER) CONTAMINATION BY PAHs (CRA, Intera)
- AREAS OF VISIBLE COAL / OIL TAR CONTAMINATION IN OVERBURDEN (CRA, Intera)

REFERENCE:
BASE PLAN BY TOTTEN SIMS HUBICKI ASSOCIATES
SITE DEVELOPMENT STUDY, RIDEAU CAMPUS
File No. OC158A-1, Dated 1998-04-24

SPECIAL NOTE:
THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT

SCALE: 1 : 1500	PROJECT: Characterization of Surface Materials Algonquin College Rideau Campus
PROJECT No. 001-2721	SHEET TITLE: AREAS OF COAL TAR IMPACT
DES BY	
DR BY S.L./W.M.	
CHK BY PLE	
RVW BY	
Golder Associates	Date: MAY 18, 2000
	DRAWING FIGURE 4

FILE: O:\FILE\00\001-2721\ACAD\FIGURE4.DWG MAY 2000

Geosyntec
consultants

APPENDIX B

Site Redevelopment Plan

Excerpt from the Indicative Design Plan Received via email on November 4, 2020 from the University of Ottawa.

IBI GROUP
400-333 Preston ave.
Ottawa, ON
613-241-3300
ibigroup.com

200 Lees Campus

SCALE: 1 : 500

06/11/20

Indicative Design - Site Plan

AS01

Geosyntec
consultants

APPENDIX C

Risk Assessment Calculations

TABLE C1 *Geosyntec Consultants*

COC CONCENTRATIONS BESIDE A DEEP EXCAVATION IN THE COMMUNITY USE AREA

Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Equations:

C_{trench} (Concentration in Trench) = C_{gw} x VF

KiG (Gas-Phase Mass Transfer Coefficient) = $(MW,H_2O/MW)^{0.335}$ x $(T/298)^{1.005}$ x Kg,H_2O; where T is in Kelvin

KiL (Liquid-Phase Mass Transfer Coefficient) = $(MW,O_2/MW)^{0.5}$ x (T/298) x KlO_2; where T is in Kelvin

Ki (Overall Mass Transfer Coefficient) = 1/[(1/KiL)+((R*T)/(HLC*KiG))]; where T is in Kelvin

VF (Volatilization Factor) = Ki*A*F*CF1*CF2*CF3*(1/ACH)*(1/V)

ACH = U * CF3 / Length of trench

Input Definitions:

ACH = Air changes per hour

CF = Conversion factor

C_{gw} = Concentration in Groundwater (Groundwater EPC)

F = Fraction of floor through which contaminant can enter trench

HLC = Henry's Law Constant

MW = Molecular Weight of COC

Kg,H2O = Gas-phase mass transfer coefficient of water vapor at 25°C

KlO2 = Liquid-phase mass transfer coefficient of oxygen at 25°C

MW,H2O = Molecular weight of O_2

MW,O_2 = Molecular weight of oxygen

R = Ideal gas constant

T = Average system temperature (based on default [15°C], Ministry, 2011)

For Mass-Transfer Coefficients [2]

Kg,H_2O	0.833	cm/s
MW,H_2O	18.015	g/mol
Kl,O_2	0.002	cm/s
MW,O_2	31.998	g/mol
T	15	°C
T	288	°K
R	8.20E-05	atm-m^3/mol-K

For Emission Flux & C_{trench}

CF1	1.00E-03	L/cm^3
CF2	1.00E+04	cm^2/m^2
CF3	3600	s/hr
F	1	unitless
U [5]	3.06	m/s

Trench Dimensions [4]

Length	1.00	m
Width	1.00	m
Depth	6.00	m
Volume	6.00	m^3
Area (A)	1.00	m²

Contaminant of Concern (COC) [2]	CAS Number	Molecular Weight MW [2] g/mol	Henry's Law Constant HLC [2] atm-m^3/mol	Gas-Phase Mass Transfer Coefficient KiG [1] cm/s	Liquid-Phase Mass Transfer Coefficient KiL [1] cm/s	Overall Mass Transfer Coefficient Ki [1] cm/s	COC in Groundwater C_{gw} [3] µg/L	Volatilization Factor VF [1] L/m^3	COC in Trench C_{trench} [1] µg/m^3
Acenaphthylene	208968	152.20	5.11E-03	3.94E-01	8.86E-04	8.77E-04	5.88	4.78E-04	2.8E-03

Notes:

(1) The potential migration of vapours from groundwater to trench air was estimated based on the methods presented in Virginia Department of Environmental Quality Unified Risk Assessment Model - VURAM User Guide (VDEQ, 2020) for Exposure of workers to volatiles in a construction/utility trench when the groundwater is less than or equal to 15 feet deep (i.e. shallow water is expected to pool in the bottom of the excavation). Equations utilized are shown above.

(2) Chemical parameters were obtained from the Ontario Ministry of the Environment Conservation and Parks (MECP) Modified Generic Risk Assessment Model (MGRA). November 1, 2016 (Ministry, 2016). https://files.ontario.ca/2016_modified_generic_risk_assessment_model.xlsx

(3) Maximum on-site measured groundwater concentration from Table 4.4.

(4) Trench dimensions assume a caisson scenario.

(5) Minimum of average monthly wind speeds over 20 years from Ottawa MacDonald-Cartier International Airport (Environment Canada, 2017)

TABLE C2

COC CONCENTRATIONS BESIDE A SHALLOW EXCAVATION IN THE COMMUNITY USE AREA

Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Equations:

$$C_{trench} = J(t) \times VF$$

$$J(t) = C_{soil}^{-\mu t} \times \left|\frac{D_{eff}}{\pi t}\right|^{0.5} \times e^{\left|\frac{-CL^2}{4 D_{eff} t}\right|} - e^{\left|\frac{-(CL+CW)^2}{4 D_{eff} t}\right|}$$

$$VF = \frac{T_{ca}}{Width \times Depth \times U}$$

$$D_{eff} = \frac{\theta_{as}^{3.33} \times D_{air} \times H + \theta_{w}^{3.33} D_{wat}}{\theta_T^{2}}$$

$$\rho b \times f_{oc} \times K_{oc} + \theta_{ws} + \theta_{as} \times H$$

$$T_{ca}\ (m^2) = |\text{trench width}\ (m)| \times |\text{trench length}\ (m)| + |\text{trench length}\ (m)| \times |\text{trench depth}\ (m)| \times 2 + |\text{trench width}\ (m)| \times |\text{trench depth}\ (m)| \times 2$$

Input Definitions:

θ_{as} = Vapour-filled porosity of vadose zone
θ_T = Total porosity in vadose zone (default value)
θ_{ws} = Water-filled porosity of vadose zone (default value)
ρb = soil bulk density
π = Pi (3.14)
C_{soil} = Concentration in Soil (Site-specific maximum detected concentration)
D_{air} = Diffusion coefficient in air
D_{eff} = Effective molecular diffusion through soil
D_{wat} = Diffusion coefficient in water
f_{oc} = Fraction organic carbon
H = Henry's Law Constant (unitless)
J(t) - Instantaneous flux from soil (calculated)
K_{oc} = Organic carbon water partition coefficient
t = Averaging time for flux
T_{ca} = Trench contaminant area (sub-equation)
U = Wind speed
VF = Volatilization Factor (sub-equation)

For Effective Diffusion Coefficients [3]		
θ_{as} - coarse	0.241	cm^3/cm^3
θ_{ws} - coarse	0.119	cm^3/cm^3
θ_T - coarse	0.36	cm^3/cm^3

For Emission Flux & C_{trench}		
U [6]	3.06	m/s
f_{oc}	0.005	unitless
ρb	1.7	g/cm^3
t	1	s
VF	11.27	s/m

Trench Dimensions & Factors [2]		
Length	13.00	m
Width	1.00	m
Depth	2.00	m
Volume	26.00	m^3
T_{ca}	69.00	m^2
CL	13.00	m
CW	2.00	m

TABLE C2

COC CONCENTRATIONS BESIDE A SHALLOW EXCAVATION IN THE COMMUNITY USE AREA

Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Contaminant of Concern (COC) [3]		CAS Number	Henry's Law Constant H [3] unitless	Diffusion Coefficient in Air D_{air} [3] m^2/d	Diffusion Coefficient in Water D_{wat} [3] m^2/d	Organic Carbon Water Partition K_{oc} [3] cm^3/g	Effective Diffusivity D_{eff} m^2/d	Maximum Concentration in Soil C_{soil} [4,5] mg/kg	Instantaneous Flux of COC from Soil Surface J(t) $\mu g/m^2/s$	Concentration of COC in Trench C_{trench} $\mu g/m^3$
B[a]P Equivalents	[7]	B[a]PE	1.87E-05	3.72E-01	7.78E-05	7.87E+05	8.34E-11	41	1.74E-12	2.0E-11
Acenaphthylene		208968	5.11E-03	3.79E-01	6.51E-05	6.12E+03	3.31E-07	3.1	3.24E-08	3.7E-07
Anthracene		120127	2.27E-03	2.80E-01	6.69E-05	2.04E+04	3.44E-08	10.8	3.82E-09	4.3E-08
Benz[a]anthracene		56553	4.91E-04	4.41E-01	7.78E-05	2.31E+05	1.21E-09	38.4	9.02E-11	1.0E-09
Benzo[a]pyrene		50328	1.87E-05	3.72E-01	7.78E-05	7.87E+05	8.34E-11	28.3	1.20E-12	1.4E-11
Benzo[b]fluoranthene		205992	2.69E-05	1.95E-01	4.80E-05	8.03E+05	5.17E-11	27.5	5.68E-13	6.4E-12
Benzo[k]fluoranthene		207089	2.39E-05	1.95E-01	4.80E-05	7.87E+05	5.20E-11	18.2	3.79E-13	4.3E-12
Chrysene		218019	2.14E-04	2.14E-01	5.37E-05	2.36E+05	3.70E-10	32.9	1.30E-11	1.5E-10
Dibenz[a h]anthracene		53703	5.03E-06	1.75E-01	4.48E-05	2.62E+06	1.32E-11	2.3	6.07E-15	6.8E-14
Fluoranthene		206440	3.62E-04	2.61E-01	5.49E-05	7.09E+04	1.95E-09	70.8	3.38E-10	3.8E-09
Indeno[1 2 3-cd]pyrene		193395	1.42E-05	1.64E-01	4.89E-05	2.68E+06	1.46E-11	7.8	2.41E-14	2.7E-13
Naphthalene		91203	1.80E-02	5.10E-01	6.48E-05	1.84E+03	5.11E-06	15.6	1.00E-05	1.1E-04
Phenanthrene		85018	1.73E-03	0.00E+00	5.78E-05	2.08E+04	2.09E-09	35.3	1.87E-10	2.1E-09
Benzene		71432	2.27E-01	7.60E-01	8.47E-05	1.66E+02	9.52E-04	0.5	8.43E-04	9.5E-03

Notes:

(1) The potential migration of vapors from soil to trench air was estimated based on the methods presented by Jury et al. (Jury, 1990) and Sanders et al. (Sanders, 1994) for calculating the volatilization of organic compounds from the soil surface. Equations utilized are shown above.

(2) Contaminant source is assumed to equal total length and depth of trench. Trench dimensions are based on reasonable estimates; the depth corresponds to the maximum

(3) Chemical parameters were obtained from the Ontario Ministry of the Environment Conservation and Parks (MECP) Modified Generic Risk Assessment Model (MGRA). November 1, 2016 (Ministry, 2016). https://files.ontario.ca/2016_modified_generic_risk_assessment_model.xlsx

(4) Soil concentrations from Table 4.4.

(5) To be conservative, assumes no degradation of initial COC concentration thus flux remains constant, and no effects due to precipitation.

(6) Minimum of average monthly wind speeds over 20 years from Ottawa MacDonald-Cartier International Airport (Environment Canada, 2017)

(7) Benzo[a]pyrene parameters are used as a surrogate for B[a]P Equivalents.

Only sufficiently volatile COCs are presented in this table.

TABLE C3

COC CONCENTRATIONS BESIDE A SHALLOW EXCAVATION IN THE PARKLAND AREA

Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Equations:

$$C_{trench} = J(t) \times VF$$

$$J(t) = C_{soil}^{-\mu t} \times \left|\frac{D_{eff}}{\pi t}\right|^{0.5} \times e^{\left|\frac{-CL^2}{4 D_{eff} t}\right|} - e^{\left|\frac{-(CL+CW)^2}{4 D_{eff} t}\right|}$$

$$VF = \frac{T_{ca}}{Width \times Depth \times U}$$

$$D_{eff} = \frac{\theta_{as}^{3.33} \times D_{air} \times H + \theta_{w}^{3.33} D_{wat}}{\theta_T^{2}}$$

$$\rho b \times f_{oc} \times K_{oc} + \theta_{ws} + \theta_{as} \times H$$

$$T_{ca}\ (m^2) = |\text{trench width}\ (m)| \times |\text{trench length}\ (m)| + |\text{trench length}\ (m)| \times |\text{trench depth}\ (m)| \times 2 + |\text{trench width}\ (m)| \times |\text{trench depth}\ (m)| \times 2$$

Input Definitions:

θ_{as} = Vapour-filled porosity of vadose zone

θ_T = Total porosity in vadose zone (default value)

θ_{ws} = Water-filled porosity of vadose zone (default value)

ρb = soil bulk density

π = Pi (3.14)

C_{soil} = Concentration in Soil (Site-specific maximum detected concentration)

D_{air} = Diffusion coefficient in air

D_{eff} = Effective molecular diffusion through soil

D_{wat} = Diffusion coefficient in water

f_{oc} = Fraction organic carbon

H = Henry's Law Constant (unitless)

J(t) - Instantaneous flux from soil (calculated)

K_{oc} = Organic carbon water partition coefficient

t = Averaging time for flux

T_{ca} = Trench contaminant area (sub-equation)

U = Wind speed

VF = Volatilization Factor (sub-equation)

For Effective Diffusion Coefficients [3]		
θ_{as} - coarse	0.241	cm^3/cm^3
θ_{ws} - coarse	0.119	cm^3/cm^3
θ_T - coarse	0.36	cm^3/cm^3

For Emission Flux & C_{trench}		
U [6]	3.06	m/s
f_{oc}	0.005	unitless
ρb	1.7	g/cm^3
t	1	s
VF	11.27	s/m

Trench Dimensions & Factors [2]		
Length	13.00	m
Width	1.00	m
Depth	2.00	m
Volume	26.00	m^3
T_{ca}	69.00	m^2
CL	13.00	m
CW	2.00	m

TABLE C3

COC CONCENTRATIONS BESIDE A SHALLOW EXCAVATION IN THE PARKLAND AREA

Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Contaminant of Concern (COC) [3]		CAS Number	Henry's Law Constant H [3] unitless	Diffusion Coefficient in Air D_{air} [3] m^2/d	Diffusion Coefficient in Water D_{wat} [3] m^2/d	Organic Carbon Water Partition K_{oc} [3] cm^3/g	Effective Diffusivity D_{eff} m^2/d	Maximum Concentration in Soil C_{soil} [4,5] mg/kg	Instantaneous Flux of COC from Soil Surface J(t) $\mu g/m^2/s$	Concentration of COC in Trench C_{trench} $\mu g/m^3$
B[a]P Equivalents	[7]	B[a]PE	1.87E-05	3.72E-01	7.78E-05	7.87E+05	8.34E-11	9.9	4.20E-13	4.7E-12
Acenaphthene	[8]	83329	7.44E-03	3.64E-01	6.64E-05	6.12E+03	4.60E-07	0.5	8.67E-09	9.8E-08
Acenaphthylene		208968	5.11E-03	3.79E-01	6.51E-05	6.12E+03	3.31E-07	0.7	7.76E-09	8.7E-08
Anthracene		120127	2.27E-03	2.80E-01	6.69E-05	2.04E+04	3.44E-08	1.8	6.51E-10	7.3E-09
Benz[a]anthracene		56553	4.91E-04	4.41E-01	7.78E-05	2.31E+05	1.21E-09	5.1	1.20E-11	1.4E-10
Benzo[a]pyrene		50328	1.87E-05	3.72E-01	7.78E-05	7.87E+05	8.34E-11	6.2	2.61E-13	2.9E-12
Benzo[b]fluoranthene		205992	2.69E-05	1.95E-01	4.80E-05	8.03E+05	5.17E-11	11.7	2.42E-13	2.7E-12
Benzo[ghi]perylene	[3a]	191242	1.35E-05	2.35E-01	4.52E-05	2.68E+06	1.39E-11	4.1	1.17E-14	1.3E-13
Benzo[k]fluoranthene		207089	2.39E-05	1.95E-01	4.80E-05	7.87E+05	5.20E-11	1.3	2.79E-14	3.1E-13
Chrysene		218019	2.14E-04	2.14E-01	5.37E-05	2.36E+05	3.70E-10	4.9	1.94E-12	2.2E-11
Dibenz[a h]anthracene		53703	5.03E-06	1.75E-01	4.48E-05	2.62E+06	1.32E-11	1.3	3.41E-15	3.8E-14
Fluoranthene		206440	3.62E-04	2.61E-01	5.49E-05	7.09E+04	1.95E-09	10.6	5.06E-11	5.7E-10
Fluorene		86737	3.93E-03	3.14E-01	6.81E-05	1.13E+04	1.16E-07	0.6	1.26E-09	1.4E-08
Indeno[1 2 3-cd]pyrene		193395	1.42E-05	1.64E-01	4.89E-05	2.68E+06	1.46E-11	3.7	1.15E-14	1.3E-13
Naphthalene	[8]	91203	1.80E-02	5.10E-01	6.48E-05	1.84E+03	5.11E-06	0.5	3.20E-07	3.6E-06
Phenanthrene	[3a]	85018	1.73E-03	2.35E-01	5.78E-05	2.08E+04	2.21E-08	7.1	1.30E-09	1.5E-08
Pyrene		129000	4.87E-04	2.35E-01	6.26E-05	6.94E+04	2.37E-09	8.4	5.38E-11	6.1E-10

Notes:

(1) The potential migration of vapors from soil to trench air was estimated based on the methods presented by Jury et al. (Jury, 1990) and Sanders et al. (Sanders, 1994) for calculating the volatilization of organic compounds from the soil surface. Equations utilized are shown above.

(2) Contaminant source is assumed to equal total length and depth of trench. Trench dimensions are based on reasonable estimates; the depth corresponds to the maximum depth

(3) Chemical parameters were obtained from the Ontario Ministry of the Environment Conservation and Parks (MECP) Modified Generic Risk Assessment Model (MGRA). November 1, 2016 (Ministry, 2016). https://files.ontario.ca/2016_modified_generic_risk_assessment_model.xlsx

a) No values for diffusivity in air were available - pyrene was used as a surrogate for these parameters.

(4) Soil concentrations from Table 4.1

(5) To be conservative, assumes no degradation of initial COC concentration thus flux remains constant, and no effects due to precipitation.

(6) Minimum of average monthly wind speeds over 20 years from Ottawa MacDonald-Cartier International Airport (Environment Canada, 2017)

(7) Benzo[a]pyrene parameters are used as a surrogate for B[a]P Equivalents.

(8) Maximum soil concentration is a reporting limit.

Only sufficiently volatile COCs are presented in this table.

TABLE C4
CONSTRUCTION WORKER TRENCH AIR INHALATION RISKS
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

$$\text{Exposure Concentration} = \frac{\text{Cair} \times EF_a \times EF_b \times EF_c \times ED}{AP \times C}$$

where,

Cair	=	vapour concentration in trench air (mg/m^3)	**For the Construction Worker**				
EF_c	=	hours per day of exposure (h/d)	Cair	=	Excavation air concentration (mg/m³) (G-2)		
EF_b	=	days per week of exposure (d/w)	EF_a	=	39	w/y	Ministry, 2011
EF_a	=	weeks per year of exposure (w/y)	EF_b	=	5	d/w	assumed
ED	=	duration of exposure (y)	EF_c	=	9.8	h/d	Ministry, 2011
AP	=	averaging period, time over which exposure is averaged (y)	ED	=	1.5	y	Ministry, 2011
C	=	unit conversion (h/y)	AP	=	1.5	y for Threshold	Ministry, 2011
					56	y for Non-Threshold	Ministry, 2011
			C	=	8,760	h/y	Ministry, 2011

Exposure Medium	Exposure Route	Contaminant of Concern	Trench Air Concentration	Threshold Toxicants			Non-Threshold Toxicants		
				Inhalation Dose	RfC	Hazard Quotient	EPC	IUR	ILCR
			(µg/m³)	(mg/m³)	(mg/m³)		(mg/m³)	(mg/m³)$^{-1}$	
Modeled From Groundwater	Inhalation	Acenaphthylene	2.8E-03	6.1E-07	--	--	1.6E-08	6.0E-03	9.8E-11
Exposure Medium	**Exposure Route**	**Contaminant of Concern**	**Trench Air Concentration**	**Threshold Toxicants**			**Non-Threshold Toxicants**		
				Inhalation Dose	**RfC**	**Hazard Quotient**	**EPC**	**IUR**	**ILCR**
			(µg/m³)	**(mg/m³)**	**(mg/m³)**		**(mg/m³)**	**(mg/m³)$^{-1}$**	
Modeled From Soil Community Use Area	Inhalation	B[a]P Equivalents	2.0E-11				1.1E-16	6.0E-01	6.9E-17
		Acenaphthylene	3.7E-07	8.0E-11	--	--	2.1E-12	6.0E-03	1.3E-14
		Anthracene	4.3E-08	9.4E-12	--	--	2.5E-13	6.0E-03	1.5E-15
		Benz[a]anthracene	1.0E-09	2.2E-13	--	--	5.9E-15	6.0E-02	3.6E-16
		Benzo[a]pyrene	1.4E-11	2.9E-15	2.0E-06	1.5E-09	7.9E-17	6.0E-01	4.7E-17
		Benzo[b]fluoranthene	6.4E-12	1.4E-15	--	--	3.7E-17	6.0E-02	2.2E-18
		Benzo[k]fluoranthene	4.3E-12	9.3E-16	--	--	2.5E-17	6.0E-02	1.5E-18
		Chrysene	1.5E-10	3.2E-14	--	--	8.6E-16	6.0E-03	5.1E-18
		Dibenz[a h]anthracene	6.8E-14	1.5E-17	--	--	4.0E-19	6.0E-01	2.4E-19
		Fluoranthene	3.8E-09	8.3E-13	--	--	2.2E-14	6.0E-03	1.3E-16
		Indeno[1 2 3-cd]pyrene	2.7E-13	5.9E-17	--	--	1.6E-18	6.0E-02	9.5E-20
		Naphthalene	1.1E-04	2.5E-08	3.7E-03	6.6E-06	6.6E-10	--	--
		Phenanthrene	2.1E-09	4.6E-13	--	--	1.2E-14	--	--
		Benzene	9.5E-03	2.1E-06	3.0E-02	6.9E-05	5.6E-08	2.2E-03	1.2E-10

TABLE C4
CONSTRUCTION WORKER TRENCH AIR INHALATION RISKS
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Exposure Medium	Exposure Route	Contaminant of Concern	Trench Air Concentration	Threshold Toxicants			Non-Threshold Toxicants		
				Inhalation Dose	RfC	Hazard Quotient	EPC	IUR	ILCR
			(µg/m³)	(mg/m³)	(mg/m³)		(mg/m³)	(mg/m³)$^{-1}$	
Modeled From Soil Parkland Area	Inhalation	B[a]P Equivalents	4.7E-12				2.8E-17	6.0E-01	1.7E-17
		Acenaphthene	9.8E-08	2.1E-11	--	--	5.7E-13	6.0E-04	3.4E-16
		Acenaphthylene	8.7E-08	1.9E-11	--	--	5.1E-13	6.0E-03	3.1E-15
		Anthracene	7.3E-09	1.6E-12	--	--	4.3E-14	6.0E-03	2.6E-16
		Benz[a]anthracene	1.4E-10	3.0E-14	--	--	7.9E-16	6.0E-02	4.8E-17
		Benzo[a]pyrene	2.9E-12	6.4E-16	2.0E-06	3.2E-10	1.7E-17	6.0E-01	1.0E-17
		Benzo[b]fluoranthene	2.7E-12	5.9E-16	--	--	1.6E-17	6.0E-02	9.6E-19
		Benzo[ghi]perylene	1.3E-13	2.9E-17	--	--	7.7E-19	6.0E-03	4.6E-21
		Benzo[k]fluoranthene	3.1E-13	6.9E-17	--	--	1.8E-18	6.0E-02	1.1E-19
		Chrysene	2.2E-11	4.8E-15	--	--	1.3E-16	6.0E-03	7.7E-19
		Dibenz[a h]anthracene	3.8E-14	8.4E-18	--	--	2.2E-19	6.0E-01	1.3E-19
		Fluoranthene	5.7E-10	1.2E-13	--	--	3.3E-15	6.0E-03	2.0E-17
		Fluorene	1.4E-08	3.1E-12	--	--	8.3E-14	--	--
		Indeno[1 2 3-cd]pyrene	1.3E-13	2.8E-17	--	--	7.6E-19	6.0E-02	4.5E-20
		Naphthalene	3.6E-06	7.9E-10	3.7E-03	2.1E-07	2.1E-11	--	--
		Phenanthrene	1.5E-08	3.2E-12	--	--	8.5E-14	--	--
		Pyrene	6.1E-10	1.3E-13	--	--	3.5E-15	6.0E-04	2.1E-18

Notes:

1) Modeled excavation air concentrations are obtained from C1 through C3.
2) No sub-chronic TRVs were recommended by the Ministry for the applicable COCs; chronic TRVs were used instead.

HQ or ILCR in **bold** exceed threshold of 0.2 or $1x10^{-6}$, respectively
For a threshold toxicant (tt), HQ = avg. daily dose (EPC) ÷ TRV (RfC)

TABLE C5
CONSTRUCTION WORKER RISK EQUATIONS
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

DERMAL CONTACT WITH GROUNDWATER CONSTRUCTION WORKER

$$DA_{event} = 2 * FA * K_p * C_{GW} * \sqrt{\frac{6 * \tau_{event} * t_{event}}{\pi}} * CF$$

$$EXP_{DermTrench} = \frac{DA_{event} * SA * EV * EF * ED}{BW * AT * CF2}$$

where,

DA_{event}	=	Absorbed dose per event (µg/cm^2-event), when $t_{event} < t^*$	AT	=	averaging time (days over which exposure is averaged)
C_{Gw}	=	concentration of COC in water (µg/L)	FA	=	Fraction absorbed water (1.0 unitless)
K_p	=	dermal permeability coefficient of chemical in water (cm/h)	τ_{event}	=	Lag time per event (chemical specific)
EV	=	event frequency (events/d)	t_{event}	=	Event duration
SA	=	receptor's skin area exposed to ground water (cm^2)	t*	=	2.4 x t_{event}
EF	=	exposure frequency (d/y)	π	=	pi
ED	=	exposure duration (y)	CF	=	Conversion factor (L/cm³)
BW	=	receptor's body weight (kg)	CF2	=	Conversion factor (µg/mg)

For the Construction Worker

Cw	=	by analyte	mg/cm^3	From EPC Tables; (mg/cm3 = mg/L /1000 or ug/L /1000000)
Kp	=	by analyte	cm/h	Ministry, 2011 (from US EPA, 2004)
SA	=	2,145	cm^2	hands and forearms (Ministry, 2011 (Table 2.20)
t_{event}	=	0.5	h/event	professional judgement
EV	=	2	event/d	assume contact 2 times every working day
EF	=	195	d/y	5 d/w x 39 w/y
ED	=	1.5	y	Ministry, 2011
BW	=	70.7	kg	Ministry, 2011
AT	=	548	d	= ED years for threshold toxicants
		20,440	d	= 56 years for non-threshold toxicants
FA	=	1		
CF	=	0.001	L/cm³	
CF2	=	1000	µg/mg	
τ_{event}	=	compound specific	hr/event	From U.S. EPA (2004) RAGS, Volume I, Part E

INCIDENTAL INGESTION OF GROUNDWATER CONSTRUCTION WORKER

$$\text{Exposure Concentration} = \frac{Cgw \times DWIR \times EF_a \times EF_b \times ED \times RAF_{oral}}{BW \times AP \times C1 \times C2}$$

where,

Cgw	=	concentration of COC in groundwater (µg/L)
DWIR	=	receptor's drinking water intake rate (L/d)
EF_a	=	days per week of exposure (d/w)
EF_b	=	weeks per year of exposure (w/y)
ED	=	exposure duration (y)
RAF_{oral}	=	relative absorption factor for oral exposure (unitless and COC-specific)
BW	=	receptor's body weight (kg)
AP	=	averaging period, time over which exposure is averaged (y)
C1	=	unit conversion (d/y)
C2	=	unit conversion (µg/mg)

For the Construction Worker

Cs	=	by analyte	µg/L	From EPC Tables
DWIR	=	0.02	L/d	Virginia DEQ, 2019
EF_a	=	5	d/w	assume contact every working day
EF_b	=	39	w/y	Ministry, 2011 (winter not included)
ED	=	1.5	y	Ministry, 2011
RAF_{oral}	=	by analyte	unitless	From Tox Info Table
BW	=	70.7	kg	Ministry, 2011
AP	=	1.5	y	= ED years for threshold toxicants
		56	y	= 56 years for non-threshold toxicants
C1	=	365	d/y	unit conversion
C2	=	1,000	µg/mg	unit conversion

Threshold/ Non-Threshold Toxicants
For a threshold toxicant (tt), HQ = avg. daily dose (EPC) ÷ TRV (RfC)
For a non-threshold toxicant (ntt), ILCR = avg. daily dose (EPC) x TRV (IUR)

TABLE C6
CONSTRUCTION WORKER RISK CALCULATIONS
Proposed Site Redevelopment, 200 Lees Avenue, Ottawa, Ontario

Exposure Medium	Exposure Route	Contaminant of Concern	CAS Number	Maximum Measured Groundwater Concentration (µg/L)	Kp (cm/h)	τ_{event} (Note 1) (h/event)	DA_{event} (µg/cm²-event)	Threshold Toxicants			Non-Threshold Toxicants			Uses RFD-sub
								Dose (mg/kg/day)	RfD (mg/kg/day)	Hazard Quotient	Dose (mg/kg/day)	CSF $(mg/kg/day)^{-1}$	ILCR	
Groundwater, All-Depths	Dermal	Acenaphthylene	208968	5.88	0.1410	1.43	0.0019	6.3E-05	6.0E-01	1.0E-04	1.7E-06	1.0E-02	1.7E-08	Y

Exposure Medium	Exposure Route	Contaminant of Concern	CAS Number	Maximum Measured Groundwater Concentration (µg/L)	Relative absorption factor for (dermal/ oral/ inhalation) exposure (unitless)	Threshold Toxicants			Non-Threshold Toxicants			Uses RFD-sub
						Dose (mg/kg/day)	RfD (mg/kg/day)	Hazard Quotient	Dose (mg/kg/day)	CSF $(mg/kg/day)^{-1}$	ILCR	
Groundwater, All-Depths	Incidental Ingestion	Acenaphthylene	208968	5.88	1	8.1E-07	6.0E-01	1.3E-06	2.2E-08	1.0E-02	2.2E-10	Y

Note 1 - No value available for Acenaphthylene. Value for Pyrene is used as a surrogate.

Geosyntec consultants

engineers | scientists | innovators

REMEDIAL ACTION PLAN
PROPOSED REDEVELOPMENT SITE, WEST PORTION OF 200 LEES AVENUE, OTTAWA, ONTARIO

Prepared for

CIMA+

Prepared by

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Project Number TR0885B

December 11, 2020

TABLE OF CONTENTS

LIST OF FIGURES

APPENDICES

1. INTRODUCTION

This Remedial Action Plan (RAP) was prepared by Geosyntec Consultants International, Inc. (Geosyntec), in coordination with CIMA Canada Inc. (CIMA+), to address known subsurface impacts in support of the redevelopment of the west portion of the property located at 200 Lees Avenue, in Ottawa, Ontario (the Site). A plan showing the location and layout of the Site is provided as Figure 1.

The 200 Lees Avenue property is owned and managed by the University of Ottawa (uOttawa) and is presently developed as a University campus with five building blocks (Blocks A through E). The main occupant of the property is uOttawa's Faculty of Health Sciences. Portions of the property are also occupied by the Faculty of Engineering, the Faculty of Arts, Sports Services, and a library. The Site, or focus of this RAP, is a 20,520 square metre (m^2) area located on the west portion of the larger 200 Lees Avenue property which is scheduled for redevelopment. The majority of the Site is the northern portion (approximately 18,800 m2) that contains the current buildings; this northern portion is referred to herein as "the Community Use Area". The southern portion of the Site is a strip (approximately 1,700 m2) along the multi-use trail; this southern portion is referred to herein as "the Parkland Area". Design plans for the Site show the area scheduled for redevelopment to be bounded by an existing access road to the north, Blocks A and E to the east, a Transitway corridor to the west, and a multiuse pathway to the south. Preliminary design plans that were considered in the approach to this RAP are provided in Appendix A. The area defined by the landscaping plan and as outlined by the green line on Figure 1, is considered the redevelopment area.

It is Geosyntec's understanding that the redevelopment will include the demolition of Buildings B, C, and D to make way for the construction of a new, multi-level 'C-shaped' building (the 'future Site Building'). The preliminary design plans in Appendix A show that the northern part of the Site zoned Transit Oriented Development Zone (TD2 and TD3) (approximately 18,780 m^2) will contain the new "C" shaped building and the south area within 30 meters (m) of the Rideau River will only consist of applicable landscaping activities and the area is zoned Parks and Open Space (O1H))(approximately 1,740 m^2) (City of Ottawa, 2020). It is understood that the future Site Building will be slab-on-grade, and will be located within the approximate footprint of existing Buildings C and D. No changes to the land use are planned.

2. OBJECTIVES

The objectives of this RAP are as follows:

- Identify the remedial or risk-based management approaches best suited to address concentrations of contaminants of concern (COCs) in consideration of uOttawa's needs and future use of the Site. Geosyntec understands that the redevelopment of the Site is scheduled to begin in 2021;

- Develop a preliminary action plan for the implementation of viable remedial or risk-based management approaches. Further refinement and evaluation of the action plan will be conducted upon the finalization of the redevelopment plan of the Site;
- Outline health & safety, and soil & groundwater management measures to protect workers interacting with subsurface materials during the planned redevelopment of the Site; and
- Develop preliminary cost estimates to assist with the selection of viable remediation or risk-based approaches identified herein.

Geosyntec understands there is no intention to file a Record of Site Condition (RSC) for the Site, as a more sensitive land use is not proposed in either of the Sites zoning codes (i.e. Transit Oriented Development Zone (TD2 and TD3) and Parks and Open Space (O1H)) (City of Ottawa, 2020). Overall, the RAP is presented within the framework of Ontario Regulation 153/04, as amended (O.Reg. 153/04). This report was prepared with the objective to present an environmental Site management strategy in relation to the subsurface condition of the Site associated with the Site's redevelopment to be supported by approval agencies such as the City of Ottawa, Rideau Valley Conservation Authority and other agencies as appropriate.

3. PROJECT UNDERSTANDING

The following subsections present Geosyntec's understanding of historical activities, geological/hydrogeological conditions, and the distribution of COCs at the Site. This understanding is based on available records and environmental investigations completed at the Site to date and forms the basis for the formulation of this RAP.

3.1 Summary of Past Investigations

Numerous subsurface investigations, dating back to the 1980s, have been completed for the Site and surrounding area. A summary of past investigations is provided in a Phase One Environmental Site Assessment (ESA) report to support this proposed development completed by CIMA+ (CIMA+, 2020a). The report indicated that the Site historically served as an incinerator waste landfill from 1906 through 1947. Subsequent Phase Two ESA (CIMA+, 2020b) and Supplemental Subsurface Investigation (CIMA+, 2020c) was completed by CIMA+ in 2020 to further evaluate subsurface conditions at the Site and address data gaps identified in the Phase One ESA. The results of the cumulative investigations have identified soil/aggregate fill material across the Site with varying quantities of deleterious materials (e.g., cinders and ash, and construction debris) associated with the former incinerator waste landfilling. Concentrations of polycyclic aromatic hydrocarbons (PAHs), petroleum hydrocarbons (PHCs), and metals in submitted soil/fill materials, have been historically identified at concentrations exceeding the applicable Site Conditions Standards (SCS) summarized in Section 2.3. Figures prepared during the CIMA+ Phase Two ESA, showing the Site layout, historical sample locations, and distribution of COCs, are provided in Appendix B.

The presence of free-phase coal tar and concentrations of PAHs in groundwater exceeding generic SCS, have also been historically identified in the northwest corner of the Site CIMA+ (2020a). The free-phase coal tar and groundwater impacts are attributed to an off-Site coal gasification plant which was formerly located to the north and northwest of the Site. The coal tar impacts are under the hydraulic control of a pump and treat system located to the north of the Site (across Lees Avenue at the Transitway Station (referred to herein after as "the Transitway pump and treat system"), which is operated by the City of Ottawa.

In the conceptual model defined by CIMA+(2020b) the following Site conditions were identified:

- "Geological conditions were confirmed with a heterogeneous fill layer laterally extensive across the Site consisting of sandy granular fill, cinders and ashes, and construction debris; silty and fine sand alluvium with silty clays, coarse sand, and gravels; glacial till deposits with some clay and gravel; and fractured black shale;

- Soil concentrations above the applicable SCS, are limited to PAH (Benz(a)anthracene, Benzo(b)fluoranthene, and Benzo(a)pyrene) and heavy metals (arsenic, cadmium, copper, lead, and zinc) within the fill material on-Site (between 2.1 and 3.7 mbgs);

    - Analytical results for PAH in soil have reported concentrations lower than the maximums reported prior to 2002 with an overall decrease in the average concentration of PAH parameters. Metals concentrations continue to note variability across the Site due to the heterogeneous nature resulting in isolated "hot spots" and wide-spread impacts within the fill;

- Soil analytical results of fill reported concentrations of leachable lead above the applicable criteria and therefore are considered leachate toxic waste;

- Groundwater elevations and flow within the shallow overburden is dominated by the operation of the Transitway Station groundwater control system located on the property to the northwest of the Site, consistent with historical Site conditions.

- Groundwater concentrations were below applicable SCS with the exception for PAH (Acenaphthylene) in MW12-11. That well is in the northwestern portion of the Site closest to the known source of coal tar, that is being managed by the Transitway Station groundwater control system.

- Groundwater impacts are consistent with historical results and limited to PAH parameters located within the northwest portion of the Site and therefore not within the proposed development area or building footprint;

- Lowering of the groundwater table resulting in changes to the gradients, (construction dewatering etc.) could results in the mobilization of the coal tar. Groundwater

concentrations within the bedrock were reported below the applicable SCS and/or below the laboratory reportable detection limit for each parameter analyzed; and,

- Groundwater analytical results were compared to historical and continue to be limited to PAH parameters located within the northwestern portion of the Site. With concentrations of metals in groundwater below the applicable SCS."

The above Site conditions must be considered in the redevelopment of the Site.

In support of the Supplemental Subsurface Investigation conducted by CIMA+ (CIMA+, 2020c), a soil vapour investigation was recently conducted at the Site in order to determine whether coal tar impacts on the northwest portion of the Site present an unacceptable vapour intrusion risk for the future Site development. Concentrations of naphthalene and benzene in soil vapour samples collected from the area were below the Provincial screening levels applicable to the Site. Based on these results, the coal tar impacts are not anticipated to result in a vapour intrusion risk for the future Site development and provisions for the implementation of vapour intrusion controls are not considered to be required.((CIMA+, 2020c) and (Geosyntec, 2020))

During the CIMA+ Phase Two ESA (CIMA+, 2020b), a composite sample of drummed soil cuttings was prepared to determine whether the material may be disposed of at a landfill facility as a non-hazardous waste, per the requirements of O.Reg. 347/90. The composite sample was submitted for laboratory Toxicity Leachate Characteristic Procedure (TCLP) analyses, and the analytical results for the TCLP analyses were compared to the Schedule 4 criteria presented in O.Reg. 347/90. All reported leachate concentrations for parameters analyzed for the submitted sample were below the Schedule 4 criteria, with the exception of a lead leachate concentration (9.98 milligrams per litre [mg/L]) exceeded the corresponding Schedule 4 limit of 5 mg/L. Under O.Reg. 347/90, soil with leachate concentrations exceeding Schedule 4 criteria is considered 'leachate toxic wastes' and is subject to additional provisions (e.g., treatment) before the material can be disposed of at a landfill facility (CIMA+, 2020b) (CIMA+, 2020c).

Following the Phase Two ESA, a Supplemental Subsurface Investigation (SSI) (CIMA+, 2020c) was conducted by CIMA+ to further investigate the leachate toxicity findings. Six soil samples collected from the Site during the SSI were submitted for supplemental laboratory TCLP analyses. All reported leachate concentrations were below the O.Reg. 347/90 Schedule 4 criteria, with the exception of lead leachate concentrations (5.73 mg/L [original analysis] and 38 mg/L [re-analysis]) reported for a soil composite sample collected from a borehole (BH20-9), advanced in the southwest portion of the Site. Based on this result and the previous Phase Two ESA findings, CIMA+ concluded that the soil fill material was variable with respect to waste classification and has the potential to classify as leachate toxic for lead for waste disposal purposes.

The SSI also included further sampling of fill material in the southwest portion of the Site for mercury analyses (CIMA+, 2020c). A composite soil sample historically collected by others from this area of the Site identified a mercury concentration exceeding current Table 3 SCS, and it was

recommended that this finding be further investigated (CIMA+, 2020b). Three soil samples were collected from the Site in the general area of the past composite sample during the SSI and submitted for mercury analyses. All reported mercury concentrations (ranging between 0.15 micrograms per gram [µg/g] to 3.32 µg/g) were below the Table 3 SCS of 3.9 µg/g. Thus, mercury was removed as a COC at the Site.

A Screening Level Human Health and Ecological Risk Assessment (HHERA) was prepared by Geosyntec, in coordination with CIMA+, in order to address the subsurface impacts identified at the Site (Geosyntec, 2020). The HHERA identified potentially unacceptable risks related to direct contact with PAHs and metals in soils for all ecological receptors considered, except for terrestrial mammals and birds within the Community Use Area of the Site. For the Community Use Area, the ecological assessment considers maintaining natural habitat that is not comparable in quality to an uncontaminated setting but instead allowing habitat for species that are adapted or less sensitive to the COCs at the property. For the Parkland Area, more consideration was given to protecting ecological receptors because of proximity to the Rideau River.

The following Risk Management Measures (RMMs) were recommended as an outcome of the HHERA for both human and ecological receptors during anticipated construction and operation of the redeveloped Site:

- Develop and implement RMMs that involve construction of a cover over affected soils or remediation/removal to eliminate the direct contact pathway for soil COC concentrations in both the Community Use Area and the Parkland Area to address potential risks associated with future long-term contact with PAHs and metals in fill materials and soil by workers, students, and recreational visitors and by plants and soil organisms and to address potential risks to mammals and birds in the Parkland Area.
- Develop and implement a worker health and safety plan to guide all excavations at the Site and to prevent dermal contact and dust inhalation. When excavating in the coal tar area of the Site, the plan should include measures to prevent vapour inhalation and direct contact with Non Aqeous Phase Liquid (NAPL).
- Develop and implement a soil and groundwater management plan for intrusive activities potentially in contact with or exposing soils or groundwater at the Site to: (i) prevent the re-use of soil at locations where they can be contacted by people using the Site and by ecological receptors; and (ii) prevent the uncontrolled movement or discharge of NAPL and COCs in soil or groundwater at the Site.
- Groundwater monitoring is recommended to confirm that operation of the groundwater recovery system at the Transitway Station continues to maintain hydraulic control of the coal tar impacted area of the Site.
- Expansion of the groundwater monitoring network to include installation and water level measurement of wells within the Parkland Area north of the multi-use pathway is recommended to evaluate uncertainties regarding groundwater – surface water

interactions. A contingency plan should be developed should these results indicate that groundwater may be discharging to the Rideau River.

3.2 Geology/Hydrogeology

A Phase Two Conceptual Site Model (CSM) was prepared for the Site by CIMA+, which included an understanding of geological/hydrogeological conditions at the Site, as developed from available records and previous subsurface investigations. The Phase One CSM identified four distinct units at the Site. A generalized summary of these units is provided below (CIMA+, 2020b):

- ***Fill*** – Consisting of a heterogenous mix of materials including sandy granular fill, cinders and ash, and construction debris. The fill material was observed to have a maximum thickness of approximately 5 m and is present beneath the entirety of the Site;
- ***Alluvium*** – Predominantly consisting of silty, fine-textured sand, interbedded with silty clays and coarse sand and gravel deposits. The Geotechnical Report (Golder, 2020) shows this to be a silty clay. The deposit underlies the fill material has been observed at depths ranging between approximately 3 and 10 m below existing ground surface (bgs);
- ***Till*** – Described as a dense, basal sandy silt glacial till with some clay and gravel. The unit underlies the alluvium and has been observed at depths ranging between 7 to 11 m bgs; and
- ***Shale Bedrock (Billings Formation)*** – The overburden is underlain by a slightly weathered, shale bedrock. The bedrock interface has been observed at depths ranging between 10 to 13 m bgs.

The Phase Two ESA (CIMA+, 2020b) included the advancement of five boreholes, the installation of two additional monitoring wells, and monitoring and sampling of existing monitoring wells. Geological and hydrogeological observations were generally consistent with previous findings, noting a generally larger thickness of fill material (vs. earlier investigation) at the five newly advanced borehole locations. The thickness of the fill observed at these boreholes was reported to range between approximately 5.2 m and 6.0 m. In consideration of these most recent findings, as well as earlier findings, an average fill thickness of 5.5 m is assumed at the Site for the purposes of this RAP.

The previous investigations indicated a multidirectional groundwater flow direction at the Site due to the operation of the City of Ottawa's Transitway Station groundwater collection system to the northwest of the Site. The system limits the on-Site migration of coal tar impacts onto the Site. Groundwater on the Site generally flows to the northwest towards the system. Supplemental evaluation has shown that it is quite likely that the groundwater flow is from the Rideau River to the northwest towards the system (Geosyntec, 2020). Depths to groundwater measured ranged between approximately 5.8 m bgs and 9.1 m bgs (CIMA+, 2020b). The shallow groundwater table was typically observed within the alluvium deposit. Groundwater elevation contouring by CIMA+ indicated that the groundwater flow regime at the Site continues to be strongly influenced by the

City of Ottawa hydraulic control system, with the groundwater flow direction at the Site directed largely to the northwest (CIMA+, 2020b).

3.3 Site Condition Standards

Analytical data for submitted soil and groundwater samples collected from the Site have been compared to numerical criteria presented in the Ontario Ministry of the Environment, Conservation, and Parks (MECP) document titled '*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*', dated July 1, 2011 (Ministry, 2011).

For the Community Use Area, the Phase Two ESA (CIMA+, 2020b) identifies the applicable generic SCS to be the Table 3: Full-Depth Site Condition Standards in a Non-Potable Ground Water Condition for industrial, commercial, and community property use and coarse textured soils (Table 3 SCS), based on the following rationale:

- The current and future land use of the Community Use Area is a university which is considered community property use, pursuant to Section 3 of the Post-secondary Education Choice and Excellence Act, 2000 and O. Reg. 153/04, thus meeting the O. Reg. 153/04 definition of community use.
- Potable water for the Site is obtained from the City of Ottawa municipal system which primarily derives its water from the Ottawa River. There are no drinking water wells located on the Site or within 250 m of the Site; therefore, a non-potable groundwater condition exists at the Site.
- The Community Use Area is not considered environmentally sensitive as per Section 41 of O. Reg. 153/04.
    - CIMA+ identified that the Site is not located within or adjacent to an area of natural significance, as defined in O. Reg 153/04.
    - Soil pH values were confirmed to be between 7.0 and 8.0 for all samples analyzed (BH20-4-SS5).
- There are no surface water bodies present in the Community Use Area or within 30 m of it; therefore, Section 43.1 (1)(b) of O. Reg. 153/04 is not applicable.
- Laboratory results for grain size analysis indicate that the Site soils are coarse textured.
- Bedrock is located at a depth greater than 2 m bgs at the Site; therefore, the Site is not considered a shallow soil property as per Section 43.1(1)(a) of O. Reg. 153/04.

For the Parkland Area, the applicable generic SCS are the Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition for all types of property use and soil textures (Table 9 SCS), based on the following rationale:

- The current and future land use of the Parkland Area is a landscaped area (with the exception of the small portion of Building D, which will be demolished), thus meeting the O. Reg. 153/04 definition of parkland use;
- As described above, a non-potable groundwater condition exists at the Site and the Site is not a shallow soil property; and
- The Parkland Area is not considered environmentally sensitive as per Section 41 of O. Reg. 153/04 (Geosyntec, 2020).

3.4 Nature and Extent of Subsurface Impacts

Based on a review of the cumulative results of environmental investigations, the HHERA identified the following COCs for the Site:

- ***Soil*** – Twelve (12) PAH parameters, eight (8) metals parameters, and benzene, have been identified in soil at concentrations exceeding Table 3 SCS. The PAH parameters defined as COCs include acenaphthylene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenz[a,h]anthracene, fluoranthene, indeno[1,2,3-cd]pyrene, phenanthrene, and naphthalene. Metals parameters defined as COCs include arsenic, barium, cadmium, chromium (total), copper, lead, selenium, and zinc.
- ***Groundwater –*** Only acenaphthylene has been identified at concentrations exceeding the Table 3 SCS during recent groundwater sampling efforts at the Site and represents the sole COC for this media.
- **Soil Vapour** – A soil vapour investigation was conducted (CIMA+, 2020c) to determine whether volatile parameters associated with coal tar impacts on the northwest portion of the Site may present an unacceptable vapour intrusion risk for the future Site development. Concentrations of naphthalene and benzene in soil vapour samples collected from the area were below the Provincial screening levels applicable to the Site. Therefore, no COCs are identified for soil vapour.

The PAHs and metals COCs identified for soil are located within the fill material at the Site and have not been observed in the underlying native soil. The benzene Table 3 SCS exceedance in soil, and acenaphthylene Table 3 SCS exceedance in the groundwater sample collected from monitoring well MW12-11, were identified in the northwest portion of the Site and are attributed to the historical coal tar impacts originating from the area to the north of the Site, across Lees Avenue. Further migration of coal tar impacts onto the Site from this location is prevented by the Transitway pump and treat system. This RAP assumes continued operation of this system to prevent further on-Site impacts and, as such, provisions for barrier controls or remediation for these coal tar impacts have not been provided herein.

4. REMEDIAL OPTIONS EVALUATION

Subsurface contaminants may be addressed through remediation, risk-based approaches, or some combination of the two remedies. With respect to remediation, numerous technologies are available to physically, chemically, thermally, and/or biologically reduce contaminant concentrations in soil and groundwater. The appropriateness and efficacy of any given remediation technology is contingent on a multitude of factors, including but not limited to, the contaminant type, depth of impacts, soil permeability, hydrogeological and geochemical conditions, time constraints, and budget. A risk-based approach involves the implementation of RMMs to effectively eliminate potential exposure pathways to human and ecological receptors. The remediation of contaminants to reduce concentration levels to meet generic SCS effectively defers the need to implement any RMMs at a given property. Where remediation to generic SCS cannot be practically accomplished, some level of remediation may nevertheless be considered to reduce impacts and consequentially reduce the number of RMMs needed to safeguard potential receptors. A strictly risk-based approach may also present an adequate remedy, in situations where RMM requirements (in the absence of remediation) are not considered a substantial burden to the future operation of the property in question.

The majority of the identified COCs are present in the surficial fill material. Coal tar impacts in groundwater at the Site are limited to the northwest corner of the Site and are subject to the Transitway pump and treat system (CIMA, 2020a). Further, no indications of unacceptable vapour intrusion risks associated with the coal tar impacts were identified during a recent soil vapour investigation (Geosyntec, 2020). In consideration of these factors, the HHERA, and based on Geosyntec's understanding of the Client's needs and preferences, the primary driver under consideration as part of this Remedial Option Evaluation (ROE) is the impacted fill material.

4.1 Evaluation of Remediation Approaches

COCs identified in the fill material include various PAHs and metals parameters. Particularly with respect to metals, these parameters are chemically robust in nature and highly resistant to chemical, biological, or thermal destruction. Further, chemical and biological approaches to address the majority of the COCs would be further hampered, and ineffective, in addressing deleterious materials (e.g., ash, cinders, construction debris) in the fill material. As such, remedial approaches centered around chemical, biological, or thermal treatments are not carried forward for further evaluation as part of this ROE, given a low (or effectively unrealistic) probability of success.

A successful approach to address the fill material would require physical treatment measures, beginning with the removal of the fill through excavation. Once excavated, the soil can either be removed from the Site for disposal at an appropriate landfill facility or held for further treatment.

Alternatives to landfilling could include soil sorting/segregation and soil washing techniques. A soil sorting/segregation approach would involve extracting soil (with the potential to be chemically and physically suitable for on-Site reuse), from other deleterious/anthropogenic materials making up the fill at the Site, using sorting plants. Segregated soil would be subsequently stockpiled for

confirmatory testing, and pending the results, subjected to further treatment through soil washing. Soil washing is a process in which water and surfactants are utilized to blast/remove contaminants from the surface of soil particles. Wash water created in the process is either treated or removed to a treatment facility as a liquid waste. Whereas this approach may be viable insofar as reducing the level of landfilling required to remediate the Site, it is not considered practically feasible given the laborious and time-consuming nature of the approach, and timeframes required to obtain permits for the operation in light of uOttawa's redevelopment schedule (to be initiated in 2021). Further, the area of the Site is not expected to be conducive to the successful/practical implementation of this approach given its considerable space requirements. As such, soil segregation/sorting and soil washing approaches are not further evaluated as part of this ROE.

Per the rationale discussed above, only one remediation approach is considered viable with respect to addressing the subsurface impacts at the Site in the prescribed timeframe: the physical excavation of the fill material for **off-Site disposal at a landfill (Option 1)**. An action plan to implement Option 1 is provided in Section 5. An alternative (risk-based approach) to remediation is described in the following subsection.

4.2 Evaluation of Risk-Based Approach

In lieu of remediation through Option 1, **a risk-based approach (Option 2)** is also considered as part of this ROE. RMMs required to prevent unacceptable risks to future receptors of the Site were identified in the HHERA, and include the implementation of barrier caps (e.g.., hard caps or soil fill caps) across the surface of the Site, as well as the implementation of project-specific health and safety plans (HASPs), and soil and groundwater management plans (SGMP), for future intrusive works which would result in worker exposure to the subsurface. The Modified Generic Risk Assessment (MGRA) User Guide (MECC, 2016) sets out guidance for such barrier caps. The objective of the barrier cap(s) are as follows:

- Prevent the re-use of soil at locations above the barrier to prevent direct contact of COCs in soil by people using the Site and by plants and soil organisms;
- Minimize worker exposure to groundwater during excavation dewatering, including the potential for direct contact with, incidental ingestion of, and inhalation of vapours off-gassing from groundwater; and
- Prevent the uncontrolled movement or discharge of COCs in soil or groundwater.

Hard caps would be consequentially installed at the Site during the construction of the future Site building slab and asphalt-paved parking areas/access routes, so long as the proposed construction designs are reviewed and adjusted (where required) to duly satisfy both the engineered designs and the RMM specifications. Geosyntec anticipates that the baseline construction designs will likely be sufficient to meet the RMM specifications for hard caps or can be modified to meet the RMM specifications with no substantive additional effort.

Areas of the future redevelopment void of hard surfaces (e.g., landscaped areas) would require a soil/aggregate cap. To satisfy the requirements of the HHERA and O.Reg. 153/04, the soil/aggregate cap would require a minimum thickness of 0.5 m in areas of the proposed redevelopment(within the area proposed for new landscaping) located more than 30 m from the Rideau River (as specified in the MGRA User Guide, Appendix 9, Section 1 Hard cap/Shallow Cap Barrier RMM) , and a minimum thickness of 1.5 m in areas north of the multi-use pathway in the Parkland Area (refer to Figure 1- the area within 30 metres of the Rideau River bounded by the green landscaping boundary to south up to the Community Use Area) (as specified in the MGRA User Guide, Appendix 9, Section 2.2 Hard cap/Shallow Cap Barrier (modified s3 soil component value) RMM). This may be accomplished by excavating and landfilling the upper surface of fill material, for replacement with suitable soil/aggregate. As only the upper surface of the impacted fill material would require removal for a portion of the Site, a reduction in soil removal and landfilling (and associated costs; see Section 5) would be realized with respect to Option 1.

Although Option 2 results in a cost savings, some disadvantages to the approach are noted. Firstly, the approach results in a requirement for long-term operation and management (O&M) of the RMMs to address COCs left-in-place. Under O.Reg. 153/04, regular barrier cap integrity inspections by a Qualified Person (QP) are required. Further, under Option 2, the implementation of project-specific HASPs and SGMPs for intrusive works (beyond the upcoming redevelopment activities) would be necessitated to protect the subsurface worker. Additional measures may also be required to address concentrations of COCs exceeding the applicable Table 1 SCS, if identified for this area during future soil and groundwater sampling activities (see Section 5). Further once installed a Site Specific HASP needs to be developed (as specified in the MGRA User Guide, Appendix 9, Section 9 - Health and Safety Plan).

Geosyntec also notes that long-term RMMs can result in negative implications with respect to property financing and sale. However, the approach provides a generally more practical and cost-effective measure of addressing the COCs. As such, an action plan to implement Option 2 has been developed and is presented in Section 5.

5. REMEDIAL ACTION PLAN

This section presents generalized action plan to address COCs at the Site, using either;

Option 1 full remedial excavation of impacted fill material at the Site or

Option 2 a risk-based approach

The action plan is based on the information available at the time of writing. To date, a detailed design plan for the future development has yet to be completed. As such, this RAP has adopted a number of assumptions to enable a preliminary framework to address subsurface impacts at the Site and propagate further discussion and refinement with uOttawa. Upon completion of the development plan, this RAP should be re-evaluated, and approaches refined, to optimize the selected approach.

Prior to initiating either Option 1 or 2, a detailed soil leachate toxicity investigation program is required. The results of initial TCLP analyses for soil cuttings generated at the Site have identified varying results with respect to soil leachate toxicity. It is unknown whether the fill material which would classify as leachate toxic is limited to specific areas of the fill or widespread. Material classified as leachate toxic must be treated until leachate contaminant concentrations are reduced to levels meeting the O.Reg. 347/90 Schedule 4 criteria prior to landfill disposal, at substantial additional cost. Further investigation would be required to further characterize (this can be done in situ or while the material excavated through stockpiling) the extent of leachate toxic soil, identify treatment options/feasibility (if required), and ensure appropriate waste disposal practices. An evaluation of potential cost implications associated with the management and treatment of leachate toxic soil is presented in Section 8.

5.1 Option 1: Remedial Excavation

Option 1 involves the excavation of all fill material present at the Site for off-Site removal and disposal at a landfill facility. Based on the available analytical data, impacts are confined to the fill material at the Site and the need to excavate a substantive volume of underlying native soil is not anticipated. The fill material has an average thickness of approximately 5.5 m and is present beneath the entirety of the proposed redevelopment area which is approximately 20,520 m^2. In order to capture all of the fill material, the depth of the excavation is expected to be advanced to an average depth of approximately 5.8 m bgs, which includes an allowance to remove the upper 0.3 m of underlying native soil, which is expected to be compromised through mixing during the excavation activities.

During the implementation of this approach, an adequate degree of sloping will need to be maintained along the periphery of the excavation cavity in order to maintain the stability of the excavation sidewalls. At this time, it is assumed that more substantive engineering controls (e.g., shoring) would not be required during the excavation activities to achieve remediation targets. Should excavation within the support envelope for proximal buildings or neighbouring lands be required, further investigation will be required to develop engineered plans.

During the excavation activities, exposed fill material with no visual/olfactory evidence of impacts may be segregated and stockpiled for confirmatory soil sampling purposes to evaluate its chemical suitability for potential re-use as backfill material. If feasible, this approach would result in a reduction in costs associated with landfilling and backfill sourcing. Requirements for verification screening and sampling of stockpiled material intended for re-use at the Site are presented in Section 7 (Soil and Groundwater Management).

The depth to groundwater at the Site is generally located in the native alluvial soil deposit located beneath the fill zone. As such, substantial dewatering and related costs to treat pooled water accumulated in the excavation cavity is not anticipated. Nevertheless, some surface water and perched groundwater infiltration should be expected. It is anticipated that the pooled water will largely percolate through the bottom of the excavation cavity and can be generally managed without the implementation of dewatering/treatment systems. Should the need for some form of

dewatering arise during excavation, requirements for groundwater management are presented in Section 7 (Soil and Groundwater Management).

Upon completion of the excavation activities, verification soil sampling must be conducted along the sidewalls and base of the resulting cavity in accordance with O.Reg. 153/04, and under the supervision of a QP. Minimum confirmatory sampling requirements for excavations with footprints of up to 1,000 $m^{2,}$ are presented in Table 3 of Schedule D in O.Reg. 153/04. Confirmatory soil samples must be submitted for laboratory analyses of the COCs (e.g., PAHs and metals), as a minimum, and must be selected based on the results of field screening. Soil samples submitted for laboratory analysis must represent 'worse-case' conditions and should provide overall spatial coverage of the excavation limits. Where the results of laboratory analyses for a given confirmatory soil sample do not meet the applicable SCS, the location of the exceeding soil sample must be further excavated and a supplemental round of confirmatory soil sampling must be conducted along the new excavation limits.

Upon confirmation that all impacted fill material has been removed from the Site, the excavation cavity can be backfilled to original grade with a combination of verified soil fill material excavated from the Site, and imported fill/aggregate. Requirements for confirmatory screening and sampling of stockpiled material, and imported soil, are presented in Section 7 (Soil and Groundwater Management). Backfill compaction must be conducted to the engineered specifications required to support the future development, as determined by the Site constructor's Engineer.

The excavation of soil fill material from the Site is not expected, in and of itself, to address coal tar groundwater impacts in the northwest portion of the Site. Note that the HHERA has concluded that if the Transitway pump and treat system is continued, this area of coal tar impacts does not require further mitigation under a RMM. However, if remediation is desired, a combination of excavation 'seeding' or reagent injections through the bottom of the excavation surface can be conducted in this area of the Site to mitigate the groundwater impacts. Seeding involves either the direct placement of a remedial reagent on the surface of the excavation or mixing of the reagent with backfill material. Further groundwater evaluation in this area must be conducted prior to groundwater treatment in this location, to determine geochemical conditions and identify an appropriate treatment reagent(s). At a minimum, the reagent(s) should include activated carbon (or similar) to prevent further on-Site migration of coal tar impacts from the source area to the north of the Site after the completion of the remediation activities.

5.2 Option 2: Risk Based Approach - Barrier Capping

As noted above, this option would be a risk-based approach and would involve the installation of barrier caps across the Site surface to meet the RMM requirements defined in the HHERA. The cap options for the Site per the Geosyntec (2020), O. Reg 153/04 and the MGRA User Guide, are as follows:

1. Shallow Soil Cap Barrier – Cover, above the COCs in soil, that is at least 0.5 m thick in the Community Use Area of the Site, and at least 1.5 m thick in the Parkland Area (south portion) of the Site and consists of capping soil;
2. Hard Cap Barrier – Asphalt or concrete cover layer, above COCs in soil, that is at least 225 mm thick and consists of at least 75 mm of hot mix asphalt or poured concrete underlain by Granular "A" aggregate or equivalent material, and includes a building slab or building foundation and floor slab meeting these specifications; and
3. Fill Cap Barrier - Cover, above the COCs in soil, that is at least 0.5 m thick in the Community Use Area of the Site, and at least 1.5 m thick in the Parkland Area (south portion) of the Site. The fill cap may be comprised of soil, wood chips or other landscaping finishes (e.g. patio stones, cobbles etc.).

Hard caps would be consequentially installed at the Site during the construction of the future Site building slab and asphalt-paved parking areas/access routes, so long as the proposed construction designs are reviewed and adjusted (where required) to duly satisfy both engineered design plans for the redevelopment and the specifications for hard cap barriers presented above.

The remainder of the Site (e.g., landscaped areas) will require a 0.5 m (majority portion) or 1.5 m (south portion) surficial thickness of soil material meeting the applicable SCS, or appropriate 'non-soil' fill material (e.g., wood chips, landscaping materials). As a conservative approach, this RAP assumes that soil material meeting the applicable SCS (and no 'non-soil' fill material) will be utilized to cap the proposed landscaped areas, given the additional requirements for this method. The installation of a soil barrier cap may be accomplished by excavating and landfilling the upper portion of the fill material and replacing the material with Table 1 SCS (Parkland Area) or Table 3 SCS (remainder of the Site) compliant soil/aggregate, as appropriate.

During the excavation activities, fill/aggregate material with no visual/olfactory evidence of impacts may be segregated and stockpiled for confirmatory soil sampling purposes to evaluate its chemical suitability for potential re-use as backfill material. If feasible, this approach would result in a reduction in costs associated with landfilling and backfilling. Requirements for verification screening and sampling of stockpiled material intended for re-use at the Site are presented in Section 7 (Soil and Groundwater Management).

Water table lowering efforts are not anticipated given the RMM will be above the local water table due to the shallow/surficial nature of the excavation. Should the need for some form of water management arise during excavation, requirements for groundwater management are presented in Section 7 (Soil and Groundwater Management).

No requirements for confirmatory soil sampling along the excavation limits are required under Option 2. Following the removal of the upper portion of impacted soil fill, the excavation can be backfilled to original grade with a combination of verified soil fill material excavated from the Site, and imported fill/aggregate. Requirements for confirmatory screening and sampling of stockpiled material, and imported soil, are presented in Section 7 (Soil and Groundwater

Management). Backfill compaction must be conducted to the engineered specifications required to support the future development, as determined by the Site constructor's Engineer.

In accordance with O.Reg. 153/04, a maintenance program for the cap must also be prepared by the installer and implemented by a QP and is to be retained by the Owner so as to ensure the continuing integrity of each barrier so long as the COCs are present at the Site, including, at a minimum:

i. procedures and timing for implementing the program;

ii. semi-annual inspections, in spring and fall, of the barrier;

iii. noting any deficiencies in the barrier observed during the inspections, or at any other time;

iv. repairing promptly any such deficiencies, to the original design specifications, with written confirmation by a Licensed Professional Engineer that the barrier has been properly repaired, to be retained by the Owner and be available for inspection upon request by a Provincial Officer;

v. contingency measures, such as fencing, to be implemented if cracks, breaches or any loss of integrity of the Barrier cannot be repaired or addressed in a timely manner, to prevent exposure to the Property Specific COC in that area of the Site; and

vi. recording, in writing, all inspections, deficiencies, repairs and implementation of contingency measures, to be retained by the Owner;

and which is,

vii. delivered to the Owner before use of all or any part of the Site begins, or within 90 days following completion of covering of all or any part of the Site, whichever is earlier; and

viii. updated and delivered to the Owner within 30 days following making any alteration to the program.

Geosyntec notes that the COCs are not expected to naturally attenuate in a foreseeable timeframe. As such, barrier inspections would be required for an indefinite period, and it is unlikely that the frequency of barrier inspections can be decreased in the absence of remediation.

If this option is selected as the preferred remedial measure, additional requirements may be needed during foundation construction and design. A more detailed geotechnical evaluation should be completed once the design elements are determined. Preliminary recommendations are as follows:

- If deep foundations are recommended for the site, appropriate construction methods should be utilized to avoid any cross contamination of the underlying soil layers and groundwater.

- Material or design elements may be required to avoid sulphate attack potential on concrete elements or corrosion of steel sections.
- Granular pads or asphalt substructures shall be designed such that they do not damage the designed cap. The design of these elements shall be compatible with the cap design.
- The existing fill and the underlying clayey/silty material may be subjected to short and long term settlements under the applied loading from the cap construction (specially if the cap is constructed on top of the existing grade). Appropriate assessments should be considered to mitigate any potential damages to the cap construction.

It is prudent that the additional costs for the foundation design be considered at the evaluation stage for the preferred remediation option. Also, if long term settlements are envisioned, maintenance and repair works for the cap may be required.

5.3 Additional Considerations

Once a final design plan becomes available, the following measures, if feasible, may be considered to optimize the RAP presented herein:

- Excavated fill may be bermed at (portions of) the Site as a measure to defer costs associated with landfilling the material, provided that the resulting berm(s) is/are capped using the methods discussed in Section 5.3. It is noted that the placement of impacted soil fill in areas of the Site located within 30 m of the Rideau River is not permitted; and
- A soil barrier cap may be installed on top of existing grade ("overloaded") to defer costs associated with the excavation and landfilling of the upper portion of impacted fill material. This approach is feasible if the existing Site grade may be increased in areas of proposed landscaping.

Although the above-noted measures may result in cost savings, estimated costs and approaches presented herein are developed under the conservative assumption that these measures cannot be accommodated by the redevelopment design specifications. The RAP and estimated costs may be refined at a future time to include these measures upon receipt of further information, discussions with uOttawa, and further feasibility evaluation.

Geosyntec also understands that uOttawa intends to plant trees in the future landscaped areas. The selection of backfill or soil capping material should be reviewed with the Site landscaper and/or arborist to ensure that the material is conducive to the growth and sustainability of the proposed tree species.

5.4 Contingency Measures and Monitoring Program

Both Options 1 and 2 are expected to have a high probability of addressing the COCs at the Site. This section provides potential solutions to address performance failures during the implementation of either of these approaches.

For Option 1, verification soil sampling is to be completed along the limits of the excavation in order to ensure that all impacted soil fill material has been removed. In the event that exceedances of the applicable SCS are encountered in areas of the excavation limits during the verification sampling, the areas may be further excavated and verified until such time that all concentrations of COCs in all verification samples are shown to meet the applicable SCS. If necessary, engineering controls (e.g., slot excavations, shoring, underpinning) may be implemented to remove residual impacted fill in load-bearing areas. Alternative remediation approaches (e.g., injections) may also be considered to address residual impacts, depending on the number/types of COCs remaining. Any areas of residual impacts may also be barrier capped following the methods outlined for Option 2.

For Option 2, a semi-annual inspection program, following the guidance of O.Reg. 153/04 (Ministry, 2016), is recommended to monitor the integrity of the barrier caps to ensure that they continue to remain effective in preventing exposures to the underlying fill. If deficiencies are encountered, the area of compromised barrier cap should be fenced/controlled until such time that repairs can be made. Deficiencies associated with hard caps (e.g., cracks/pitting) can be repaired through asphalt/concrete repairs or replacement. Deficiencies associated with soil/fill caps can be addressed by replacing the material following the procedures described in Section 6 and 7.

In the Parkland Area Geosyntec (2020) notes that the primary concern for this area is the potential for contaminant migration to the Rideau River through the groundwater pathway. The absence of this pathway needs to be confirmed through groundwater level monitoring of a minimum of three surveyed new monitoring wells and a surface level station to be completed in this area after cap installation and redevelopment of the Site to confirm that the groundwater flow from this area is not towards the Rideau River. For this reason, a quarterly groundwater and surface water level monitoring program is recommended for a period of one year to establish temporal trends in the hydraulic gradient with the Rideau River. The frequency (if any) of further monitoring activities may be re-evaluated pending the results of the first annual round of quarterly monitoring. If the results of the monitoring program are suggestive of flow to the Rideau River the groundwater program should be expanded with the COCs at the Site on a quarterly basis.

A corrective action in this area if needed would be barrier controls along the south end of the Site. Such barrier controls could range from using phytoremediation hydraulic controls (trees), to hydraulic controls such as sheet pile walls, to localized interceptor trenches.

In the northwest portion of the Site, Geosyntec (2020) noted the presence of Benzene, Toluene, Ethybenzene, and Xylene (BTEX) and PAH compounds in the subsurface in groundwater, more than 30 m away from the foundation of the proposed Building. BTEX and PAHs (Geosyntec, 2020) have been monitored long term at the Site and groundwater levels have confirmed that the recovery system at the Transitway pump and treat system has control over the groundwater level at the Site resulting in a groundwater flow regime towards the Transitway pump and treat system. Following installation of the cap in this part of the Site, it is recommended that groundwater levels be monitored at three locations in this area on a quarterly basis for one year to demonstrate that

this continues. If an agreement can be developed with the City of Ottawa with regard to permanence of this groundwater control system operated by the City, the groundwater level monitoring may be reduced at the direction of a QP.

6. HEALTH AND SAFETY MANAGEMENT

A HASP must be prepared in accordance with applicable Ministry of Labour health and safety regulations and take into consideration potential risks associated with exposures to COCs as described herein. The plan must also include ventilation of excavations to control exposures to COCs in excavation air and to ensure the health and safety of workers and controls, including the use of Personal Protective Equipment (PPE), to prevent contact with groundwater during subsurface work and dewatering activities. The project-specific management plan must coordinate with the HASP to protect workers from exposures to vapours and groundwater due to the presence of COCs in groundwater when excavating or conducting other activities that may result in contact with groundwater. The plans must be coordinated so that vapour generation during dewatering or other subsurface activities is avoided through the use of controls, to the extent practical. Ventilation must be conducted consistent with the requirements of the Occupational Health and Safety Act including regulations for confined space (O.Reg. 632.05), at a minimum. Work shall also be completed in accordance with the "Contractor's Environmental Obligations Agreement " as published by uOttawa (uOttawa, 2019).

Prior to initiation of any project (as defined by the Occupational Health and Safety Act, as amended), the local Ministry of Labour office must be notified of the proposed activities and that the property contains contaminated soils and groundwater. The plan must be overseen by an appropriately QP to review the provisions of the plan with respect to the proposed site work and conduct daily inspections.

On implementation and completion of Option 2 – A Property HASP needs to be developed in accordance with MGRA User Guide (refer to Appendix 9 Section 9 Health and Safety Plan).

7. SOIL AND GROUNDWATER MANAGEMENT

As part of the soil and groundwater management during construction various plans, measures and controls shall be considered and included in the specifications of the design package to reduce and/or eliminate risk to human and ecological receptors due to the presences of COCs.

7.1 Soil and Groundwater Management Plan

A project specific SGMP must be prepared prior to conducting the upcoming RAP/redevelopment activities and should be included in the design specifications. If a risk-based approach (Option 2) is selected to manage the Site COCs (e.g., impacted soil/fill is to remain at the Site), project-specific SGMPs must also be implemented prior to conducting any subsequent intrusive activities that could potentially result in contact with or exposing subsurface soils or groundwater at the Site.

The plan must be developed to be consistent with the application of the applicable SCS for the Site and the following goals developed based on the results of the RA and risk reduction requirements:

- Prevent the re-use and/or deposit of impacted soils and deleterious fill materials excavated from the Site at inappropriate off-Site locations;
- Minimize worker exposure to groundwater during excavation dewatering, including the potential for direct contact with, incidental ingestion of, and inhalation of vapours off-gassing from groundwater; and
- Prevent the uncontrolled movement or discharge of COCs in soil or groundwater.
- The project specific SGMP must be conducted under the supervision of a QP. The QP must be engaged with sufficient time prior to conducting such activities to allow development of a project-specific management plan adherent to this SGMP and applicable regulations. This requirement for advance engagement does not apply to intrusive activities of a time-sensitive and urgent nature. Should such a situation arise, a QP must be engaged at the earliest opportunity.

Following the requirements of O.Reg. 153/04, the project-specific management plan must be:

- Delivered to the Property Owner before any intrusive activities are undertaken; and
- Updated and delivered to the Property Owner within 30 days following making any alteration to the plan.

7.2 Dust, Sediment, and Tracked Soil Control Measures

Measures must be established to control dust, sediment, and prevent the tracking of subsurface soils during the excavation of soil and included in the design specifications. These measures must include:

- Excavation work areas must be closed off to the general public and demarcated using temporary fencing, barricades or signage, as appropriate;
- Dried soil must be wetted or tarped, as required, to prevent the generation of dust;
- Erosion control fencing must be erected around the work area;
- Soil accumulated on the tracks or tires of earth moving equipment and vehicles within the work area must be removed and appropriately managed to exit the work area;
- Completed work area must be adequately protected to prevent erosion; and
- PPE utilized within the work area must be cleaned or disposed of, as appropriate, prior to exiting the work area.

7.3 Soil Management

Soil excavated from or brought to the Site must be managed in accordance with the Health & Safety considerations presented in Section 6, and the requirements of O. Reg. 153/04. In addition, future soil management activities at the Site may be subject to additional requirements outlined in O.Reg. 406/19 (the On-Site and Excess Soil Management Regulation), which is scheduled to come into force in a staged approach, beginning on January 1, 2021 (Ministry, 2019).

7.3.1 Verification of Excavated Soil for Re-Use Considerations

Confirmatory screening and sampling of stockpiled material excavated from the Site, intended for re-use as backfill material, must be completed in accordance with the minimum screening and analytical testing requirements presented in O.Reg. 153/04, and under the supervision of a QP. Minimum stockpile sampling frequency requirements for up to 5,000 cubic metres (m^3) of excavated soils intended for re-use are presented in Table 2 of Schedule D in O.Reg. 153/04. For soil volumes of more than 5,000 m^3 of soil, the minimum number of verification soil samples must follow the following formula:

$$N = 32 + (V - 5000) \div 300,$$

Where;
N - the minimum number of verification samples; and
V - the total volume of soil

Verification soil samples must be submitted for laboratory analyses of the Site soil COCs (e.g., PAHs and metals), as a minimum, and must be selected based on the results of field screening. Soil samples submitted for laboratory analysis must represent 'worse-case' conditions and should provide overall spatial coverage of the soil stockpiles. Sampling along the surfaces of stockpiles must be avoided. Where the results of laboratory analyses for a given verification soil samples do not meet the applicable SCS, the corresponding stockpile must not be used for final placement at the Site.

7.3.2 Management of Imported Soils

The importation of soil would be required to backfill excavation cavities to original grade during upcoming construction/RAP activities and may be required for subsequent intrusive works if a risk-based approach (Option 2) is selected. Verification screening and sampling must be completed to ensure the appropriateness of imported soils for on-Site re-use. Specific requirements will be contingent on the source of the imported soil. It should be noted that environmental assessments and a risk assessment, using O.Reg. 153/04 as guidance framework, have been completed for the Site. However, the submission of a Certificate of Property Use (CPU), in support of the redevelopment of the Site to a more sensitive land use is not required or intended for the Site. Given that the risk-based standards developed for the Site will not be subject to a Provincial instrument, imported soils must meet the requirements of the Ontario Excess Soil Rules (Ministry, 2019) .

As of January 1, 2021, soil imported from off-Site locations, excluding commercially sourced soil from aggregate pits or quarries (as defined in the Ontario *Aggregate Resources Act*), will be subject to the requirements of O.Reg. 406/19, and may include (but is not necessarily limited to) an evaluation of past uses at the source property, soil characterization activities, an on-Site re-use feasibility assessment, as well as registration and tracking procedures. Specific requirements under O.Reg. 406/19 are contingent on the source property. Therefore, if soil is to be imported from an off-Site location which is not an aggregate pit or quarry, a QP must be engaged to review the source property (and relevant environmental information) for the purposes of determining the requirements needed to meet O.Reg. 406/19.

It is noted that aggregate pits and quarries are exempt from the requirements of O.Reg. 406/19. If commercially sourced soil is to be imported to the Site, screening and sampling of the material to the requirements of Section 55 of O.Reg. 153/04 must be conducted under the supervision of a QP in order to verify that the material meets the Table 3 SCS. In accordance with O.Reg. 153/04, the verification program must include (but is not limited to) the submission of a minimum of one soil sample (for the first 5,000 m^3, or one soil sample for every 3,000 m^3 imported thereafter) for laboratory analysis. Parameters to be analyzed as part of the analytical program should include, as a minimum, O.Reg. 153/04 specific metals and inorganic parameters, and PHCs. In addition, the analytical suite must include any other potential COCs associated with the source site, or which may have been introduced during transport.

7.4 Groundwater Management

Excavations completed as part of the RAP/redevelopment activities are projected to be confined to the vadose zone (e.g., above the shallow water table). As such, groundwater management measures presented herein are limited to minor quantities of perched water which may be released during excavation, and surface water/precipitation infiltration. In the event that dewatering activities are required to facilitate deeper excavation beyond the shallow water table, further provisions (beyond those defined herein) may be required to ensure that hydraulic containment of groundwater impacts associated with the historical off-Site coal gasification plant is maintained.

Excavations or intrusive activities that may result in exposure of perched groundwater or a need to discharge surface water pooled in excavation cavities, must be managed as follows:

- Per the health and safety considerations presented in Section 6;
- Groundwater and surface water collected from excavation cavities from any part of the Site must not be reintroduced to the subsurface in any other part of the Site or at any other property;
- If groundwater or surface water collected at the Site is intended to be discharged to the Municipal sewer system, a permit must first be obtained from the City of Ottawa. The effluent quality must be characterized and monitored in accordance with the requirements of the permit and applicable by-law criteria. A treatment system may be utilized to reduce concentrations of COCs to criteria meeting permit and by-law requirements provided that

a permit is obtained. As noted a PTTW may be also be desired. If groundwater pumping exceeds 50,000 Litres per day a PTTW will be required from MECP. A staged excavation may prevent the risk of large areas of pooled water that may require a PTTW.

- As an alternative to sewer discharge, groundwater or surface water collected from excavation cavities may be transported from the Site by appropriately licensed waste haulers for off-Site treatment and disposal at an approved waste receiver. Wastes must be manifested and registered with the Ontario Hazardous Waste Information Network (HWIN).

7.5 Record Keeping

Written records surrounding any soil and groundwater management measures undertaken at the Site must be prepared and retained by the Site Owner per the requirements of O.Reg 153/04. The records must include, but not limited to the information listed below in addition to any applicable requirements specified in O. Reg. 153/04 and O. Reg. 406/19:

- Dates and duration of the intrusive activities being undertaken;
- Weather and Site conditions during the intrusive activities;
- The location and depth of excavation activities, and dewatering activities, if any;
- Dust control and soil tracking control measures;
- Characterization results for excavated soil and any soil brought to or removed from the Property, and for any ground water from dewatering;
- Soil management activities including soil quantities excavated and brought to and removed from the Site, and stockpile management and storm water runoff control;
- Management activities for any groundwater from dewatering;
- Names and contact information for the QPs and on-site contractors involved in the intrusive activities;
- Names and contact information for any haulers and receiving sites for soil and any ground water removed from the Property, and for haulers and source sites of any soil brought to the Site; and
- Any complaints received relating to the intrusive activities, including the soil, storm water and any groundwater management activities.

8. PRELIMINARY COST ESTIMATES

8.1 General Considerations and Limitations

For comparative purposes, and to evaluate the cost feasibility of Options 1 and 2, Geosyntec has prepared order-of-magnitude, Class D (AACE, 2020) engineering cost estimates for these

approaches. Total estimated costs include a 25% contingency and are based on assumptions listed herein. The preliminary cost estimates are presented in the following subsections, and in Tables 1 and 2. It is noted that, in the absence of a detailed design plan for the future development and further investigation, these cost estimates are considered preliminary. The cost estimates may be refined at a future time upon receipt of further information and discussions with uOttawa.

8.2 Option 1: Remedial Excavation

The following major assumptions/conditions have been assumed in order to generate the cost estimate to complete Option 1:

- The entirety of the Site would be excavated to a depth of approximately 5.8 m bgs, resulting in a total volume of soil excavation of 119,016 m^3 of soil, or 214,229 metric tonnes (MT) assuming a density of 1.8 MT per m^3. The volume calculations do not include stability sloping. The assumed depth of excavation is the sum of the approximate average thickness of the fill material (5.5 m), and the upper 0.3 m of native soil which is expected to become comprised through mixing with the overlying fill during the excavation process;
- It is assumed that 25% of the excavated fill material will be chemically/physically suitable for re-use as backfill at the Site;
- The implementation of engineering controls (e.g., shoring), beyond sloping along the excavation perimeter, will not be required to achieve the target excavation depths;
- Substantive efforts/costs to address pooled water in the excavation will not be required;
- Efforts to apply reagent to address groundwater coal tar impacts in the northwest portion of the Site are contingent on further investigation. However, these costs are not expected to be substantive relative to the overall level of effort required to accomplish Option 1, and are therefore not carried forward; and
- Estimated costs are incremental to the Site redevelopment. Costs for contractor engagement/mobilization, removal of the existing buildings/structures, Site preparation, and ground surface restoration (e.g., asphalt paving and landscaping) have not been considered.

The preliminary, estimated order-of-magnitude cost range to accomplish Option 1 is between **$14,300,000** to **$50,170,000** (excluding taxes). This does not include detailed geotechnical considerations as noted above. It is noted that, in the absence of further soil leachate toxicity data, the high end cost range includes a provision for the treatment of up to 50% of the excavated fill material to meet Schedule 4 criteria (O'Reg 347/558) prior landfill disposal.

8.3 Option 2: Barrier Capping

The following major assumptions/conditions have been assumed in order to generate the cost estimate to complete Option 2:

- For the purposes of this RAP, and based on a review of preliminary conceptual designs, it is assumed that approximately 40% of the Site will be hard capped during the Site redevelopment, and the remainder (60%) of the Site will require a soil barrier cap. The soil fill cap across the majority of the landscaped area (11,270 m^2) will have a thickness of 0.5 m or greater (Community Use Area). A thicker, 1.5 m soil barrier fill cap will be installed in landscaped area (1,042 m^2) in the Parkland Area of the Site (i.e. south border, north of multi-use pathway). The soil fill caps will involve a strip excavation of the upper portion of impacted fill for replacement with 'clean' imported fill. This results in a total excavation volume of 7,198 m3, or 12,957 MT assuming a density of 1.8 MT per m^3. Geosyntec notes that, given the complex layout of the proposed exterior landscaped and paved areas, discussions with the Site developer/constructor are recommended to optimize the soil capping and redevelopment approach. It is assumed that soil capping can be limited to the landscaped areas at this time. However, it may be more practical to install a soil cap across the entirety of the Site exterior to facilitate the construction of the exterior design plan;
- No vendor quotes were obtained for the formulation of the cost estimate. It is noted that, an incremental rate of $350 per MT for the treatment of hazardous soil prior to landfilling to meet Schedule 4 criteria (O'Reg 347/558) has been assumed in the absence of verifying the extent of hazardous material, available local resources, landfill capacities, and contractor engagement. The remainder of the unit rates are estimated based on Geosyntec's industry experience and typical local market conditions at the time of writing;
- It is assumed that 25% of the excavated fill material will be chemically/physically suitable for re-use as backfill at the Site;
- Estimated costs are incremental to the Site redevelopment. Costs for contractor engagement/mobilization, removal of the existing buildings/structures, Site preparation, and ground surface restoration (e.g., asphalt paving and landscaping) have not been considered.

The preliminary, estimated order-of-magnitude cost range to accomplish Option 2 is between **$990,000 to $3,160,000** (excluding taxes). This does not include detailed geotechnical considerations as noted above. It is noted that, in the absence of further soil leachate toxicity data, the high end cost range includes a provision for the treatment of up to 50% of the excavated fill material to meet Schedule 4 criteria prior landfill disposal.

In addition to the initial capital costs, the annual costs to complete and document the cap are estimated to be approximately **$10,000** per annum, at a minimum. In addition, the cost for one year of groundwater monitoring and monitoring well installation has been estimated to be approximately $20,000. This estimate does not include potential future costs to repair barrier cap deficiencies, implementation of barrier controls and/or a groundwater monitoring program in the

Parkland portion of the Site, or develop SGMPs and HASP for intrusive works, as the scope of these tasks (if required) cannot be estimated at this time.

9. SUMMARY

The results of Geosyntec's ROE identified two viable options for the purposes of addressing COCs identified at the Site, which include the full remedial excavation of impacted fill material at the Site (Option 1), or a risk-based approach (Option 2) which would entail the implementation of RMMs identified in the HHERA. An action plan to implement either of these approaches was provided in Section 5. In addition, Health & Safety and Soil & Groundwater Management considerations surrounding the management of COCs at the Site have been outlined in Sections 6 and 7, respectively.

Both Options 1 and 2 are considered to have a high probability of success in addressing the known COCs for the Site. A generalized summary of advantages/disadvantages, and preliminary cost estimates for each of the approaches, is provided in the table below:

Approach	**Advantages**	**Disadvantages**	**Preliminary Cost Estimate (excluding taxes)**
Option 1 (Remedial Excavation)	No long-term O&M requirements.	Substantially higher cost	**$14,300,000** to **$50,170,000**
	Higher potential to obtain full market value if property disposition is considered in the future.	Longer timeframe required to complete; may push back scheduled 2021 start of redevelopment activities.	
Option 2 (Risk-Based Approach)	Significantly reduced costs.	Long-term O&M component; including barrier cap inspections, barrier repairs (if required) and COC management plans.	**$990,000 to $3,160,000 initial capital costs.** **Minimum $10,000 per annum for barrier inspections and documentation (minimum total $200,000 over a 20-year O&M timeframe). Additional O&M costs may be required for cap repairs, barrier controls and monitoring (estimated at $20,000 for one year), and COC management plans (if required).**
	Approach could be practically implemented in tandem with redevelopment activities.	Potential implications on sale value if property disposition is considered in the future.	

The approaches and cost estimates provided herein are preliminary and based on available information at the time of writing. The intention of this RAP is to provide uOttawa with an initial framework to identify next steps for the management of known COCs. Upon further development of the Site redevelopment plan, discussions with uOttawa, and additional investigation, Geosyntec would be pleased to further refine and focus this RAP to uOttawa's preferred path forward.

10. LIMITATION AND REPORT USE

The findings and conclusions presented in this report are the result of Geosyntec's professional interpretation of the information collected at the time of the above-described field work. We cannot "certify" or guarantee that any property is free of environmental impairment. No warranties regarding the environmental quality of the property are expressed or implied. We are not responsible for independent conclusions, opinions, or recommendations made by others or otherwise based on the findings presented in this report.

This report has been prepared solely for the benefit of Geosyntec's client, CIMA + and the University of Ottawa. Geosyntec grants CIMA+ and the University of Ottawa the right-to-rely on the report contents. CIMA+ engaged Geosyntec to perform this assessment in accordance with an agreement governing the nature, scope, and purpose of the work as well as other matters critical to the engagement. All reports prepared by Geosyntec both verbal and written, are for the sole use and benefit of CIMA+ and the University of Ottawa. CIMA+ and the University of Ottawa may assign this report, without the consent of Geosyntec, to any of its corporate affiliates, subsidiaries, partnerships, and joint ventures, who may each rely on this report and get the full benefits therefrom. No other assignment of this report may be made without the written permission of CIMA+, the University of Ottawa and Geosyntec.

It is emphasized that the subsurface data were collected at discrete points at the site and thus represent the conditions at the investigated points. It is assumed that the available data are representative of the site conditions.

Either verbally or in writing, third parties may come into possession of this report or all or part of the information generated as a result of this work. A third party shall have the right to rely on Geosyntec opinions rendered in connection with this assessment only with Geosyntec's written consent which may be conditioned on the third party's agreement to be bound to acceptable conditions and limitations similar to those agreed to by the Client. Please note that Geosyntec's consent to provide a right-to-rely on the RAP is subject to Client's approval and to agreement to Geosyntec's terms and conditions associated with Geosyntec's performance of the RAP.

11. CLOSURE

Should you have any questions regarding the contents of the RAP, please do note hesitate to contact the undersigned.

Respectfully Submitted,

Colin Kelly B.Sc., P. Geo. QP_{ESA}
Project Scientist

Berend Velderman M.Sc. P. Geo., $QP_{ESA/RA}$
Senior Consultant

Ali Nasseri-Moghaddam, Ph.D., P.Eng.
Principal

12. REFERENCES

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FIGURES

Property parcel
Landscaping boundary
Zoning Boundary

Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

Sources:
- Landscaping boundary, IBI Group, 2020
- Zoning boundary, City of Ottawa, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : City of Ottawa Imagery, 2017

General Notes:
Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Survey by: -
Figure by: J. Scott
Concept by: K. Greer
Verified by: K. Greer
Revision 00 -- Issued for rport - 02 December 2020

Source: Figure provided by CIMA+ on December 2, 2020.

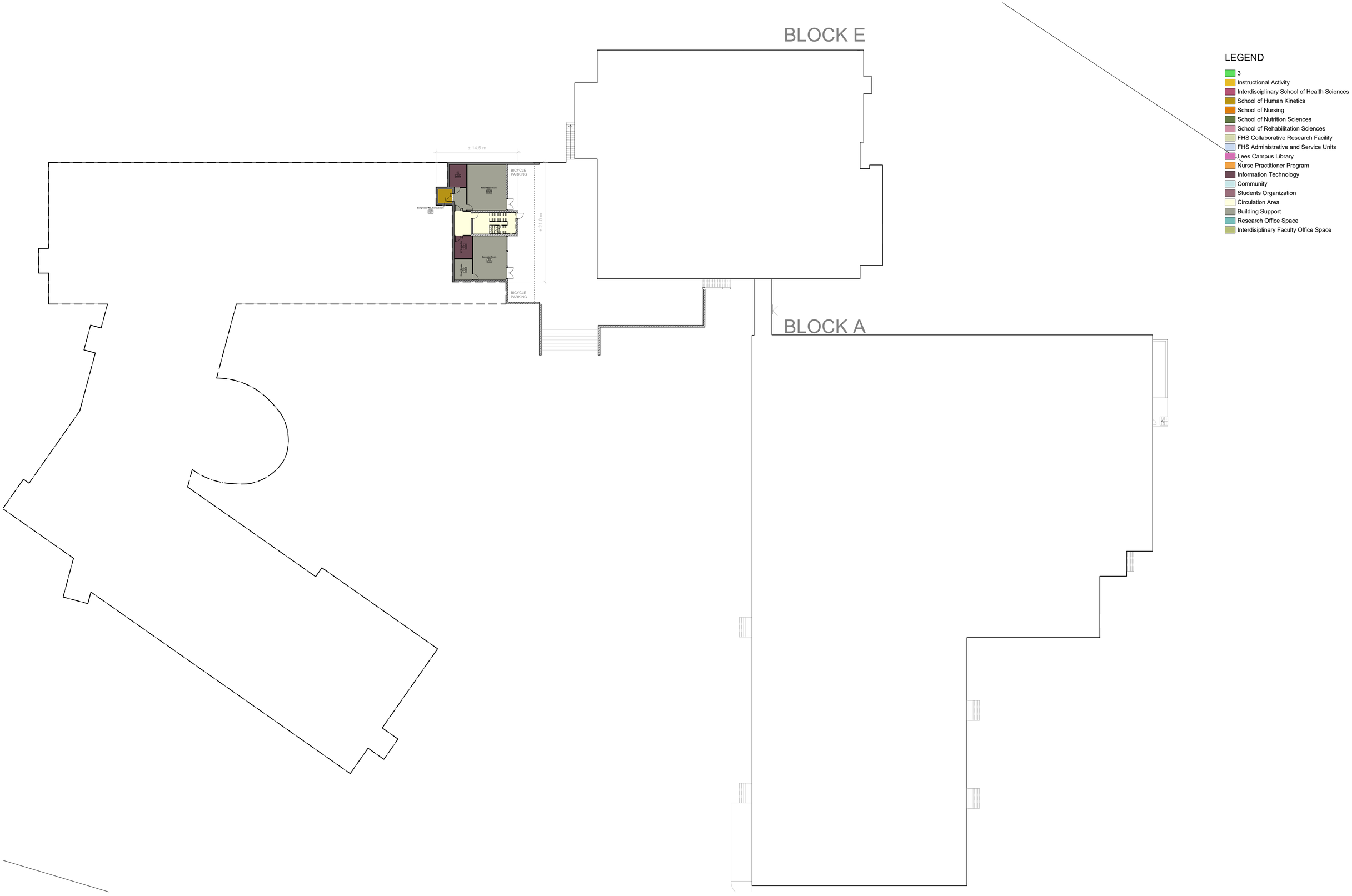
Site Location Map and Site Plan
Supplemental Subsurface Investigation
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Geosyntec consultants | CIMA+ | Figure 1

Guelph | December 2020

Site Location Map and Site Plan_1R0885.ai

APPENDIX A
DESIGN PLANS



IBI GROUP
400-333 Preston ave.
Ottawa, ON
613-241-3300
ibigroup.com

200 Lees Campus

SCALE: 1 : 300

06/11/20

Indicative Design - Level 0

A00

IBI

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uOttawa

200 Lees Campus

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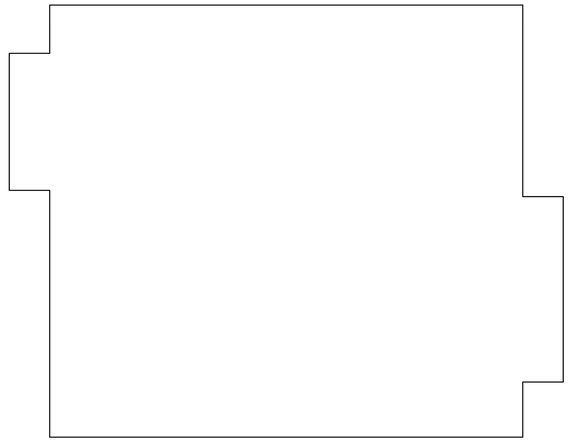
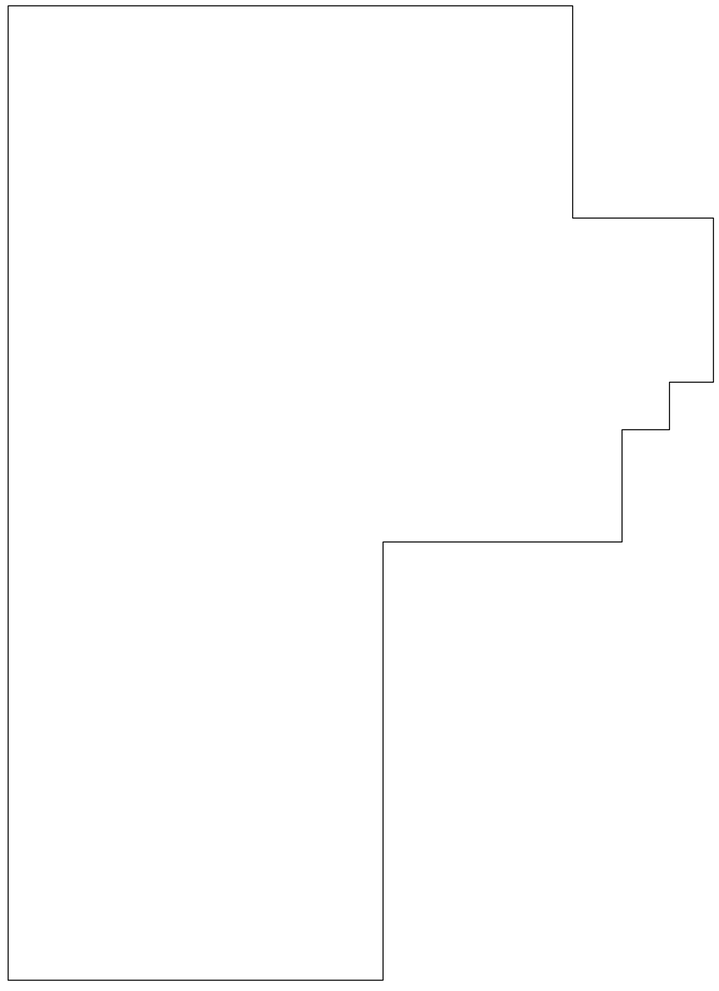
06/11/20

Indicative Design - Level 01

A01





LEGEND

- 3
- Instructional Activity
- Interdisciplinary School of Health Sciences
- School of Human Kinetics
- School of Nursing
- School of Nutrition Sciences
- School of Rehabilitation Sciences
- FHS Collaborative Research Facility
- FHS Administrative and Service Units
- Lees Campus Library
- Nurse Practitioner Program
- Information Technology
- Community
- Students Organization
- Circulation Area
- Building Support
- Research Office Space
- Interdisiplinary Faculty Office Space

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SCALE: 1 : 300

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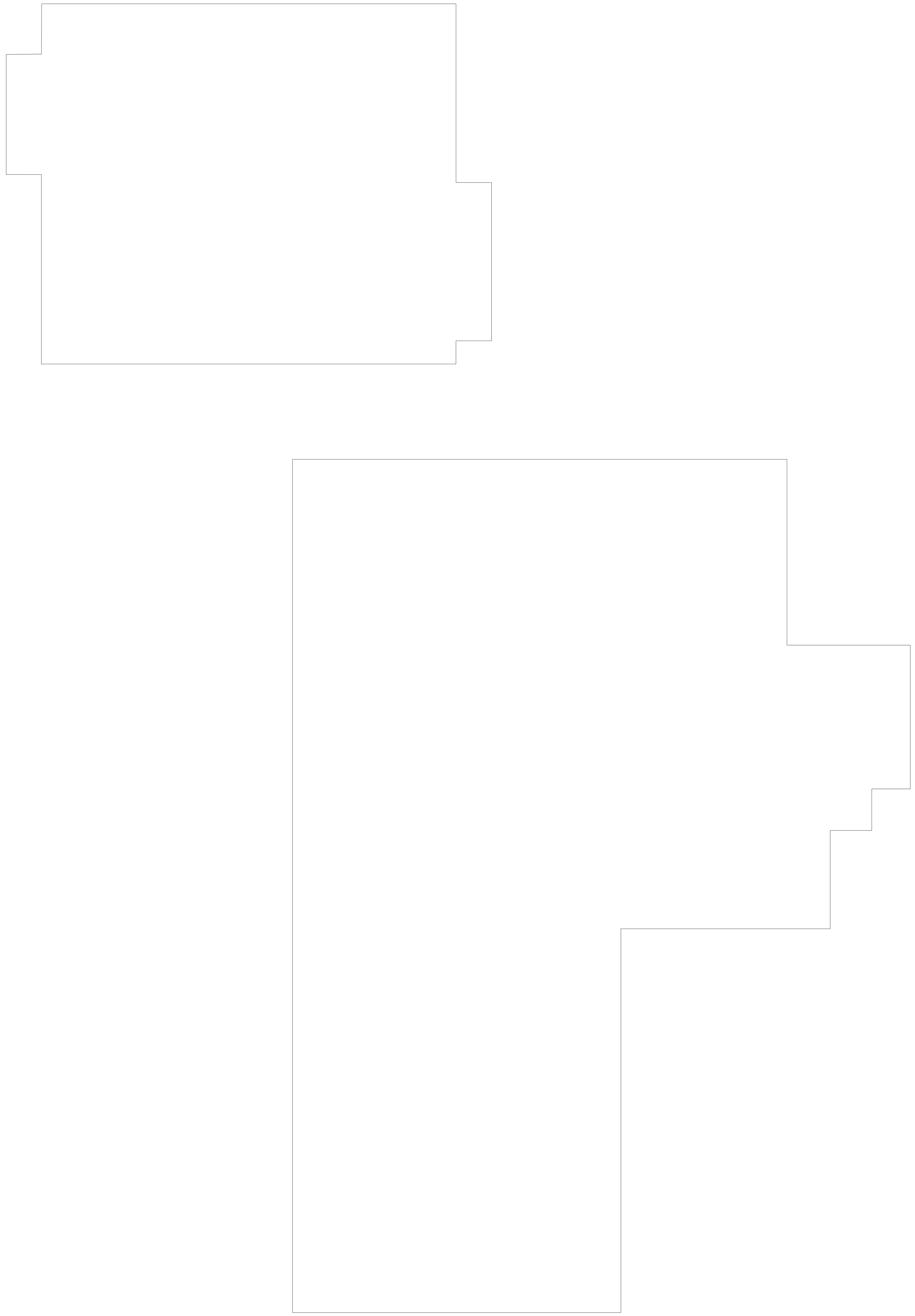
Indicative Design - Level 02

A02



LEGEND

- 3
- Instructional Activity
- Interdisciplinary School of Health Sciences
- School of Human Kinetics
- School of Nursing
- School of Nutrition Sciences
- School of Rehabilitation Sciences
- FHS Collaborative Research Facility
- FHS Administrative and Service Units
- Lees Campus Library
- Nurse Practitioner Program
- Information Technology
- Community
- Students Organization
- Circulation Area
- Building Support
- Research Office Space
- Interdisiplinary Faculty Office Space

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200 Lees Campus

SCALE: 1 : 300

06/11/20

Indicative Design - Level 03

A03

LEGEND

- 3
- Instructional Activity
- Interdisciplinary School of Health Sciences
- School of Human Kinetics
- School of Nursing
- School of Nutrition Sciences
- School of Rehabilitation Sciences
- FHS Collaborative Research Facility
- FHS Administrative and Service Units
- Lees Campus Library
- Nurse Practitioner Program
- Information Technology
- Community
- Students Organization
- Circulation Area
- Building Support
- Research Office Space
- Interdisiplinary Faculty Office Space

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SCALE: 1 : 300

06/11/20

Indicative Design - Level 04

A04

LEGEND

- 3
- Instructional Activity
- Interdisciplinary School of Health Sciences
- School of Human Kinetics
- School of Nursing
- School of Nutrition Sciences
- School of Rehabilitation Sciences
- FHS Collaborative Research Facility
- FHS Administrative and Service Units
- Lees Campus Library
- Nurse Practitioner Program
- Information Technology
- Community
- Students Organization
- Circulation Area
- Building Support
- Research Office Space
- Interdisiplinary Faculty Office Space

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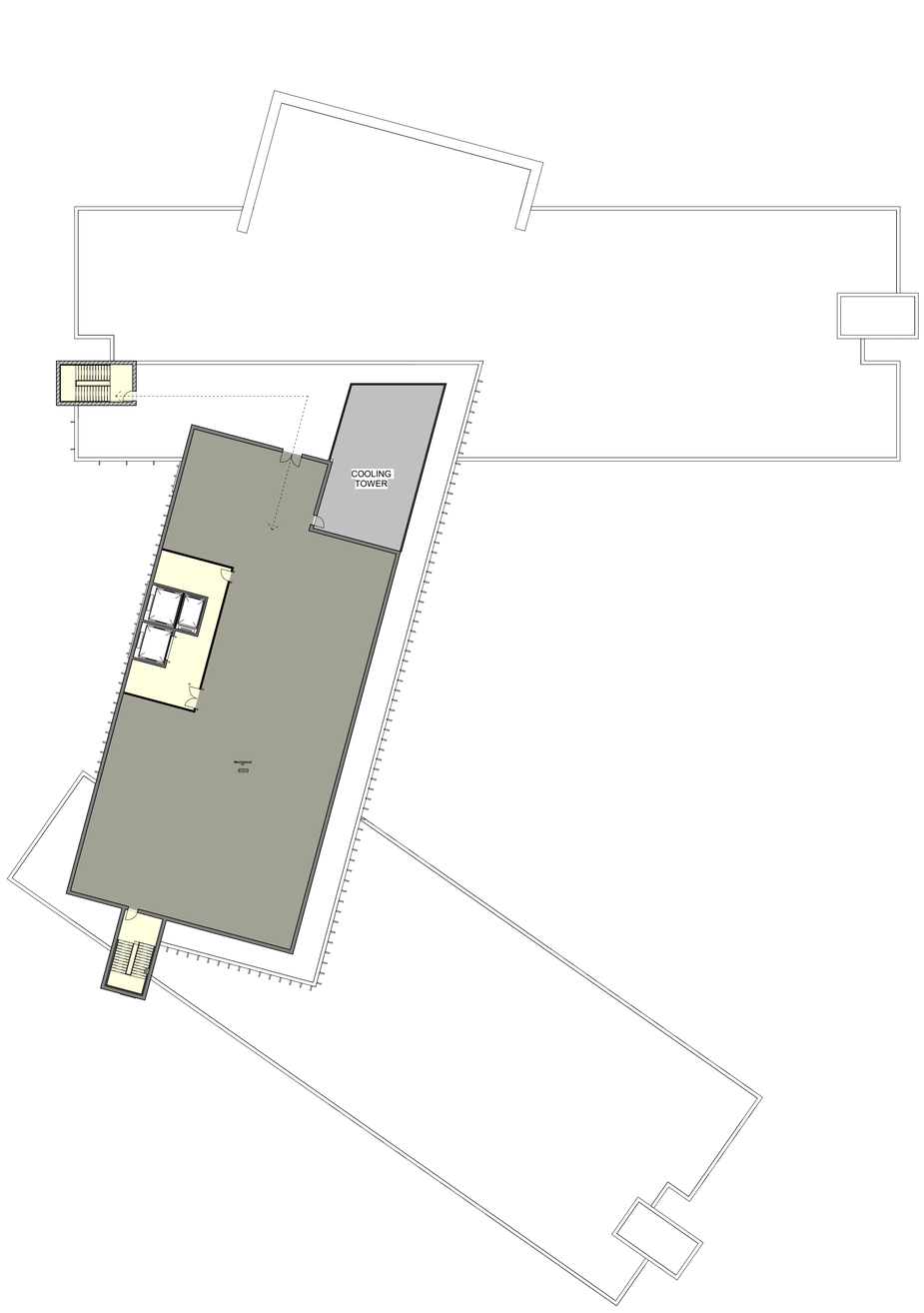
Indicative Design - Level 05

A05



LEGEND

- 3
- Instructional Activity
- Interdisciplinary School of Health Sciences
- School of Human Kinetics
- School of Nursing
- School of Nutrition Sciences
- School of Rehabilitation Sciences
- FHS Collaborative Research Facility
- FHS Administrative and Service Units
- Lees Campus Library
- Nurse Practitioner Program
- Information Technology
- Community
- Students Organization
- Circulation Area
- Building Support
- Research Office Space
- Interdisiplinary Faculty Office Space

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Indicative Design - Level 06

A06

Indicative Design - Site Plan

AS01

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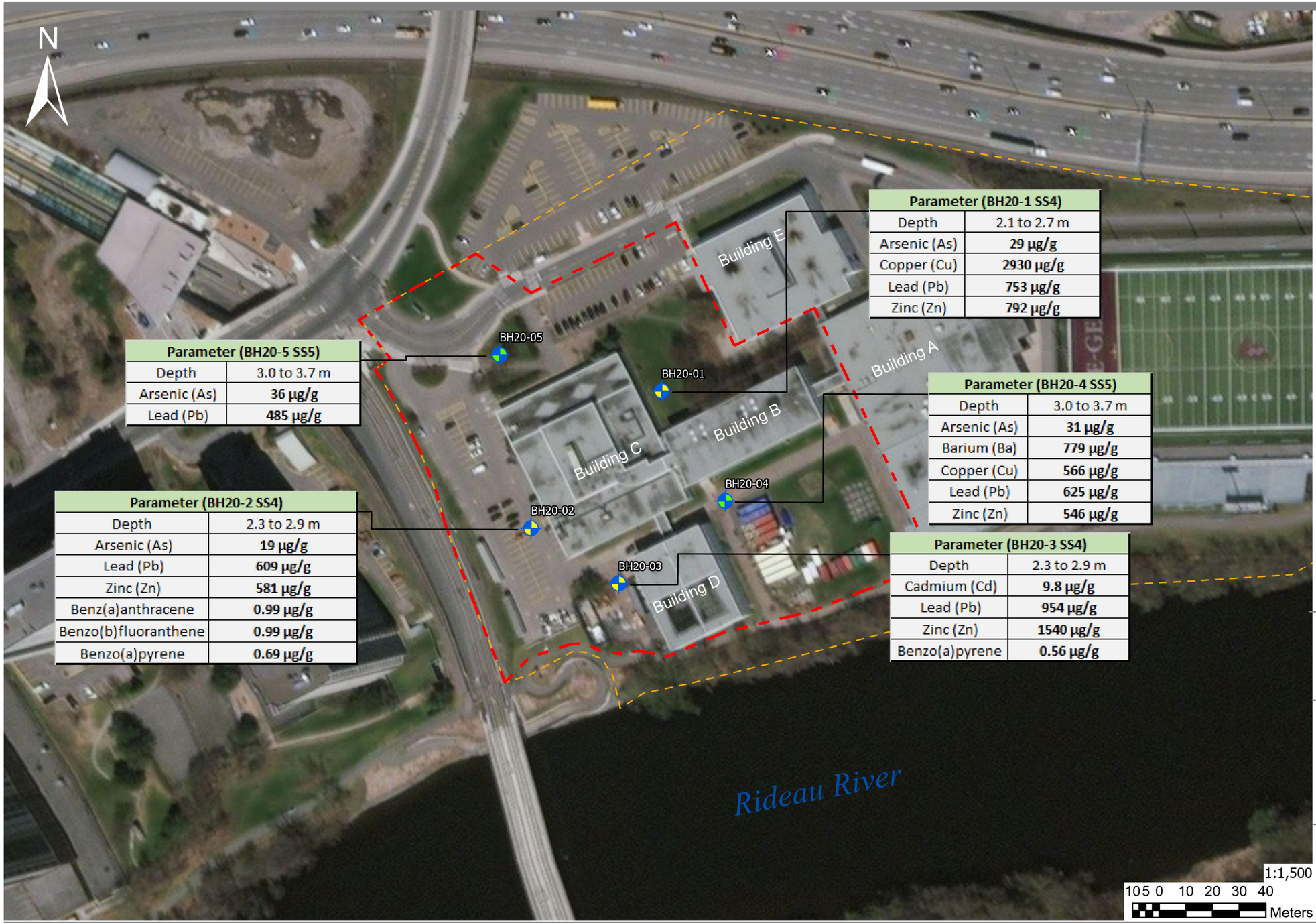
SCALE: 1 : 500

06/11/20

APPENDIX B

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT FIGURES (CIMA+, 2020)



Phase Two Study Area
Property Parcel
Monitoring Well Locations (CIMA, 2020)
Monitoring Well Locations (Golder, 2020)

Standards[1] - Table 3 SCS (PAH)	
Parameter	µg/g
Naphthalene	9.6
Acenaphthylene	0.15
Acenaphthene	96
Fluorene	62
Phenanthrene	12
Anthracene	0.67
Fluoranthene	9.6
Pyrene	96
Benz(a)anthracene	0.96
Chrysene	9.6
Benzo(b)fluoranthene	0.96
Benzo(k)fluoranthene	0.96
Benzo(a)pyrene	0.3
Indeno(1,2,3-cd)pyrene	0.76
Dibenz(a,h)anthracene	0.1
Benzo(g,h,i)perylene	9.6
1 and 2 Methlynaphthalene	76

Standards[1] - Table 3 SCS (Metals)	
Parameter	µg/g
Antimony (Sb)	40
Arsenic (As)	18
Barium (Ba)	670
Beryllium (Be)	8
Boron (B)	120
Cadmium (Cd)	1.9
Chromium (Cr)	160
Cobalt (Co)	80
Copper (Cu)	230
Lead (Pb)	120
Molybdenum (Mo)	40
Nickel (Ni)	270
Selenium (Se)	5.5
Silver (Ag)	40
Thallium (Tl)	3.3
Uranium (U)	33
Vanadium (V)	86
Zinc (Zn)	340

0.0 - Exceedances above Table 3 SCS

Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

Sources:
- Terrestrial Survey, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : City of Ottawa imagery, 2017

General Notes:

1: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Community Property Use - Coarse Grained Soils
- Dimensions on the plan should be read and not measured.
Figures are to be reviewed and interpreted with the associated report.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 8 - Soil Analytical Results with Exceedances above SCS (2020)

Phase Two Environmental Site Assessment
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Ref # : C10-A001049-080-111

Survey by : J. Scott, L. Robert
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer

Revision 00 - - Issued for report - 09 October 2020

Phase Two Study Area
Property Parcel
Monitoring well locations (Geofirma, 2013; Franz, 2013; uOttawa, 2019)
Monitoring Well Locations (CIMA, 2020)
Monitoring Well Locations (Golder, 2020)

Standards[1] - Table 3 SCS (PAH)	
Parameter	µg/L
Naphthalene	1400
Acenaphthylene	1.8
Acenaphthene	600
Fluorene	400
Phenanthrene	580
Anthracene	2.4
Fluoranthene	130
Pyrene	68
Benzo(a)anthracene	4.7
Chrysene	1
Benzo(b)fluoranthene	0.75
Benzo(k)fluoranthene	0.4
Benzo(a)pyrene	0.81
Indeno(1,2,3-cd)pyrene	0.2
Dibenz(a,h)anthracene	0.52
Benzo(g,h,i)perylene	0.2
2-and 1-methyl Naphthalene	1800

0.0 - Exceedances above Table 3 SCS

Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

Sources:
- Terrestrial Survey, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : City of Ottawa imagery, 2017

General Notes:

1: Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Ground Water Condition - All types of property use
- Dimensions on the plan should be read and not measured. Figures are to be reviewed and interpreted with the associated report. Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 9 - Groundwater Analytical Results with Exceedances above SCS (2020)

Phase Two Environmental Site Assessment
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Ref # : C10-A001049-080-111

Survey by : J. Scott, L. Robert
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer

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Phase Two Study Area

Property Parcel

Spatial Reference
Name: WGS 1984 UTM Zone 18N
PCS: WGS 1984 UTM Zone 18N
GCS: GCS WGS 1984
Datum: WGS 1984

Sources:
- Terrestrial Survey, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : Esri, HERE, Garmin, NGA, USGS, NPS, NRCan, GeoEye, Maxar

General Notes:

Figures are to be reviewed and interpreted with the associated report.
Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 1 - Site Location Map and Site Plan

Phase Two Environmental Site Assessment
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Ref # : C10-A001049-080-111

Survey by : J. Scott
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer

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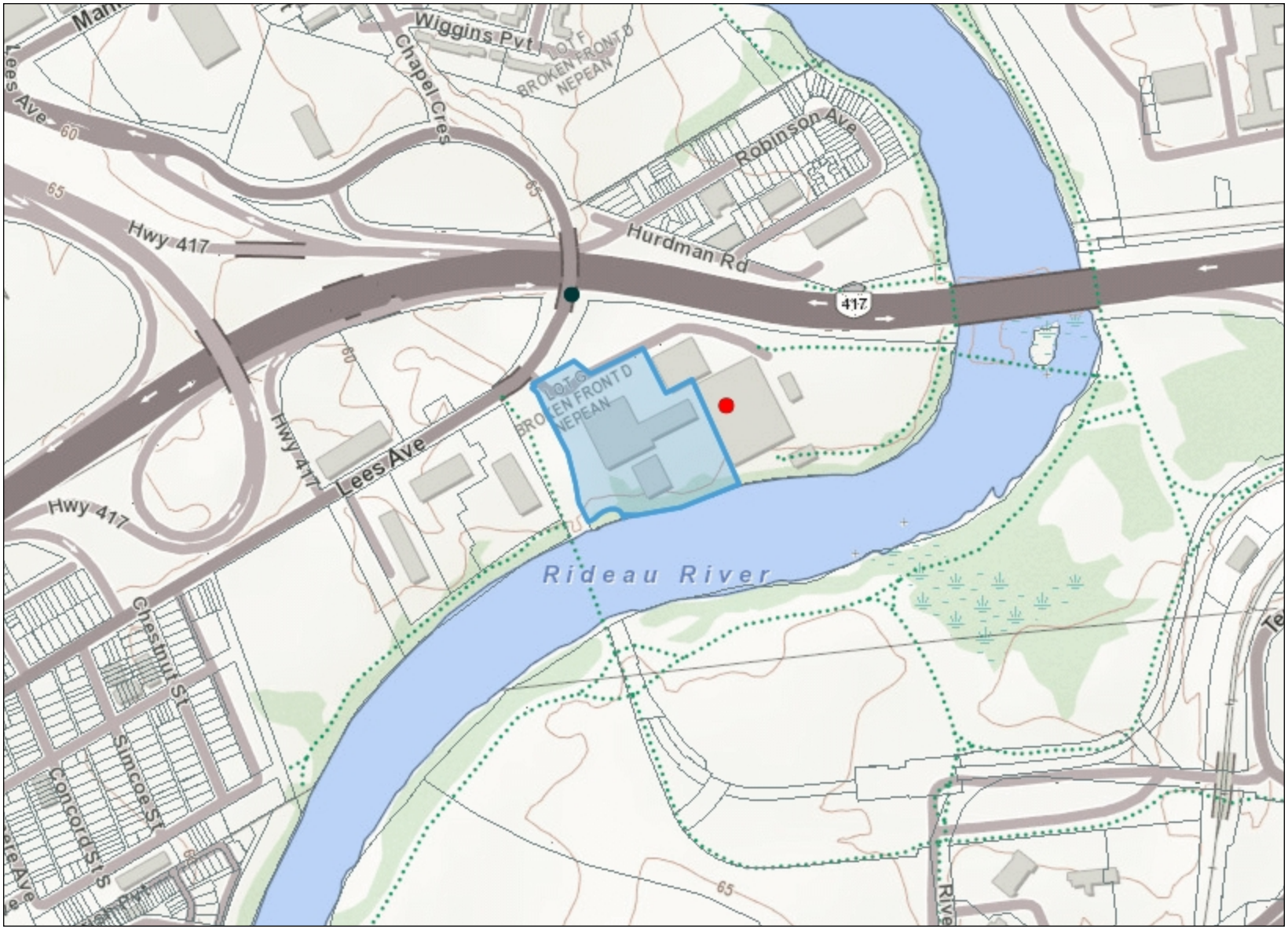
Ontario

MINISTRY OF NATURAL RESOURCES AND FORESTRY

Make a Topographic Map

Figure 2 - Site Layout and Topography

Notes:



Legend

- Building as Symbol
- Building to Scale
- Airport
- Heliport \ Hospital Heliport
- Seaplane Base
- Ferry Route
- Trail Head \ Trail
- Railway \ Train Station
- Railway with Bridge
- Railway with Tunnel
- Road (Major → Minor)
- Winter Road
- Road with Bridge
- Road with Tunnel
- Primary, Kings or 400 Series Highway
- Secondary Highway
- Tertiary Highway
- District, County, Regional or Municipal Road
- Toll Highway
- One Way Road
- Road with Permanent Blocked Passage
- Road with Address Ranges
- Hydro Line, Communication Line or Unknown Transmission Line
- Natural Gas Pipeline, Water Pipeline or Unknown Pipeline
- Spot Height
- Index Contour
- Contour
- Wooded Area
- Wetland
- Waterbody
- Waterbody Elevation
- Watercourse
- Falls
- Rapids
- Rapids \ Falls
- Rapids
- Rocks
- Lock Gate
- Dam \ Hydro Wall
- Dam \ Hydro Wall
- Provincial \ State Boundary
- International Boundary
- Upper Tier \ District Municipal Boundary
- Lower Tier \ Single Tier Municipal Boundary
- Lot Line
- Indian Reserve
- Provincial Park
- National Park
- Conservation Reserve
- Military Lands

0 0.3 km

Projection: Web Mercator

N

- Phase Two Study Area
- Property Parcel
- Previous Investigation Locations (Geofirma, 2013; Franz, 2013)
- Investigation Locations (CIMA+, 2020)
- Investigation Locations (Golder, 2020)

Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

Sources:
- Terrestrial Survey, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : GeoEye, Maxar

General Notes:

Figures are to be reviewed and interpreted with the associated report.
Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

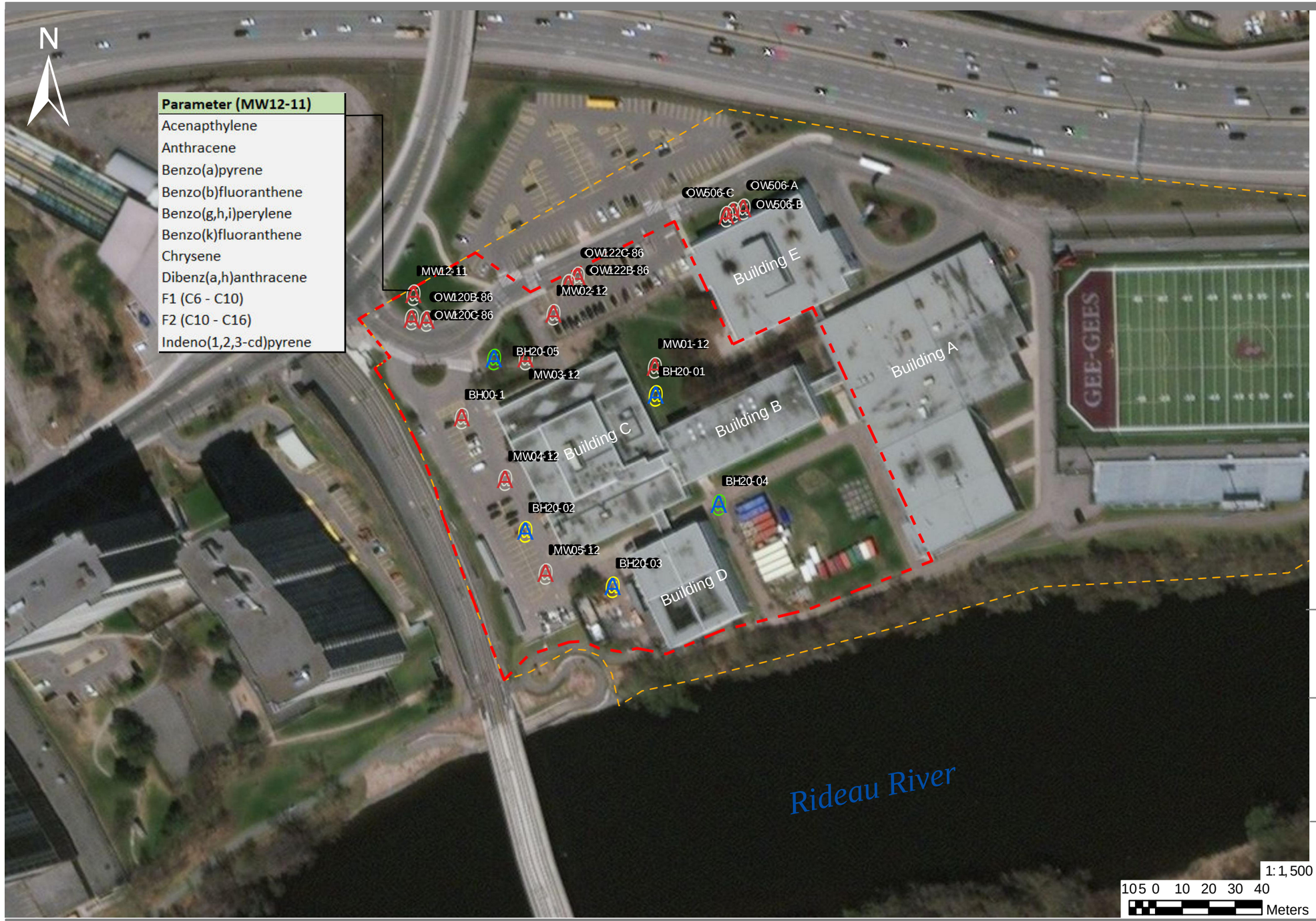
Figure 3 - Summary of Sub-surface Investigation Locations (2012 - 2020)

Phase Two Environmental Site Assessement
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Ref # : C10-A001049-080-111

Survey by : J. Scott
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer

Revision 00 - - Issued for report - 09 October 2020



Phase Two Study Area
Property Parcel
Monitoring well locations (Geofirma, 2013; Franz, 2013; uOttawa, 2019)
Monitoring Well Locations (CIMA, 2020)
Monitoring Well Locations (Golder, 2020)

Indicates compounds with maximum concentrations above Table 3 SCS at well location.

Parameter (MW12-11)
Acenaphthene

Standards[1] - Table 3 SCS		MW12-11 Max
Parameter	µg/L	Concentrations (µg/L)
Acenaphthylene	1.8	**73.1**
Anthracene	2.4	**5.02**
Benzo(a)pyrene	0.81	**3.1**
Benzo(b)fluoranthene	0.75	**3.24**
Benzo(g,h,i)perylene	0.2	**1.3**
Benzo(k)fluoranthene	0.4	**1.25**
Chrysene	1	**3.24**
Dibenz(a,h)anthracene	0.52	**0.57**
F1 (C6-C10)	750	**1770**
F2 (C10 to C16)	150	**760**
Indeno(1,2,3-cd)pyrene	0.2	**1.32**

Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

Sources:
- Terrestrial Survey, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : USDA FSA, GeoEye, Maxar

1:1,500
10 5 0 10 20 30 40
Meters

General Notes:

Figures are to be reviewed and interpreted with the associated report.
Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA+. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 4 - Summary of Groundwater Investigation Locations with Maximum Concentrations

Phase Two Environmental Site Assessement
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Survey by : J. Scott/L. Robert
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer
Revision 00 - - Issued for report - 29 October 2020

Ref # : C10-A001049-080-111

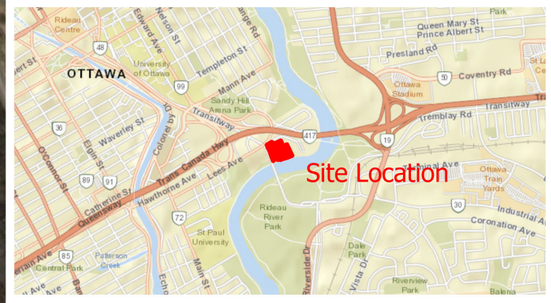
Phase Two Study Area
Property Parcel
Estimated Extent of Coal Tar Impacts on uOttawa property (from off-site sources)

Areas of Potential Environmental Concern (APEC)

APEC A: Historic Landfill
APEC B: Historic coal tar impacts

Potentially Contaminating Activity (PCA)

Waste Disposal and Waste Management (58) PCA
Asphalt and Bitumen Manufacturing (5) and Coal Gasification (9) PCA



Spatial Reference
Name: WGS 1984 UTM Zone 18N
PCS: WGS 1984 UTM Zone 18N
GCS: GCS WGS 1984
Datum: WGS 1984

Sources:
- Terrestrial Survey, 2020
- Coal Tar Plume, Suppl. ESA, Franz Environmental Ltd., 2011
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : Esri, HERE, Garmin, INCREMENT P, NGA, USGS, NRCan, GeoEye, Maxar

General Notes:

Figures are to be reviewed and interpreted with the associated report.
Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 5 - Phase One Conceptual Site Model

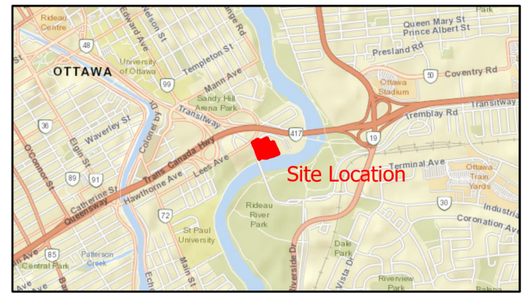
Phase Two Environmental Site Assessment
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Ref # : C10-A001049-080-111

Survey by : J. Scott
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer

Revision 00 - - Issued for report - 09 October 2020

Phase Two Study Area
Property Parcel
Monitoring well locations (Geofirma, 2013; Franz, 2013; uOttawa, 2019)
Monitoring Well Locations (CIMA, 2020)
Monitoring Well Locations (Golder, 2020)



Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

Sources:
- Terrestrial Survey, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : Esri, HERE, Garmin, INCREMENT P, NGA, USGS, NRCan, GeoEye, Maxar

1:1,500
10 5 0 10 20 30 40
Meters

General Notes:

Figures are to be reviewed and interpreted with the associated report.
Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

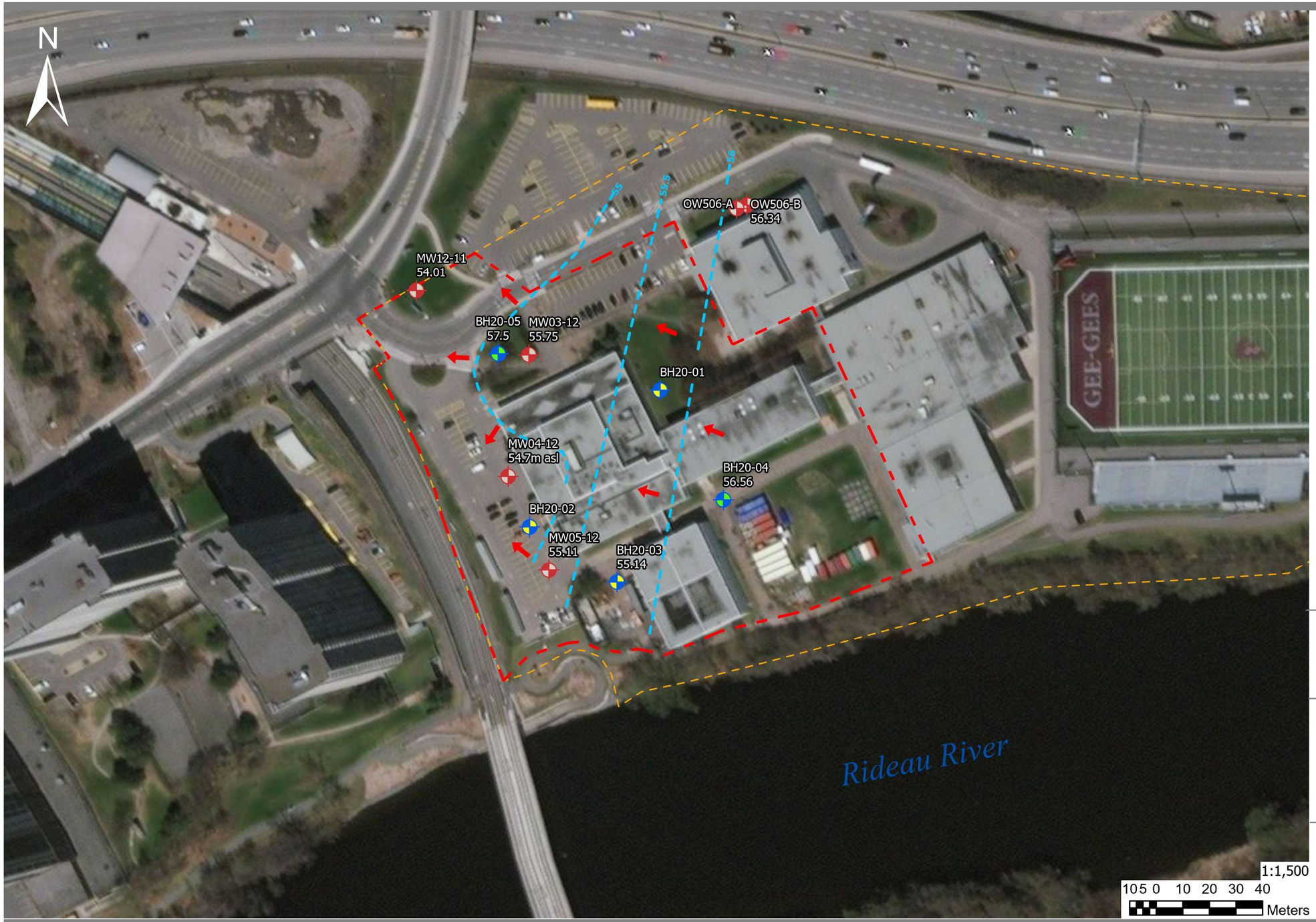
Figure 6 - Soil and Groundwater Investigation Locations

Phase Two Environmental Site Assessment
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Ref # : C10-A001049-080-111

Survey by : J. Scott
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer

Revision 00 - - Issued for report - 09 Oct 2020



Phase Two Study Area

Property Parcel

Monitoring Well Locations (CIMA+, 2020)

Monitoring Well Locations (Golder, 2020)

Monitoring well locations (Geofirma, 2013; Franz, 2013; uOttawa, 2019)

10 Groundwater elevations (July 2020) - in meters above sea level (m asl)*

Overburden groundwater flow direction

1:1,500

105 0 10 20 30 40

Meters

Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

Sources:
- Terrestrial Survey, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : Esri, HERE, Garmin, INCREMENT P, NGA, USGS, NRCan, GeoEye, Maxar

General Notes:

*: GW elevation = Top of Well PVC Riser Elevation (m asl) - water level (m asl)
- Figures are to be reviewed and interpreted with the associated report.
Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 7 - Groundwater Elevation and Overburden Flow Direction

Phase Two - Environmental Site Assessment
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Ref # : C10-A001049-080-111

Survey by : J. Scott, L. Robert
Figure by : J. Scott
Concept by : J. Scott
Verified by : K. Greer
Revision 00 - - Issued for report - 09 October 2020

University of Ottawa

Supplemental Subsurface Investigation

Proposed Site Redevelopment 200 Lees Avenue Ottawa, Ontario

C10-A001049

CIMA+ file number: A001049
30 November 2020 – Review 00

University of Ottawa

Supplemental Subsurface Investigation

Proposed Site Redevelopment 200 Lees Avenue Ottawa, Ontario

Prepared by:

Lindsay Brown-Scrbic
Senior Technologist

Verified by:

Karen Greer, M.Sc., P.Geo., QP$_{ESA}$
Senior Hydrogeologist

240 Catherine Street, Suite 110, Ottawa, Ontario
Canada K2P 2G8

CIMA+ file number: A001049
30 November 2020 – Review 00

Confidentiality and Ownership

Table of Contents

List of Appendices

1. Introduction

CIMA Canada Inc. (**CIMA+**) was retained by the University of Ottawa (uOttawa) to complete a supplemental subsurface investigation on a portion of the 200 Lees Avenue property planned for redevelopment, herein referred to as the "Site". The work follows a Phase Two Environmental Site Assessment (ESA) completed **CIMA+** titled *Phase Two Environmental Site Assessment, University of Ottawa - Part of 200 Lees Avenue. CIMA+, 2020*. A Site Location Map and Site Plan is provided as **Figure 1 (Appendix A)**.

During the Phase Two ESA (CIMA+, 2020) and as part of the screening of past analytical data for the preliminary human health and ecological risk assessment (HHERA) (being completed by Geosyntec Consultants Inc. [Geosyntec]), it was determined that a supplemental subsurface investigation was to be completed to provide supplemental information to support the Risk Assessment (RA) and Remedial Action Plan (RAP). The scope and objectives of the supplemental subsurface investigation are as follows:

+ Soil and vapour sampling in the northwest corner for benzene and naphthalene to provide supplemental information to inform the HHERA with information within 30 m of the building footprint;
+ Further delineation of mercury concentrations in soil within the southwest corner of the site to address historical concentrations within the fill in this area; and
+ Assessment of leachable lead in Toxicity Leachate Characteristics Procedure (TCLP) samples to determine whether there is variability in the leachate toxicity within the fill across the Site for waste disposal purposes.

The purpose of this report is to provide the results of the supplemental subsurface investigation completed as per the recommendations of the Phase Two ESA (CIMA+, 2020) as it relates to the proposed redevelopment of the Site. This report should be read in conjunction with the Phase Two ESA (CIMA+, 2020).

1.1 Applicable Site Condition Standards

The analytical results were assessed using the "Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act," MOE, July 1, 2011:

+ Samples were compared to the Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Ground Water Condition for community property use with coarse textured soils (Table 3 SCS).

Site specific aspects that support the use of the Table 3 SCS include:

+ The current and future land use of the Site is a university which is considered community property use, pursuant to Section 3 of the Post-secondary Education Choice and Excellence Act, 2000;
+ Grain size analysis was performed on two (2) samples (BH20-4 SS5 and BH20-4 SS12) which were found to be coarse in texture. Therefore, analytical results will be compared to coarse textured soil SCS;

- Potable water for the Site is obtained from the City of Ottawa municipal system which primarily derives its water from the Ottawa River. There are no drinking water wells located on the Site or within 250 m of the Site (CIMA+, 2020);
- Bedrock on-Site has been reported at a depth of approximately 10 to 13 meters below ground surface (mbgs); and
- The Site does not to meet any other environmentally sensitive classification:
    - The Site is not located within or adjacent to an area of natural significance, as defined in O.Reg 153/04; and
    - Soil pH values were confirmed to be between 7.0 and 8.0 for all samples analysed (BH20-4-SS5).

It should be noted that the area of the 200 Lees Avenue planned for redevelopment and identified as the buildable area, is located outside the 30 m buffer of the Rideau River (as shown on **Figure 1** in **Appendix A**). The SCS applicable for the work completed as part of the Phase Two ESA and the work herein is therefore Table 3 SCS, as detailed above. Re-development work within the 30 m buffer will be limited to landscaping activities. The extent of landscaping activities, is also identified on **Figure 1** in **Appendix A**.

2. Investigation Method

The supplemental subsurface investigation included the completion of a limited investigation of soil and soil vapour quality on-Site. **CIMA+** field professional, under the supervision of the Qualified Person, supervised the on-Site drilling activities; logged the boreholes, recorded detailed field observations, collected representative soil samples, and installed soil vapour probes. Geosyntec provided technical support for the soil vapour probe installations. The tasks carried out are detailed below.

- A utility locator was retained to complete public and private utility clearances and identify any underground utilities within the proposed work areas on the Site;
- Drilling activities were completed at the Site on October 19, 2020 by Strata Drilling Group, a licensed well contractor as per Ontario Regulation 903/04 (O.Reg 903/04). The drilling was completed by using a 6712-DT Geoprobe drill rig equipped with dual tube sampling capabilities.
- **CIMA+** supervised and collected soil samples for environmental testing of three (3) boreholes which were completed with technical direction from Geosyntec for the installation of soil vapour probes within the fill (BH20-6, BH20-7 and BH20-8 equipped respectively with soil gas vapour probes SGP-06, SGP-07 and SGP-08);
- **CIMA+** supervised and collected soil samples for environmental testing of three (3) boreholes (BH20-9, BH20-10 and BH20-11) within the fill;
- The geology of the boreholes was logged, and representative soil samples were collected from each location for field screening and laboratory analysis. Any significant staining and/or odours were noted. A RKI Eagle II multi-gas detector equipped with photoionization detector (PID) capabilities and a PID detector was used to measure soil vapours in the collected samples;
- Collection of a minimum of two (2) soil samples from each borehole as well as a single duplicate sample using a split spoon sampler for submission to a certified laboratory for analysis of benzene, naphthalene and/or mercury;

- The soil vapour probes were purged and sampled on October 19 and 20 by Geosyntec field staff and soil gas samples were collected from SGP-06, SGP-07 and SGP-08 as described in Geosyntec's Supplemental Soil Vapour Investigation report (**Appendix B**);
- Composite soil samples from each of the boreholes were collected and submitted as per the TCLP and compared to Schedule 4 of O.Reg 347 for soil disposal purposes;
- Approximately 10% of the samples, soil and soil vapour consisted of quality assurance/quality control (QA/QC) samples. All samples were analysed by AGAT Laboratories in Toronto, ON, a Canadian Association for Laboratory Accreditation Inc. (CALA) accredited laboratory; and
- A detail elevation survey of the newly installed boreholes and soil vapour probes was completed by **CIMA+**.

The rationale for the testing locations and their scope of testing is as follows:

Investigation Location	Rationale	Chemical of Concern (COC)
BH20-6/SGP-06	Soil and vapour quality in the fill within 30 m of proposed new building	Benzene, Naphthalene and TCPL
BH20-7/SGP-07	Soil and vapour quality in the fill within 30 m of proposed new building	Benzene, Naphthalene and TCPL
BH20-8/SGP-08	Soil and vapour quality in the fill within 30 m of proposed new building	Benzene, Naphthalene and TCPL
BH20-9	Soil quality in the fill with the southern western portion of the Site	Mercury and TCLP
BH20-10	Soil quality in the fill with the southern western portion of the Site	Mercury and TCLP
BH20-11	Soil quality in the fill with the southern western portion of the Site	Mercury and TCLP

Detailed methodologies relating to the installation and sampling of the soil vapour probes are included within **Appendix B**. The supplemental subsurface investigation activities outlined above were completed in accordance with methodologies outlined within the Phase Two ESA (CIMA+, 2020) and are therefore not provided herein.

3. Results and Discussion

3.1 Drilling Activities

A Site Plan depicting the locations of all boreholes and soil vapour probes is provided as **Figure 2 (Appendix A)** and drilling logs are provided in **Appendix C**. Full details pertaining to installation of the soil vapour probes is provided in **Appendix B**. A total of six (6) boreholes were advanced; three (3) of which were completed within the fill in the northwestern portion of the site (BH20-6, BH20-7 and BH20-8) and three (3) additional locations were completed within the fill in the southwestern portion of the Site (BH20-9, BH20-10 and BH20-11). Soil gas vapour probes were installed in boreholes BH20-6, BH20-7 and BH20-8, and are identified as SGP-06, SGP-07 and SGP-08, respectively.

3.2 Soil Texture

The predominant overburden material was observed to be fill with some silty and fine sand alluvium interbedded with silty clays and coarse sand and gravels, generally coarser with depth. The fill material was noted to be highly heterogeneous in nature resulting in isolated “hot spots” and wide-spread impacts within the fill across the Site. Drilling logs with full geological descriptions is provided in **Appendix C**.

3.3 Soil: Field Screening

Soils samples were screened for soil vapours. The field screening results are shown on the drilling logs in **Appendix C**. The vapour readings detected during drilling were all below the detection limit (<1 ppm) for the field equipment with the exception of the BH20-7 SS4 with a reading of 0.5 ppm. None of the field screening results suggested evidence of volatile compounds.

3.4 Soil Quality

Soil samples selected for laboratory analysis were submitted for benzene, naphthalene and/or mercury. A blind duplicate soil sample was also collected and analysed for QA/QC purposes. Soil sampling included: three (3) samples each for benzene, naphthalene including one (1) duplicate samples for QA/QC; and three (3) samples for mercury.

Soil analytical results were reported below the applicable Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Ground Water Condition for community property use with coarse textured soils (Table 3 SCS) for the parameters analyzed. The analytical results for the soil samples collected during borehole drilling are summarized in **Table 1 (Appendix D).** The Laboratory Certificates of Analysis are provided in **Appendix E**.

3.5 Soil Vapour

The soil vapour probes were purged and sampled. Analytical samples were collected and four (4) samples, one (1) from each probe SGP-06, SGP-07 and SGP-08 and a QA/QC sample was submitted for laboratory analysis of benzene and naphthalene. Soil vapour concentrations for naphthalene and benzene did not exceed the applicable provincial screening level in relation to the proposed redevelopment of the Site. Full details including sample methodology, QA/QC as well as results are provided in **Appendix B**.

3.6 Waste Characterization

A composite sample was collected from the soil cuttings from each borehole location for a total of six (6) samples to better understand the waste classification of the soil fill at the Site. Samples were submitted to the laboratory for analyses as per the TCLP. Results are provided in **Table 2 (Appendix D)**. The results were then compared to Schedule 4 of Ontario Regulation 347 (O. Reg 347) for waste classification purposes. Analytical results reported concentrations of leachable lead above the applicable criteria from one (1) locations (BH20-9) located in the southwestern portion of the Site. The fill soils for that sample are therefore deemed to be a leachate toxic waste as per O. Reg 347. Various other metals (barium, boron, cadmium, and chromium) had concentrations above the reportable detection limit, but below the criteria. The remaining soil samples from BH20-6, BH20-7, BH20-8, BH20-10 and BH20-11 all had results that were less than the leachate toxic criteria. Together with the waste classification results of the Phase Two ESA (CIMA+, 2020), the findings show that the fill is variable in terms of waste classification. As a result, some of the fill soil has the potential to classify as leachate toxic with respect to lead when removed off-site as waste.

3.7 Elevation Surveying

On November 5, 2020, **CIMA+** completed a details site survey of the drilling locations and soil vapour probes. Coordinates and elevations are provided within the drilling logs provided in **Appendix C**.

3.8 Quality Assurance and Quality Control Results

Field blind duplicate samples and internal laboratory duplicate samples were analysed to assess potential variability introduced by field sampling procedures during soil sampling. Blind duplicate sample at 10% frequency was collected with samples taken by collecting a separate grab sample immediately following the collection of the original sample. The soil blind duplicate sample was collected from BH20-6 SS3 (DUP1) and analysed for benzene and naphthalene.

A Relative Percent Difference (RPD) between the samples was calculated using the following formula:

Where: $$RPD = \frac{\left|\left(V_{\text{field sample}} - V_{\text{field duplicate}}\right)\right|}{\text{mean}} \times 100$$

$V_{\text{field sample}}$: the concentration of the original field sample

$V_{\text{field duplicate}}$: the concentration of the field duplicate

RPDs less than 25% are considered acceptable. For an RPD > 25%, careful consideration of the quality of the sample is made to determine whether the value is representative of the site conditions before it is accepted.

Sampling precision was determined by calculating the relative percentage difference (RPD) for the duplicate samples as described above. Concentrations less than five times the Reportable; Detection Limit (RDL) become increasingly imprecise and, in these cases, the results are not considered sufficiently reliable and an RPD is not calculated. When the analytical result for one or both of a duplicate pair are less than the RDL (i.e. non-detect), an RPD cannot be calculated.

Internal laboratory QA/QC testing results are shown as part of the laboratory results located in **Appendix E**. It should be noted that the laboratory initiated a re-analysis of the TCLP analysis for BH20-9. The re-run of the sample yielded an RPD of >200%. The variation in the sample results was attributed to the heterogeneity of the sample.

4. Conclusions

A supplemental subsurface investigation was completed, and a summary of the results are as follows:

+ Mercury concentrations in soil within the southwestern portion of the Site have been characterized and concentrations are below the applicable Table 3 SCS;
+ Benzene and naphthalene concentrations in soil fill in the northwestern portion of the Site are below the application Table 3 SCS;
+ Soil vapour for benzene and naphthalene were below the applicable SVSL and therefore soil vapour is not a concern for the proposed building; and
+ Together with the waste classification results of the Phase Two ESA (CIMA+, 2020), the findings show that the soil fill at the site is variable in terms of waste classification. Some of the fill soil has the potential to classify as leachate toxic with respect to lead when removed off-site as waste.

5. Limiting Conditions

CIMA+ completed diligent and reasonable research in the conduct of this evaluation, with respect to the recognized laws and standards of practice. The facts presented in this report are strictly limited to the period of investigation. The conclusions presented in this report are based on the available information and represent our professional opinion, the observations made during the Site investigations and the information obtained from communications with various contacts. The interpretation presented in this report is limited to this data.

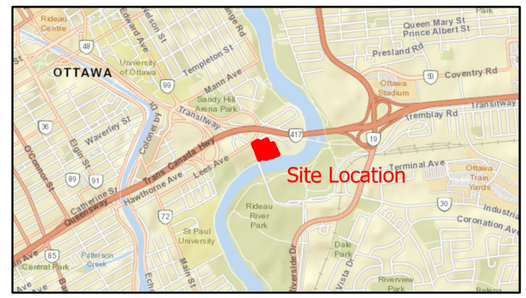
CIMA+ is not responsible for erroneous conclusions due to voluntary abstention or the non-availability of pertinent information. Any opinion expressed in relation to legal or regulatory conformity is technical and should not be, in any case, considered as legal advice.

CIMA+ prepared this for the University of Ottawa. The use, reliance on or decisions based on this report by a third party are the responsibility of those parties unless previously authorized by **CIMA+** and accepts no responsibility for any loss or damages to any unauthorized third party as a result of decisions made or actions taken based on this report. This report should be read in conjunction with the Phase Two ESA (CIMA+, 2020) report.

A

Appendix A
Figures

- Phase Two Study Area
- Property parcel
- Zoning boundary
- Landscaping boundary



Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

Sources:
- Landscaping boundary, IBI Group, 2020
- 30 m zoning boundary, City of Ottawa, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : City of Ottawa Imagery, 2017

General Notes:

Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

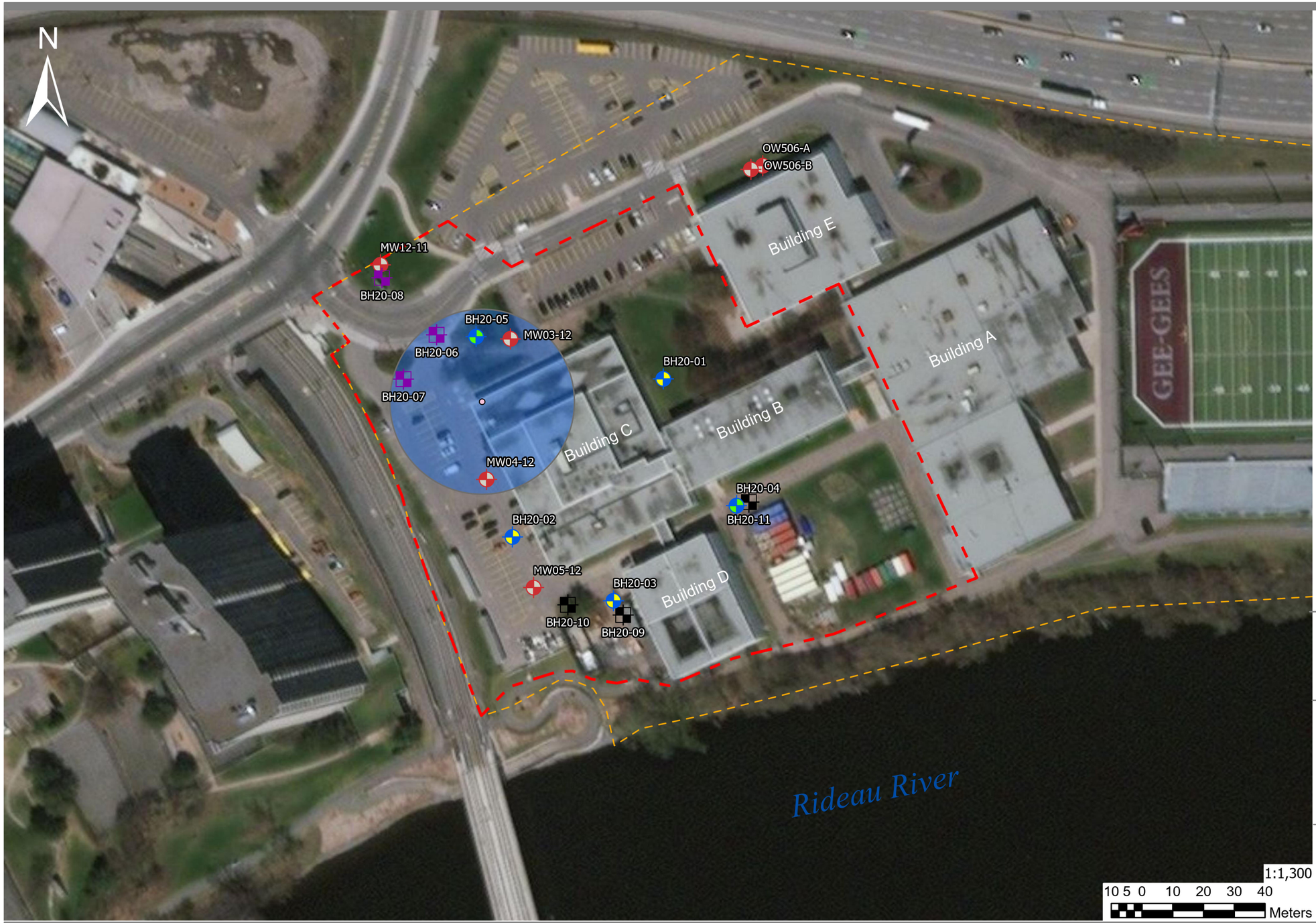
Figure 1 - Site Location Map and Site Plan

Supplemental Subsurface Investigation
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

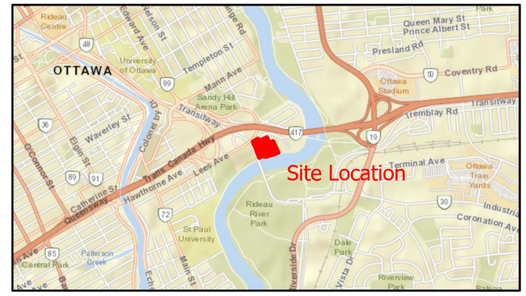
Ref # : C10-A001049-080-111

Survey by : -
Figure by : J. Scott
Concept by : K. Greer
Verified by : K. Greer

Revision 00 - - Issued for report - 19 November 2020



Phase Two Study Area
Property Parcel
Borehole & Vapour Monitoring Location (CIMA+, October 2020)
Borehole Location (CIMA+, October 2020)
Monitoring well locations (Geofirma, 2013; Franz, 2013; uOttawa, 2019)
Monitoring Well Locations (CIMA, 2020)
Monitoring Well Locations (Golder, 2020)
Reference Point
30 m buffer (reference point)



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Meters

Spatial Reference
Name: NAD 1983 UTM Zone 18N
PCS: NAD 1983 UTM Zone 18N
GCS: GCS North American 1983
Datum: North American 1983

Sources:
- Terrestrial Survey, 2020
- Topo. Plan, Annis, O'Sullivan, Vollebekk Ltd., 2020
- Basemap : City of Ottawa Imagery, 2017

General Notes:
Dimensions on the plan should be read and not measured.
Any errors or omissions should be reported to CIMA +. The boundaries, areas and title deeds must be verified by a surveyor.

Figure 2 - Supplemental Subsurface Investigation Locations

Supplemental Subsurface Investigation
200 Lees Avenue, Ottawa, Ontario
University of Ottawa

Ref # : C10-A001049-080-111

Survey by : -
Figure by : J. Scott
Concept by : K. Greer
Verified by : K. Greer

Revision 00 - - Issued for report - 12 November 2020

B

Appendix B
Soil Vapour Memo (Geosyntec)

Geosyntec consultants

424-135 Laurier Street West
Ottawa, Ontario K1P 5J2
PH 343.803.4940
FAX 888.635.3470
www.geosyntec.com

November 12, 2020

Karen Greer, M.Sc., P. Geo
CIMA Canada Inc.
110–240 Catherine Street
Ottawa, Ontario
K2P 2G8

Subject: Supplemental Soil Vapour Investigation
Proposed Site Redevelopment at 200 Lees Avenue, Ottawa, Ontario

Dear Ms. Greer:

Geosyntec Consultants International, Inc. (Geosyntec) was retained by CIMA Canada Inc. (CIMA+) to conduct a Supplemental Soil Vapour Investigation (SSVI) to support the redevelopment of the west portion of the property located at 200 Lees Avenue, in Ottawa, Ontario (the Site). The purpose of this letter is to provide the details and findings of the soil vapour probe installation and vapour sampling completed at the Site on October 19th and 20th, 2020. It is understood that this letter will be attached as an appendix to a supplemental subsurface investigation report by CIMA+.

1. BACKGROUND

The proposed redevelopment includes demolition of existing buildings on the Site and construction of a new single-story slab-on-grade building (except for a small basement mechanical room). The Site was formerly a municipal incinerator waste landfill from 1906 to 1947 and included a railway yard and incinerator. To the northwest of the Site was a former coal gasification plant that is now occupied by the Ottawa-Carleton Transitway Station which operates a groundwater control system. Free-phase coal tar and groundwater impacts on the northwest corner of the Site are attributable to the off-Site coal gasification plant. The coal tar impacts are under the hydraulic control of the groundwater control system located to the north of the Site (across Lees Avenue), which is operated by the City of Ottawa (CIMA+, 2020).

During preparation of the Phase Two Environmental Sites Assessment (ESA) (CIMA+, 2020) and as part of the screening of past analytical data for the preliminary human health and ecological risk assessment (HHERA) (being completed by Geosyntec), it was determined that screening of soil concentration data for the Site identified that benzene and naphthalene soil concentrations of

samples collected in the northwest portion of the Site were above health-based screening levels for the soil vapour migration to indoor air vapour intrusion (VI) pathway). The benzene and naphthalene were determined to require further soil vapour assessment.

2. SCOPE OF WORK AND OBJECTIVES

The scope of work conducted as part of this SSVI was developed in consultation with CIMA+. The scope of work was developed to evaluate soil vapour concentrations of benzene and naphthalene in the northwest corner of the Site to provide supplemental information to inform the HHERA. The following scope of work was conducted:

- Installation of soil vapour probes;
  - One soil vapour probe near monitoring well MW12-11 where previously collected soil samples had concentrations of benzene and naphthalene above the health-based VI soil screening levels;
  - Two soil vapour probes to evaluate soil vapour concentrations within approximately 30 metres (m) of the proposed building;
- Purging and sampling of three soil vapour probes;
- Submittal of three soil vapour samples (and one field duplicate) for laboratory analysis of benzene and naphthalene; and
- Implementation of quality assurance/quality control (QA/QC) measures.

3. METHODOLOGY

The following sections details the soil vapour probe installation, sampling and analytical methods.

3.1 Soil Vapour Probe Installation

Three soil vapour probes (SGP-06, SGP-07 and SGP-08) were installed on October 19th, 2020 by Strata Drilling (Strata). Strata was subcontracted and supervised by CIMA+ for the drilling of the borehole and soil sampling activities, while Geosyntec provided technical direction on the installation of the soil vapour probes. The soil vapour probe construction details are provided in Attachment A and the soil vapour probe locations are highlighted on Figure 1 of the Supplemental Sub-surface Investigation report by CIMA+. SGP-06 is located approximately 30 m north of the existing Building C on the entrance roadway. SGP-07 was installed approximately 17 m southwest

of SGP-06 and is approximately 30 m northwest of the existing Building C. SGP-08 was installed near MW12-11.

Strata advanced boreholes for installation of the soil vapour probes using a Geoprobe 6620DT direct push drill rig. Each borehole was 5.7 centimetre (cm) in diameter and advanced to the target depth of approximately 3.5 metres below ground surface (m bgs). A pre-constructed soil vapour probe consisting of approximately 4 m length of 0.6 cm (¼-inch) diameter Nylaflow™ tubing connected to a 15.2 cm (6-inch) stainless steel screen was inserted to the bottom of the borehole. Impact glass beads were placed to form a sand pack in the borehole and extended from the bottom of the borehole up to approximately 0.15 m above the top of the screen. The sand pack was sealed with an approximately 0.15 m thick layer of hydrated granular bentonite, followed by a thick slurry mixture of powdered bentonite and water to about 0.6 m bgs. The borehole was topped with a layer of silica sand extending from the top of the seal to ground surface.

The top of each probe was fitted with a compression-fit ball valve to maintain an air-tight seal between installation and sampling. The probes were completed with flush-mounted protective casings. SGP-06 was installed in the roadway and was secured at surface with concrete. SGP-07 and SGP-08 were installed in grassy areas and did not require surface concrete.

3.2 Soil Vapour Probe Purging and Sampling

The three newly installed probes (SGP-6, SGP-7 and SGP-8) were purged and sampled on October 19th and 20th, 2020. Each soil vapour probe was pneumatically tested to evaluate the permeability of the soils surrounding the screened interval to ensure they were permeable enough for soil vapour sample collection. The material surrounding the screened interval is considered sufficiently permeable to conduct soil vapour sampling if the applied vacuum of the probe is less than 30 inches of water vacuum (in. H_2O) at a sampling flow rate of 0.2 L/min. Pneumatic tests were conducted by extracting soil vapour from the probe and measuring both flow and corresponding vacuum at flow rates in the range of 0.1 to 0.5 litres per minute (L/min). The pneumatic testing confirmed that each probe was sufficiently permeable for soil vapour sampling (i.e. had an applied vacuum less than 30-in. H_2O at 0.2 L/min).

Prior to sample collection, a shut-in test was performed at each soil vapour probe to check for leaks within the sample train. The shut-in test involved closing the valve at the probe, exerting a vacuum on the system using a vacuum chamber and then using a vacuum gauge to observe if the vacuum

was maintained in the lines. A vacuum of about 40 in. H_2O was applied to the sample train and monitored for about 30 seconds.

The integrity of the soil vapour probe construction and sample train were also leak tested during purging by placing a shroud over the assembly and filling the shroud with helium. The concentration of helium in the shroud was measured using a MDG-2002 helium detector. The helium concentration of the purged soil vapour was also measured using the helium detector. Soil vapour concentrations less than 5% of the concentration of helium in the shroud are typically used as verification of the absence of leaks (i.e., that atmospheric air is not leaking through the probe surface seal or sample train fittings). The helium concentrations of the field screened samples were all less than 5% of the minimum concentration in the shroud; therefore, neither the shut-in tests nor leak tests indicated the presence of leaks.

In combination with the helium leak check screening, each soil vapour probe purge volume was also screened for total volatile organic compounds (VOCs) with a calibrated photoionization detector (PID) and methane (CH_4), carbon dioxide (CO_2), and oxygen (O_2) with an Eagle 2 landfill gas meter. Each vapour probe was purged for a minimum of three successive 1-litre Tedlar™ bag samples to confirm generally stable screening readings prior to collection of a sample for laboratory analysis.

After purging, a soil vapour sample was collected directly into a batch-certified 1.4-litre Summa® canister with a 140 millilitre per minute flow controller. The canister was connected to the probe via a "T" fitting prior to initiating purging such that the cannister connections were included in the leak check process. Initial and final vacuum levels in the Summa® canister were measured and recorded. A blind field duplicate sample (labelled SGP-100) was collected at SGP-08 with a single flow controller with two Summa® canisters connected via a "T" fitting.

3.3 Soil Vapour Sample Analysis

Four soil vapour samples were submitted under chain of custody to AGAT Laboratories (AGAT) of Mississauga, Ontario, for laboratory analysis of benzene and naphthalene. Soil vapour samples were analyzed via U.S. Environmental Protection Agency (EPA) Method TO-15 which is currently the Canadian/Ontario best practice for analysis.

3.4 QA/QC

QA/QC measures were implemented to produce data that are useful, appropriate and accurate. These measures included the following:

- Field screening meters were checked and calibrated to the manufacturer's instructions;
- Sample trains for soil vapour sampling were leak checked using shut-in test methods and helium tracer prior to sample collection;
- Summa® canister samples had the initial and final vacuum levels measured in the field and upon receipt by the laboratory and these values were compared to identify any potential leak during shipment; and
- One soil vapour duplicate sample was submitted for laboratory analysis as part of the soil vapour sampling program.

4. RESULTS AND DISCUSSION

4.1 Soil Vapour Probe Purging

Soil vapour measurements of CH_4, CO_2, O_2 and total PID VOC concentrations recorded during soil vapour probe purging are attached in Table 1. The concentration of helium in the shroud and in each purge volume are also provided on Table 1.

Total PID VOC concentration measurements recorded during sample purging ranged between 0.4 parts per million by volume (ppm_v) (SGP-06) to a maximum of 3.8 ppm_v (SGP-08).

O_2 concentrations in all three soil vapour probes were below atmospheric conditions (21%) with a minimum O_2 concentration of 5.1 % at SGP-8 and a maximum O_2 concentration of 15.8% at SGP-6. Corresponding CO_2 concentrations were below atmospheric conditions (0.04%) with a maximum concentration of 12.3% measured at SPG-7 and a minimum CO_2 concentration of 3.1% at SGP-6. CH_4 was not detected in any of the soil vapour probes (0.0%). Benzene concentrations in soil vapour are aerobically degraded in the subsurface in the presence of O_2 concentrations greater than about 2% (ITRC, 2014). Therefore, the measured O_2 concentrations in the soil vapour probes are sufficient for the biodegradation of benzene.

4.2 Soil Vapour Analytical Results

The analytical results for the soil vapour samples collected and submitted for laboratory analysis for benzene and naphthalene are summarized in Table 2 and the laboratory report is provided in Attachment B.

The current and proposed future land use is "community use" as defined in the Ontario Brownfields Regulation (Ontario Regulation 153/04, as amended or "O. Reg. 153/04"). Although this regulation does not apply to the planned redevelopment of the Site (as a Record of Site Condition is not required), this VI assessment is being conducted in the spirit of the regulation as per the City of Ottawa Site plan application requirements. Therefore, to assess the soil vapour concentration data, Geosyntec calculated soil vapour screening levels (SVSLs) for benzene and naphthalene using the methodology consistent with O. Reg. 153/04 for industrial / commercial / community use properties. SVSLs were calculated using the industrial health-based indoor air criteria provided in the Modified Generic Risk Assessment 'Approved Model' (MOECC, 2016), divided by the MOECC default soil vapour to indoor air attenuation factor for industrial/commercial buildings (0.004) provided in the Draft Technical Guidance: Soil Vapour Intrusion Assessment (MOECC, 2013). A bioattenuation adjustment factor of 100 was applied to the SVSL to account for biodegradation of the benzene and naphthalene vapours. The bioattenuation factor is consistent with the approach take by O.Reg. 153/04 for a separation distance from sample depths greater than 3 m (MOE, 2011) and is consistent the measurement of O_2 in soil vapour probes greater than 2%. The SVSL are compiled in Table 2.

Samples from all three soil vapour probes had benzene concentrations that ranged from 1.9 micrograms per cubic metre (µg/m^3) (SGP-06) to 32.7 µg/m^3 (SGP-08), with the maximum concentration corresponding to the duplicate sample from SGP-08. All benzene sample concentrations are more than three orders of magnitude below the SVSL of 40,700 µg/m^3.

None of the soil vapour samples had naphthalene concentrations greater than the laboratory detection limit of 5.2 µg/m^3. The detection limit for naphthalene is more than four orders of magnitude below the SVSL of 66,200 µg/m^3.

4.3 QA/QC

Geosyntec validated the laboratory analytical data by reviewing sample holding times, analyte lists, canister vacuum, leak check results and field and laboratory QA/QC results. The detailed

findings of the data validation are provided in Attachment B. Overall, based on the data validation, they are usable for meeting the project objectives.

The analytical results from the primary and field duplicate samples were compared based on a relative percent difference (RPD). The RPD for benzene was 54%, which exceeded the 30% RPD criteria. Although the laboratory reported results for benzene were outside the RPD criteria, no qualifiers were added to the data, as the sample integrity was confirmed by the following procedures:

- The primary and duplicate sample were collected at the same time, through a single flow controller and a duplicate "T" fitting and therefore each canister would consist of the same soil vapour sample.
- Both the primary and duplicate sample canisters had the same measured initial and final vacuum indicting both canisters filled at the same rate.
- Sample canister final vacuum measurements for the primary and duplicate were confirmed upon receipt by the laboratory and were the same value, indicating the neither canister leaked during shipment.
- Helium tracer testing indicated each sample was free from leaks.
- Laboratory canister certifications indicate that sample canisters were clean prior to use.

5. SUMMARY AND CONCLUSIONS

Soil vapour concentrations for naphthalene and benzene did not exceed the applicable provincial screening level in relation to the proposed redevelopment of the Site. Therefore, none of the soil vapour sampling results indicate a potential source of VI in the area of the Site where previous soil sampling results showed the potential presence of benzene and naphthalene in soil at concentrations above health-based criteria for VI.

Sincerely,

Paul Nicholson, P.Eng (ON)
Senior Engineer

Berend Jan Velderman, M.Sc., P.Geo (ON), QP$^{ESA/RA}$
Senior Hydrogeologist

Attachment: Table 1: Soil Vapour Screening Results
Table 2: Soil Vapour Analytical Results
Attachment A: Soil Vapour Construction Details
Attachment B: Data Validation Summary and Laboratory Analytical Report

References:

CIMA+, 2020. Phase Two Environmental Site Assessment – Proposed Site Redevelopment at 200 Lees Avenue, Ottawa, Ontario. 30 October.

ITRC, 2014. Guidance Document. Petroleum Vapor Intrusion. Fundamentals of Screening, Investigation and Management. October.

Ministry of Environment Ontario. 2011. Soil, Ground Water and Sediment Standards for Use under Part XV.I of the Environmental Protection Act. April 15, 2011.

Ministry of Environment and Climate Change (MOECC), 2013. Draft Technical Guidance: Soil Vapour Intrusion Assessment, September 2013. PIBS # 8477.

Ministry of Environment and Climate Change (MOECC), 2016. Modified Generic Risk Assessment 'Approved Model, November 2016. PIBS # 8450e.

soil vapour installation and sampling final

TABLES

TABLE 1
SOIL VAPOUR SCREENING RESULTS
200 Lees Avenue, Ottawa, Ontario

						Helium Tracer Gas			Parameters			
Location	**Date (dd-mm-yy)**	**Elapsed Time (min)**	**Bag Volume (L)**	**Cumulative Volume Removed (L)**	**Purge Rate (LPM)**	**Shroud Minimum (%)**	**Shroud Maximum (%)**	**Sample (ppm_v)**	**O_2 (%)**	**CO_2 (%)**	**CH_4 (%)**	**VOCs by PID (ppm_v)**
SGP-06	19-Oct-2020	12	0.50	0.50	0.04	12.6	21.5	0.0	15.8	1.7	0.0	0.5
Initial Vacuum: <0.1 in. H2O		25	0.50	1.00	0.03	11.8	16.1	0.0	15.1	2.6	0.0	0.4
		40	0.50	1.50	0.03	12.6	15.9	0.0	14.9	2.8	0.0	0.6
		54	0.50	2.00	0.04	12.1	18.1	0.0	14.5	3.1	0.0	0.6
SGP-07	20-Oct-2020	8	0.50	0.50	0.06	13.1	18.6	0.0	8.6	6.0	0.0	0.8
Initial Vacuum: <0.1 in. H2O		18	0.50	1.00	0.05	14.1	20.2	0.0	4.3	12.3	0.0	1.0
		28	0.00	1.50	0.05	11.8	16.5	0.0	7.0	11.0	0.0	0.7
SGP-08[1]	20-Oct-2020	7	0.50	0.50	0.07	13.4	21.6	0.0	5.7	9.3	0.0	2.8
Initial Vacuum: <0.1 in. H2O		14	0.50	1.00	0.07	14.9	20.1	0.0	5.5	9.9	0.0	3.8
		22	0.00	1.50	0.06	11.8	15.6	0.0	5.1	10.9	0.0	3.6

Notes:
< - less than
% - percent by volume
CH_4 - methane
CO_2 - carbon dioxide
LPM - litres per minute
in. Hg - inches of mercury
in. H_2O - inches of water
L - litres
LOW - purge rate less than 0.01 LPM
min - minute
NA - not available - unable to measure initial vacuum
-- tracer test not completed as Helium tank empty
O_2 - oxygen
PID - photoionization detector
ppm_v - parts per million by volume
VOCs - volatile organic compounds
[1] - duplicate sample taken at this location (SGP-100)

TABLE 2
SOIL VAPOUR ANALYTICAL RESULTS
200 Lees Avenue, Ottawa, Ontario

Location: Date Sampled: Laboratory ID: Sample ID: Pressure on Receipt (in. Hg):	Soil Vapour Screening Level (Industrial/ Commercial)[1,2,3]	SGP-06 19-Oct-20 SGP-06-10192020 -9	SVP-07 20-Oct-20 SGP-07-10202020 -7	SVP-08 20-Oct-20 SGP-08-10202020 -6	SVP-100 20-Oct-20 SGP-100 -6
Volatile Organic Compounds (µg/m^3)					
Benzene	40,700	**2.4**	**1.9**	**18.8**	**32.7**
Naphthalene	66,200	5.2 U	5.2 U	5.2 U	5.2 U

Notes:

[1] Soil vapour screening level calculated using the following equation: $C_{sv} = C_{air}^{T} / \alpha_v$ from *"Draft Technical Guidance: Soil Vapour Intrusion Assessment September 2013", MOECC (PIBS # 8477).*

Where: C_{sv} = soil vapour screening level

C_{air}^{T} = HBIAC (residential or industrial/commercial)

α_v = air criteria divided by the MOECC default industrial/commercial attenuation factor (0.004).

[2] All HBIAC values used in the calculation of the soil vapour screening levels were from *"Modified Generic Risk Assessment 'Approved Model' November 2016", MOECC (PIBS # 8450e)* .

[3] Factor of 100 applied to the soil vapour screening level to account for biodegradation for soil at depths greater than 3 m bgs. *"Rationale for the Development of Soil and Groundwater Standards for Use at Contaminated Sites in Ontario", MOE, 2011 (PIBS 7386e01)*

Acronyms:

-- - screening level not available

Bold - associated value is detected

HBIAC - health-based indoor air criteria

ID - identifier

m bgs - metres below ground surface

in. Hg - inches of mercury

µg/m^3 - micrograms per cubic metre

MGRA - Modified Generic Risk Assessment

MOECC - Ontario Ministry of the Environment and Climate Change

MOE - Ontario Ministry of the Environment (now MOECC)

SGP - soil vapour probe

U - analyte not detected; associated value is reporting limit

ATTACHMENT A

Soil Vapour Probe Construction Forms

SOIL GAS PROBE CONSTRUCTION

GeoSyntec Consultants
130 Research Lane, Suite 2
Guelph, Ontario, Canada N1G 5G3
(519)822-2230 Fax (519)822-3151

Probe ID SGP-06 **Site Location** 4 Ottawa, 200 Lees Ave.
Project Name 4 Ottawa **Field Personnel** D Drago
Project Number TR0885B **Recorded By** D. Drago

Permit Number
Installation Date(s) 10.20 oct. 19.2020 **Drilling Contractor** Strata Soil
Drilling Method Geoprobe Direct push **Driller** Auston, Thomas
Borehole Diameter 2"

Materials Used

Riser Pipe: ☐ Diameter ☐ ☑ cm/inches
☐ ☐ Construction ☐ ☐
☐ PVC schedule
☐ Stainless Steel
☐ Other

Screen : ☐ Length ☐ 6" ☐ ☐ cm/inches ☑
☐ ☐ Diameter ☐ ☐ cm/inches
☐ ☐ Slot Size ☐ ☐ ☐ cm/inches
☐ ☐ Construction ☐ ☐
☐ PVC schedule
☐ Stainless Steel
☐ Other

Bottom End Cap: ☐ Male ☐ Female ☐ Slip
☐ PVC
☐ Stainless Steel
☐ Other SS point

Top Cap: ☐ Male ☐ Female
☐ PVC
☐ Stainless Steel
☐ Other

Top Cap: ☑ Brass ☐ Stainless ☐ PVC

Protective Casing: ☑ Flush mount
☐ Above grade

☐ Length ☐ ☐ ☐ cm/inches ☐ ☐
☐ ☐ Stickup ☐ cm/inches
☐ ☐ Construction ☐ ☐ Cast Aluminum
☐ Cast Steel
☐ Other

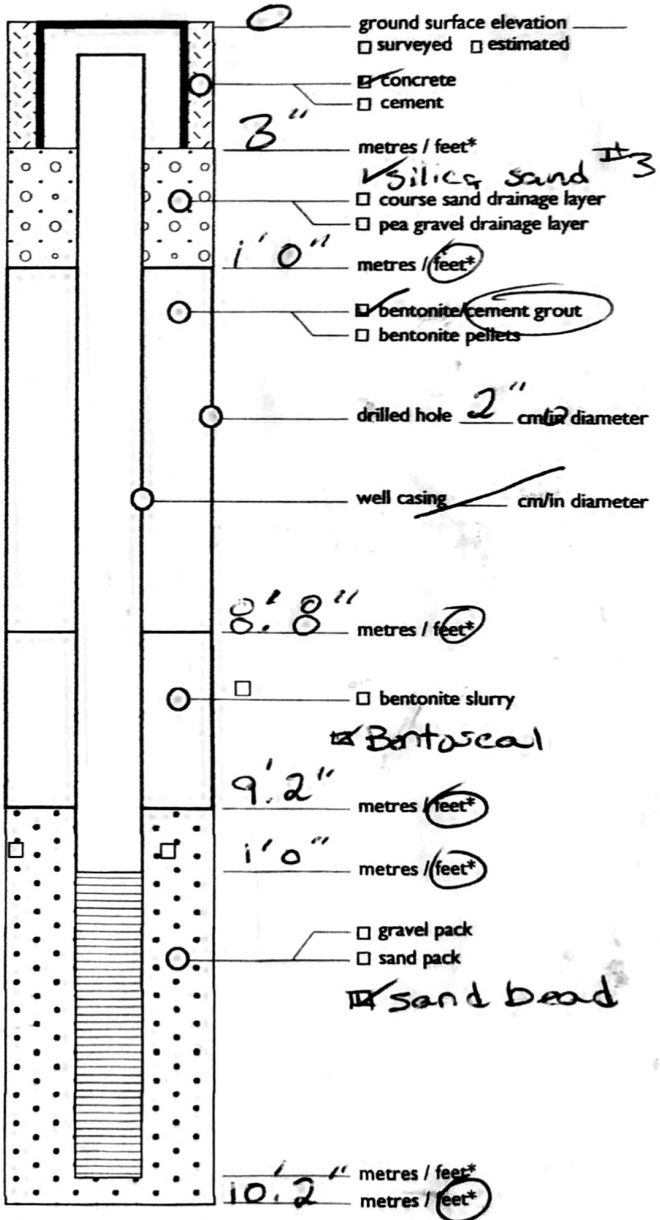
Casing Installation: Depth ☐ ☐ ☐ cm/inches ☐ ☐
☐ ☐ Diameter ☐ ☐ cm/inches

Drain:
Coarse Sand: ___ bags of ☐ ☐ kg/lb per bag ☐ Size
Pea Gravel: ___ bags of ☐ ☐ kg/lb per bag ☐ Size

Sandpack:
Coarse Sand: ___ bags of ☐ ☐ kg/lb per bag ☐ Size
Fine Sand: 1/2 bags of ☐ ☐ kg/lb per bag ☐ Size #3 silica

Seal:
Bentonite Pellets: ___ bags of ___ kg/lb per bag ☐ Type
Bentonite Slurry: 1/4 bags of 2 5 kg/lb per bag ☐ Type Bensea

Grout:
Cement: ___ bags of ___ kg/lb per bag Type
Bentonite: 1/2 bags of 2 5 kg/lb per bag Type Volk - Grout



Measuring Point is Top of Well Casing Unless Otherwise Noted

* *Depth Below Ground Surface*

Soil Gas Probe Construction.xls

SOIL GAS PROBE CONSTRUCTION

GeoSyntec Consultants
130 Research Lane, Suite 2
Guelph, Ontario, Canada N1G 5G3
(519)822-2230 Fax (519)822-3151

Probe ID SGP-07 **Site Location** 200 Lees ave, Ottawa
Project Name Ottawa **Field Personnel** D. Dragon
Project Number TRO885.R **Recorded By** D. Dragon

Permit Number —
Installation Date(s) 11:15 Oct-19-2020 **Drilling Contractor** Strata Soil
Drilling Method Geoprobe Direct push **Driller** Huston, Thomas
Borehole Diameter 2"

Materials Used

Riser Pipe: ☐ Diameter ☐ ☒ cm/inches
☐ ☐ Construction ☐ ☐
☐ PVC schedule ____
☒ Stainless Steel
☐ Other ____

Screen : ☐ Length ☐ 6" ☐ ☐ cm/inches ☐
☐ ☐ Diameter ☐ ☐ cm/inches
☐ ☐ Slot Size ☐ ☐ ☐ cm/inches
☐ ☐ Construction ☐ ☐
☐ PVC schedule ____
☐ Stainless Steel
☐ Other ____

Bottom End Cap: ☐ Male ☐ Female ☐ Slip
☐ PVC
☒ Stainless Steel
☐ Other SS point

Top Cap: ☐ Male ☐ Female
☐ PVC
☐ Stainless Steel
☐ Other ____

Top Cap: ☒ Brass ☐ Stainless ☐ PVC

Protective Casing: ☐ Flush mount
☐ Above grade
☐ Length ☐ ☐ ☐ cm/inches ☐ ☐
☐ ☐ Stickup ☐ ____ cm/inches
☐ ☐ Construction ☐ ☐ Cast Aluminum
☐ Cast Steel
☐ Other ____

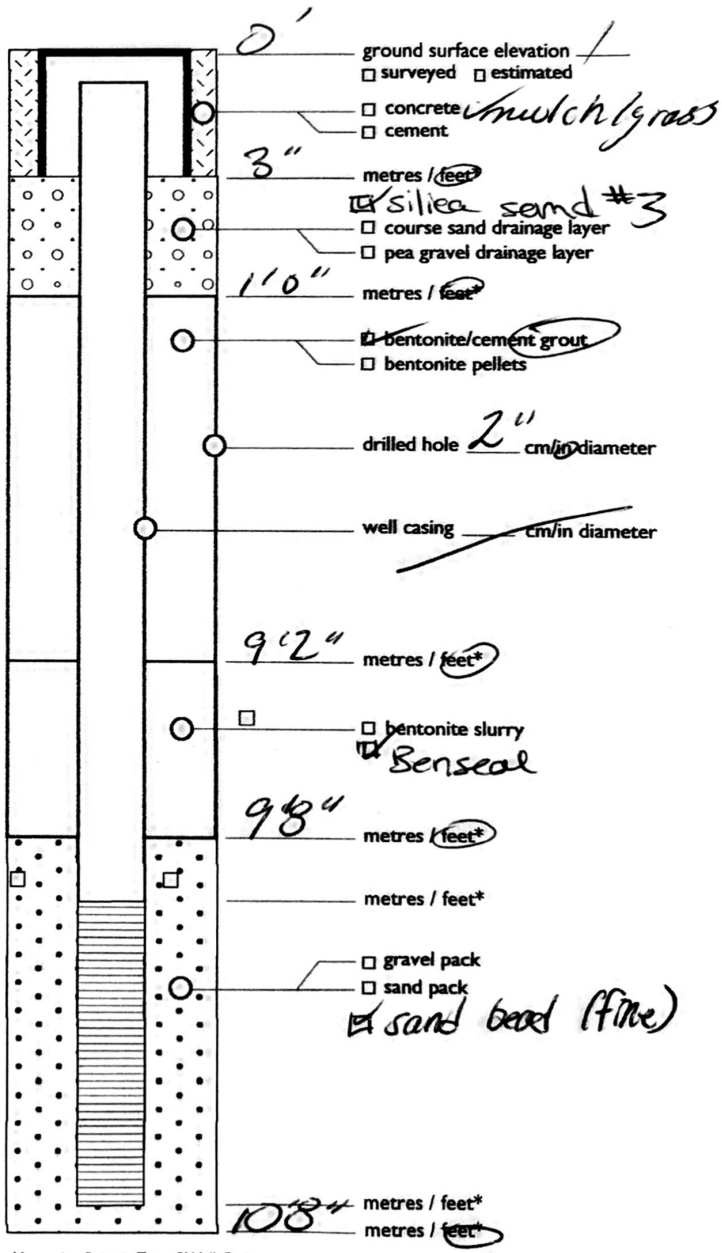
Casing Installation: Depth ☐ ☐ ☐ cm/inches ☐ ☐
☐ ☐ Diameter ☐ ☐ ☐ cm/inches

Drain:
Coarse Sand: ___ bags of ☐ ☒ kg/lb per bag ☐ Size ____
Pea Gravel: ___ bags of ☐ ☒ kg/lb per bag ☐ Size ____

Sandpack:
Coarse Sand: ___ bags of ☐ ☒ kg/lb per bag ☐ Size ____
Fine Sand: 1/8 bags of ☐ 23 kg/lb per bag ☐ Size #3 Silica Sand

Seal:
Bentonite Pellets: ___ bags of ___ kg/lb per bag ☐ Type ____
Bentonite Slurry: 1/4 bags of 25 kg/lb per bag ☐ Type Benseal

Grout:
Cement: ___ bags of ___ kg/lb per bag Type ____
Bentonite 1/2 bags of 23 kg/lb per bag Type PK-Grout



Measuring Point is Top of Well Casing Unless Otherwise Noted

** Depth Below Ground Surface*

Soil Gas Probe Construction.xl

SOIL GAS PROBE CONSTRUCTION

GeoSyntec Consultants
130 Research Lane, Suite 2
Guelph, Ontario, Canada N1G 5G3
(519)822-2230 Fax (519)822-3151

Probe ID SGP-08 **Site Location** 200 Lees ave, Ottawa
Project Name U Ottawa **Field Personnel** D. Drage
Project Number TR0885B **Recorded By** D. Drage

Permit Number _____ **Drilling Contractor** Strata
Installation Date(s) Oct. 14. 2020 **Driller** Auston, Thomas
Drilling Method Geoprobe Direct Push
Borehole Diameter 2"

Materials Used

Riser Pipe: ☐ Diameter ☐ ☐ cm/inches
☐ ☐ Construction ☐ ☐
☐ PVC schedule _____
☐ Stainless Steel
☐ Other _____

Screen : ☐ Length ☐ 6" ☐ ☐ cm/inches ☐
☐ ☐ Diameter ☐ ☐ cm/inches
☐ ☐ Slot Size ☐ ☐ ☐ cm/inches
☐ ☐ Construction ☐ ☐
☐ PVC schedule _____
☐ Stainless Steel
☐ Other _____

Bottom End Cap: ☐ Male ☐ Female ☐ Slip
☐ PVC
☐ Stainless Steel
☐ Other SS point

Top Cap: ☐ Male ☐ Female
☐ PVC
☐ Stainless Steel
☐ Other _____

Top Cap: ☐ Brass ☐ Stainless ☐ PVC

Protective Casing: ☐ Flush mount
☐ Above grade

☐ Length ☐ ☐ ☐ cm/inches ☐ ☐
☐ ☐ Stickup ☐ _____ cm/inches
☐ ☐ Construction ☐ ☐ Cast Aluminum
☐ Cast Steel
☐ Other _____

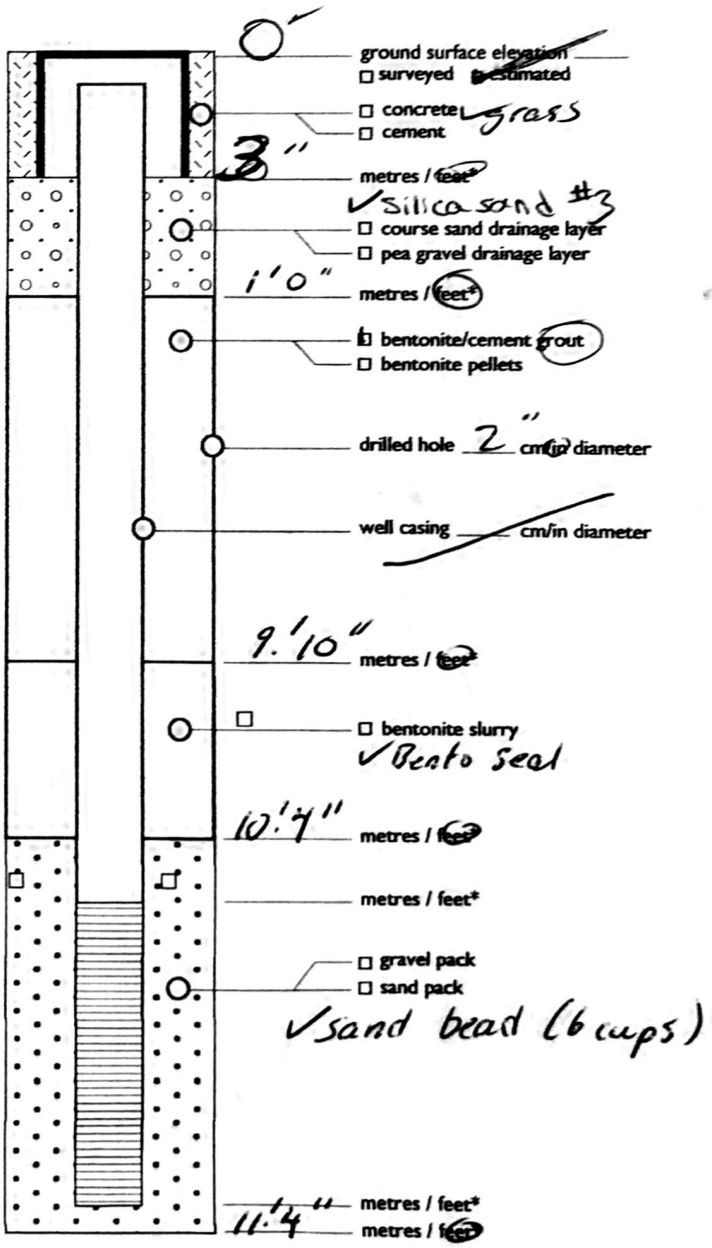
Casing Installation: Depth ☐ ☐ ☐ cm/inches ☐ ☐
☐ ☐ Diameter ☐ ☐ cm/inches

Drain:
Coarse Sand: ___ bags of ☐ ☐ kg/lb per bag ☐ Size _____
Pea Gravel: ___ bags of ☐ ☐ kg/lb per bag ☐ Size _____

Sandpack:
Coarse Sand: ___ bags of ☐ ☐ kg/lb per bag ☐ Size _____
Fine Sand: 1/4 bags of ☐ ☐ kg/lb per bag ☐ Size #2 silica

Seal:
Bentonite Pellets: ___ bags of ___ kg/lb per bag ☐ Type _____
Bentonite Slurry: 1/2 bags of 1/2 kg/lb per bag ☐ Type Beraseal 23 kg

Grout:
Cement: ___ bags of ___ kg/lb per bag Type _____
Bentonite: 1/2 bags of 23 kg/lb per bag Type 20% - GROUT



Measuring Point is Top of Well Casing Unless Otherwise Noted

* Depth Below Ground Surface

Soil Gas Probe Construction.rtf

ATTACHMENT B

Date Validation Summary and Laboratory Analytical Report

ATTACHMENT B
DATA VALIDATION SUMMARY

Soil vapour samples were analyzed for benzene and naphthalene by AGAT Laboratories (AGAT), a Canadian Association for Laboratory Accreditation Inc. (CALA) accredited laboratory in Mississauga, Ontario. The data were validated according to standard data validation procedures (USEPA, 2017) with the addition of the review of purging records and leak check information.

Laboratory data such as sample hold times, analyte lists, method blanks, method blank spikes, surrogates, and laboratory duplicates were reviewed to evaluate whether the samples were analyzed within specified times, the laboratory instrument was operating within specifications, and reporting met project requirements. Field duplicate and primary samples were reviewed. Field data such as sample labels and dates were also reviewed. Overall, based on this data validation, the data as qualified are usable for meeting project objectives.

The following data quality items were noted during data validation:

- Field parameters in SGP-06 were on a slight decreasing trend at the time of sampling, however, the variability in parameters was considered suitable and no qualification was recommended;
- Leak tests passed for all samples, as no helium was detected during purging;
- All samples were collected and analyzed as planned;
- All samples were analyzed within the laboratory hold times, although the laboratory did not report analysis times;
- The pressure in the Summa™ canister between the field and laboratory was measured to be within four inches of mercury (in Hg);
- Laboratory canister certification confirmed that canisters were clean prior to deployment (all analytes were below reporting limit). Several analytes were flagged by the laboratory as part of the certification process however, an explanation of the qualifier was not provided. The flagged compounds were not related to benzene or naphthalene therefore, no qualification was recommended;
- Method blank results were within acceptable criteria (i.e., no detected concentrations);
- Method blank spike recovery was within laboratory acceptance limits;
- Reference material analyte recovery analysis were within acceptance limits;
- All surrogate recoveries were within acceptable criteria; and,
- One field duplicate sample was collected (primary sample SGP-08-10202020 and duplicate sample SGP-100). The relative percent difference (RPD) for benzene was 54%, which exceeded the general 30% RPD criteria. No qualifiers were added as the sample procedures indicate the sample integrity was maintained during sample collection and transport.

The data are concluded to be representative, of known and acceptable accuracy and precision and suitable for use.

References:

US EPA. 2017. National Functional Guidelines for Superfund Inorganic Methods Data Review. EPA-540-R-2017-001. January 2017.

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: CIMA+ S.E.N.C.
240 CATHERINE STREET, SUITE 110
OTTAWA, ON K2P2G8
(613) 860-2462

ATTENTION TO: Karen Greer

PROJECT: A001049

AGAT WORK ORDER: 20T663247

AIR QUALITY MONITORING REVIEWED BY: Theresa Stephenson, Manager of Technical Services

DATE REPORTED: Oct 26, 2020

PAGES (INCLUDING COVER): 5

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*Notes

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories

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CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 20T663247

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

BTEX & Naphthalene in Air (Canister)

DATE RECEIVED: 2020-10-20

DATE REPORTED: 2020-10-26

SAMPLE DESCRIPTION:				SGP-06-10182020	SGP-07-10202020	SGP-08-10202020	SGP-100
SAMPLE TYPE:				Air	Air	Air	Air
DATE SAMPLED:				2020-10-19	2020-10-20	2020-10-20	2020-10-20
Parameter	Unit	G / S	RDL	1585985	1585986	1585987	1585988
pressure upon receipt	inHg			-9	-7	-6	-6
Benzene	µg/m3		0.64	2.4	1.90	18.8	32.7
Naphthalene	µg/m3		5.2	<5.2	<5.2	<5.2	<5.2
Surrogate	Unit	Acceptable Limits					
4-Bromofluorobenzene	%	70-130		98	95	90	87

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

1585985-1585988 VOC analysis was performed from an air canister sample, using a Cold Vapor Trap preconcentrator and GC/MSD.

Analysis done at AGAT 5623 McAdam Road Mississauga location.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20T663247

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

Air Quality Monitoring

RPT Date: Oct 26, 2020			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
BTEX & Naphthalene in Air (Canister)															
Benzene	1557770		< 0.64	< 0.64	0.0%	< 0.64	135%	60%	140%	134%	50%	140%			
Naphthalene	1557770		< 5.2	< 5.2	0.0%	< 5.2	120%	60%	140%	140%	50%	140%			

Certified By:

AGAT Laboratories

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http://www.agatlabs.com

Method Summary

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20T663247

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Air Quality Monitoring			
pressure upon receipt			N/A
Benzene	AQM-248-16000	modified from EPA TO15	GC/MS
Naphthalene	AQM-248-16000	modified from EPA TO15	GC/MS
4-Bromofluorobenzene	AQM-248-16000	modified from EPA TO15	GC/MS

AGAT Laboratories

AGAT WO#: 20T663247

Notes:

Air Analysis Chain of Custody Record

Same Yes ☑ / No ☐

Company: ~~Karen Greer~~ CIMA+	Company: CIMA+
Contact: Karen Greer	Contact: Karen Greer
Address: 110-240 St. Catherine St. Ottawa, ON	Address: 110-240 St. Catherine St. Ottawa, ON
Phone: 343-796-9651 Fax:	1. Name: Karen Greer
Client Project #: A201049 PO:	Email: Karen.Greer@cima.com
AGAT Quote #: 351725	2. Name:
	Email:

Regular TAT ☑ 10 working days
Rush TAT* ☐ 3 working days ☐ 2 working days

BY FILLING OUT THIS SECTION, THE CLIENT ACCEPTS THAT SURCHARGES WILL BE ATTACHED TO THIS ANALYSIS. IF NOT COMPLETED, REGULAR TAT WILL BE DEFAULT.

*TATs ARE EXCLUSIVE OF WEEKENDS AND STATUTORY HOLIDAYS

FOR RUSH TAT, CONFIRM AVAILABILITY WITH LABORATORY.

153 CCME
419 Other

SAMPLE ID	CANISTER #	FLOW CONTROLLER #	DATE SAMPLED	INITIAL PRESSURE	FINAL PRESSURE	AMBIENT TEMPERATURE	SAMPLE TYPE: AMBIENT	SOIL VAPOUR	BUILDING	INDOOR AIR	OUTDOOR AIR	Start for VOCs	Benzene	Naphthalene	REPORT UNITS mg/m³	REPORT UNIT ppmv	REPORT UNITS ug/m³
SGP-26-10192020	6460	/	Oct-14-2020	-29.0	-9.5	8°C		X					X	X			
SGP-07-10202020	6447	/	Oct-20-2020	-28.0	-7.5	10°C		X					X	X			
SGP-03-10202020	6449	/	Oct-20-2020	-29.0	-7.5	10°C		X					X	X			
SGP-100	20114	/	Oct-20-2020	-29.0	-7.5	10°C		X					X	X			
								~~X~~									
							49										

Samples Relinquished By (Print Name and Sign): Dave Driggs	Date/Time: 10/20/2020	Samples Received By (Print Name and Sign): [illegible]	Date/Time: 20/10/20 13h
Samples Relinquished By (Print Name and Sign): [illegible]	Date/Time: 2020 13:15 10/20/16h	Samples Received By (Print Name and Sign):	Date/Time:
Samples Relinquished By (Print Name and Sign):		Samples Processed By (Print Name and Sign):	Date/Time:

Pink Copy - Client
Yellow Copy - AGAT
White Copy - AGAT

Page 1 of 1

N°:

AGAT Laboratories

Wednesday Oct 28th, 2020

This certificate confirms that the follows canisters have been certified clean, In accordance with U.S. EPATO15. One canister has been selected and analyze d. These canister have been found to contain <0.2ppbv concentrations of all target analytes and the batch have been considered clean.

WO#20T663247

Project # A001049

Canister #	Batch #	Date cleaned
6460	903	14/10/2020
6449	903	14/10/2020
6447	902	13/10/2020
114	899	07/10/2020

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2020_Oct_19_0737\
Data File : 2020_Oct_19_0737_041.D
Acq On : 20 Oct 2020 3:27 pm
Operator : LIMS import
Sample : Can clean batch # 903
Misc : can 31250
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Oct 28 13:53:37 2020
Quant Method : C:\msdchem\1\methods\200826TO15.M
Quant Title : TO 15 VOCs in Air (Canisters)
QLast Update : Wed Aug 26 12:23:52 2020
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) BromoChloroMethane	6.427	49	66726	20.00	ppbv	# 0.00
43) 1,4-Difluorobenzene	8.220	114	174564	20.00	ppbv	# 0.00
58) Chlorobenzene-d5	11.530	117	139127	20.00	ppbv	# 0.00
System Monitoring Compounds						
69) BromoFluoroBenzene (Surr)	12.597	95	101577	21.52	10v	0.00
Target Compounds						Qvalue
2) Propylene	0.000		0	N.D.		
3) Dichlorodifluoromethane	0.000		0	N.D.		
4) Dichlorotetrafluoroethane	0.000		0	N.D.		
5) Ethanol	0.000		0	N.D.		d
6) Freon-113	0.000		0	N.D.		
7) Chloromethane	0.000		0	N.D.		
8) Vinyl Chloride	0.000		0	N.D.		
9) 1,3-Butadiene	0.000		0	N.D.		
10) Bromomethane	0.000		0	N.D.		
11) Chloroethane	0.000		0	N.D.		
12) Vinyl Bromide	0.000		0	N.D.		
13) Trichlorofluoromethane	0.000		0	N.D.		
14) Acetone	0.000		0	N.D.		d
15) Isopropanol	0.000		0	N.D.		
16) 1,1-Dichloroethene	0.000		0	N.D.		
17) Dichloromethane	0.000		0	N.D.		d
18) Carbon Disulfide	0.000		0	N.D.		d
19) Trans 1,2-Dichloroethene	0.000		0	N.D.		
20) Methyl t-Butyl Ether	0.000		0	N.D.		
21) 1,1-Dichloroethane	0.000		0	N.D.		
22) Vinyl acetate	0.000		0	N.D.		
23) Hexane	0.000		0	N.D.		
24) Methyl Ethyl Ketone	0.000		0	N.D.		
25) Cis-1,2-Dichloroethene	0.000		0	N.D.		
26) Chloroform	0.000		0	N.D.		
27) Ethyl Acetate	0.000		0	N.D.		
28) Tetrahydrofuran	0.000		0	N.D.		
29) 1,2-Dichloroethane	0.000		0	N.D.		
30) 1,1,1-Trichloroethane	0.000		0	N.D.		
31) Iso-octane	0.000		0	N.D.		
32) Cyclohexane	0.000		0	N.D.		
33) Carbon Tetrachloride	0.000		0	N.D.		
34) Benzene	0.000		0	N.D.		
35) 1,2-Dichloropropane	0.000		0	N.D.		
36) Heptane	0.000		0	N.D.		
37) Trichloroethene	0.000		0	N.D.		
38) Bromodichloromethane	0.000		0	N.D.		
39) 1,4-Dioxane	0.000		0	N.D.		
40) Methyl methacrylate	0.000		0	N.D.		
41) Cis-1,3-Dichloropropene	0.000		0	N.D.		
42) Trans-1,3-Dichloropropene	0.000		0	N.D.		
44) Methyl Isobutyl Ketone	0.000		0	N.D.		
45) 1,1,2-Trichloroethane	0.000		0	N.D.		

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Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
46) Toluene	0.000		0	N.D.		
47) 2-Hexanone	0.000		0	N.D.		
48) Dibromochloromethane	0.000		0	N.D.		
49) 1,2-Dibromoethane	0.000		0	N.D.		
50) Tetrachloroethene	0.000		0	N.D.		
51) Chlorobenzene	0.000		0	N.D.		
52) Ethylbenzene	0.000		0	N.D.		
53) m&p-Xylene	0.000		0	N.D.		
54) Bromoform	0.000		0	N.D.		
55) Styrene	0.000		0	N.D.		
56) 1,1,2,2-Tetrachloroethane	0.000		0	N.D.		
57) o-Xylene	0.000		0	N.D.		
59) 1-ethyl-4-methylbenzene	0.000		0	N.D.		
60) 1,3,5-Trimethylbenzene	0.000		0	N.D.		
61) 1,2,4-Trimethylbenzene	0.000		0	N.D.		
62) 1,3-Dichlorobenzene	0.000		0	N.D.		
63) Benzyl Chloride	0.000		0	N.D.		
64) 1,4-Dichlorobenzene	0.000		0	N.D.		
65) 1,2-Dichlorobenzene	0.000		0	N.D.		
66) 1,2,4-Trichlorobenzene	0.000		0	N.D.		
67) Naphthalene	0.000		0	N.D.		
68) HCBD	0.000		0	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

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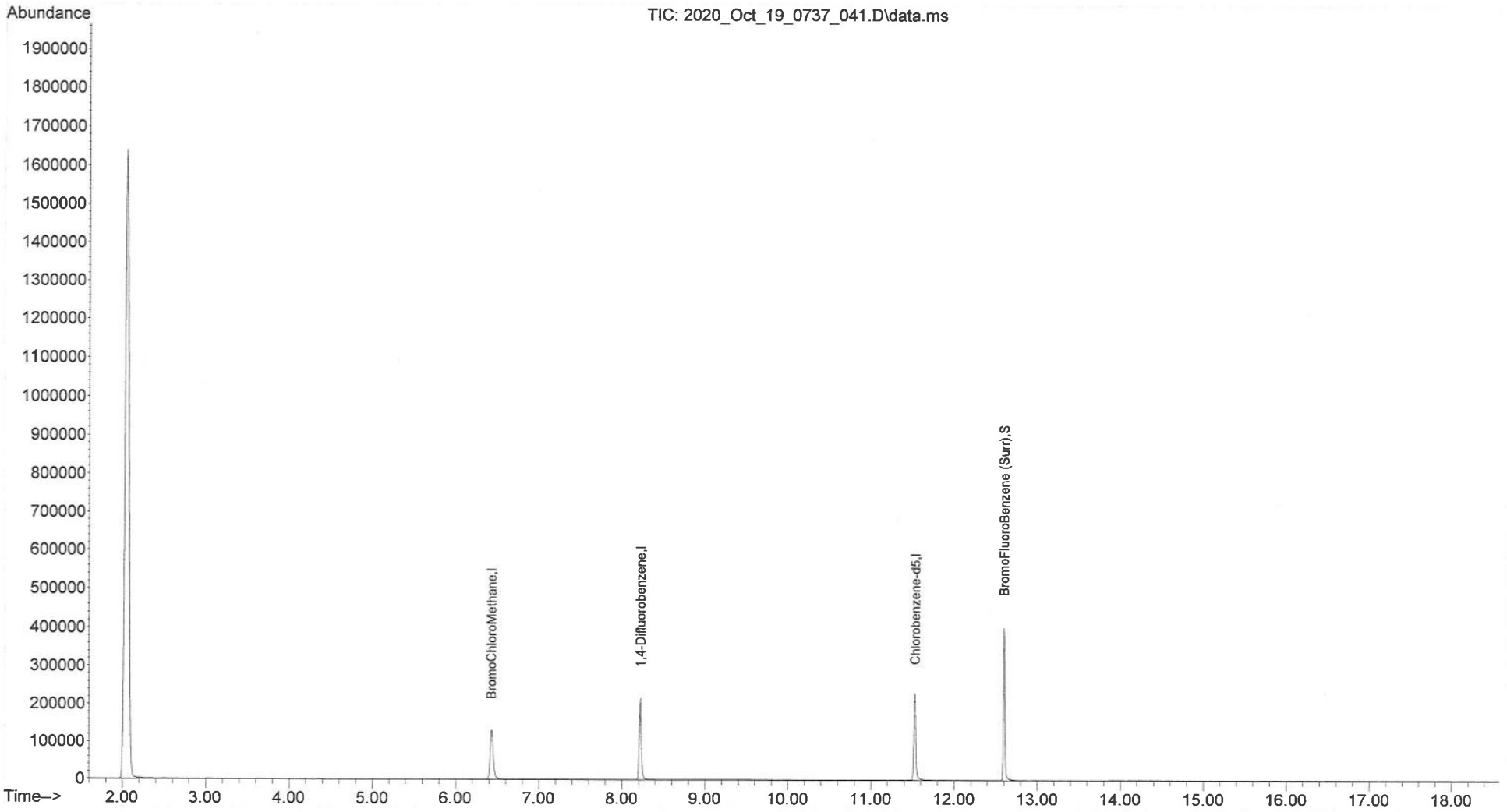

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2020_Oct_19_0737\
Data File : 2020_Oct_19_0737_045.D
Acq On : 20 Oct 2020 5:38 pm
Operator : LIMS import
Sample : Can clean batch # 902
Misc : can 106
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Oct 28 13:54:31 2020
Quant Method : C:\msdchem\1\methods\200826TO15.M
Quant Title : TO 15 VOCs in Air (Canisters)
QLast Update : Wed Aug 26 12:23:52 2020
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) BromoChloroMethane	6.427	49	65646	20.00	ppbv	# 0.00
43) 1,4-Difluorobenzene	8.220	114	174126	20.00	ppbv	# 0.00
58) Chlorobenzene-d5	11.530	117	136799	20.00	ppbv	# 0.00
System Monitoring Compounds						
69) BromoFluoroBenzene (Surr)	12.603	95	96198	20.73	10v	0.00
Target Compounds						Qvalue
2) Propylene	0.000		0	N.D.		
3) Dichlorodifluoromethane	0.000		0	N.D.		
4) Dichlorotetrafluoroethane	0.000		0	N.D.		
5) Ethanol	0.000		0	N.D.	d	
6) Freon-113	0.000		0	N.D.		
7) Chloromethane	0.000		0	N.D.		
8) Vinyl Chloride	0.000		0	N.D.		
9) 1,3-Butadiene	0.000		0	N.D.		
10) Bromomethane	0.000		0	N.D.		
11) Chloroethane	0.000		0	N.D.		
12) Vinyl Bromide	0.000		0	N.D.		
13) Trichlorofluoromethane	0.000		0	N.D.		
14) Acetone	0.000		0	N.D.	d	
15) Isopropanol	0.000		0	N.D.	d	
16) 1,1-Dichloroethene	0.000		0	N.D.		
17) Dichloromethane	0.000		0	N.D.	d	
18) Carbon Disulfide	0.000		0	N.D.	d	
19) Trans 1,2-Dichloroethene	0.000		0	N.D.		
20) Methyl t-Butyl Ether	0.000		0	N.D.		
21) 1,1-Dichloroethane	0.000		0	N.D.		
22) Vinyl acetate	0.000		0	N.D.		
23) Hexane	0.000		0	N.D.		
24) Methyl Ethyl Ketone	0.000		0	N.D.		
25) Cis-1,2-Dichloroethene	0.000		0	N.D.		
26) Chloroform	0.000		0	N.D.		
27) Ethyl Acetate	0.000		0	N.D.		
28) Tetrahydrofuran	0.000		0	N.D.		
29) 1,2-Dichloroethane	0.000		0	N.D.		
30) 1,1,1-Trichloroethane	0.000		0	N.D.		
31) Iso-octane	0.000		0	N.D.		
32) Cyclohexane	0.000		0	N.D.		
33) Carbon Tetrachloride	0.000		0	N.D.		
34) Benzene	0.000		0	N.D.		
35) 1,2-Dichloropropane	0.000		0	N.D.		
36) Heptane	0.000		0	N.D.		
37) Trichloroethene	0.000		0	N.D.		
38) Bromodichloromethane	0.000		0	N.D.		
39) 1,4-Dioxane	0.000		0	N.D.		
40) Methyl methacrylate	0.000		0	N.D.		
41) Cis-1,3-Dichloropropene	0.000		0	N.D.		
42) Trans-1,3-Dichloropropene	0.000		0	N.D.		
44) Methyl Isobutyl Ketone	0.000		0	N.D.		
45) 1,1,2-Trichloroethane	0.000		0	N.D.		

Data Path : C:\msdchem\1\data\2020_Oct_19_0737\
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Acq On : 20 Oct 2020 5:38 pm
Operator : LIMS import
Sample : Can clean batch # 902
Misc : can 106
ALS Vial : 5 Sample Multiplier: 1

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Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
46) Toluene	0.000		0	N.D.		
47) 2-Hexanone	0.000		0	N.D.		
48) Dibromochloromethane	0.000		0	N.D.		
49) 1,2-Dibromoethane	0.000		0	N.D.		
50) Tetrachloroethene	0.000		0	N.D.		
51) Chlorobenzene	0.000		0	N.D.		
52) Ethylbenzene	0.000		0	N.D.		
53) m&p-Xylene	0.000		0	N.D.		
54) Bromoform	0.000		0	N.D.		
55) Styrene	0.000		0	N.D.		
56) 1,1,2,2-Tetrachloroethane	0.000		0	N.D.		
57) o-Xylene	0.000		0	N.D.		
59) 1-ethyl-4-methylbenzene	0.000		0	N.D.		
60) 1,3,5-Trimethylbenzene	0.000		0	N.D.		
61) 1,2,4-Trimethylbenzene	0.000		0	N.D.		
62) 1,3-Dichlorobenzene	0.000		0	N.D.		
63) Benzyl Chloride	0.000		0	N.D.		
64) 1,4-Dichlorobenzene	0.000		0	N.D.		
65) 1,2-Dichlorobenzene	0.000		0	N.D.		
66) 1,2,4-Trichlorobenzene	0.000		0	N.D.		
67) Naphthalene	0.000		0	N.D.		
68) HCBD	0.000		0	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

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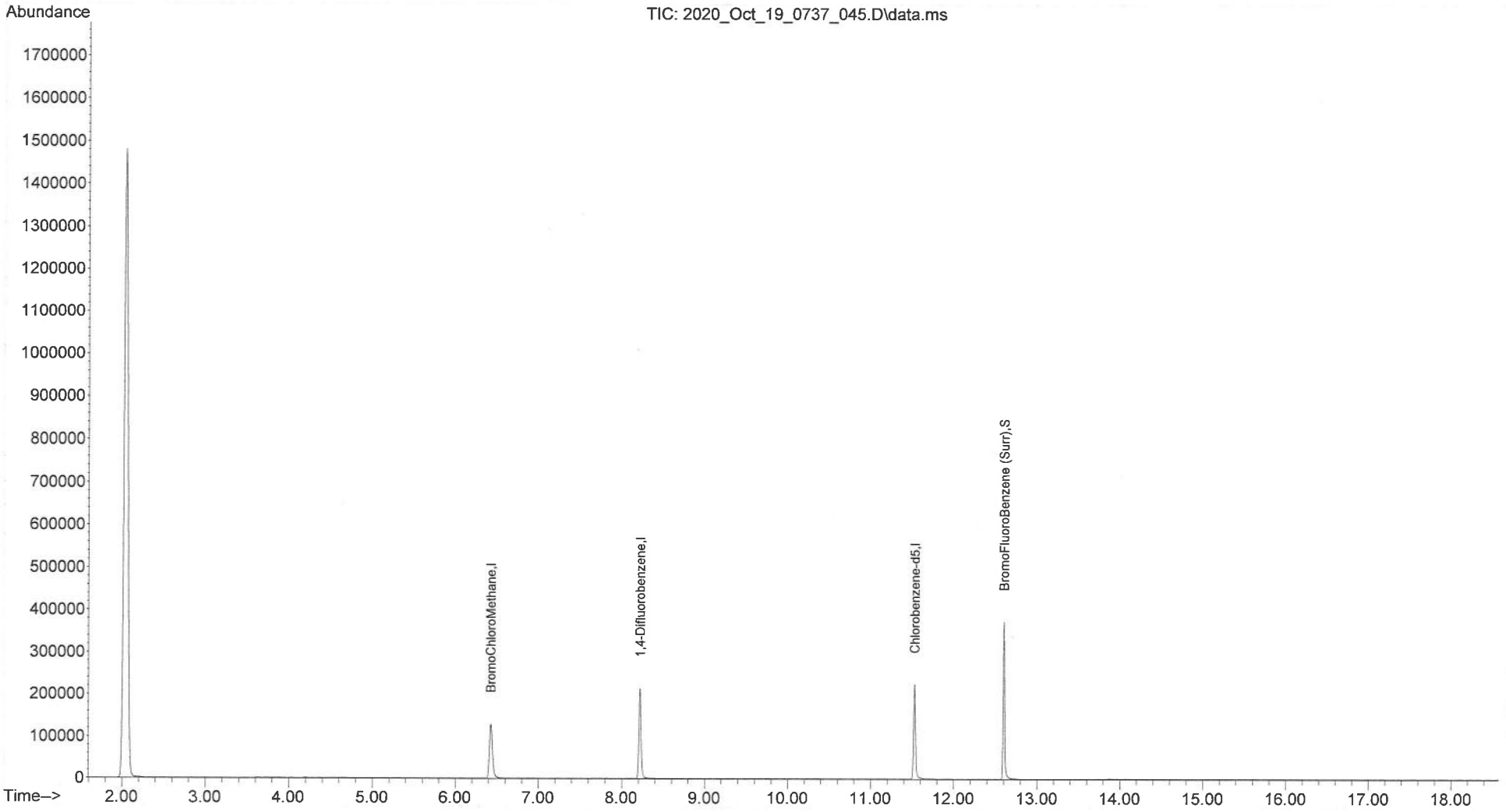


Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2020_Oct_07_1028\
Data File : 2020_Oct_07_1028_022.D
Acq On : 8 Oct 2020 8:30 am
Operator : LIMS import
Sample : Cln Btch899
Misc : Can 190
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Oct 28 13:57:10 2020
Quant Method : C:\msdchem\1\methods\200826TO15.M
Quant Title : TO 15 VOCs in Air (Canisters)
QLast Update : Wed Aug 26 12:23:52 2020
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) BromoChloroMethane	6.421	49	74802	20.00	ppbv	# 0.00
43) 1,4-Difluorobenzene	8.214	114	210455	20.00	ppbv	# 0.00
58) Chlorobenzene-d5	11.530	117	155080	20.00	ppbv	# 0.00
System Monitoring Compounds						
69) BromoFluoroBenzene (Surr)	12.597	95	110255	20.96	10v	0.00
Target Compounds						Qvalue
2) Propylene	0.000		0	N.D.	d	
3) Dichlorodifluoromethane	0.000		0	N.D.	d	
4) Dichlorotetrafluoroethane	0.000		0	N.D.		
5) Ethanol	0.000		0	N.D.		
6) Freon-113	0.000		0	N.D.		
7) Chloromethane	0.000		0	N.D.		
8) Vinyl Chloride	0.000		0	N.D.	d	
9) 1,3-Butadiene	0.000		0	N.D.		
10) Bromomethane	0.000		0	N.D.		
11) Chloroethane	0.000		0	N.D.		
12) Vinyl Bromide	0.000		0	N.D.		
13) Trichlorofluoromethane	0.000		0	N.D.	d	
14) Acetone	0.000		0	N.D.	d	
15) Isopropanol	0.000		0	N.D.	d	
16) 1,1-Dichloroethene	0.000		0	N.D.		
17) Dichloromethane	0.000		0	N.D.	d	
18) Carbon Disulfide	0.000		0	N.D.	d	
19) Trans 1,2-Dichloroethene	0.000		0	N.D.		
20) Methyl t-Butyl Ether	0.000		0	N.D.		
21) 1,1-Dichloroethane	0.000		0	N.D.		
22) Vinyl acetate	0.000		0	N.D.		
23) Hexane	0.000		0	N.D.		
24) Methyl Ethyl Ketone	0.000		0	N.D.		
25) Cis-1,2-Dichloroethene	0.000		0	N.D.	d	
26) Chloroform	0.000		0	N.D.		
27) Ethyl Acetate	0.000		0	N.D.		
28) Tetrahydrofuran	0.000		0	N.D.		
29) 1,2-Dichloroethane	0.000		0	N.D.		
30) 1,1,1-Trichloroethane	0.000		0	N.D.		
31) Iso-octane	0.000		0	N.D.		
32) Cyclohexane	0.000		0	N.D.		
33) Carbon Tetrachloride	0.000		0	N.D.		
34) Benzene	0.000		0	N.D.		
35) 1,2-Dichloropropane	0.000		0	N.D.		
36) Heptane	0.000		0	N.D.		
37) Trichloroethene	0.000		0	N.D.		
38) Bromodichloromethane	0.000		0	N.D.		
39) 1,4-Dioxane	0.000		0	N.D.		
40) Methyl methacrylate	0.000		0	N.D.		
41) Cis-1,3-Dichloropropene	0.000		0	N.D.		
42) Trans-1,3-Dichloropropene	0.000		0	N.D.		
44) Methyl Isobutyl Ketone	0.000		0	N.D.		
45) 1,1,2-Trichloroethane	0.000		0	N.D.		

Data Path : C:\msdchem\1\data\2020_Oct_07_1028\
Data File : 2020_Oct_07_1028_022.D
Acq On : 8 Oct 2020 8:30 am
Operator : LIMS import
Sample : Cln Btch899
Misc : Can 190
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Oct 28 13:57:10 2020
Quant Method : C:\msdchem\1\methods\200826TO15.M
Quant Title : TO 15 VOCs in Air (Canisters)
QLast Update : Wed Aug 26 12:23:52 2020
Response via : Initial Calibration

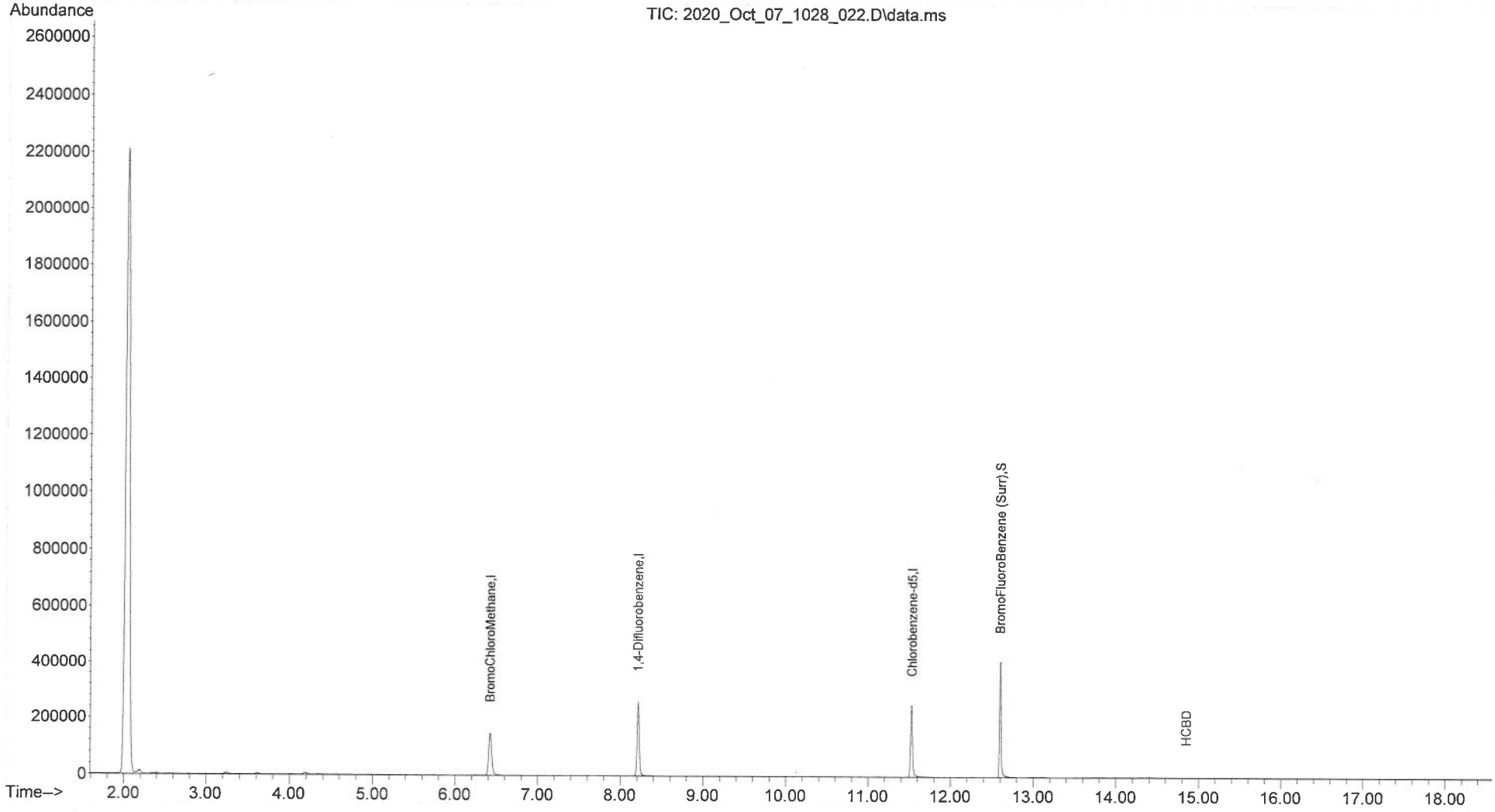
Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
46) Toluene	0.000		0	N.D.	
47) 2-Hexanone	0.000		0	N.D.	
48) Dibromochloromethane	0.000		0	N.D.	
49) 1,2-Dibromoethane	0.000		0	N.D.	
50) Tetrachloroethene	0.000		0	N.D.	
51) Chlorobenzene	0.000		0	N.D.	
52) Ethylbenzene	0.000		0	N.D.	
53) m&p-Xylene	0.000		0	N.D.	
54) Bromoform	0.000		0	N.D.	
55) Styrene	0.000		0	N.D.	
56) 1,1,2,2-Tetrachloroethane	0.000		0	N.D.	
57) o-Xylene	0.000		0	N.D.	
59) 1-ethyl-4-methylbenzene	0.000		0	N.D.	
60) 1,3,5-Trimethylbenzene	0.000		0	N.D.	
61) 1,2,4-Trimethylbenzene	0.000		0	N.D.	
62) 1,3-Dichlorobenzene	0.000		0	N.D.	
63) Benzyl Chloride	0.000		0	N.D.	
64) 1,4-Dichlorobenzene	0.000		0	N.D.	
65) 1,2-Dichlorobenzene	0.000		0	N.D.	
66) 1,2,4-Trichlorobenzene	0.000		0	N.D.	
67) Naphthalene	0.000		0	N.D.	
68) HCBD	14.840	225	74	0.00 ppbv #	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2020_Oct_07_1028\
Data File : 2020_Oct_07_1028_022.D
Acq On : 8 Oct 2020 8:30 am
Operator : LIMS import
Sample : Cln Btch899
Misc : Can 190
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Oct 28 13:57:10 2020
Quant Method : C:\msdchem\1\methods\200826TO15.M
Quant Title : TO 15 VOCs in Air (Canisters)
QLast Update : Wed Aug 26 12:23:52 2020
Response via : Initial Calibration



C

Appendix C
Borehole Logs

240, Catherine Street
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Telephone:(613) 860-2462

Borehole/Soil Vapour Probe

Log BH20-6

Drilling date: 2020/10/19
Technician: L. Robert
Prepared by: L. Brown
Revised by: K. Greer

Client: University of Ottawa
Project no: A001049
Project Name: uOttawa Supplemental Phase II Environmental Site Assessment
Address: 200 Lees, Ottawa (ON)

Easting : 5029385
Northing : 447649

Ground Surface Elevation : 61.495 m
Top of Casing Elevation : N/A
Groundwater Elevation : N/A

Contractor: Strata Drilling Group
Equipment: Geoprobe
Drill type: 6712-DT
Type of sample: Dual Tube

Sample types

RC	Rock core
SS	Split spoon sample
MA	Manual auger
MS	Manual sampler
ST	Shelby Tube
CL	Clear liner

Terminology

traces	< 10 %
some	10 - 20 %
(ey) or (y)	20 - 35 %
and	35 - 50 %

Soil classification

Silt and clay	< 0,08 mm
Sand	0,08 - 5 mm
Gravel	5 - 80 mm
Cobbles	80 - 300 mm
Boulders	> 300 mm

Relative density 'N' blows

Very loose	0 - 4
Loose	4 - 10
Compact	10 - 30
Dense	30 - 50
Very dense	>50

Subsurface Profile			Sample Details						Soil Vapour Probe Construction	
Depth / Elevation (m)	Graphic Log	Description	Sample ID	Sample Type	Blows/15cm	Headspace Concentrations TOV (ppm)	Headspace Concentrations CVC (ppm / %lel)	Lab Analysis	Description	Diagram
0										
0.08 / 61.42		ASPHALT								
		FILL. Organic soils with trace silty sand.	SS1	CL		<0.1			Flushmount protective cover with concrete seal	
		Silty sand with traces of gravel, ash and wood. Dry. loose. Brownish grey							Silica sand #3	
		Trace of glass and layers of silty sand.	SS2	CL		<0.1			Sample tubing with cement grout	
2										
			SS3 & DUP 1	CL		<0.1		Napthalene, Benzene		
4									Sand beads	
4.27 / 57.23		Silt to clayey silt. Saturated. Slightly compacted. Brownish grey							Slotted steel screen	
4.88 / 56.62									Stainless steel end cap with sand beads	
4.88		END OF BOREHOLE								

Notes :

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Borehole/Soil Vapour Probe

Log BH20-7

Drilling date: 2020/10/19
Technician: L. Robert
Prepared by: L. Brown
Revised by: K. Greer

Client: University of Ottawa
Project no: A001049
Project Name: uOttawa Supplemental Phase II Environmental Site Assessment
Address: 200 Lees, Ottawa (ON)

Easting : 5029375
Northing : 447640

Ground Surface Elevation : 60.645 m
Top of Casing Elevation : N/A
Groundwater Elevation : N/A

Contractor: Strata Drilling Group
Equipment: Geoprobe
Drill type: 6712-DT
Type of sample: Dual Tube

Sample types

RC	Rock core
SS	Split spoon sample
MA	Manual auger
MS	Manual sampler
ST	Shelby Tube
CL	Clear liner

Terminology

traces	< 10 %
some	10 - 20 %
(ey) or (y)	20 - 35 %
and	35 - 50 %

Soil classification

Silt and clay	< 0,08 mm
Sand	0,08 - 5 mm
Gravel	5 - 80 mm
Cobbles	80 - 300 mm
Boulders	> 300 mm

Relative density 'N' blows

Very loose	0 - 4
Loose	4 - 10
Compact	10 - 30
Dense	30 - 50
Very dense	>50

Subsurface Profile			Sample Details						Soil Vapour Probe Construction	
Depth / Elevation (m)	Graphic Log	Description	Sample ID	Sample Type	Blows/15cm	Headspace Concentrations TOV (ppm)	Headspace Concentrations CVC (ppm / %lel)	Lab Analysis	Description	Diagram
0										
0.08 / 60.57		ASPHALT								
		FILL SILTY SAND with gravel. Crushed rock.	SS1	CL		<0.1			Flushmount protective cover with concrete seal Silica sand #3	
		Silty sand with traces of porcelin, ash and wood debris. Moist. Loose. Blackish brown.								
		Traces of glass shards, granular ash and silty sand.	SS2	CL		<0.1			Sample tubing with cement grout	
2										
			SS3	CL		<0.1			Sand beads Slotted steel screen Stainless steel end cap with sand beads	
4		Loose, dry								
4.88 / 55.77		SILT to clayey silt. Slightly moist. Compact	SS4	CL		0.5		Napthalene, Benzene		
4.88 / 55.77		END OF BOREHOLE								

Notes :

mBGS - metres below ground surface
ppm - parts per million
%LEL - percent lower explosive limit
PHC F1-F4 - petroleum hydrocarbon fractions 1-4
PAH polycyclic aromatic hydrocarbons
TOV - total organic vapours
CVC - combustible vapour concentrations

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Borehole/Soil Vapour Probe

Log BH20-8

Drilling date: 2020/10/19
Technician: L. Robert
Prepared by: L. Brown
Revised by: K. Greer

Client: University of Ottawa
Project no: A001049
Project Name: uOttawa Supplemental Phase II Environmental Site Assessment
Address: 200 Lees, Ottawa (ON)

Easting : 5029406
Northing : 447631

Ground Surface Elevation : 61.701 m
Top of Casing Elevation : N/A
Groundwater Elevation : N/A

Contractor: Strata Drilling Group
Equipment: Geoprobe
Drill type: 6712-DT
Type of sample: Dual Tube

Sample types

RC	Rock core
SS	Split spoon sample
MA	Manual auger
MS	Manual sampler
ST	Shelby Tube
CL	Clear liner

Terminology

traces	< 10 %
some	10 - 20 %
(ey) or (y)	20 - 35 %
and	35 - 50 %

Soil classification

Silt and clay	< 0,08 mm
Sand	0,08 - 5 mm
Gravel	5 - 80 mm
Cobbles	80 - 300 mm
Boulders	> 300 mm

Relative density 'N' blows

Very loose	0 - 4
Loose	4 - 10
Compact	10 - 30
Dense	30 - 50
Very dense	>50

Subsurface Profile			Sample Details						Soil Vapour Probe Construction	
Depth / Elevation (m)	Graphic Log	Description	Sample ID	Sample Type	Blows/15cm	Headspace Concentrations TOV (ppm)	Headspace Concentrations CVC (ppm / %lel)	Lab Analysis	Description	Diagram
0										
0.08 / 61.62		ASPHALT								
		FILL. Organic soil with traces of silt and sand. Silty sand with traces of gravel, ash. Dry. Black. Beige sand. Slightly compacted. Dry	SS1	CL		<0.1			Flushmount protective cover with concrete seal Silica sand #3	
			SS2	CL		<0.1				
2		Sand with brick and gravel. Traces of silty clay, ash and wood debris. Loose. Dry							Sample tubing with cement grout	
			SS3	CL		<0.1				
		Trace of glass shards								
4			SS4	CL		<0.1		Napthalene, Benzene	Sand beads Slotted steel screen Stainless steel end cap with sand beads	
		Trace of clayey silt								
4.42 / 57.28		TILL. Sand and silt, Compact, moist and dark grey.								
4.88 / 56.82		END OF BOREHOLE								
4.88										

Notes :

mBGS - metres below ground surface
ppm - parts per million
%LEL - percent lower explosive limit
PHC F1-F4 - petroleum hydrocarbon fractions 1-4
PAH polycyclic aromatic hydrocarbons
TOV - total organic vapours
CVC - combustible vapour concentrations

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Borehole Log

BH20-9

Drilling date: 2020/10/19
Technician: L. Robert
Prepared by: L. Brown
Revised by: K. Greer

Client: University of Ottawa
Project no: A001049
Project Name: uOttawa Supplemental Phase II Environmental Site Assessment
Address: 200 Lees, Ottawa (ON)

Easting : 447710
Northing : 447710

Ground Surface Elevation : 62.223 m
Top of Casing Elevation : N/A
Groundwater Elevation : N/A

Contractor: Strata Drilling Group
Equipment: Geoprobe
Drill type: 6712-DT
Type of sample: Dual Tube

Sample types

RC	Rock core
SS	Split spoon sample
MA	Manual auger
MS	Manual sampler
ST	Shelby Tube
CL	Clear liner

Terminology

traces	< 10 %
some	10 - 20 %
(ey) or (y)	20 - 35 %
and	35 - 50 %

Soil classification

Silt and clay	< 0,08 mm
Sand	0,08 - 5 mm
Gravel	5 - 80 mm
Cobbles	80 - 300 mm
Boulders	> 300 mm

Relative density 'N' blows

Very loose	0 - 4
Loose	4 - 10
Compact	10 - 30
Dense	30 - 50
Very dense	>50

Subsurface Profile			Sample Details						Well Completion	
Depth / Elevation (m)	Graphic Log	Description	Sample ID	Sample Type	Blows/15cm	Headspace Concentrations TOV (ppm)	Headspace Concentrations CVC (ppm / %lel)	Lab Analysis	Description	Diagram
0										
0.03 / 62.20		GRAVEL								
		FILL Silty gravel Sandy SILT with gravel. Compacted. Slightly moist FILL. Silty sand with some gravel, ask, brick, mortar, grout and porcelin. Moist. Compact . Black.	SS1	CL		<0.1				
			SS2	CL		<0.1		Mercury		
			SS3	CL		<0.1				
1.83 / 60.39		END OF BOREHOLE								

Notes :

mBGS - metres below ground surface
ppm - parts per million
%LEL - percent lower explosive limit
PHC F1-F4 - petroleum hydrocarbon fractions 1-4
PAH polycyclic aromatic hydrocarbons
TOV - total organic vapours
CVC - combustible vapour concentrations

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Borehole Log

BH20-10

Drilling date: 2020/10/19
Technician: L. Robert
Prepared by: L. Brown
Revised by: K. Greer

Client: University of Ottawa
Project no: A001049
Project Name: uOttawa Supplemental Phase II Environmental Site Assessment
Address: 200 Lees, Ottawa (ON)

Easting : 5029296
Northing : 447695

Ground Surface Elevation : 62.354 m
Top of Casing Elevation : N/A
Groundwater Elevation : N/A

Contractor: Strata Drilling Group
Equipment: Geoprobe
Drill type: 6712-DT
Type of sample: Dual Tube

Sample types

RC	Rock core
SS	Split spoon sample
MA	Manual auger
MS	Manual sampler
ST	Shelby Tube
CL	Clear liner

Terminology

traces	< 10 %
some	10 - 20 %
(ey) or (y)	20 - 35 %
and	35 - 50 %

Soil classification

Silt and clay	< 0,08 mm
Sand	0,08 - 5 mm
Gravel	5 - 80 mm
Cobbles	80 - 300 mm
Boulders	> 300 mm

Relative density 'N' blows

Very loose	0 - 4
Loose	4 - 10
Compact	10 - 30
Dense	30 - 50
Very dense	>50

Subsurface Profile			Sample Details						Well Completion	
Depth / Elevation (m)	Graphic Log	Description	Sample ID	Sample Type	Blows/15cm	Headspace Concentrations TOV (ppm)	Headspace Concentrations CVC (ppm / %lel)	Lab Analysis	Description	Diagram
0										
0.03 / 62.33		ASHPLALT								
		FILL Silty SAND and gravel. Traces of asphalt	SS1	CL		<0.1				
		Silty sand with traces of bricks and grout. Loose, dry.	SS2	CL		<0.1		Mercury		
1.83 / 60.52		Organic soil with some glass shards	SS3	CL		<0.1				
1.83		END OF BOREHOLE								

Notes :

mBGS - metres below ground surface
ppm - parts per million
%LEL - percent lower explosive limit
PHC F1-F4 - petroleum hydrocarbon fractions 1-4
PAH polycyclic aromatic hydrocarbons
TOV - total organic vapours
CVC - combustible vapour concentrations

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Borehole Log

BH20-11

Drilling date: 2020/10/19
Technician: L. Robert
Prepared by: L. Brown
Revised by: K. Greer

Client: University of Ottawa
Project no: A001049
Project Name: uOttawa Supplemental Phase II Environmental Site Assessment
Address: 200 Lees, Ottawa (ON)

Easting : 5029320
Northing : 447750

Ground Surface Elevation : 61.389 m
Top of Casing Elevation : N/A
Groundwater Elevation : N/A

Contractor: Strata Drilling Group
Equipment: Geoprobe
Drill type: 6712-DT
Type of sample: Dual Tube

Sample types

RC	Rock core
SS	Split spoon sample
MA	Manual auger
MS	Manual sampler
ST	Shelby Tube
CL	Clear liner

Terminology

traces	< 10 %
some	10 - 20 %
(ey) or (y)	20 - 35 %
and	35 - 50 %

Soil classification

Silt and clay	< 0,08 mm
Sand	0,08 - 5 mm
Gravel	5 - 80 mm
Cobbles	80 - 300 mm
Boulders	> 300 mm

Relative density 'N' blows

Very loose	0 - 4
Loose	4 - 10
Compact	10 - 30
Dense	30 - 50
Very dense	>50

Subsurface Profile			Sample Details						Well Completion	
Depth Elevation (m)	Graphic Log	Description	Sample ID	Sample Type	Blows/15cm	Headspace Concentrations TOV (ppm)	Headspace Concentrations CVC (ppm / %lel)	Lab Analysis	Description	Diagram
0										
0.03 61.36		GRAVEL								
		FILL GRAVEL and silty sand. SAND. Beige, dry, loose.	SS1	CL		<0.1				
2		Silty sand with traces of charred metal and ash.	SS2	CL		<0.1				
		Silty sand wih traces of wood debris, ash and glass. Dry. Loose	SS3	CL		<0.1		Mercury		
3.66 57.73		END OF BOREHOLE								

Notes :

mBGS - metres below ground surface
ppm - parts per million
%LEL - percent lower explosive limit
PHC F1-F4 - petroleum hydrocarbon fractions 1-4
PAH polycyclic aromatic hydrocarbons
TOV - total organic vapours
CVC - combustible vapour concentrations

D

Appendix D
Tables

A001049 - uOttawa
Table 1 - Soil Analytical Results

Parameter	Units	Standards[1] Table 3 SCS	RDL	BH-20-6_SS3 2.44 to 3.05 m Fill 2020-10-19	DUP-1 2.44 to 3.05 m Fill 2020-10-19	BH-20-7_SS4 3.66 to 4.23 m Fill 2020-10-19	BH-20-8_SS4 3.66 to 4.23 m Fill 2020-10-19	BH-20-9_SS2 0.76 to 1.22 m Fill 2020-10-19	BH-20-10_SS2 0.76 to 1.22 m Fill 2020-10-19	BH-20-11_SS3 2.1 to 2.7 m Fill 2020-10-19
Polyaromatic Hydrocarbons (PAH)										
Naphthalene	µg/g	9.6	0.05	<0.05	0.14	0.39	<0.05	-	-	-
Acenaphthylene	µg/g	0.15	0.05	-	-	-	-	-	-	-
Acenaphthene	µg/g	96	0.05	-	-	-	-	-	-	-
Fluorene	µg/g	62	0.05	-	-	-	-	-	-	-
Phenanthrene	µg/g	12	0.05	-	-	-	-	-	-	-
Anthracene	µg/g	0.67	0.05	-	-	-	-	-	-	-
Fluoranthene	µg/g	9.6	0.05	-	-	-	-	-	-	-
Pyrene	µg/g	96	0.05	-	-	-	-	-	-	-
Benz(a)anthracene	µg/g	0.96	0.05	-	-	-	-	-	-	-
Chrysene	µg/g	9.6	0.05	-	-	-	-	-	-	-
Benzo(b)fluoranthene	µg/g	0.96	0.05	-	-	-	-	-	-	-
Benzo(k)fluoranthene	µg/g	0.96	0.05	-	-	-	-	-	-	-
Benzo(a)pyrene	µg/g	0.3	0.05	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	µg/g	0.76	0.05	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	µg/g	0.1	0.05	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	µg/g	9.6	0.05	-	-	-	-	-	-	-
1 and 2 Methlynaphthalene (Calculated)	µg/g	76	0.05	-	-	-	-	-	-	-
Petroleum Hydrocarbons (PHC)										
Benzene	µg/g	0.32	0.02	<0.02	<0.02	<0.02	<0.02	-	-	-
Toluene	µg/g	68	0.05	-	-	-	-	-	-	-
Ethylbenzene	µg/g	9.5	0.05	-	-	-	-	-	-	-
Xylenes (Total)	µg/g	26	0.05	-	-	-	-	-	-	-
F1 (C6 to C10)	µg/g	55	5	-	-	-	-	-	-	-
F1 (C6 to C10) minus BTEX	µg/g	55	5	-	-	-	-	-	-	-
F2 (C10 to C16)	µg/g	230	10	-	-	-	-	-	-	-
F2 (C10 to C16) minus Naphthalene	µg/g		10	-	-	-	-	-	-	-
F3 (C16 to C34)	µg/g	1700	50	-	-	-	-	-	-	-
F3 (C16 to C34) minus PAHs	µg/g		50	-	-	-	-	-	-	-
F4 (C34 to C50)	µg/g	3300	50	-	-	-	-	-	-	-
Gravimetric Heavy Hydrocarbons	µg/g	3300	50	-	-	-	-	-	-	-
Metals										
Antimony (Sb)	µg/g	40	0.8	-	-	-	-	-	-	-
Arsenic (As)	µg/g	18	1	-	-	-	-	-	-	-
Barium (Ba)	µg/g	670	2	-	-	-	-	-	-	-
Beryllium (Be)	µg/g	8	0.5	-	-	-	-	-	-	-
Boron (B)	µg/g	120	5	-	-	-	-	-	-	-
Cadmium (Cd)	µg/g	1.9	0.5	-	-	-	-	-	-	-
Chromium (Cr)	µg/g	160	5	-	-	-	-	-	-	-
Cobalt (Co)	µg/g	80	0.5	-	-	-	-	-	-	-
Copper (Cu)	µg/g	230	1	-	-	-	-	-	-	-
Lead (Pb)	µg/g	120	1	-	-	-	-	-	-	-
Mercury (Hg)	µg/g	3.9	0.10	-	-	-	-	0.49	0.15	3.32
Molybdenum (Mo)	µg/g	40	0.5	-	-	-	-	-	-	-
Nickel (Ni)	µg/g	270	1	-	-	-	-	-	-	-
Selenium (Se)	µg/g	5.5	0.4	-	-	-	-	-	-	-
Silver (Ag)	µg/g	40	0.2	-	-	-	-	-	-	-
Thallium (Tl)	µg/g	3.3	0.4	-	-	-	-	-	-	-
Uranium (U)	µg/g	33	0.5	-	-	-	-	-	-	-
Vanadium (V)	µg/g	86	1	-	-	-	-	-	-	-
Zinc (Zn)	µg/g	340	5	-	-	-	-	-	-	-

Ontario Regulation 153/04 (Amended April 15, 2011)
Table 3: Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Ground Water Condition
Community Property Use - Coarse Grained Soils
RDL Reportable Detection Limit
123 Concentrations above applicable SCS
- Not Analysed

A001049 - uOttawa
Table 2 - Soil Analytical Results - TCLP

Parameter	Unit	Standards	RDL	BH 20-6 TCLP 10/19/2020	BH 20-7 TCLP 10/19/2020	BH 20-8 TCLP 10/19/2020	BH 20-9 TCLP 10/19/2020	BH 20-9 TCLP Re-Analysis* 10/19/2020	BH 20-10 TCLP 10/19/2020	BH 20-11 TCLP 10/19/2020
O. Reg. 558 Metals										
Arsenic Leachate	mg/L	2.5	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Barium Leachate	mg/L	100	0.1	0.732	1.24	0.706	0.981	1.42	1.3	0.744
Boron Leachate	mg/L	500	0.05	<0.050	<0.050	<0.050	0.079	0.157	0.106	<0.050
Cadmium Leachate	mg/L	0.5	0.01	<0.010	<0.010	<0.010	0.031	0.07	0.214	0.011
Chromium Leachate	mg/L	5	0.01	<0.010	<0.010	<0.010	0.089	0.482	0.013	<0.010
Lead Leachate	mg/L	5	0.01	0.039	0.048	0.04	**5.73**	**38**	3.28	0.049
Selenium Leachate	mg/L	1	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Silver Leachate	mg/L	5	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium Leachate	mg/L	10	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
O. Reg. 558 - Semi Volatile Organic Compounds (SVOC)										
Pyridine	mg/L	5	0.01	<0.010	-	-	-	-	-	-
Cresols	mg/L	200	0.012	<0.012	-	-	-	-	-	-
Ortho-Cresol	mg/L	200	0.004	<0.004	-	-	-	-	-	-
Meta & Para-Cresol	mg/L	200	0.008	<0.008	-	-	-	-	-	-
Hexachloroethane	mg/L	3	0.004	<0.004	-	-	-	-	-	-
Nitrobenzene	mg/L	2	0.004	<0.004	-	-	-	-	-	-
Hexachlorobutadiene	mg/L	0.5	0.004	<0.004	-	-	-	-	-	-
2,4,6-Trichlorophenol	mg/L	0.5	0.05	<0.05	-	-	-	-	-	-
2,4,5-Trichlorophenol	mg/L	400	0.004	<0.004	-	-	-	-	-	-
2,4-Dinitrotoluene	mg/L	0.13	0.004	<0.004	-	-	-	-	-	-
2,3,4,6-Tetrachlorophenol	mg/L	10	0.004	<0.004	-	-	-	-	-	-
Hexachlorobenzene	mg/L	0.13	0.004	<0.004	-	-	-	-	-	-
Dinoseb	mg/L	1	0.004	<0.004	-	-	-	-	-	-
Benzo(a)pyrene	mg/L	0.001	0.001	<0.001	-	-	-	-	-	-
2-Fluorophenol	%			74	-	-	-	-	-	-
Phenol-d6	%			69	-	-	-	-	-	-
2,4,6-Tribromophenol	%			84	-	-	-	-	-	-
Chrysene-d12	%			84	-	-	-	-	-	-
BNA Extr	NA			Y	-	-	-	-	-	-
O. Reg. 558 - Volatile Organic Compounds (VOC)										
Vinyl Chloride	mg/L	0.2	0.03	<0.030	-	-	-	-	-	-
1,1 Dichloroethene	mg/L	1.4	0.02	<0.020	-	-	-	-	-	-
Dichloromethane	mg/L	5	0.03	<0.030	-	-	-	-	-	-
Methyl Ethyl Ketone	mg/L	200	0.09	<0.090	-	-	-	-	-	-
Chloroform	mg/L	10	0.02	<0.020	-	-	-	-	-	-
1,2-Dichloroethane	mg/L	0.5	0.02	<0.020	-	-	-	-	-	-
Carbon Tetrachloride	mg/L	0.5	0.02	<0.020	-	-	-	-	-	-
Benzene	mg/L	0.5	0.02	<0.020	-	-	-	-	-	-
Trichloroethene	mg/L	5	0.02	<0.020	-	-	-	-	-	-
Tetrachloroethene	mg/L	3	0.05	<0.050	-	-	-	-	-	-
Chlorobenzene	mg/L	8	0.01	<0.010	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	20	0.01	<0.010	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/L	0.5	0.01	<0.010	-	-	-	-	-	-
Toluene-d8	% Recovery		1	86	-	-	-	-	-	-

RDL - Reported Detection Limit
The sample was leached according to Regulation 558 protocol. Analysis was performed on the leachate.

123 Concentration above applicable criteria
\- Not Analysed
* Re-analysis by the laboratory

E

Appendix E
Laboratory Certificates of Analyses

AGAT Laboratories

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TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: CIMA+ S.E.N.C.
240 CATHERINE STREET, SUITE 110
OTTAWA, ON K2P2G8
(613) 860-2462

ATTENTION TO: Karen Greer

PROJECT: A001049

AGAT WORK ORDER: 20T663247

AIR QUALITY MONITORING REVIEWED BY: Theresa Stephenson, Manager of Technical Services

DATE REPORTED: Oct 26, 2020

PAGES (INCLUDING COVER): 5

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*Notes

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
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- The test results reported herewith relate only to the samples as received by the laboratory.
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- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

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http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 20T663247

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

BTEX & Naphthalene in Air (Canister)

DATE RECEIVED: 2020-10-20

DATE REPORTED: 2020-10-26

SAMPLE DESCRIPTION:				SGP-06-10182020	SGP-07-10202020	SGP-08-10202020	SGP-100
SAMPLE TYPE:				Air	Air	Air	Air
DATE SAMPLED:				2020-10-19	2020-10-20	2020-10-20	2020-10-20
Parameter	Unit	G / S	RDL	1585985	1585986	1585987	1585988
pressure upon receipt	inHg			-9	-7	-6	-6
Benzene	µg/m3		0.64	2.4	1.90	18.8	32.7
Naphthalene	µg/m3		5.2	<5.2	<5.2	<5.2	<5.2
Surrogate	Unit	Acceptable Limits					
4-Bromofluorobenzene	%	70-130		98	95	90	87

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

1585985-1585988 VOC analysis was performed from an air canister sample, using a Cold Vapor Trap preconcentrator and GC/MSD.

Analysis done at AGAT 5623 McAdam Road Mississauga location.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

AGAT Laboratories

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CANADA L4Z 1Y2
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Quality Assurance

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20T663247

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

Air Quality Monitoring

RPT Date: Oct 26, 2020			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
BTEX & Naphthalene in Air (Canister)															
Benzene	1557770		< 0.64	< 0.64	0.0%	< 0.64	135%	60%	140%	134%	50%	140%			
Naphthalene	1557770		< 5.2	< 5.2	0.0%	< 5.2	120%	60%	140%	140%	50%	140%			

Certified By:

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Method Summary

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20T663247

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Air Quality Monitoring			
pressure upon receipt			N/A
Benzene	AQM-248-16000	modified from EPA TO15	GC/MS
Naphthalene	AQM-248-16000	modified from EPA TO15	GC/MS
4-Bromofluorobenzene	AQM-248-16000	modified from EPA TO15	GC/MS

AGAT Laboratories

AGAT WO#: 20T663247

Notes:

Air Analysis Chain of Custody Record

Same Yes ☑ / No ☐

Company: ~~Karen Greer~~ CIMA+	Company: CIMA+
Contact: Karen Greer	Contact: Karen Greer
Address: 110-240 St. Catherine St. Ottawa, ON	Address: 110-240 St. Catherine St. Ottawa, ON
Phone: 343-796-9651 Fax:	1. Name: Karen Greer
Client Project #: A201049 PO:	Email: Karen.Greer@cima.com
AGAT Quote #: 351725	2. Name:
	Email:

Regular TAT ☑ 10 working days
Rush TAT* ☐ 3 working days ☐ 2 working days

BY FILLING OUT THIS SECTION, THE CLIENT ACCEPTS THAT SURCHARGES WILL BE ATTACHED TO THIS ANALYSIS. IF NOT COMPLETED, REGULAR TAT WILL BE DEFAULT.

*TATs ARE EXCLUSIVE OF WEEKENDS AND STATUTORY HOLIDAYS

FOR RUSH TAT, CONFIRM AVAILABILITY WITH LABORATORY.

153 CCME
419 Other

SAMPLE ID	CANISTER #	FLOW CONTROLLER #	DATE SAMPLED	INITIAL PRESSURE	FINAL PRESSURE	AMBIENT TEMPERATURE	SAMPLE TYPE: AMBIENT	SOIL VAPOUR	BUILDING	INDOOR AIR	OUTDOOR AIR	Start for VOCs	Benzene	Naphthalene	REPORT UNITS mg/m³	REPORT UNIT ppmv	REPORT UNITS ug/m³
SGP-26-10192020	6460	/	Oct-14-2020	-29.0	-9.5	8°C		X					X	X			
SGP-07-10202020	6447	/	Oct-20-2020	-28.0	-7.5	10°C		X					X	X			
SGP-03-10202020	6449	/	Oct-20-2020	-29.0	-7.5	10°C		X					X	X			
SGP-100	20114	/	Oct-20-2020	-29.0	-7.5	10°C		X					X	X			
								~~X~~									
							49										

Samples Relinquished By (Print Name and Sign): Dave Driggs	Date/Time: 10/20/2020	Samples Received By (Print Name and Sign): [illegible]	Date/Time: 20/10/20 13h
Samples Relinquished By (Print Name and Sign): [illegible]	Date/Time: 2020 13:15 10/20/16h	Samples Received By (Print Name and Sign):	Date/Time:
Samples Relinquished By (Print Name and Sign):		Samples Processed By (Print Name and Sign):	Date/Time:

Pink Copy - Client
Yellow Copy - AGAT
White Copy - AGAT

Page 1 of 1

N°:

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CLIENT NAME: CIMA+ S.E.N.C.
240 CATHERINE STREET, SUITE 110
OTTAWA, ON K2P2G8
(613) 860-2462

ATTENTION TO: Karen Greer

PROJECT: A001049

AGAT WORK ORDER: 20Z666057

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Lab Manager

TRACE ORGANICS REVIEWED BY: Oksana Gushyla, Trace Organics Lab Supervisor

DATE REPORTED: Oct 30, 2020

PAGES (INCLUDING COVER): 15

VERSION*: 1

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Certificate of Analysis

AGAT WORK ORDER: 20Z666057

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:200 Lees Avenue

SAMPLED BY:Luc Robert

O. Reg. 153(511) - ORPs (Soil)

DATE RECEIVED: 2020-10-20

DATE REPORTED: 2020-10-30

				SAMPLE DESCRIPTION:	BH20-9 SS2	BH20-10 SS2	BH20-11 SS3
				SAMPLE TYPE:	Soil	Soil	Soil
				DATE SAMPLED:	2020-10-19	2020-10-19 12:00	2020-10-19 12:00
Parameter	Unit	G / S	RDL		1582897	1582898	1582899
Mercury	µg/g	3.9	0.10		0.49	0.15	3.32

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis performed at AGAT Toronto (unless marked by *)

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Certificate of Analysis

AGAT WORK ORDER: 20Z666057

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:200 Lees Avenue

SAMPLED BY:Luc Robert

O. Reg. 558 Metals

DATE RECEIVED: 2020-10-20

DATE REPORTED: 2020-10-30

		SAMPLE DESCRIPTION:		BH 20-6_TCLP	BH 20-7_TCLP	BH 20-8_TCLP	BH 20-9_TCLP	BH 20-10_TCLP	BH 20-11_TCLP
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2020-10-19	2020-10-19	2020-10-19	2020-10-19	2020-10-19	2020-10-19
Parameter	Unit	G / S	RDL	1582887	1582888	1582889	1582890	1582891	1582892
Arsenic Leachate	mg/L	2.5	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Barium Leachate	mg/L	100	0.100	0.732	1.24	0.706	0.981	1.30	0.744
Boron Leachate	mg/L	500	0.050	<0.050	<0.050	<0.050	0.079	0.106	<0.050
Cadmium Leachate	mg/L	0.5	0.010	<0.010	<0.010	<0.010	0.031	0.214	0.011
Chromium Leachate	mg/L	5	0.010	<0.010	<0.010	<0.010	0.089	0.013	<0.010
Lead Leachate	mg/L	5	0.010	0.039	0.048	0.040	5.73	3.28	0.049
Selenium Leachate	mg/L	1	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Silver Leachate	mg/L	5	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium Leachate	mg/L	10	0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

1582890 The sample matrix was heterogeneous.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 20Z666057

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:200 Lees Avenue

SAMPLED BY:Luc Robert

O. Reg. 558 Metals re-analysis

DATE RECEIVED: 2020-10-20

DATE REPORTED: 2020-10-30

		SAMPLE DESCRIPTION:		BH 20-9_TCLP
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2020-10-19
Parameter	Unit	G / S	RDL	1582890
Arsenic Leachate	mg/L	2.5	0.010	<0.010
Barium Leachate	mg/L	100	0.100	1.42
Boron Leachate	mg/L	500	0.050	0.157
Cadmium Leachate	mg/L	0.5	0.010	0.070
Chromium Leachate	mg/L	5	0.010	0.482
Lead Leachate	mg/L	5	0.100	38.0
Mercury Leachate	mg/L	0.1	0.01	<0.01
Selenium Leachate	mg/L	1	0.010	<0.010
Silver Leachate	mg/L	5	0.010	<0.010
Uranium Leachate	mg/L	10	0.050	<0.050

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

1582890 The sample matrix was heterogeneous.

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Certificate of Analysis

AGAT WORK ORDER: 20Z666057

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:200 Lees Avenue

SAMPLED BY:Luc Robert

PAHs (Soil)

DATE RECEIVED: 2020-10-20

DATE REPORTED: 2020-10-30

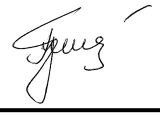
		SAMPLE DESCRIPTION:		BH 20-6 SS3	DUP-1	BH20-7 SS4	BH20-8 SS4
		SAMPLE TYPE:		Soil	Soil	Soil	Soil
		DATE SAMPLED:		2020-10-19	2020-10-19	2020-10-19	2020-10-19
Parameter	Unit	G / S	RDL	1582893	1582894	1582895	1582896
Naphthalene	µg/g	9.6	0.05	<0.05	0.14	0.39	<0.05
Moisture Content	%		0.1	15.8	14.6	13.8	9.4
Surrogate	Unit	Acceptable Limits					
Naphthalene-d8	%	50-140		82	90.0	89	74
Acenaphthene-d10	%	50-140		86	94.0	97	78
Chrysene-d12	%	50-140		66	82	78	84

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

1582893-1582896 Results are based on the dry weight of the soil.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:



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Certificate of Analysis

AGAT WORK ORDER: 20Z666057

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLING SITE:200 Lees Avenue

SAMPLED BY:Luc Robert

VOCs (Soil)

DATE RECEIVED: 2020-10-20

DATE REPORTED: 2020-10-30

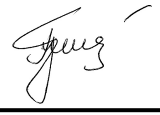
				SAMPLE DESCRIPTION:	BH 20-6 SS3	DUP-1	BH20-7 SS4	BH20-8 SS4
				SAMPLE TYPE:	Soil	Soil	Soil	Soil
				DATE SAMPLED:	2020-10-19	2020-10-19	2020-10-19	2020-10-19
Parameter	Unit	G / S	RDL		1582893	1582894	1582895	1582896
Benzene	ug/g	0.32	0.02		<0.02	<0.02	<0.02	<0.02
Moisture Content	%		0.1		15.8	14.6	13.8	9.4
Surrogate	Unit	Acceptable Limits						
Toluene-d8	% Recovery	50-140			89	85	92	92
4-Bromofluorobenzene	% Recovery	50-140			89	77	87	84

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

1582893-1582896 The sample was analyzed using the high level technique. The sample was extracted using methanol, a small amount of the methanol extract was diluted in water and the purge & trap GC/MS analysis was performed. Results are based on the dry weight of the soil.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:



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Exceedance Summary

AGAT WORK ORDER: 20Z666057

PROJECT: A001049

CLIENT NAME: CIMA+ S.E.N.C.

ATTENTION TO: Karen Greer

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
1582890	BH 20-9_TCLP	ON Reg 558	O. Reg. 558 Metals	Lead Leachate	mg/L	5	5.73
1582890	BH 20-9_TCLP	ON Reg 558	O. Reg. 558 Metals re-analysis	Lead Leachate	mg/L	5	38.0

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Quality Assurance

CLIENT NAME: CIMA+ S.E.N.C.
AGAT WORK ORDER: 20Z666057
PROJECT: A001049
ATTENTION TO: Karen Greer
SAMPLING SITE:200 Lees Avenue
SAMPLED BY:Luc Robert

Soil Analysis

RPT Date: Oct 30, 2020

PARAMETER	Batch	Sample Id	DUPLICATE Dup #1	DUPLICATE Dup #2	DUPLICATE RPD	Method Blank	REFERENCE MATERIAL Measured Value	REFERENCE MATERIAL Acceptable Limits Lower	REFERENCE MATERIAL Acceptable Limits Upper	METHOD BLANK SPIKE Recovery	METHOD BLANK SPIKE Acceptable Limits Lower	METHOD BLANK SPIKE Acceptable Limits Upper	MATRIX SPIKE Recovery	MATRIX SPIKE Acceptable Limits Lower	MATRIX SPIKE Acceptable Limits Upper
O. Reg. 558 Metals															
Arsenic Leachate	1582887	1582887	<0.010	<0.010	NA	< 0.010	103%	70%	130%	107%	80%	120%	118%	70%	130%
Barium Leachate	1582887	1582887	0.732	0.800	8.9%	< 0.100	105%	70%	130%	111%	80%	120%	125%	70%	130%
Boron Leachate	1582887	1582887	<0.050	<0.050	NA	< 0.050	94%	70%	130%	81%	80%	120%	81%	70%	130%
Cadmium Leachate	1582887	1582887	<0.010	<0.010	NA	< 0.010	101%	70%	130%	100%	80%	120%	97%	70%	130%
Chromium Leachate	1582887	1582887	<0.010	<0.010	NA	< 0.010	99%	70%	130%	100%	80%	120%	95%	70%	130%
Lead Leachate	1582887	1582887	0.039	0.041	NA	< 0.010	97%	70%	130%	91%	80%	120%	87%	70%	130%
Selenium Leachate	1582887	1582887	<0.010	<0.010	NA	< 0.010	107%	70%	130%	119%	80%	120%	130%	70%	130%
Silver Leachate	1582887	1582887	<0.010	<0.010	NA	< 0.010	103%	70%	130%	101%	80%	120%	118%	70%	130%
Uranium Leachate	1582887	1582887	<0.050	<0.050	NA	< 0.050	106%	70%	130%	104%	80%	120%	98%	70%	130%

Comments: NA signifies Not Applicable.
Duplicate NA: results are under 5X the RDL and will not be calculated.

O. Reg. 558 Metals															
Arsenic Leachate	1593448		<0.010	<0.010	NA	< 0.010	101%	70%	130%	113%	80%	120%	117%	70%	130%
Barium Leachate	1593448		0.789	0.831	5.2%	< 0.100	101%	70%	130%	100%	80%	120%	114%	70%	130%
Boron Leachate	1593448		0.053	0.053	NA	< 0.050	101%	70%	130%	96%	80%	120%	96%	70%	130%
Cadmium Leachate	1593448		<0.010	<0.010	NA	< 0.010	99%	70%	130%	102%	80%	120%	98%	70%	130%
Chromium Leachate	1593448		<0.010	<0.010	NA	< 0.010	103%	70%	130%	105%	80%	120%	103%	70%	130%
Selenium Leachate	1593448		<0.010	<0.010	NA	< 0.010	96%	70%	130%	108%	80%	120%	113%	70%	130%
Silver Leachate	1593448		<0.010	<0.010	NA	< 0.010	95%	70%	130%	102%	80%	120%	90%	70%	130%
Uranium Leachate	1593448		<0.050	<0.050	NA	< 0.050	100%	70%	130%	106%	80%	120%	108%	70%	130%
O. Reg. 153(511) - ORPs (Soil)															
Mercury	1605145		<0.10	<0.10	NA	< 0.10	108%	70%	130%	98%	80%	120%	74%	70%	130%

Comments: NA signifies Not Applicable.
Duplicate NA: results are under 5X the RDL and will not be calculated.

O. Reg. 558 Metals re-analysis															
Arsenic Leachate	1593448		<0.010	<0.010	NA	< 0.010	101%	70%	130%	113%	80%	120%	117%	70%	130%
Barium Leachate	1593448		0.789	0.831	5.2%	< 0.100	101%	70%	130%	100%	80%	120%	114%	70%	130%
Boron Leachate	1593448		0.051	0.054	NA	< 0.050	101%	70%	130%	96%	80%	120%	90%	70%	130%
Cadmium Leachate	1593448		<0.010	<0.010	NA	< 0.010	99%	70%	130%	102%	80%	120%	98%	70%	130%
Chromium Leachate	1593448		<0.010	<0.010	NA	< 0.010	103%	70%	130%	105%	80%	120%	103%	70%	130%
Lead Leachate	1593448		0.013	0.012	NA	< 0.010	90%	70%	130%	101%	80%	120%	98%	70%	130%
Mercury Leachate	1593448		<0.01	<0.01	NA	< 0.01	98%	70%	130%	104%	80%	120%	100%	70%	130%
Selenium Leachate	1593448		<0.010	<0.010	NA	< 0.010	96%	70%	130%	108%	80%	120%	113%	70%	130%
Silver Leachate	1593448		<0.010	<0.010	NA	< 0.010	95%	70%	130%	102%	80%	120%	90%	70%	130%
Uranium Leachate	1593448		<0.050	<0.050	NA	< 0.050	100%	70%	130%	106%	80%	120%	108%	70%	130%

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20Z666057

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:200 Lees Avenue

SAMPLED BY:Luc Robert

Soil Analysis (Continued)

RPT Date: Oct 30, 2020			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
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Quality Assurance

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20Z666057

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:200 Lees Avenue

SAMPLED BY:Luc Robert

Trace Organics Analysis

RPT Date: Oct 30, 2020			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
PAHs (Soil)															
Naphthalene	1589572		<0.05	<0.05	NA	< 0.05	99%	50%	140%	108%	50%	140%	92%	50%	140%
VOCs (Soil)															
Benzene	1584027		<0.02	<0.02	NA	< 0.02	71%	50%	140%	86%	60%	130%	71%	50%	140%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By:

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MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: CIMA+ S.E.N.C.

AGAT WORK ORDER: 20Z666057

PROJECT: A001049

ATTENTION TO: Karen Greer

SAMPLING SITE:200 Lees Avenue

SAMPLED BY:Luc Robert

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Mercury	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Arsenic Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Barium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Boron Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Cadmium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Chromium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Lead Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Selenium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Silver Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Uranium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Mercury Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Trace Organics Analysis			
Naphthalene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Moisture Content	ORG-91-5106	Tier 1 Method	BALANCE
Naphthalene-d8	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Acenaphthene-d10	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Chrysene-d12	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Toluene-d8	VOL-91-5002	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5002	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Moisture Content		Tier 1 method	BALANCE

LgBlK (TGICC) – 8-8|9.0|9.1

AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
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webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only

Work Order #: 2076666057

Cooler Quantity: One - ice

Arrival Temperatures: 11.2 | 11.8 | 11.9

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes:

Report Information:

Company: CIMA+
Contact: Karen Greer
Address: 110-240 Catherine St.
Ottawa, ON K2P 2G8
Phone: 343-996-9656 Fax: 613-860-1870
Reports to be sent to:
1. Email: Karen.greer@cima.ca
2. Email:

Regulatory Requirements: ☐ No Regulatory Requirement

(Please check all applicable boxes)

☒ Regulation 153/04
Table 3 (Indicate One)
☒ Ind/Com
☐ Res/Park
☐ Agriculture

Soil Texture *(Check One)*
☒ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region _____ (Indicate One)
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
_____ (Indicate One)

Is this submission for a **Record of Site Condition?** ☐ Yes ☒ No

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: A001049
Site Location: 200 Lees Avenue
Sampled By: Luc Robert (819-790-0979)
AGAT Quote #: 351752 PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y / N	Field Filtered - Metals, Hg, CrVI	O. Reg 153	Metals and Inorganics	☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals ☐ 153 Metals (Incl. Hydrides)	ORPs: ☐ B-HWS ☐ Cl ☐ CN ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	PHCs F1 - F4	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use	TCLP As per (Metals) Quote 351752				Potentially Hazardous or High Concentration (Y/N)
BH 20-6 _ TCLP	2020-10-19	AM	1	Soil		/																		X				
BH 20-7 _ TCLP	2020-10-19	AM	1	Soil		/																		X				
BH 20-8 _ TCLP	2020-10-19	AM	1	Soil		/																		X				
BH 20-9 _ TCLP	2020-10-19	AM	1	Soil		/																		X				
BH 20-10 _ TCLP	2020-10-19	AM	1	Soil		/																		X				
BH 20-11 _ TCLP	2020-10-19	AM	1	Soil		/																		X				

Samples Relinquished By (Print Name and Sign): L. Brown L. Brown	Date 20-20-10-20	Time 11:00	Samples Received By (Print Name and Sign): [illegible]	Date 2020/10/20	Time 12h16
Samples Relinquished By (Print Name and Sign): WB to Fed Ex 202011012O	Date	Time 16h05	Samples Received By (Print Name and Sign): SIMRAN	Date Oct 21/20	Time
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time 10:05 am

Page 1 of 4

N°: T101380

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AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only

Work Order #: 2076606057

Cooler Quantity:

Arrival Temperatures: Sec Reg 1

Custody Seal Intact: ☐Yes ☐No ☐N/A

Notes:

Report Information:

Company: CIMA+
Contact: Karen Greer
Address: 100-240 Catherine St.
Ottawa, ON K2P 2G8
Phone: 343-996-9656 Fax: 613-860-1870
Reports to be sent to:
1. Email: karen.greer@cima.ca
2. Email:

Regulatory Requirements: ☐ No Regulatory Requirement

(Please check all applicable boxes)

☒ Regulation 153/04
Table 3 *Indicate One*
☒ Ind/Com
☒ Res/Park
☐ Agriculture

Soil Texture *(Check One)*
☒ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region _____ *Indicate One*
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
_____ *Indicate One*

Is this submission for a **Record of Site Condition?** ☐ Yes ☒ No

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: A001049
Site Location: 200 Lees Avenue, Ottawa
Sampled By: Luc Robert (819-790-0979)
AGAT Quote #: 35 1752 PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics (☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ 153 Metals (incl. Hydrides) ☐ Hydride Metals)	O. Reg 153: ORPs: ☐ B-HWS ☐ Cl ☐ CN ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	O. Reg 153: Full Metals Scan	O. Reg 153: Regulation/Custom Metals	O. Reg 153: Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	O. Reg 153: Volatiles: ☐ VOC ☐ BTEX ☐ THM	O. Reg 153: PHCs F1 - F4	O. Reg 153: ABNs	O. Reg 153: PAHs	O. Reg 153: PCBs: ☐ Total ☐ Aroclors	O. Reg 153: Organochlorine Pesticides	O. Reg 153: TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	O. Reg 153: Sewer Use	Naphthalene	Benzene	Mercury		Potentially Hazardous or High Concentration (Y/N)
BH20-6 SS3	2020-10-19	AM	2	Soil																	X	X			
DUP-1	2020-10-19	AM	2	Soil																	X	X			
~~(BH20-5)~~ BH20-7 SS4	2020-10-19	AM	2	Soil																	X	X			
BH20-8 SS4	2020-10-19	AM	2	Soil																	X	X			
BH20-9 SS2	2020-10-19	AM	2	Soil																			X		
BH20-10 SS2	2020-10-19	PM	2	Soil																			X		
BH20-11 SS3	2020-10-19	PM	2	Soil																			X		

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
L. Braun L. Braun	2020-10-20	11:00	[illegible]	20/10/20	12h16
[illegible]	20201010120	16h00			

Page 2 of 4

N°: T 101383

AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only

Work Order #: 2076666057

Cooler Quantity:

Arrival Temperatures: See pg 1

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes:

Report Information:

Company: CIMA+
Contact: Karen Greer
Address: 100-240 Catherine St
Ottawa ON K2P 2G8
Phone: 343-996-9656 Fax: 613-860-1870
Reports to be sent to:
1. Email: Karen.greer@cima.ca
2. Email:

Regulatory Requirements: ☐ No Regulatory Requirement

(Please check all applicable boxes)

☒ Regulation 153/04
Table 3 *Indicate One*
☒ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture *(Check One)*
☒ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region _____ *Indicate One*
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
_____ *Indicate One*

Is this submission for a **Record of Site Condition?** ☐ Yes ☒ No

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: A001049
Site Location: 200 Lees Avenue
Sampled By: Luc Robert (819-790-0979)
AGAT Quote #: 351752 PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y/N	Field Filtered - Metals, Hg, CrVI	O. Reg 153: Metals and Inorganics	O. Reg 153: All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals ☐ 153 Metals (Incl. Hydrides)	O. Reg 153: ORPs: ☐ B-HWS ☐ Cl ☐ CN ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	O. Reg 153: Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_2+NO_3	O. Reg 153: Volatiles: ☐ VOC ☐ BTEX ☐ THM	O. Reg 153: PHCs F1 - F4	O. Reg 153: ABNs	O. Reg 153: PAHs	O. Reg 153: PCBs: ☐ Total ☐ Aroclors	O. Reg 153: Organochlorine Pesticides	O. Reg 153: TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	O. Reg 153: Sewer Use	ON HOLD					Potentially Hazardous or High Concentration (Y/N)
BH 20-6 _ 2	2020-10-19	AM	2	Soil	on hold																			X					
Dup 2	2020-10-19	AM	2	Soil	on hold																			X					
BH 20-8 _ 3	2020-10-19	AM	2	Soil	on hold																			X					
BH 20-7 _ 1	2020-10-19	AM	2	Soil	on hold																			X					
BH 20-7 _ 1B	2020-10-19	AM	2	Soil	on hold																			X					
BH 20-9 _ 1C	2020-10-19	AM	2	Soil	on hold																			X					
BH 20-11 _ 1B	2020-10-19	AM	2	Soil	on hold																			X					
BH 20-6 _ 4A	2020-10-19	AM	2	Soil	on hold																			X					
BH 20-6 _ 1	2020-10-19	AM	2	Soil	on hold																			X					
BH 20-7 _ 2	2020-10-19	AM	2	Soil	on hold																			X					
BH 20-11 _ 1A	2020-10-19	AM	2	Soil	on hold																			X					

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
L. Brown L. Brown	2020-10-20	11:00	LP	20 10 20	12h16
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
LD to FedEx	20/10/20	16h00			
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time

Page 3 of 4

N°: T101384

Document ID: DIV-78-1511-010

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Revision 1.0 - June 25, 2019

AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only

Work Order #: 2076606057

Cooler Quantity:

Arrival Temperatures: See pg 1

Custody Seal Intact: ☐Yes ☐No ☐N/A

Notes:

Report Information:

Company: CIMA+
Contact: Karen Greer
Address: 100-240 Catherine St.
Ottawa, ON K2P 2G8
Phone: 343-996-9656 Fax: 613-860-1870
Reports to be sent to:
1. Email: Karen.Greer@cima.ca
2. Email:

Regulatory Requirements:

☐ No Regulatory Requirement
(Please check all applicable boxes)

☒ Regulation 153/04
Table 3 (Indicate One)
☒ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture (Check One)
☒ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region (Indicate One)
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
(Indicate One)

Is this submission for a **Record of Site Condition?** ☐ Yes ☒ No

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: A001049
Site Location: 200 Lees Ave
Sampled By: Luc Robert (819-790-0979)
AGAT Quote #: 351752 PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics (☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals ☐ 153 Metals (incl. Hydrides))	O. Reg 153: ORPs: ☐ B-HWS ☐ Cl ☐ CN ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	O. Reg 153: Full Metals Scan	O. Reg 153: Regulation/Custom Metals	O. Reg 153: Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	O. Reg 153: Volatiles: ☐ VOC ☐ BTEX ☐ THM	O. Reg 153: PHCs F1 - F4	O. Reg 153: ABNs	O. Reg 153: PAHs	O. Reg 153: PCBs: ☐ Total ☐ Aroclors	O. Reg 153: Organochlorine Pesticides	O. Reg 153: TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	O. Reg 153: Sewer Use	On Hold					Potentially Hazardous or High Concentration (Y/N)
BH 20-7_3	2020-10-19	AM	2	Soil	on hold																X				
BH 20-8_2	2020-10-19	AM	2	Soil	on hold																X				
BH 20-10-1B	2020-10-19	PM	2	Soil	on hold																X				

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
L. Brown	2020-10-20	11:00		20/10/20	12h16
	20/10/20	16h00			

Page 4 of 4

Nº: T101377

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uOttawa

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Université d'Ottawa | University of Ottawa

Vendor Health & Safety Requirements

Version January 2021

uOttawa

Table of Contents

PART 1 INTRODUCTIONS AND OBJECTIVES

Safety is an essential component of every activity. All retained Vendors and their associated Subcontractors will conduct all work in a safe manner and shall meet or exceed the latest revision of all Local/Federal/Provincial laws, regulations, standards, and industry best practices relating to health and safety.

The Vendor shall perform the work, or ensure that it is performed, in a manner to avoid risk of injury or damage to persons or property, adjacent property, or environment. The Vendor shall ensure that effective mechanisms are in place to identify and evaluate hazards related to the work activities and locations, and, to ensure that effective mechanisms are in place to control those hazards and their associated risks.

The Vendor shall be responsible for ensuring every person on the site complies with the applicable measures and requirements contained in:

a) Ontario's Occupational Health and Safety Act and Regulations
b) Ontario's Workplace Safety and Insurance Act
c) Technical Standards and Safety Act and Regulations
d) Fire and Building Codes
e) City of Ottawa by-laws
f) University of Ottawa policies and procedures
g) Vendor's policies and procedures
h) All other legislation, regulations and standards as applicable

In event of a conflict between any provisions of the above authorities, the most stringent provisions shall govern.

This document has been prepared to ensure the safe completion of work by all retained parties and is applicable to all Vendors engaged directly by uO and their Subcontractors. This document is to be included as part of the Terms and Conditions for all vendors, whether on a vender list or retained directly by uO to conduct work.

All Vendors will communicate this guide to all employees and subcontractors and ensure the contents of this guide are fully understood.

This guide is not intended to replace requirements set forth in legislation (either Federal, Provincial or Municipal), regulations, codes, standards, guidelines, directives, tender documents, contracts, or any other legal reference – it is solely intended to serve as a supplement to the aforementioned materials. The information contained within this guideline is not exhaustive – if you have questions concerning safety

or environmental impacts of an operation or activity, please contact your employer or your uO Representative.

All Vendors who fail to comply with this guide, all applicable rules, regulations and standards, or uO procedures and policies will be subject to uOttawa's non-compliance escalation process.

Safety cannot be compromised; safe work is everyone's responsibility.

PART 2 DEFINITIONS

2.1 Construction Project

To meet the definition of a construction project, both definitions of "project" and "construction" must be met.

2.1.1 Construction

As defined in the Occupational Health and Safety Act, construction includes erection, alternation, repair, dismantling, demolition, structural maintenance, painting, land clearing, earth moving, grading, excavating, trenching, digging, boring, drilling, blasting, or concreting, the installation of any machinery or plant, **and** any work or undertaking **in connection with a project**, but does not include any work or undertaking underground in a mine.

2.1.2 Project

As defined in the Occupational Health and Safety Act, a project means a construction project, whether public or private including:

a) the construction of a building, bridge, structure, industrial establishment, mining plant, shaft, tunnel, caisson, trench, excavation, highway, railway, street, runway, parking lot, cofferdam, conduit, sewer, water main, service connection, telegraph, telephone or electrical cable, pipe line, duct or well, or any combination thereof,
b) the moving of a building or structure, and
c) any work or undertaking, or any lands or appurtenances used in connection with construction.

2.2 Constructor

The Occupational Health and Safety Act defines a constructor as a person who undertakes a project for an owner and includes an owner who undertakes all or part of a project, or by more than one employer. By managing the construction project, the constructor has specific duties under the Occupational Health and Safety Act and is responsible for protecting the health and safety of the workers. The contract awarded will specify the constructor for the project. **Within this document the "Constructor" is referred to as the "General Contractor".**

2.3 Employer

The Occupational Health and Safety Act defines the Employer as a person who employs one or more workers or contracts for the services of one or more workers and includes a Vendors or Subcontractors who performs work or supplies services, and a Vendor or Subcontractor who undertakes with an owner, constructor, or subcontractor to perform work or supply services. Depending on the project type, the employer can be the University of Ottawa, the Constructor, the Vendor, or the Subcontractor.

2.4 Owner

According to the Occupational Health and Safety Act, an owner includes a trustee, receiver, mortgagee in possession, tenant, lessee, or occupier of any lands or premises used or to be used as a workplace, and a person who acts for or on behalf of an owner as an agent or delegate. In most cases, the owner will be the University of Ottawa.

2.5 Subcontractor

An individual or organization who is performing work on behalf of a parent Contractor.

2.6 uO Representative

The main contact person for the Vendor

2.7 Vendor/Consultant

An individual or organization who supply services to the University.

PART 3 CONSTRUCTOR

The role of the Constructor at a construction project includes having total control of all aspects of the work, and particularly as they relate to occupational health and safety. The Constructor shall provide effective direct supervision of the work to ensure conformity to the contract documents, including the requirements of all applicable regulations, codes, standards or guidelines.

The Constructor is to submit all required requests to the Ministry of Labour, Training, and Skills Department. Depending on the scope of work this could include:

a) Form 016-0069E Notice of Diving Operation
b) Form 016-0070E Notice of Trench Work
c) Form 016-0071E Notice of Window Cleaning Work
d) Form 016-0072E Notice of Asbestos Removal Work
e) Form 016-0079E Asbestos Work Report
f) Form 016-0077E Notice for Tunnels Shafts, Caissons, and Cofferdams
g) Form 016-0080 Notice of Use of a Suspended Work Platform System

Before beginning work at a project every constructor and employer engaged in construction must complete a MLTSD approved registration form:

a) Form 016-1000E Registration of Constructors and Employers Engaged in Construction

MLTSD Form 0175 Notice of Project is required if any the following apply:

b) The total cost of labour and materials for the project is expected to exceed $50,000
c) The work is the erection or structural alteration of a building more than two storeys or more than 7.5 metres high
d) The work is the demolition of a building at least four metres high with a floor area of at least thirty square metres

e) The work is the erection, structural alteration or structural repair of a bridge, an earth-retaining structure or a water-retaining structure more than three metres high or of a silo, chimney or a similar structure more than 7.5 metres high
f) Work in compressed air is to be done at the project
g) A tunnel, caisson, cofferdam or well into which a person may enter is to be constructed at the project
h) A trench into which a person may enter is to be excavated at the project and the trench is more than 300 meters long or more than 1.2 meters deep and over thirty meters long
i) A part of the permanent or temporary work is required by O. Reg. 213/91 to be designed by a professional engineer

The GC shall have the sole responsibility for oversight of all construction means, methods, techniques sequences and procedures, occupational health and safety, and the overall coordination of the work. The GC shall control access to the project site to ensure there is no unauthorized access. If uO staff or other Vendors require access to the project site this must be coordinated with the GC and the uO Representative.

3.1 Maintenance Contractors (non-construction)

For non-construction maintenance contractors in Ontario workplaces the governing legislation is both the Occupational Health and Safety Act (OHSA) and O. Reg 851/90: Industrial Establishments.

PART 4 VENDOR HSE PROGRAM

The Vendor shall possess and maintain a formal health, safety and environment program appropriate to the risk of services provided. This program must contain policies and procedures in respect to all worksite related hazards that could be reasonably expected, through the course of the work being undertaken. The health and safety program shall comply with regulatory and legislative requirements and uO policies as applicable and shall include but not be limited to the following elements:

a) Health and safety policy signed by a company executive
b) Violence and Harassment policy signed by a company executive
c) Objectives and targets
d) HSE performance metrics
e) Hazard identification
f) Risk mitigation and control processes
g) Training matrix and program
h) Incident management program
i) Return to work program
j) Internal audit program
k) Management review and continual improvement
l) Subcontractor management program
m) Progressive discipline process

As part of this program, all Vendor employees shall have received awareness and practical training relevant to the hazards identified and are competent to complete all tasks assigned to them.

The Vendor shall deliver to uO any H&S related documentation so requested by uO.

PART 5 PROJECT SPECIFIC H&S PLANS

A project specific safety plan is to be developed and provided by the Vendor to detail health & safety controls specific to the individual construction project it is designed for. A health & safety manual does not suffice as a project specific safety plan. The project specific safety plan is to be based on a project specific hazard assessment and is to include the emergency response plans specific for that project.

Vendors are required to provide the project health & safety plan before the start of any construction project work. The plan must align with the Building H&S plans (where in place, project specifications, and the contract.

The Vendor is to prepare the project health & safety plan based on a health & safety risk assessment for the construction project performed by the Vendor. The project specific safety plan must create a system that connects activities to hazards and hazard control. It must be written to protect site personnel, visitors, and the general public from exposure to health & safety hazards on the job site. The Vendor is to communicate the project specific safety plan to all contractors and subcontractors who will work at the job site.

The Vendor is to present the project specific health & safety plan to the Project Manager for review to ensure that it meets certain requirements. uO's review of the Vendor's health & safety plan should not be considered as approval and does not reduce the Vendor's overall responsibility for construction health & safety.

Note that a change order that impacts the scope of the work being performed may prompt the need for revisions to the project specific H&S plan.

The project specific health & safety plan should include but not be limited to the following elements:

a) Reference to a completed activity-specific health and safety hazard assessment
b) Controls and mitigations for all health and safety hazards identified in the hazard assessment
c) Plan for dealing with any potential constraints due to the location of construction project (ex: proximity to residents/classes/labs, confined spaces, working at heights, tunnel access, pool area, outdoor work, extreme temperatures, AODA impacts)
d) Plan for mitigating high level noise, vibration, or dust if required
e) A list of regulatory legislation and CSA requirement that will be followed for the Work
f) Project specific emergency response plans specific to the project sharing no resources or equipment for its implementation with uOttawa or any other Vendors
g) Assigning a competent Supervisor to monitor the work and to be onsite at all times when work is being performed

h) Selection and operation of a health & safety representative or Joint Health and Safety Committee as required by OHSA section 8(1)
i) Health and safety monitoring plan for throughout the project duration
j) Reporting and responding process for non-conformances on the project site
k) Accident reporting, incident response, and investigation plans
l) Corrective actions to be taken to address risk and opportunities for improvements
m) List of equipment with associated health & safety controls
n) Access control, security, H&S board, hoarding and signage plans. Signage to be in French first, English second. Vendor signage to be posted at project entrance and to include company name and contact information
o) Traffic Management requirements and plan
p) Material and heavy equipment movement and storage requirements
q) H&S procedures during any shutdowns required for the Work
r) Toilet and clean-up facilities for the project
s) Areas of disposal of waste and chute to be used for the project
t) A copy of worker certifications required including subcontractors
u) Orientation requirements for workers, subcontractors, and visitors to project site
v) A plan for communicating any changes to hazards and controls with workers on the project site
w) A plan to submit regular updates to uO on health & safety performance. Report can include aspects such as: accident/near misses, H&S monitoring of project site, safety tailgates, summary of any Provincial health and safety (MLTSD) inspections and orders

PART 6 REPORTING HAZARDOUS CONDITIONS

All Vendors shall report immediately to their uO Representative the development/identification of any additional hazardous conditions observed that was not identified by Vendor in the original hazard assessment the Vendor performed for the Construction Project. Vendors will not undertake work in the area where the hazardous condition exists. The Vendor is responsible for developing and implementing health & safety controls to mitigate the hazard while not allowing this to impact the timelines of project deliverables.

PART 7 SAFETY TRAINING AND COMPETENCY REQUIREMENTS

Vendors shall identify the specific training activities to be undertaken to comply with industry and regulatory standards in order to ensure the supervisors and workers are "competent" as understood in the Occupational Health and Safety Act of the province of Ontario. This training must be completed prior to commencement of work. At any given moment throughout the contract the Vendor must be able to demonstrate the completion of any required training through the required documentation and certifications to provide proof that all workers on-site have the proper training to undertake the work as defined within the contract. uO reserves the right, at any time, to remove anyone from the site that does not meet the training requirements or demonstrate that they are not a competent worker.

7.1 Orientation

Prior to any individual performing work on a project site, they must complete the University of Ottawa Vendor orientation and the Vendor's project specific orientation. The Vendor has responsibility for the health & safety of any individual that enters their project site.

If the project is to take place within a laboratory, the Vendor must participate in applicable orientation that is specific to the laboratory environment.

PART 8 EMERGENCY RESPONSE

8.1 Project Specific Emergency Response Plan

The Vendor shall develop project emergency procedures specific to the project site. The Vendor shall ensure that these emergency procedures are posted in a conspicuous place at the project. The project specific emergency response plan shall be compliance with the applicable regulatory and legislative requirements, and should include but not be limited to the following elements:

a) Emergency response procedure, how to respond to an emergency
b) Communication plan of the procedure to ensure all workers on-site are familiar with it
c) Hazard specific emergency response plans such as:
    i. Working at heights
    ii. Confined space entry
d) Emergency resources such as:
    i. Fire extinguishers
    ii. Spill containment equipment
    iii. First aid kits
e) Communication systems: all workers on-site must have a method of two-way communication for in case of emergency
f) Emergency phone numbers and location of nearest hospital
g) First aider information

8.2 Vendor First Aid Response

All Vendors shall provide first aid to employees in accordance with applicable legislation and regulatory requirements. As per O. Reg 1101/90: First Aid Requirements, the Vendor must have qualified first aider(s) on-site and all required first aid supplies readily available at the construction project whenever work is being done. uO reserves the right to request the training records for first aiders located on-site.

8.2.1 Health Care

uO has an on-site medical clinic located at 100 Marie-Curie Pvt. The clinic is equipped to provide basic medical assistance in the event that medical care is required. If subsequent or additional healthcare is required, the medical clinic staff will direct an individual to the nearest hospital. Transportation to a hospital is neither provided nor paid for, however may be arranged via ambulance or taxi.

For any assistance requiring further care, it is recommended to call 911 and/or Protection Services at 613-562-5411 or ext. 5411 from a landline in the campus to obtain the required care.

8.2.2 Nearest Hospitals

uO is located within a reasonable distance to three (3) hospitals – these are:

a) Ottawa Hospital – General Campus (5.1 kms)
b) Hôpital Montfort (5.5 kms)
c) Ottawa Hospital – Civic Campus (6.2 kms)

8.2.3 Protection Services

In addition to civic emergency services such as police, fire and ambulance, Protection Services team is available to assist in emergency situations **on campus.**
https://www.uottawa.ca/protection/en/about/how-to-reach-us

Protection Services is available 24 hours a day / 7 days per week and can be reached in an emergency in the following fashions:

Emergency Phones

There are more than 140 emergency phones on uO's campuses. Vendors have the duty to familiarize themselves and all employees to the location of phones as applicable to the location of the work.

Figure 1 – Examples of emergency phone (often referred to as "blue phones") across campus

Public Phones (Payphone)

Protection Services can be contacted free of charge in an emergency by using a pay telephone on any of the campuses.

Figure 2 – Examples of emergency buttons on payphones located on campus; calls are free of charge to Protection Services.

Panic Buttons

Panic buttons are located in a number of areas on the University campus, such as women's washrooms, laboratories, isolated areas, etc.

Figure 3 – Example of an emergency button on campus.

By Phone

Protection Services can be reached in the event of an emergency on campus at ext. 5411. All phones have an emergency button pre-programmed on the phone. If calling by cell phone, the number is **613-562-5411**.

In Person

Alert a Protection Services member on patrol or visit the Protection Services offices.

Figure 4 – Main entrance of 141 Louis-Pasteur; the main office of Protection Services. Protection Services maintains satellite offices at Roger Guindon Hall (2013) as well as 200 Lees Ave (C146). Reports may also be submitted by speaking with a Protection Services member.

8.2.4 Automated External Defibrillators (AEDs)

uO is equipped with AEDs at key areas across campus; most notably, with Protection Services vehicles. Areas involving high physical demands are similarly equipped; these areas would include spaces such as gymnasiums (Montpetit, 200 Lees, Sports Complex). For a complete list of locations review uO's AED Guideline: https://orm.uottawa.ca/sites/orm.uottawa.ca/files/automated-external-defibrillators.pdf. Vendors have the duty to familiarize themselves and all employees to the location of AEDs as applicable to the location of the work.

8.2.5 Emergency Devices

Throughout the campus there are also emergency devices, such as emergency showers and emergency eyewashes. Many of these units are in public hallways and are alarmed to Protection Services, if activated, to provide a more expedient response to an injured person. Vendors have the duty to familiarize themselves and all employees to the location of emergency devices as applicable to the location of the work.

8.3 Building Evacuation Plans

All building emergency egress plans and designated alternate routes are prominently displayed in all buildings; notably at exit points and near stairways. **If work is being conducted that will obstruct an occupant exit, or limit access to another part of the building, this must be assessed, in conjunction with the uO Representative, prior to the execution of any work.** Vendors must ensure that all persons working on the project are aware of the nearest exit and the appropriate muster point in the event of a building evacuation. An example of a plan is seen below.

Figure 5 – an example of building evacuation routes posted within buildings.

The Vendor is responsible for the evacuation of their staff in case of an emergency. The Vendor shall put in place an emergency response plan including the plan for the evacuation of the Vendor's staff. The Vendor must always maintain a current list of their employees and subcontractors on-site to be able to account for their personnel at their pre-determined evacuation point in the event of a building evacuation.

8.3.1 Alarms

Several different types of alarms exist at uO which initiates different responses based on the type of alarm. Some examples include fire, intrusion, door held open, motion/perimeter sensors, atmospheric monitoring, low velocity, -80^{o} refrigerators, etc.

If an alarm sounds or is otherwise known to have been activated, remove yourself from immediate threat and immediately notify Protection Services 613-562-5411 (or ext. 5411) of the alarm. Provide your name, company name, contact information and await instructions. Remain available in a safe location. A Protection Services member will be sent to the location to provide assistance.

8.4 Hazard-Specific Emergency Procedures

uO has developed specific procedures for Hazard-Specific Emergencies. www.uottawa.ca/are-you-ready/what-to-do/hazard-specific-procedures.

Some examples of such procedures include:

a) Fire smoke or gas
b) Hazardous materials
c) Medical emergencies
d) Suspected public health issue
e) Criminal activity
f) Alarming behaviour or suspicious persons
g) Suspicious package
h) Severe weather
i) Earthquake
j) Flooding and significant water leaks
k) Power failure
l) Emergencies abroad

Further information on emergency preparedness at uO can be found online at www.uottawa.ca/are-you-ready. Any questions related to emergency management at uO may be directed to the uO Representative.

The University has implemented an Emergency Notification System (ENS) that can be utilized by downloading the uOttawa safety app – SecurUO. The ENS will be active in major situations, such as a critical violent event, a serious fire, a serious hazardous material spill, or severe weather. https://www.uottawa.ca/are-you-ready/uottawa-alert

Figure 6 – image of uOttawa's safety app - SecurUO

PART 9 ACCIDENTS/NEAR MISS

9.1 Reporting

All accidents, incidents, near misses and close calls occurring on the project site shall be reported to the construction project site-supervisor responsible for the work site forthwith. The Vendor must immediately notify the uO Representative if the work that is being done results in potential exposures to members of the University community, damages to University property, or any other impacts (actual or potential) affecting uO. The Vendor shall notify the uO within 24 hours of any other accidents or near misses that happen on the project site.

The Vendor shall report all incidents which meet reporting requirements under the Occupational Health & Safety Act and Regulations to the proper authority as prescribed. It is the responsibility of the employer to report any injuries sustained by one of their workers to the Workplace Safety and Insurance Board.

9.1.1 Critical Injury or Fatality

Situations where an individual has sustained a "critical injury" the Vendor shall follow these steps:

1) Provide first aid care to the injured worker
2) Call emergency services
3) Immediately call the Ministry of Labour, Training & Skills Development (MLTSD) 1-877-202-0008 (Obtain MLTSD agent name and tracking number). Provide agent with: a) GC name, b) Construction project location, c) contact information, d) nature of incident.
4) As soon as possible notify the uO Representative

O. Regulation 834/90: Critical Injury - Defined

a) Places life in jeopardy
b) Produces unconsciousness
c) Results in substantial loss of blood
d) Involves the fracture of a leg or arm, but not a finger or toe*
e) Involves the amputation of a leg, arm, hand or foot, but not finger or toe*
f) Consists of burns to a major portion of the body
g) Causes the loss of sight in one eye

** NOTE: A fracture to the hand, wrist, foot or ankle constitutes a critical injury. As does an amputation or fracture to more than one finger or toe.*

9.2 Investigation

Accident and incident investigations shall be conducted as soon as practical after the immediate actions of controlling the scene and treating the injured have been addressed. Wherever possible, preserve the scene until the investigation is complete, particularly for events which will be investigated by the prevailing regulatory agency or police. An investigation report is intended to identify the immediate circumstances of the event and any immediate actions taken to prevent a re-occurrence and/or to inform others of potential risks which may need to be addressed. Copies of the report will be sent to concerned parties including the uO representative for review and actioning as appropriate. Incident investigation corrective actions should be implemented as soon as reasonably practical and affected personnel briefed

on any changes in work procedures or processes which may be altered as a result of the findings of the investigation. uO reserves the right to conduct supplementary investigations if deemed necessary in the circumstances.

9.3 Monitoring and Non-Compliance Incident Response

The Vendor shall be responsible for managing their workers and addressing all reported non-compliance concerns. Vendors are responsible to initiate an investigation as well as administer an appropriate disciplinary process for all known incidents.

uO reserves the right to monitor for adherence to contract agreements and project plan as applicable at construction-sites or any other sites on its premises. The University will bring health and safety matters to the attention of the contact person designated by the Vendor with the expectation that the Vendor remedies the situation without undue delay. The University reserves the right to notify pertinent regulatory authorities as necessary.

For all issues regarding non-compliance, including orders issued by any regulatory body regarding the work on the project site, Vendors are fully responsible to rectify and correct all non-conformances within the timeframe as issued. Vendors are to submit a written report detailing all corrective actions taken to comply with the non-conformance to the uO Representative for review. The uO Representative has the authority to escalate all issues as necessary.

uO's Vendor Performance Management Process uses an escalation process for non-compliances which comprises of "absolutes" and the "three strikes" methodology. Review the following documents for more information:

1. UOttawa – Vendor Performance Management Process
2. Appendix A : Vendor Non-Compliance Incident Report Form
3. Appendix B: Escalation Process for Vendor non-compliance

PART 10 UNIVERSITY OF OTTAWA POLICIES

The University of Ottawa has developed policies and guidelines that are applicable to the University Community and include provisions for Vendors.

The Vendor shall have and maintain documents and procedures that are compliant with legislative requirements and uO policies and guidelines.

All uO policies can be read in full online in the Administrative Policies section of the University of Ottawa website (www.uottawa.ca/administration-and-governance/policies-and-regulations#administrative-policies). Any questions related to a policy may be addressed to your uO Representative.

Some relevant uO policies:

a) Policy 35 – Key Control
b) Policy 44 – Traffic and Parking
c) Policy 54 – Enterprise Risk Management
d) Policy 58 – Smoking Policy

e) Policy 66 – Violence Prevention
f) Policy 67 – Sexual Harassment
g) Policy 67a – Prevention of Harassment and Discrimination
h) Policy 67b – Prevention of Sexual Violence
i) Policy 77 – Occupational Health and Safety
j) Policy 91 – Environmental Management

Part 11 Vendor Conduct

11.1 Personal conduct

The University strives to ensure a welcoming and accepting environment. All persons on campus shall maintain a high level of professionalism and consideration. uO will not tolerate any Vendor using profanity or engaging in horseplay or any behavior that may put themselves or others at risk. Vendors shall abide by all rules, procedures, and policies in place at the University. In all instances, Vendors shall cooperate fully with site personnel. Issues or concerns are to be brought to the attention of the uO Representative.

11.2 Prevention of Violence, Harassment, and Discrimination

The University will not tolerate acts of threats or workplace violence.

uO is committed to maintaining a safe workplace and to protecting the University community. uO will take every precaution reasonable in the circumstances for the protection of a worker and to prevent workplace violence. The University is committed to maintaining an environment that promotes the understanding and respect for dignity of each person in the University community and having a workplace that is free from harassment and discrimination.

Vendor shall adopt the same standard of zero tolerance, and undertake the prevention and investigation of harassment, violence, and all other forms of inappropriate behavior in the workplace. uO expects all Vendors to take appropriate action to prevent, report, and investigate all incidents of this nature and will not tolerate any retaliatory action by any person.

All incidents involving harassment or violent behavior must be brought to the attention of the uO Representative.

11.3 Illicit Substances

Under no circumstances are persons permitted to perform work at uO under the influence of drugs, alcohol or other cognitive impairing substances. Consumption of such substances on a work site is strictly prohibited. Vendors found under the influence of or in possession of illegal drugs or alcohol will be immediately removed from site and will be subjected to all applicable legal recourses.

11.4 Prescription Medication

Vendors' employees shall notify their employer if they are required to take a prescription drug and of any restrictions that may affect their ability to perform work safely. Vendor shall address all such issues and to modify schedules and tasks assigned accordingly.

11.5 Smoking

Smoking is prohibited in all buildings without exception. Smoking is only permitted in designated areas and away from all entrance doorways. Smoking is not permitted when working outdoors, on a roof area or in any underground parking structure. Smoking is prohibited at the entire Alta Vista Campus which includes Roger Guindon, 600 and 850 Peter Morand.

All provincial and municipal by-laws and site-specific smoking rules are enforced at all sites.

11.6 Driving

All traffic regulations are strictly enforced on campus. The speed limit on campus is 25 km/h maximum; unless otherwise stated. All Vendors are expected to observe traffic rules and drive carefully, particularly at intersections and entrances/exits to parking areas and garages. uO features several pedestrian malls as well as restricted vehicle roadways and one-way vehicle circulation. Vendors shall familiarize themselves with proper circulation routes and not drive or park in restricted areas.

Vendors shall only drive in designated areas and may not drive in areas posted as restricted unless prior authorization is received by the uO Representative. Vendors may not drive on lawns, sidewalks, or landscaped areas. Any damages due to a violation of this requirement must be repaired at the Vendor's expense.

Due to the volume of people on campus at a given time, including students and visitors to the University, it is highly recommended that vehicles operating in reverse (ex: a backing-up vehicle to a loading zone or delivery port) be equipped with a noticeable, audible signal. Additionally, the use of a signal person may be required in certain circumstances.

All equipment and vehicle operators must be properly licensed to operate the vehicles or equipment on-site.

11.7 Parking

All vehicles are to be parked in authorized areas only. Parking in restricted areas, fire lanes or roadways is prohibited. Only permits issued by Protection Services are valid on University Property. Vendors are to abide by the arrangements made for parking for their work.

uO reserves the right to limit the number of Vendor vehicles parked on-site. All fees associated with parking arrangement are the Vendor's responsibility.

When a vehicle is parked illegally on University property a parking violation ticket may be issued or the vehicle may be towed away on the authority of the Director, Protection Services, at the expense and risk of its owner, in which case City of Ottawa authorities will be advised.

uO will not be responsible for any damage occurring to any vehicles (including trailers, rented equipment and other vehicles or vehicle accessories) parked on uO property. No vehicles are to be parked on-site outside of the normal working hours, without prior, written authorization from the uO Representative and permission from the Parking Division of Protection Services. www.uottawa.ca/parking

11.8 Loading Zones

Regular loading dock areas may be used for loading or unloading provided prior arrangements have been made with the uO Representative. When using loading docks, the driver will be responsible to ensure all wheel chocks are put in place to secure the vehicle. Once the loading or unloading of the vehicle is complete, the vehicle is to be removed immediately.

Most large buildings at uO have dedicated loading zones. There is no smoking, idling of vehicles, staging, or parking when in a loading area; this is denoted by signage posted in the area. These zones serve as ports for incoming and outgoing materials and are used by several internal and external clients. Loading zones are not limited to physical materials, and in some buildings are meant for the delivery / pick-up of hazardous materials.

Frequently accessed loading areas include (among others):

a) 141 Louis-Pasteur (Facilities)
b) 160 Louis-Pasteur Private (STEM)
c) D'Iorio (Science)
d) University Centre (Food Services)
e) Roger Guindon (Medicine)
f) Morisset (Library)
g) 90 University (Housing)
h) Colonel By (Engineering)

Delivery of materials must be properly coordinated with the uO Representative; uO loading zones must remain accessible for business purposes.

11.9 Overpasses

Vehicular circulation may pass underneath pedestrian overpasses that span the roadways over top of Louis-Pasteur Pvt., Jean-Jacques Lussier Pvt., and University Pvt. The clearance height markings are clearly posted on the overpasses. The overpass heights are not uniform; therefore prior to navigating the campus routes with large equipment, please verify clearance heights to avoid damage to equipment and / or the building.

Figure 7 – photo of the overpass located at Fauteux Hall

Part 12 Vendor work at the University of Ottawa

12.1 University of Ottawa Hours of Work

While work occurs during all hours of the day, uO hours of operation are 8:45 am to 5:00 pm during the months of September to May. During the months of June to August, core hours are reduced 1 hour to 4:00 pm.

It is strongly recommended that high impact work – such as work involving high noise levels, dust generation, painting, application of finishes / varnishes (i.e. high-odour substances) or other significant disruptions – be conducted during off-hours. This practice serves the following purposes:

1. Reduces impact on the University Community;
2. Reduces burden on Vendor for coordinating work.

A plan for after-hours work is recommended to be jointly developed by the uO Representative and the Vendor in order to minimize possible impacts on regular business at uO.

12.2 Vendor Signage and Access

12.2.1 Signage

Vendors shall supply and install warning signs, barriers, barricades, etc., as appropriate to the work being undertaken and the risk to the uO community. Vendors are responsible to ensure all warning signs and / or tags are clearly legible and in both official languages where required with French first and English second.

For Construction Projects, the Vendor is responsible for posting in a conspicuous place on-site all the required health and safety documentation associated with the work as well as the Vendor's contact information, emergency contact information, and emergency procedures.

All signs posted must meet the requirements of the applicable regulations and be posted at all entrances and in sufficient number to provide appropriate coverage and adequate warning of the hazards associated with the work taking place. The Vendor is responsible to remove all warning signs posted in their work area at the end of the work.

Where signs and barricades do not provide adequate protection, particularly along a road or walkway, traffic protection personnel are to be used.

Vendors are required to follow all posted warning, safety and security signs and barriers.

12.2.2 Access to Construction Zones

The project site must be secure at all times to prevent unauthorized access. This is the responsibility of the Vendor. Vendor is responsible to ensure all travel ways near the work area are adequately protected from all potential hazards, which may include physical barriers, fencing or guarding. The following requirements must be adhered to for public way protection:

- O. Reg 213 s. 64-66
- City of Ottawa By-Law No. 2014-220
- Ontario Traffic Manual – Book 7: Temporary Conditions

If work requires entry by the Vendor / Subcontractor to an occupied area of the University premises or another construction project site, such access must be coordinated with the uO Representative and be scheduled in advance. Under no circumstances is work to be conducted in occupied areas until authorized by the uO Representative.

12.3 Storage / Staging area

The Vendor may store material on-site only with a permit obtained prior to storing anything on site. Vendors are responsible to manage the storage areas, including securing against unauthorized access. Storage areas are to be located where there is minimal impact to the uO community. Building materials, supplies, or other project related items must not extend to outside of the predetermined area allocated for the project. The storage of hazardous materials must meet all applicable regulatory requirements for safety and environmental protection. Emergency procedures appropriate to the type, quantity, and location of material being stored are to be in place. Any stored chemicals must abide by 'Hazardous Materials' section of this document.

12.4 Clean-up and Washroom Facilities

Arrangements for access to washroom and eating facilities are to be made in advance with the uO Representative. Vendors are to only use the washroom and eating facilities designated to them.

For work or projects where portable facilities are required, Vendors are to verify with the uO Representative as to where the portable facilities may be located. Vendors are responsible to ensure an adequate number of hygiene facilities are provided, properly maintained, within easy access for Vendors to use and are adequately supplied with required sanitary items as per the requirements of O. Reg. 213/91 s. 29.

Vendors are also to verify with the uO Representative for appropriate rest/eating areas if on-site facilities cannot be used.

As per the requirements of O. Reg 213/91 s. 28 Vendors are responsible to supply adequate amount of drinking water for employees if potable water is not available at the work area or facility.

12.5 Keys

Vendors are permitted to use the appropriate master key(s) to facilitate access to the work site. The keys may be obtained from Protection Services Reception, located at 141 Louis-Pasteur.

The uO Representative must provide Protection Services with advance, written authorization for the Vendor to sign-out keys. If written authorization is not provided, keys will not be provided. Any problem or concerns must be addressed with the uO Representative. Exceptions to this policy will not be made under any circumstances.

Vendors must provide the following information at **each** sign-out:

a) Name
b) Organization (employer) name
c) Personal contact phone number
d) Photo identification

By requesting and accepting use of master keys, the requester agrees to fully comply with the University's Policy 35 – Key Control (www.uottawa.ca/administration-and-governance/policy-35-key-control). Keys shall be returned at the end of each day. If keys are not returned, the key requester will be called at the end of the day (via the provided personal phone number) and will be asked to return the keys immediately, at the individual / Vendor's expense, to the Protection Services main office located at 141 Louis-Pasteur Pvt.

Vendors and Subcontractors are responsible for the safeguarding of all keys provided to them as well as all costs arising out of failure to properly safeguard master keys. The provision of master keys shall not be construed as an invitation to access any other site on campus; keys furnished are for the exclusive purpose of accessing the project site(s) for the contracted work.

There are also areas of the University that are secured through electronic key card access or punch code locks. It is the responsibility of any person provided with electronic key access to ensure the area remains

secured during, and at the conclusion of, their work. Additional training or authorization may be required by uO to access these areas.

Use of uO keys is contingent on reading and understanding this document, participating in and completing the Vendor orientation training, and fulfilling any other project specific requirements as deemed necessary by uO.

12.6 Entering Residences

The Vendor shall abide by the "Code of Conduct for Service Providers" (Appendix A) when entering any occupied residences.

12.7 uO's Tunnel system

The University tunnel system houses pathways for electrical conduits, computer network cable, telephone services, chill water piping systems, potable water, and other essential services. Vendors are not to access uO's tunnel system without authorization from their uO Representative. If Vendor is required to access uO's tunnel system, the Vendor shall comply with uO's tunnel guidelines.

Any Vendors entering the tunnel system is to keep all areas secured by not leaving access doors open or otherwise accessible. If it is necessary to keep doorways open due to the nature of the work, the uO Representative is to be advised so arrangements with the Protection Services can be made (as required).

The tunnels also serve as a transportation circuit for small utility carts. These carts are electrically powered. The University has installed motion activated warning lights and mirrors to better assist in warning others of an oncoming utility cart. Utility carts are not to be used by Vendors.

Protective footwear must be worn at all times in the tunnels.

Part 13 Vendor Project Site Health & Safety

The University of Ottawa regards the Ontario Occupational Health and Safety Act and Regulations (notably, *Ontario Regulation 213/91 – Construction Projects*) as a minimum standard of performance. The University is steadfastly committed to the health and safety of the uO community and to the protection of uO property and the environment. uO strongly believes that injuries are preventable, that safety is everyone's responsibility, and that it requires awareness, involvement and commitment by the entire uO Community.

In its commitment to health and safety, the University strives to ensure that Vendors are aware of their responsibilities of the worksite and to ensure that all workers have been properly trained, have the appropriate personal protective equipment instructed in their particular task and are knowledgeable of all required health, safety, and environmental rules, regulations and standards as applicable to the assigned work.

Vendors are to ensure that the health, safety, and environmental rules as prescribed by the occupational health and safety act, environmental protection act and all other codes, standards and regulations are strictly observed for all work performed.

The Vendor is prohibited from using any of uO's property unless otherwise stipulated in the contract documents or agreed to by uO in writing. The Vendor is to provide their own tools and equipment to be used throughout the course of this contract. Vendors are recommended to keep copies of manufacturer operating manuals and standard operating procedures for all the equipment and tools brought on-site. All materials and equipment being used or installed must be suitable for the intended use and be safely installed or used in strict conformance with the manufacturer's instructions.

Inspections of equipment, processes, areas, and materials must be performed as prescribed by the Occupational Health & Safety Act and Regulations, manufacturer's instructions and good business practices. It will be the responsibility of the Vendor to conduct inspections of their equipment, tools, materials, areas, processes, and work activities in accordance with the Act and Regulations. Documentation demonstrating these inspections must be readily available upon request.

13.1 Combustion Engines

Authorization from the UO Representative is required prior to bringing combustion engines on-site.

Gasoline, LP gas or other internal combustion engines are not to be operated inside buildings unless approved oxy-catalyst exhaust purifiers are used, the exhaust is piped to an approved exhaust venting system or the exhaust is piped outside the building through a flexible or permanent exhaust hose.

13.2 Compressed Gas Cylinders

All compressed gas cylinders are to be stored, transported and used in a secure upright position. When not in use, the protective cap is to be placed on the cylinder and properly secured. All compressed gas cylinders both spent or full are required to be stored in a secure, clearly marked location, removed from any potential ignition source, common travel paths and means of egress.

13.3 Confined Spaces

A confined space refers to a fully or partially enclosed space that is not both designed for continuous human occupancy and in which an atmospheric hazard may occur because of its construction, location, contents, or work that is done within the space. Both conditions must exist for the space to be considered a "confined space".

Examples of confined spaces at uO are: elevator pits, sewers, sump pits, pressure vessels, crawlspaces, etc. Entry points at many of uO's confined spaces are denoted by the following signage:

Figure 8 – uOttawa confined space signage; posted at entry points to confined spaces.

The white space at the top of the sign is reserved for the identification number of the confined space. This number is written in and denotes the corresponding hazard assessment and entry permit for the space.

Vendors shall assess the space they'll be working in to identify if it meets the definition of a confined space even if the space does not possess the uO confined space signage. A space may become a confined space depending on the type of work that is conducted therein.

Vendors shall comply with O. Reg 632/05 when performing work in a confined space. Prior to conducting work in a confined space the uO Representative shall be notified.

In order to enter a confined space, the following measures **must** be in place:

a) All workers involved in the confined space entry must have appropriate training.
b) The hazard assessment must be reviewed to confirm that it is still current and accurate.
c) An entry plan and entry permit must be completed which will only be valid for that entry.
d) Air monitoring must be performed prior to entry and during entry to confirm there are no atmospheric hazards. The air monitoring results must be performed with properly calibrated and bumped air monitoring equipment. Air monitoring results must be recorded on the entry permit prior to entry and on regular intervals during entry.
e) An attendant must be stationed just outside of the entry to monitor the entrants inside the space.

f) A rescue plan, equipment, and rescuers must be ready to immediately effect a rescue if required. The rescue plan must be planned appropriately to the space to safely rescue the entrant. All rescue personnel must be competent and have received training on the equipment required for the rescue.

13.4 Control of Hazardous Energy

13.4.1 Electrical Work

Vendors are required to have their own electrical safety program. Vendor programs are to be adjusted to any building specific safety requirements. Certified electricians must perform the isolation and grounding of electrical transmission systems or outdoor distribution systems rated more than 750 volts in accordance with the document entitled "Electrical Utility Safety Rules" published by the Infrastructure Health and Safety Association, the Ontario Hydro Corporate Safety Rules and Policies, and with associated lockout plans.

If partial energization is required a risk assessment must be conducted and a safe work plan must be developed for this work. All electrical work must be conducted in accordance to the requirements in:

- O. Reg 213/91: Construction Projects
- Ontario Electrical Safety Code
- CSA Z462: Workplace Electrical Safety

Vendors are required to receive authorization from the uO Representative prior to shutting down any building electrical systems, circuits or equipment. Please note that advance notice is required for planned electrical works; typically, a minimum of 72 hours more time is required when the shutdown is complex. If the request is for emergency work, notify the uO Representative immediately.

Vendors shall receive authorization from the uO Representative prior to using any uO circuits and outlets. Circuits and outlets at uO are often pre-assigned, rated and distributed for specific uO equipment. Use of these outlets without proper verification could result in damage to uO equipment.

13.4.2 Lockout / Tag-out

Vendors are required to have their own program for the control of hazardous energy. Vendor programs are to be adjusted to any building specific safety requirements.

Vendors are required to receive authorization from the uO Representative prior to locking / tagging out equipment.

Vendors are responsible to provide their employees with appropriate locks, tags and lock out devices as required. Each employee is to be issued individual locks and tags. Every worker involved in a lockout

/ tag-out will place his / her own lock(s) on each piece of equipment as required to control the isolation.

Prior to bringing a piece of equipment to a zero-energy state, the Vendor must review all associated equipment and isolate all energy sources as required. After placing equipment in zero energy state the Vendor is to have a procedure in place to verify all energy sources have been de-energized.

The Vendor is required to inform the uO Representative before re-energizing any equipment. Prior to removing locks and re-energizing, all guards are to be reinstated and the Vendor is to inspect all equipment and work area to ensure it is safe to re-energize the equipment.

At the completion of work, each employee must remove their own personal locks and tags.

13.5 Designated Substances

When applicable a designated substance report will be included in the tender for construction projects. The Vendor who is awarded to the contract is to sign a document stating that they have received all designated substance report(s) (DSR) related to the project area. These DSR must be further formally distributed (including confirmations) to all Vendor and Subcontractor working on the construction project. These documents must always be kept on-site and accessible to anyone throughout the project.

If asbestos, other designated substances or additional contaminants (such as mould) are discovered during the work, the Vendor is to immediately stop work and notify the uO Representative without delay.

Authorization is required from the uO Representative before initiating any work that involves disturbance of any designated substance. Any disturbance of a designated substance is to be conducted using the appropriate safety precautions, and are to follow all building specific requirements, which may include supervision by a qualified hazardous materials consultant and air monitoring.

13.5.1 Designated substances that may be present on campus

Acrylonitrile

Acrylonitrile is used in the manufacture of synthetic fibres, rubber coating, adhesives, etc. It is colorless to pale yellow liquid with an unpleasant odour.

Arsenic

Compounds containing arsenic are used as wood preservatives, insecticides and herbicides. Arsenic is also used in alloys of copper and lead. Arsenic is a strong poison and is a silver-grey, brittle, crystalline solid.

Asbestos

All work involving planned or possible disturbance of asbestos-containing materials must comply with O. Reg. 278/05: Designated Substances – Asbestos on Construction Projects and in Buildings and Repair Operations. Authorization is required from the uO Representative before initiating any work that will involve asbestos and must be conducted in a manner that minimizes impact to the building occupants. Asbestos is a group of fibrous minerals that occur naturally in soil and rock in some geographic areas. It may be present in various building materials including shingles, ceiling tiles, floor tiles, cement products, gaskets, insulation and paper products.

In the event, that any work may involve asbestos, then Vendor shall comply with any and all uO guidelines, legislative and regulatory requirements as applicable. Vendors conducting work involving asbestos are required to have the required training and insurance. All asbestos work is to be conducted in accordance with the building requirements, which may include supervision by a qualified hazardous materials consultant and air monitoring. Vendors are responsible for providing advance written notification to provincial authorities when such notification is required. The disposal and transportation of asbestos

waste is to comply with requirements of O. Reg 347/90, provincial Environmental Protection Act and Transportation of Dangerous Goods Act.

Benzene

Benzene may be found in plastic, resin, nylon, rubber, lubricants, detergents, drugs and pesticides. Also, it is a natural component of crude oil and gasoline. Benzene is a colorless liquid with a sweet odour.

Ethylene oxide

Ethylene oxide is used in the manufacture of ethylene glycol, surfactants, fumigants, fungicides and petroleum emulsifiers. It is a colourless gas at room temperature that becomes liquid at 12°**.**

Isocyanates

Isocyanates is used in the production of polyurethane foam and resins. It is commonly found in spray foam insulation, sealants, finishes, paints, adhesives, and auto-body materials. It is a group of organic compounds formed by treating diamines with phosgene.

Lead

Lead is used in the production of batteries, ammunitions, solder, paint and pipes (including water pipes). Lead may be present in various materials in buildings, including paint, mortar, glazed ceramics, and solder. It is a naturally occurring bluish-grey metal.

Mercury

Mercury is used to produce caustic soda and was also used in thermostats, dental fillings and batteries. Mercury may be present in equipment at uO such as lab equipment (ex: thermometers, manometers, etc), medical equipment (ex: blood-pressure cuffs), thermostats, fluorescent light fixtures, etc. Is a naturally occurring metal. At normal temperatures, it is a shiny, silver-white odourless liquid. When heated, mercury becomes a colourless, odourless gas.

Silica

Silica is present in the concrete, terrazzo flooring, ceiling tiles and plaster in various buildings at uO. Silica dust may be generated by the grinding, cutting or demolition of any of these building materials. It is a transparent to grey odourless powder or crystal. It occurs widely in nature as sand, quartz, fling and diatomite.

Vinyl Chloride

Vinyl chloride is used in the manufacture of polyvinyl chloride (PVC), which is used in furniture upholstery, plastic pipes, wire and cable coating. At normal atmospheric temperature it is a colourless, flammable gas with a mild, sweet odour.

13.6 Excavations and Trenches

A lot of uO soils are contaminated beyond the first 6 inches. Consult with your uO Representative if a soil assessment or environmental consultation should be conducted prior to excavation.

Prior to conducting any excavation work, Vendors are required to ensure:

a) All underground utilities are accurately located and marked. The locates document must be onsite when excavation work is being performed.
b) All services within the excavated areas are rendered inoperative, locked and tagged out.
c) All precautions necessary to prevent damage to any utilities in the excavated areas are undertaken.
d) All precautions to protect all adjacent structures that may be affected by the excavation area are undertaken, including engaging the services of a professional engineer when required.
e) Daily inspections of the excavations are conducted. If there is evidence of possible cave-ins or slides, or signs of water infiltration, all work in the excavation is to cease until the necessary safeguards have been taken.
f) All open holes and trenches are barricaded to prevent unauthorized access.
g) Personnel do not enter a trench unless another worker is in close proximity and has easy access to the trench.
h) The walls of all trenches are supported or shored, and all barriers are in place, as required.
i) Ladders or other means of access and egress are located no more than 3 meters (10 ft.) of lateral travel between means of access.
j) All excavated material (soils), rock debris or equipment are effectively stored or retained at least 1 meter (3 feet) from the edge of the excavation to protect employees from falling objects.

Regardless of the depth of the excavation, when heavy equipment is to be operated nearby, the shoring or bracing is required to be able to withstand this extra load.

All excavations and trenches are to be back filled and compacted as soon as practical after work is completed and all associated equipment removed.

13.7 Fire Prevention Measures

Vendors are required to provide all necessary fire extinguishing equipment for the work being conducted. Prior to the commencement of work, appropriate and suitable extinguishing equipment which will permit the evacuation of the area during a fire must be in place. All equipment is to be certified with appropriate CSA, ULC or NFPA ratings. All fire extinguishers are to have an Underwriters Laboratories of Canada rating, the right rating, an inspection tag, and a current inspection date. CO2 extinguishers are preferred for laboratories where specialized and expensive equipment are used.

If any part of a fire protection system in a facility is to be disabled due to the work being performed Vendors are required to disclose all details and nature of the work to receive authorization from the uO Representative. The uO Representative must receive authorization from the uO Fire Prevention Coordinator. Vendors are also required to post notices and provide sufficient fire watch for the period of the time the system is disabled. The Vendor is to provide written notification that the disabled system has been restored to its proper operating requirements at the conclusion of the fire watch. For all fire watch activities, the Vendor must provide the uO Representative with a report detailing the entire watch period and locations affected.

13.8 Hazardous Materials

Vendors shall follow the requirements of uO Contractor's Environmental Obligations Agreement for the development of the required construction environmental management plan(s) for the management of hazardous materials being brought to the project site.

Vendors are required to obtain authorization from the uO Representative prior to bringing hazardous materials to a work location. Only minimal quantities are to be brought and maintained on-site. Contractors are to maintain an updated inventory of the hazardous materials on-site. Current Safety Data Sheets (SDSs) are to be in proximity of the hazardous materials storage and areas of use and must be accessible to uO and emergency response personnel.

Vendors are to be able to demonstrate that workers have received the following training:

a) Workplace Hazardous Materials Information System (WHMIS)
b) Transportation of Dangerous Good Act
c) Proper handling, storage and disposal of hazardous materials
d) Spill prevention and response

All flammable and combustible liquids must be stored in CSAB376-M and ULC/ORDC30 approved containers or flammable / combustible storage rooms which meet all fire code requirements. Vendors are to ensure that only the minimal amount of flammable / combustible liquids are stored on-site and in a well-ventilated area. All storage areas are to be clearly labeled with WHMIS signage indicating the hazard.

Vendors are responsible to ensure that all flammable and combustible liquids in-use are not place in or around any potential sources of ignition. In addition, a fire extinguisher appropriate for the use is required in the immediate area. When transferring or decanting flammable and combustible liquids, Vendors are to ensure all safety precautions are in place including bonding and grounding of the containers.

13.9 Hot Work

Vendors are required to receive authorization from the uO Representative prior to commencing any hot work. The uO Representative is required to contact the uO Fire Prevention Coordinator at a minimum of 2 workdays in advance of planned hot work to receive authorization.

Vendors are responsible to inspect the work area prior to commencing hot work and protect any flammable / combustible materials with appropriate fire blankets.

The Vendor must have completed hot work permit on-site whenever hot work is being performed which is only valid for that day. The hot work permit is to include a hazard assessment that was performed prior to the hot work commencing. No work shall be done unless a 5 lb ABC dry chemical fire extinguisher is on hand and immediately available. The worker shall locate the nearest fire alarm pull station. Fire watch must be conducted during the hot work and at minimum 60 minutes after. For all fire watch activities, the Vendor must provide the uO Representative with a report detailing the entire watch period and locations affected. The GC shall take all necessary precautions to prevent accidental activation of fire alarms. If smoke detectors are required to be disabled GC to notify uO Representative. uO Representative

to arrange for this through uO Electricians. Costs associated with false alarms may be charged to the Vendor.

Ventilation is required for all hot work to reduce the concentration of airborne contaminants in the work zone and to prevent the accumulation of combustible gases and vapours. In areas where mechanical ventilation is required, the Vendors are responsible to provide the necessary mechanical ventilation equipment and if required to provide air monitoring during the hot work period.

When welding, Vendors must ensure that the welder uses the required specialized personal protective equipment. Welding curtains are required around the work area to protect other personnel in the area from welding flashes.

Oxygen and acetylene cylinders shall be stored in an upright position and secured to a stable support; they must not be left free standing. Empty cylinders shall be marked and separated from the full bottles. All cylinders shall be stored away from any potentially hazardous situations, such as fire or areas where they may be exposed to mechanical damage. Any leaking compressed gas cylinder shall be removed immediately from building structures and arrangements made to remove them from the project site as soon as possible.

13.10 Housekeeping

Vendors are responsible to ensure the work area is clean and organized at all time. All tools and equipment are to be carefully stored and located so as not to block aisles, doors, fire extinguishers, fire blankets, stretchers, emergency eyewash fountains, emergency safety showers, fixed ladders, stairways, first-aid stations, elevators, etc.

Vendors are to ensure that no trip hazards exist. This includes any materials or objects protruding from floor surfaces, such as cable conduits etc. Objects protruding from floor surfaces must be made visible by placing an orange safety cone or other visible covering over the object.

Overhead storage of debris, tools, equipment, etc., is prohibited. No loose material is to be left in the area above suspended ceiling panels. All stacked material will be properly secured to prevent it from collapsing or falling. Material stored outdoors or on a roof top shall be properly secure to prevent it from being blown by high winds.

Carts, tools, materials, and equipment are not to be left unattended in aisles or stairways.

Vendor storage/staging areas, if available, will be designated by the uO Representative and must be properly marked. Vendors are responsible to maintain order in the storage/staging areas. All debris and waste generated by the Vendors will be cleaned and removed from site at regular interval and frequency, at minimum at the end of the job.

13.11 Laboratory Projects

The University of Ottawa features several buildings with undergraduate as well as research laboratory spaces. These spaces present unique hazards to Vendors; hazards which Vendors may not deal with on a regular basis.

All work involving access to specialized laboratory areas, especially (however not limited to) laboratories in the Faculties of Science, Medicine, Engineering, etc., requires thorough planning, communication and

coordination prior to site access. Vendors, via the uO Representative, are to be oriented to the actual and potential hazards that may exist in the proposed work site. Restricted access labs or high-risk labs required an escort.

a) Hazards may include:
   i. Chemical hazards – such as chemical products, etc.
   ii. Biological hazards – such as viruses, moulds, fungi, etc.
   iii. Physical hazards – such as noise, radiation, temperature extremes, etc.

For example:

a) Work involving intermittent access to the lab – a basic understanding of laboratory safety is recommended in addition to a thorough site orientation.
b) Work involving continuous access to the lab, where the lab is not decommissioned – an advanced understanding of laboratory safety is required in addition to a thorough site orientation.
c) Work involving a completely decommissioned laboratory type setting (i.e. decommissioned prior to Vendor access) does not require further laboratory introduction.

Given both the actual and potential hazards associated with laboratory work environments and the risk of impacts on research, the uO Representative is to involve the Laboratory Principle Investigator(s), Lab Manager(s) or a delegate, and the Facility Manager(s) to provide site specific information, guidance or special knowledge on equipment, work being conducted, unique hazards, and etc.

13.12 Mobile / Heavy Equipment

Vendors are required to receive authorization from the uO Representative prior to bringing large, specialized or heavy equipment on-site (ex: mobile cranes, excavators, tractor-trailers, etc.)

Vendors are to provide all details as to the type of equipment, where it will be used, and the length of time it will be on-site. Parking Services must be notified a minimum of 7 days prior to the start of the work. For a total road closure 14 days' notice is preferable for the purpose of communication to the uO community. This must be arranged via the uO Representative. The traffic protection plan must be approved by Parking Services prior to the equipment being brought on-site.

Any total road closures should be considered only as a last resort and should be planned on evenings or weekends at first if possible.

The Vendors is responsible to secure the area in which the equipment is to be operated and provide and post appropriate bilingual warning signs. Exclusion zones around work areas are to be put into place to prevent unwanted entry. The swing radius of cranes or other mobile equipment must be considered when erecting exclusion zones.

If the equipment is to remain on-site, all equipment is to be parked in an authorized, designated area which minimizes the impact to the building users and the general public. Vendors are responsible to ensure the use and storage of the equipment will not pose a safety risk to the uO community.

All heavy equipment is to be inspected daily and prior to use.

The Vendor is required to have a written procedure in place for the safe operation of equipment around or near any power lines or outdoor electrical equipment. Operation of equipment near power lines shall conform to the minimum distance allowances as per regulatory requirements (O. Reg. 213/91 s. 188)

13.13 Personal Protective Equipment (PPE)

It is the Vendor's responsibility for the provision of personal protective equipment of their employees, suitable and appropriate to the work being conducted. All PPE is expected to meet CSA Standards. Vendors must be able to demonstrate that the employees understand the PPE limitations and have been trained in proper inspection, maintenance, and safe use of the PPE. The Vendor must be able to demonstrate fit testing of the PPE where required.

The General Contractor is to identify all required personal protective equipment for the construction project site and indicate this requirement via signage posted at entry of site.

13.13.1 Footwear

Vendors are to wear approved safety footwear when working on-site. All footwear will be at a minimum grade 1 safety toe impact protection and puncture protection signified by the CSA green patch (triangle) on the footwear. Vendors working around or servicing electrical equipment are to wear electric shock resistant footwear, signified by the CSA approved white triangle with the Greek letter omega. It is recommended that all Vendors wear slip resistant footwear due to the varying conditions in all workplaces.

13.13.2 Head Protection

Vendors are required to provide their employees with head protection appropriate to the nature of the work being conducted. Vendors working in areas of low head room or where overhead work is being conducted are required to wear approved hard hats meeting or exceeding CAN/CSA Standard Z94.1. The head protection on construction project sites must have a level of type 2, class E protection.

13.13.3 Eyewear / Face Protection

Vendors are required to provide their employees with eyewear or face protection appropriate to the nature of the work being conducted. All eyewear and face protection are to meet the CAN/CSA standard requirements. Eyewear/face protection should be impact resistant. Different glasses are required for labs.

13.13.4 Hand Protection

Vendors are required to provide their employees with hand protection appropriate to the nature of the work being conducted (ex: chemical resistant or electrical gloves). All hand protection is to meet and be maintained in accordance with CSA standard requirements.

13.13.5 High Visibility Clothing

Vendors in areas with vehicular traffic are required to wear CSA approved high visibility clothing. All persons involved in ground maintenance will be required to wear high visibility clothing while performing their work.

13.13.6 Hearing Protection

uO possess spaces with noise levels over 85 dB. In compliance with O. Reg 851/15: Noise, Vendors are required to provide their employees with hearing protection appropriate to the nature of the work being

conducted. Hearing protection applies to both indoor and outdoor work. Personal Sound Transmission Devices (i.e. iPods, music playing devices) or any other personal devices that may impair hearing are not a suitable hearing protection replacement.

13.13.7 Fall Arrest / Restraint Equipment

Vendors are required to provide their employees with fall protection appropriate to the nature of the work being conducted. Only CSA approved fall arrest equipment carrying the approved CSA labels are acceptable. All employees required to use Fall Arrest / Restraint equipment must be properly trained in its use.

13.13.8 Respiratory Protection

Vendors are required to provide their employees with respiratory protection appropriate to the nature of the work and the environmental conditions. Respiratory protection is to be NIOSH approved and meet the applicable Canadian standards. Vendors are to ensure that all employees required to wear a respirator have been fit tested and are shaved to ensure that there are no impacts to the seal of the respirator.

13.14 Portable Heaters

Authorization is required from the uO Representative before any portable heater may be brought on-site. All portable heaters are required to be approved by the Canadian Standards Association or Underwriter's Laboratory.

Portable heaters are only to be used as a source of supplemental heat and not as the primary heat source, except in an emergency. Heaters may not be left unattended and are to be placed a minimum distance of 3 feet from any flammable or combustible materials and observe a minimum overhead clearance of at least 6 feet.

If a gas fire heater is being used Vendors are to ensure adequate ventilation is present and it cannot be used in a confined space. Exhaust from gas heaters is to be ducted to the outside environment.

Cylinders for propane heaters are to be placed at minimum of 10 feet from the heater and away from all heat sources. Propane cylinders are to be stored in a secured outdoor location.

For diesel or kerosene fire heaters, the heater unit is to be off and cool to the touch before fuelling. Fuel is to be stored away from the heater and in a well-ventilated area. Indoor storage is to be in a well-ventilated area or cabinet meeting all fire code requirements.

Heaters are to be placed on a stable level surface to prevent from being overturned and away from all travel paths. Heaters are to be periodically inspected to ensure safe operation following the manufacturer's instructions and serviced only by a licensed service technician.

Vendors are responsible to provide the necessary firefighting equipment in the immediate area where the unit is placed.

Heaters are not to be left on overnight.

Failure to observe all safety measures will result in their removal from site.

13.15 Tarpaulins

All tarpaulins used at site are to be flame resistant and in good condition.

13.16 Thermal Stress

Vendor is responsible to ensure that a plan is put in place to mitigate worker exposure to thermal stress, hot or cold. Ensure that the exposures do not exceed the Threshold Limit Values (TLVs) in accordance with the most recent ACGIH publication entitled *Threshold Limit Values (TLVs) for Chemical Substances and Physical Agents & Biological Exposure Indices (BEIs)*.

13.17 Tools and Equipment

13.17.1 Hand and Power Tools

Vendors are responsible for supplying all tools and equipment necessary for the completion of their work. The use of uO owned tools and equipment is not permitted under any circumstances. Vendors are required to obtain authorization from the uO Representative to store tools on-site. Tools maintained on-site that are not associated to a construction project are to be placed in locked containers or toolboxes at the end of the work day. Tools and other materials are not to be left on stepladders, scaffolds, roofs, or other places where they may be dislodged and fall or where they may create a trip hazard.

Power Tools are not to be plugged into uO outlets without authorization from the uO Representative. Vendors shall receive authorization from the uO Representative prior to using any uO circuits and outlets. Circuits and outlets at uO are often pre-assigned, rated and distributed for specific uO equipment. Use of these outlets without proper verification could result in damage to uO equipment.

All tools are only to be used for their intended purpose. Hand and power tools are to be maintained in good operating condition and inspected before use. All defective tools are to be tagged and removed from service immediately.

Mushroomed heads on cold chisels, star drills, etc., are unsafe and are not be used. Hammer handles are to be intact. Wrenches are not to be overstrained by extending the handle with a pipe or by other means.

Only utility knives equipped with a retractable blade are acceptable for use. Worn or broken blades are not to be discarded in the regular trash containers; Vendors are responsible to collect and remove these from site.

Electrical tools are to be either grounded (3-wire), double insulated, or used with ground fault circuit interrupter (GFCI) protection. Power tool cords and extension cords are to be inspected regularly and replaced if worn or cracked. All guarding or other safety devices on power tools are never to be removed, tampered with or made ineffective in any way. Prior to changing an attachment or adjusting any power operated tool, the tool is to be disconnected from its power source.

A Ground Fault Circuit Interrupter (GFCI) is to be used when operating all electrically powered tools outside or in a wet or damp environment.

Non-sparking tools are a requirement where flammable chemicals are handled or where sparks could create an explosion.

All extension cords are to be utilized such that they do not create a tripping hazard.

If working at height with tools close to the edge, all tools must be tethered to prevent falling to area below.

13.17.2 Explosive Actuated Tools

Vendors are to obtain authorization from the uO Representative prior to bringing and using explosive actuated tools to the work area. All explosive actuated fastening tools are to meet the design requirements of the CSA Standard Z166; if they do not meet these design standards they cannot be used on the premises.

The tools are not to be loaded until ready for immediate use. Vendors are not to carry a loaded tool when walking or travelling on-site. Under no circumstances is a loaded tool to be pointed in the direction of another person or used in an explosive or flammable atmosphere. Misfired cartridges are required to be placed in a water filled container and removed by the Vendors from the site.

Failure to observe all safety rules for the use of these tools will result in the immediate suspension of its use on-site.

13.18 Traffic Control

Vendors are responsible to implement traffic control measures in all areas where the work will interfere or delay the normal flow of traffic on-site. The Vendor is required to submit traffic control plans to the uO Representative prior to undertaking any work that will impact a roadway, pedestrian, and /or bicycle traffic. The Vendor shall always supply and have on-site the required traffic control plan, all traffic control signs, and equipment required to perform the work. Signs, the placement of signs, flashers and channelizing methods for the guidance and protection of vehicular and pedestrian traffic must conform to Ontario Traffic Manual Book 7.

The Vendor shall designate only competent workers to erect and maintain traffic control devices. The Vendor shall ensure and must be able to demonstrate that all staff involved in set up and take down of traffic control measures have received adequate training and instruction to assess and mitigate the risks involved.

When using a traffic control person (flag person) Vendors are responsible to ensure this person is competent and has been given adequate oral and written instructions for the work at hand, is dedicated solely to traffic control and is provided with the appropriate high visibility PPE.

The Vendor shall not park vehicles inside the work zone in a manner that blocks sightlines for vehicles or pedestrians approaching or crossing the intersections.

13.19 Working Alone

uO expects that all Vendor have and enforce their own individual working alone procedures.

13.20 Working at Heights

The Vendor shall supply, erect and maintain adequate protection for workers and public from fall hazards. These measures shall be immediately implemented whenever there is a danger of falling more than three (3) metres or other conditions as described in O. Reg. 213/91 section 26, O. Reg. 851/90 or other

applicable standards. The methods of fall protection must meet the requirements of O. Reg. 213/91: Construction Projects.

The fall protection system must be attached to appropriate and approved anchorage. When using uO designed fixed supports the Vendor shall obtain last certificate of inspection from uO.

The Vendor shall ensure and must be able to demonstrate that any worker at risk of a fall hazard has completed a working at heights training program that has been provided by a MLTSD approved provider, meets the requirements of O. Reg. 297/13, and that the validity period of the training has not expired. Proof of training can be requested at any time.

The Vendor shall develop adequate emergency rescue procedures and communicate these in writing to all workers at risk of a fall hazard. The written emergency rescue procedures must be readily available at the job site. The Vendor shall ensure that the rescue equipment identified in the emergency rescue procedure is readily available to affect a rescue when workers are at risk of a fall hazard.

13.20.1 Personal Fall Arrest/Restraint Equipment

Vendors are required to provide their employees with fall protection appropriate to the nature of the work being conducted. Only CSA approved fall arrest equipment carrying the approved CSA labels are acceptable. All employees required to use Fall Arrest / Restraint equipment must be properly trained in its use.

13.20.2 Roof Access Procedure

Vendors are to obtain authorization from the uO Representative before entering the roof. For work requiring access to a roof, the persons requesting access are expected to:

- Be pre-approved via the uO Representative.
- Possess current working at heights training by a Ministry of Labour, Training, and Skills Development approved provider.
- Present themselves to Protection Services for requisite access. Persons not having been pre-approved will be denied access, no exceptions.

13.20.3 Floor Openings and Utility Holes

Floor openings and manholes are to be guarded by substantial and properly secured barriers, railings, or covering material substantial enough to sustain twice the load of pedestrian or vehicular traffic. In addition, all floor openings are to be clearly marked and identified as such (ex: open hole below).

Where a danger of falling exists, elevated floor areas are to be provided with guardrails. In addition, toe-boards are to be provided when the possibility of falling objects striking personnel below exists.

Vendors are responsible for replacing any floor opening cover if removed, upon completion of work or if the area is left unattended.

13.20.4 Ladders

All ladders must meet or exceed the CSA Standard Z11-12. Portable ladders are to be inspected prior to each use and defective ladders are to be tagged and removed from service immediately. Under no circumstances are Vendors permitted to use any uO or building occupant owned ladders.

Only Fiberglass Reinforce Plastic (FRP) type of ladders will be permitted for use in, near, or around any electrical equipment. When climbing ladders, the worker is to maintain a three-point contact. Vendors are advised to use ladders equipped with non-slip footing. All ladders are to be set up on a stable surface. When using an extension ladder set it up 1 foot back for every 3 or 4 feet up. Tie off the ladder or otherwise secure it to prevent any movement. Secure area around ladder to prevent from any unauthorized usage.

When ladder is no longer in use ladder is to be stored in an area that will not cause any disruption to the building tenants or uO and must be secured from unauthorized use. Ladder is to be secured if stored upright, otherwise stored horizontally on the ground away from any path of travel.

13.20.5 Guardrails

Guardrails must meet the requirements of O. Reg. 213/91 Construction Projects section 26.3. Guardrails must consist of a top rail, a mid-rail, and a toe board. They must be provided around work platforms on all scaffolds, floor openings, ramps, roofs and open areas where a worker could fall from height. When guardrails or opening covers are temporarily removed, or where guardrails are not feasible, workers in the area must be protected by a full body harness connected to a fall-prevention system, with the harness and lanyard tied of to a secure, approved anchor point. Barricades, guardrails, and covers must be replaced in a proper manner immediately after work is completed.

13.20.6 Scaffolding

Scaffolding must meet the requirements of O. Reg. 213/91 sections 126 to 136. All scaffolding shall be erected and dismantled by competent workers, under the supervision of a knowledgeable and experienced supervisor. Vendors are responsible for selecting the proper type of scaffold dependent on the work. Vendors are to inspect the area for all hazards prior to erecting scaffolds. All scaffold types are to be inspected by a competent person before use.

As per Reg. 213/91 s. 130 scaffolds over 15 metres in height (ten metres if the scaffold is constructed of a tube and clamp system) must be designed and approved by a professional engineer and constructed in accordance with their design. The engineer or designated competent person will supervise the construction, inspect the scaffold before its use ensuring it is constructed in accordance with the design drawings, and provide in writing results of the inspection. Vendors are responsible to maintain the design drawings and written statement on-site while the scaffold is in use. The documents are to be available for review upon request.

All required ties to the structure are to be installed as soon as the scaffold has been completed to the tie-in area during erection. A safe and unobstructed means of access is to be provided to all scaffold platforms. All planking shall be scaffold grade or equivalent. Platform planking shall be secured to prevent movement.

Guardrails, guardrail screens, toe boards, and outriggers are to be used when required. Anchorage and bracing are to be provided so that scaffolds will be prevented from swaying, tipping, or collapsing. The footing or anchorage for scaffolds is to be sound, rigid, and capable of carrying four times the maximum intended load without setting or displacement. Vendors are responsible to ensure that all scaffolds are not loaded in excess of their designed and constructed load limit.

13.20.7 Suspended Scaffolds / Work Platforms / Boatswain Chairs

Workers installing or using suspended scaffolding, work platforms, or boatswain chairs must be certified to do so. All suspended scaffolds, work platforms and boatswain chairs are to be constructed and used in accordance with all applicable regulation and are to be attached to a fixed support or outriggers beam in accordance with the manufacturer's instructions.

All system and equipment components are to be properly installed and inspected prior to use, including:

a) Failsafe devices such as rope grabs, secondary safety devices and over speed controls are installed and operational.
b) All electrical components for power drive units are properly grounded and secured in place.
c) All tiebacks for outrigger beams, parapet clamps and lifelines are properly secured to anchor points capable of supporting 10 times the applied load.
d) An adequate number of counterweights are securely attached to the outrigger beams. If fibre ropes are used, they are to be protected from premature wear or chaffing and abrasion.

Vendors are to ensure an emergency rescue plan is in place, communicated to all Vendors involved before the start of the work and that access to the work area is controlled by adequate warning signs and barricades to prevent any unauthorized access.

13.20.8 Multi-Point Suspended Scaffolds

All multi-point suspended scaffolds are required to be designed by a professional engineer using good engineering practices and in compliance with all applicable regulations, standards and codes. A structural engineer is required to inspect the building where the scaffold is to be erected and provide a report ensuring the structural integrity of the building can support the scaffold. Vendors are responsible for notifying the Ministry of Labour, Training and Skills Department before erecting and dismantling the multi-point scaffold.

A professional engineer is required to inspect the scaffold after completion of assembly and prior to use to ensure it complies with the design drawings and provide a written inspection report.

Prior to each daily use the scaffold is to be inspected by a competent worker.

Vendors are to maintain on-site copies of all record as required by the applicable regulations.

13.20.9 Mobile Elevating Work Platforms

Workers using a mobile elevating work platform must be certified to do so. Vendors are to receive authorization from the uO Representative before bringing any mobile elevating work platforms on-site and must coordinate their use to minimize any disruption.

Vendors are responsible to ensure the elevating work platform selected is appropriate for the work being undertaken, the equipment is only used for its intended purpose, is in safe working order and all required maintenance and inspection tags and documents are in place.

Mobile elevating work platforms are not to be used to gain access to higher elevations, with the intent to exit from the platform. Work undertaken using a mobile elevating work platform is to be performed from inside the unit.

Mobile elevating work platforms are not to be operated in the vicinity of any overhead power lines and only operated on solid ground.

All operators are responsible to ensure the safety of the uO community when using the equipment and are to place appropriate warning signs and barricades in the work area as required.

Vendors are also responsible to ensure all equipment is stored in an area preventing any unauthorized access.

Vendors are to ensure that appropriate traffic control measures are used as necessary when operating mobile elevated work platform.

13.20.10 Overhead Work

For all overhead work, the area is to be properly barricaded and tagged to prevent access to the work area. The barricaded area is to be large enough to protect those in the immediate area from any potential falling debris or tools. The tag shall indicate the reason for the barricade and a contact name and number.

PART 14 ENVIRONMENTAL MANAGEMENT

Environmental considerations are part of all activities and operations within uO. While performing services and operations at uO, all Vendors must understand their environmental responsibilities.

Collaboration and performance during all contractual obligations are critical to uO's commitment to protect the environment and comply with all environmental legislation. Vendors are required to read and sign the Contractor's Environmental Obligations Agreement**.**

PART 15 Further Questions

If there are any further questions, clarifications, or suggestions to this document, please discuss with your uO Representative.

Appendix A: Code of Conduct for Service Providers

You must abide by this code of conduct while you work in rooms/units in residence or rental units of temporary occupants/residents. This code of conduct also specifies what you can expect from the University or residents/temporary occupants. Please note that residents/temporary occupants are invited to report to the University if the maintenance/housekeeping service providers and Vendors do not respect the code of conduct. You must also abide by all codes and all applicable laws (municipal, provincial, and federal laws), be covered by the WSIB, and have an adequate insurance policy to provide the service in question.

1. General Procedures:

1. Before entering the unit/bedroom/room, you must;
    a. Announce yourself (knock on the door, announce yourself, wait for a response) twice before opening the door. As you enter, you must announce yourself once more and wait for a response.
2. You are prohibited from entering a unit/bedroom/room if;
    a. there is a person inside who does not give you permission;
    b. The person would be inconvenienced by your presence.
3. Cause the least disturbance possible.
4. You must do the work during the hours stipulated by Housing Service. Any modification to the schedule must be approved by Housing Service Management.
5. You must present a piece of ID and a copy of the work order if the resident/temporary occupant asks you for it.

2. Before Work Begins:

1. The University will advise the student (note on the door and e-mail) at least 48 hours before the beginning of your services.
2. The University will give you access to the unit on the day that work is scheduled.

3. On-site: You must:

1. Avoid making excessive on-site visits to bring all required materials, tools and equipment;
2. You cannot accept specific tasks or any work demands from the resident/ temporary occupant if they ask you.
3. Not displace the residents items without permission;
4. Obtain their permission to use their things such as;
    a. a stepladder;
    b. the telephone;
    c. the bathroom or kitchen;
    d. the electricity, gas, and water;
    e. the garbage bin;

5. Do not take for yourself any article or object belonging to the resident, even if it is in the garbage;
6. Do not throw out or take out of the unit/room any article, object, or product that does not belong to you, unless it has been specifically requested by a Student Life Residences' representative;
7. Collect at the end of work all your things, including any resulting garbage.
8. Not paralyze all elevators.

4. Uncompleted Work: If you do not finish work in a unit/room the same day, you must:

1. Remove all your things from the unit/room;
2. Ensure that no product that poses a health danger is left on location;
3. Clean all the objects on which you applied cleaning products;
4. Ensure that all public services function;
5. If necessary, inform the University and the resident/ temporary occupant of possible risks.

5. Completion of Work, Deficiencies:

1. Correct all deficiencies in less than 48 hours / 24 hours (for emergencies) after inspection or as specified on the contract.
2. Once the work is completed, advise the University and obtain in writing a confirmation of satisfactory service.

6. At All Times: To demonstrate respect to residents/ temporary occupants and for propriety, you must;

1. Wear proper work attire at all times, not muscle shirts, short. The Service provider must supply the company uniform (the company logo is mandatory)
2. Work in a safe fashion and never leave objects or products that present a health danger where they could be used by others;
3. Keep your sharp-edged tools and cleaning products out of the hands of children;
4. Keep confidential all information on the subject of the resident/ temporary occupant and his or her room;
5. Do not smoke; Not be under the influence of alcohol or drugs;
6. Not use radios, CD players, MP3 players or other audio devices;
7. Use appropriate language;
8. Avoid all commentary or gestures that could be hurtful or unpleasant or have a racist or sexist implication;
9. Do not wear clothing or show tattoos that could be considered hurtful or vulgar.

7. What You Can Expect from Residents/Temporary Occupants:

1. To give you access or make arrangements to give you access;
2. To vacate or empty the location to permit you to perform your work
3. To permit you to use the electricity and water as needed to complete the work.

8. Discrimination: The University enforces policies concerning workplace equality and harassment. The University expects service providers to respect the principles of workplace equality. Any racial, sexual, or other forms of harassment coming from Vendors, agents, or third parties will not be tolerated.

9. Termination of Work: Vendor non-compliance process will be initiated for inability to comply.

10. Exceptions: No exception or modification can be made to these procedures without the consent of the Facilities and Contracts Manager

Appendix B: Waste Containers on University of Ottawa Property

1- All requests to install waste containers for projects on our campuses must be approved by the Parking and Sustainable Transportation Office (which secures permission from the fire prevention authority as necessary), as well as Facilities' Grounds and Transport section.

2- Once the request is approved, the Vendor must meet the conditions spelled out, for example, placing boards under the waste container to protect the asphalt or the ground or staying a certain distance from trees.

3- All waste containers must be fenced in to reduce the chances of people injuring themselves or of unauthorized use (for example, throwing out dangerous products or products not usually placed in the garbage).

4- The names and contact information of the Vendor must be posted on the fencing surrounding the waste container.

5- The Vendor must respect the timeline established at the initial meeting, because other projects may require the space. If there are no other projects, a new timeline can be set as necessary.

6- The Vendor must restore the site to the state it was in before the waste container was installed (for example, replacing damaged grass or plants).

7- The Vendor must pay all fees related to the request, including for parking spaces used or made inaccessible.

** Last-minute requests will not be approved.

University of Ottawa
VENDOR ACKNOWLEDGMENT FORM

Company: _____

Vendor Representative

Name: _____

Position: _____

By signing below, I hereby confirm receipt of the University of Ottawa health & safety requirements for Vendors. I understand that I am responsible to ensure that all individuals I assign to work under my contract with the University of Ottawa fully meet these expectations when on University of Ottawa premises.

_____ _____
Signature Date

Please note: legislation, policies, guidelines, directives and other documents change with time. While every effort will be made to keep this obligations document updated, uOttawa cannot guarantee complete and total accuracy, nor assume liability for, the information presented within this document. If a section is not valid or changes due to changes in law, then that provision becomes null/void, however, the remainder of the document remains in force and effect.

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