Phase II Environmental Site Assessment

Proposed New Riverside South Catholic Elementary School, Ralph Hennessey Avenue and Mount Nebo Way, Ottawa, Ontario

Type of Document: Final

Client: Centre Des Ecoles Catholiques Du Centre-Est (CECC) 4000 Rue Labelle Ottawa, Ontario K1J 1A1

Project Number: OTT-00245569-A0

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Date Submitted: April 13, 2018

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Date Submitted: April 13, 2018



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Executive Summary

EXP Services Inc. (EXP) was retained by Centre Des Ecoles Catholiques Du Centre-Est (CECCE) to complete a Phase II Environmental Site Assessment (ESA) of the proposed new riverside south catholic elementary school located at the southeast corner of Ralph Hennessey Avenue and Mount Nebo Way in Ottawa, Ontario. The purpose of the Phase II ESA is for due diligence in support of a real estate transaction. EXP understands this report will not be used to submit a Record of Site Condition due to a change in land use.

The site is located on the east side of Ralph Hennessey Avenue and south side of Mount Nebo Way in Ottawa as shown on Figure 1 in Appendix B. The site has an area of approximately 2.0 hectares and is vacant land. The subject property is in a minor institutional zoned area.

The subject site has a lower elevation than the surrounding properties, therefore there is a significant amount of fill that has to be imported to the site. Fill was being imported to the site to raise the grade of the site and therefore, there was fill of unknown quality present at the site. Much more fill material has to be imported to the site.

The findings of the Phase I ESA were presented in a report entitled *Phase I Environmental Site Assessment, Proposed Riverside South Elementary School, Ottawa, Ontario,* completed by EXP, dated April 13, 2018. The Phase I ESA identified the following APEC:

| Areas of Potential Environmental Concerns | Potential Contaminants of Concern | Rationale |
|--|---|--|
| Subject Site | | |
| APEC-1: Potential AST located on the south side of the former Radio C.J.R.C building located on the subject site from 1968 to 2009. | Petroleum hydrocarbons (PHC), volatile organic compounds (VOC), polycyclic aromatic hydrocarbons (PAH), metals and general inorganics | Due to the potential presence of the AST at the site, there could be residual impacts to soil and groundwater. |
| APEC-2: Fill of unknown quality being imported to the site to raise the grade. | PHC, VOC, and metals | Due to the presence of the former building, there could be residual impacts to soil on the subject site. |

Table EX.1: Areas of Potential Environmental Concern

Based on the Phase I ESA findings, a Phase II ESA was recommended to assess the soil and groundwater quality at the site from the above-noted APECs.

The Phase II ESA consisted advancing a one environmental borehole concurrently with a geotechnical investigation with a total of 13 boreholes located at the site. Soil samples were collected and submitted for laboratory analysis of PHC, BTEX, VOCs and metals.

For assessment purposes, EXP selected the Site Condition Standards (SCS), Table 3, Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition for institutional property use and fine textured soil, provided in *Soil, Groundwater and Sediment Standards for use Under Part XV.1 of the Environmental Protection Act*, Ministry of the Environment (MOECC), 2011 in accordance with Ontario Regulation 153/04 (as amended).

Based on the Phase II ESA results, the following summary is provided:

- The stratigraphy at the Site generally consists of a layer of a mixture of silty sand, silty clay, trace gravel fill material followed by silty sand and silty clay, underlain by clay, then glacial till. No petroleum impact to soil was observed.
- Groundwater was encountered at depths of 0.04 m to 2.25 m below the ground surface. No petroleum odours were observed during the sampling event. The groundwater flow direction was calculated to be to the northwest.
- The concentrations of PHC, BTEX, VOCs, and metals measured in the soil sample from MW/BH 6 were less than the laboratory detection limits and/or less then the MOECC 2011 Table 3 SCS.
- The concentrations of PHC, and BTEX measured in the groundwater sample from MW/BH 6 were less than the laboratory detection limits and/or less then the MOECC 2011 Table 3 SCS.

The subject site is at a lower elevation then surrounding properties, therefore more fill is expected to be imported to the site. However, the geotechnical investigation completed concurrently recommends Ontario Provincial Standard Specific material to be used though out the site.

If the wells are no longer needed, they should be decommissioned in accordance with Ontario Regulation 903.

This executive summary is a brief synopsis of the report and should not be read in lieu of reading the report in its entirety.

Centre Des Ecoles Catholiques Du Centre-Est Phase II Environmental Site Assessment Proposed New Riverside South Elementary School Ralph Hennessey Avenue and Mount Nebo Way, Ottawa, Ontario OTT-00245869-A0 April 13, 2018

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1. Introduction

EXP Services Inc. (EXP) was retained by Centre Des Ecoles Catholiques Du Centre-Est (CECCE) to complete a Phase II Environmental Site Assessment ESA of proposed new riverside south catholic elementary school located at the southeast corner of Ralph Hennessey Avenue and Mount Nebo Way in Ottawa, Ontario. The purpose of the Phase II ESA is for due diligence purposes in support of a real estate transaction. Consequently, EXP understands this report will not be used to submit a Record of Site Condition due to a change in land use.

1.1 Site Description

The site is located on the east side of Ralph Hennessey Avenue and south side of Mount Nebo Way in Ottawa as shown on Figure 1 in Appendix B. The site has an area of approximately 2.0 hectares and is vacant land. The site is legally described as Part of Lot 22, Block 322, Concession 1 (Rideau Front), Geographic Township of Gloucester, City of Ottawa and the City of Ottawa PIN is part of 043302163. The subject property is in a minor institutional zoned area.

The subject site has a lower elevation than the surrounding properties, therefore there is a significant amount of fill that has to be imported to the site.

1.2 Background

The findings of the Phase I ESA were presented in a report entitled *Phase I Environmental Site Assessment, Proposed Elementary School, Mount Nebo Way at Ralph Hennessey Avenue, Ottawa, Ontario,* EXP Services Inc., dated April 13, 2018. The Phase I ESA identified the following APECs:

| Areas of Potential Environmental Concerns | Potential Contaminants of Concern | Rationale |
|--|---|--|
| Subject Site | | |
| APEC-1: Potential AST located on the south side of the former Radio C.J.R.C building located on the subject site from 1968 to 2009. | Petroleum hydrocarbons (PHC), volatile organic compounds (VOC), polycyclic aromatic hydrocarbons (PAH), metals and general inorganics | Due to the potential presence of the AST at the site, there could be residual impacts to soil and groundwater. |
| APEC-2: Fill of unknown quality being imported to the site to raise the grade. | PHC, VOC, and metals | Due to the presence of the former building, there could be residual impacts to soil on the subject site. |

Table 1.1: Areas of Potential Environmental Concern

Based on the Phase I ESA findings summarized above, a Phase II ESA was recommended for the Site.

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1.3 Objective

The purpose of the Phase II ESA is to determine the presence or absence of impacts to soil and groundwater with respect to the above noted APECs. It is not the intent of the Phase II ESA to delineate any impacts. The Phase II ESA will be conducted in accordance with the standard as defined by CSA Standard Z769-00 (as amended) and will be completed or supervised by a Qualified Person from EXP.

2. Scope of Investigation

The Phase II ESA scope of work consisted of the following activities:

- Request local public utility locating companies (cable, telephone, gas, hydro) to mark any underground utilities present at the Site;
- Retain a private utility locating company to mark all underground utilities present in the vicinity of the borehole locations and to clear the individual borehole locations;
- Advance one (1) borehole at the site, and instrumented with a monitoring well to facilitate groundwater sampling;
- Collect representative soil samples for chemical analysis of BTEX, PHCs F1-F4, VOCs, and metals;
- Measure groundwater levels of the monitoring wells and collect groundwater samples from the monitoring wells for chemical analysis of BTEX, and PHCs F1-F4; and,
- Review the analytical data and prepare a report summarizing the findings.

3. Site Assessment Criteria

The assessment criteria, Site Condition Standards (SCS), applicable to a given site in Ontario are established under subsection 168.4(1) of the Environmental Protection Act. Tabulated generic criteria are provided in *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*, MOE, July 2011. These criteria are based on site sensitivity (sensitive or non-sensitive), groundwater use (potable or non-potable), property use (residential, parkland, institutional, commercial, industrial, community and agricultural/other), soil type (coarse or medium to fine textured) and restoration depth (full or stratified restoration). In addition, site specific criteria may be established on the basis of the findings of a Risk Assessment carried out in accordance with Part IX and Schedule C of Ontario Regulation 153/09 (O. Reg. 153/09).

For assessment purposes, EXP selected the Table 3 SCS for institutional/ residential land use with fine and medium grained soil in a non-potable groundwater condition. The with fine and medium -grained criteria were used based on field observations of soil texture.

The selection of this category was based on the following factors:

- The predominant soil type on the site was considered to be fine and medium textured, based on field observations;
- There was no intention to carry out a stratified restoration at the site;
- More than two-thirds of the site has an overburden thickness greater than 2 m;
- The site is not located within 30 m of a surface water body or an area of natural significance;
- The property is not within an area of natural significance; does not include, nor is it adjacent to an area of natural significance, nor is it part of such an area; and, it does not include land that is within 30 m of an area of natural significance, nor is it part of such an area;
- The site is fully serviced by the City of Ottawa water distribution system and, to the best of EXP's knowledge; all properties within 250 m of the site are also serviced by the municipal water supply (i.e. there are no potable water supply wells located within the Phase One Study Area); and,
- The site is planned for institutional use.

4. Methodology

4.1 Service Clearances

Prior to the commencement of drilling, the locations of underground public utilities including telephone, fibre optic, natural gas and electrical lines were marked at the Site by locating companies. A private utility locating contractor was also retained to clear the individual borehole locations.

4.2 Drilling and Soil Sampling

On April 2, 2018, concurrently with the geotechnical investigation, a total of 13 boreholes (BH 1 to BH 13) were advanced at the site by Downing Drilling, a licensed well contractor, under the full-time supervision of EXP staff. A CME 75 drill rig with split spoon samplers was used to collect the soil samples. A monitoring well was installed in BH/MW 6 to facility groundwater sampling. The locations of the boreholes and monitoring well are presented on Figure 2 in Appendix B.

Dedicated nitrile gloves (i.e., one pair per sample) were used during sample handling. No petroleum-based greases or solvents were used during drilling activities.

EXP staff continuously monitored the drilling activities to log the stratigraphy observed from the recovered soil cores, to record the depth of soil sample collection, to record total depths of borings, and to record visual or olfactory observations of potential impacts. Field observations are summarized on the borehole logs provided in Appendix B.

Soil samples identified for possible laboratory analysis were collected from the dedicated sampling tube and placed directly into pre-cleaned, laboratory-supplied glass sample jars/vials. Samples to be analysed for PHC fraction F1, BTEX, and VOCs were collected using a soil core sampler and placed in to vials containing methanol as a preservative. The jars and vials were sealed with Teflon-lined lids to minimize head-space and reduce the potential for induced volatilization during storage/transport prior to analysis.

The remaining portion of each soil sample was placed in a sealed Ziploc plastic bag and allowed to reach ambient temperature prior to field screening with a combustible vapour meter calibrated to hexane gas. The field screening measurements were made by inserting the instrument's probe into the plastic bag while manipulating the sample to ensure volatilization of the soil gases. These 'headspace' readings provide a real-time indication of the relative concentration of combustible vapours encountered in the subsurface during drilling and are used to aid in the assessment of the vertical and horizontal extent of potential impacts and the selection of soil samples for analysis.

Soil samples were selected for laboratory analysis based on combustible vapour measurements and visual, olfactory evidence of impacts (if observed), and/or anticipated zones of impacts (i.e. groundwater table).

4.3 Monitoring Well Installation

A groundwater monitoring well was installed in MW/BH 6, and piezometer were installed in BH 1, BH 2, and BH 5. The monitoring well was installed in general accordance with the Ontario Water Resources Act - R.R.O. 1990, Regulation 903 - Amended to O. Reg. 128/03 and was installed by licensed well contractors (Downing Drilling).

The monitoring well was constructed of a 50-mm diameter, 1.5 m long Schedule 40 PVC screen and appropriate length riser pipe. The well screen has a slot size of approximately 0.25 mm (slot 10) and was sealed at the base with a PVC end cap. The annular space around the well screen was backfilled with silica sand to approximately 0.3 m above the top of the screen. The sand pack was extended above the screen to allow for compaction of the sand pack and expansion of the overlying well seal. A granular bentonite ('Hole Plug') seal was placed in the borehole annulus from the top of the sand pack to approximately 0.3 m below ground surface. The monitoring well was completed with a stick up well and capped no protective steel casing was used. Details of the well installations are provided on the borehole logs in Appendix B.

4.4 Groundwater Monitoring and Sampling

Groundwater monitoring and sampling activities were conducted on April 3, 2018. Prior to sampling, the depths to groundwater in the monitoring well was measured using a water level meter and groundwater was purged from each monitoring well.

Groundwater sampling activities were completed using low-flow techniques. Purging and groundwater sampling was completed using a peristaltic pump, equipped with dedicated polyethylene tubing for each monitoring well. Groundwater samples were placed directly into the laboratory supplied bottles and/or vials and placed in a cooler containing icepacks for sample preservation purposes. The vials were inverted prior to being placed in a cooler to ensure that no head-space was present in the samples.

The representative groundwater samples were transported to Maxxam Analytics Inc. of Ottawa, under Chain of Custody protocol for chemical analysis. Sample handling/storage procedures were consistent with those outlined in Section 4.2 for soil sampling.

4.5 Deviations from CSA Standard

No deviations from the CSA Standard Z769-00 (R 2013) for Phase II ESAs, published in March 2000, were encountered during this Phase II ESA.

5. Findings

5.1 Subsurface Conditions

The detailed soil profiles encountered in the boreholes are provided on the attached borehole logs (Appendix B). Boundaries of soils indicated on the logs are intended to reflect transition zones for the purpose of environmental assessment and should not be interpreted as exact planes of geological change. A brief description of the soil stratigraphy at the Site, in order of depth, is summarized in the following sections.

5.1.1 Topsoil

A layer of topsoil was observed in all of the boreholes. The topsoil had a maximum thickness of 0.3 m in BH 12. No petroleum odours were identified in the topsoil material. Some topsoil was observed underneath some imported fill material as observed in BH 1, BH 2, BH 5, BH 7, BH 8, BH 10, and BH 13.

5.1.2 Fill Material

A layer of silty sand and silty clay, trace gravel in most of the boreholes. The fill had a maximum depth of 1.8 m in BH 12. No petroleum odours were identified in the fill material.

5.1.3 Native Material

Below the fill was a layer of silty sand and silty clay that extended to a maximum depth of 3 m (BH 5). followed by a layer of clay that extended to a depth of 6.7 m (BH 3). No petroleum odours were identified in the native soil.

5.1.4 Glacial Till

Below the native material was glacial till, silty sand to sandy silty, some clay, gravel, cobbles and that extended to the maximum depth drilled of 12 m (BH 2). No petroleum odours were identified in the glacial till material.

5.1.5 Bedrock

Limestone bedrock was encountered between 8.8 m and 12 m.

5.2 Groundwater

Groundwater elevations and water levels were measured at the site on April 10, 2018. Groundwater was encountered at a depth of 0.04 m to 2.25 m below the ground surface. No petroleum odours were observed during the sampling event. A summary of the elevation survey and groundwater levels for each well are shown on Table 5.1.

| Monitoring Well | Ground Elevation | April 1 | 0, 2018 |
|-----------------|------------------|----------------------|-----------------------|
| ID | (MASL) | Water Level (mbg) | Water Level (MASL) |
| BH 1 | 92.81 | 2.25 | 90.56 |
| BH 2 | 92.55 | 1.59 | 90.96 |
| BH 5 | 92.97 | 1.52 | 91.45 |
| MW/BH 6 | 92.32 | 0.04 | 92.28 |

Table 5.1: Groundwater Elevations

Note: Elevations were measured using an assumed benchmark relative to mean sea level.

mbg – metres below ground

MASL – metres above sea level

Based on the water levels measured on April 10, 2018, the principal direction of groundwater flow in the overburden materials was to the northwest. EXP notes that groundwater flow directions and groundwater levels could vary across the site and can be influenced by utility trenches and other subsurface structures and may migrate in the bedding stone of nearby subsurface utility trenches or buildings.

5.3 Quality Assurance and Quality Control Measures

A QA/QC program was also implemented to ensure that the analytical results received are accurate and dependable. A QA/QC program is a system of documented checks that validate the reliability of the data collected regarding any given Site. Quality Assurance is a system that ensures that quality control procedures are correctly performed and documented. Quality Control refers to the established procedures observed both in the field and in the laboratory, designed to ensure that the resulting end data meet intended quality objectives. The QA/QC program implemented by EXP incorporated the following components:

- Collection and analysis of a blind duplicate soil sample to ensure analytical precision;
- Using dedicated and/or disposal sampling equipment;
- Following proper decontamination protocols to minimize cross-contamination;
- Maintaining field notes and completing field forms to document on-site activities; and,
- Using only laboratory supplied sample containers and following prescribed sample protocols, including proper preservation, meeting sample hold times, proper chain of custody documentation, to ensure integrity of the samples.

Maxxam's QA/QC program involved the systematic analysis of control standards for the purpose of optimizing the measuring system as well as establishing system precision and accuracy and included calibration standards, method blanks, reference standards, spiked samples, surrogates and duplicates.

6. Analytical Results

6.1 Soil Quality

One worst case soil sample from MW/BH 6 was submitted for laboratory analyses. The soil analytical results are summarized on Tables 1 to 3 in Appendix C and the Certificates of Analysis are enclosed in Appendix D.

6.1.1 Petroleum Hydrocarbons including BTEX

The PHC and BTEX concentrations in soil are shown in Table 1 in Appendix C. The concentrations of PHC and BTEX measured in the analysed soil samples were less than the laboratory detection limits and/or less than the MOECC 2011 Table 3 SCS.

6.1.2 VOCs

The VOCs concentrations in soil are shown in Table 2 in Appendix C. The concentrations of VOCs measured in the analysed soil samples were less than the laboratory detection limits and/ or less than the MOECC 2011 Table 3 SCS.

6.1.3 Metals

The metals concentrations in soil are shown in Table 3 in Appendix C. The concentrations of metals measured in the analysed soil samples were less than the laboratory detection limits and/ or were less than the MOECC 2011 Table 3 SCS.

6.2 Groundwater Quality

A groundwater sample was obtained from MW/BH6 the newly installed monitoring well. The groundwater analytical results are summarized on Tables 4 in Appendix C and the Certificates of Analysis are enclosed in Appendix D.

6.2.1 Petroleum Hydrocarbons including BTEX

The PHC and BTEX concentrations in the submitted groundwater samples are shown in Table 4 in Appendix C. The concentrations of PHC and BTEX measured in the analysed groundwater samples were less than the laboratory detection limits and/ or less than the MOECC 2011 Table 3 SCS.

6.3 Quality Assurance/Quality Control (QA/QC)

Details regarding quality assurance measures taken in the field, including instrument calibration, decontamination procedures, use of dedicated equipment, sample storage and Chain of Custody documentation were provided in Section 4, Methodology.

Review of field activity documentation indicated that recommended sample volumes were collected from soil and groundwater for each analytical test group into appropriate containers and preserved with proper chemical reagents in accordance with the protocols set out in the *Protocol for Analytical Methods used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act* (MOE, 2004). Samples were preserved at the required temperatures in insulated coolers and met applicable holding time requirements, when relinquished to the receiving laboratory.

Certificates of Analysis were received from Maxxam reporting the results of all the chemical analyses performed on the submitted soil and groundwater samples. Copies of the Maxxam Certificates of Analysis

are provided in Appendix D. A review of the Certificates of Analysis prepared by Maxxam indicates that they were in compliance with the requirements set out under subsection 47(3) of O.Reg. 153/04 (as amended).

Duplicate soil sample pair MW/BH 6-S3 and its duplicate MW/BH 6-S30 were submitted for chemical analysis of BTEX and PHC F1. For QA/QC purposes, the analytical sample results are quantitatively evaluated by calculating the relative percent difference (RPD) between the samples and their duplicates. The concentrations of BTEX and PHC F1 were less than the laboratory reported detection limits for both the primary and duplicate samples and therefore RPD could not be calculated and the data is acceptable from a RPD perspective.

The analytical program conducted by Maxxam included analytical test group specific QA/QC measures to evaluate the accuracy and precision of the analytical results and the efficiency of analyte recovery during solute extraction procedures. Maxxam's laboratory QA/QC program consisted of the preparation and analysis of laboratory duplicate samples to assess precision and sample homogeneity, method blanks to assess analytical bias, spiked blanks and QC standards to evaluate analyte recovery, matrix spikes to evaluate matrix interferences and surrogate compound recoveries (VOCs only) to evaluate extraction efficiency. The laboratory QA/QC results are presented in the Quality Assurance Report provided in the Certificate of Analysis prepared by Maxxam. The QA/QC results are reported as percent recoveries for matrix spikes, spike blanks and QC standards, relative percent difference for laboratory duplicates and analyte concentrations for method blanks.

7. Conclusions

Based on the Phase II ESA results for the proposed new riverside south catholic elementary school, the following conclusions are provided:

- The stratigraphy at the Site generally consists of a layer of a mixture of silty sand, silty clay, trace gravel fill material followed by silty sand and silty clay, underlain by clay then glacial till. No petroleum impact to soil was observed.
- Groundwater was encountered at depths of 0.04 m to 2.25 m below the ground surface. No petroleum odours were observed during the sampling event. The groundwater flow direction was calculated to be to the northwest.
- The concentrations of PHC, BTEX, VOCs, and metals measured in the soil sample from MW/BH 6 were less than the laboratory detection limits and/or less then the MOECC 2011 Table 3 SCS.
- The concentrations of PHC, and BTEX measured in the groundwater sample from MW/BH 6 were less than the laboratory detection limits and/or less then the MOECC 2011 Table 3 SCS.

The subject site is at a lower elevation then surrounding properties, therefore more fill is expected to be imported to the site. However, the geotechnical investigation completed concurrently recommends Ontario Provincial Standard Specific material to be used though out the site.

If the wells are no longer needed, they should be decommissioned in accordance with Ontario Regulation 903.

8. Limitation of Liability, Scope of Report, and Third Party Reliance

Basis of Report

This report ("Report") is based on site conditions known or inferred by the investigation undertaken as of the date of the Report. Should changes occur which potentially impact the condition of the site the recommendations of EXP may require re-evaluation. Where special concerns exist, or by Centre Des Ecoles Catholiques Du Centre-Est ("the Client") has special considerations or requirements, these should be disclosed to EXP to allow for additional or special investigations to be undertaken not otherwise within the scope of investigation conducted for the purpose of the Report.

Where applicable, recommended field services are the minimum necessary to ascertain that construction is being carried out in general conformity with building code guidelines, generally accepted practices and EXP's recommendations. Any reduction in the level of services recommended will result in EXP providing qualified opinions regarding the adequacy of the work. EXP can assist design professionals or contractors retained by the Client to review applicable plans, drawings, and specifications as they relate to the Report or to conduct field reviews during construction.

Reliance on Information Provided

The evaluation and conclusions contained in the Report are based on conditions in evidence at the time of site inspections and information provided to EXP by the Client and others. The Report has been prepared for the specific site, development, building, design or building assessment objectives and purpose as communicated by the Client. EXP has relied in good faith upon such representations, information and instructions and accepts no responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of any misstatements, omissions, misrepresentation or fraudulent acts of persons providing information. Unless specifically stated otherwise, the applicability and reliability of the findings, recommendations, suggestions or opinions expressed in the Report are only valid to the extent that there has been no material alteration to or variation from any of the information provided to EXP. If new information about the environmental conditions at the Site is found, the information should be provided to EXP so that it can be reviewed and revisions to the conclusions and/or recommendations can be made, if warranted.

Standard of Care

The Report has been prepared in a manner consistent with the degree of care and skill exercised by engineering consultants currently practicing under similar circumstances and locale. No other warranty, expressed or implied, is made. Unless specifically stated otherwise, the Report does not contain environmental consulting advice.

Complete Report

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment form part of the Report. This material includes, but is not limited to, the terms of reference given to EXP by the Client, communications between EXP and the Client, other reports, proposals or documents prepared by EXP for the Client in connection with the site described in the Report. In order to properly understand the suggestions, recommendations and opinions expressed in the Report, reference must be made to the Report in its entirety. EXP is not responsible for use by any party of portions of the Report.

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Use of Report

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. No other party may use or rely upon the Report in whole or in part without the written consent of EXP. Any use of the Report, or any portion of the Report, by a third party are the sole responsibility of such third party. EXP is not responsible for damages suffered by any third party resulting from unauthorised use of the Report.

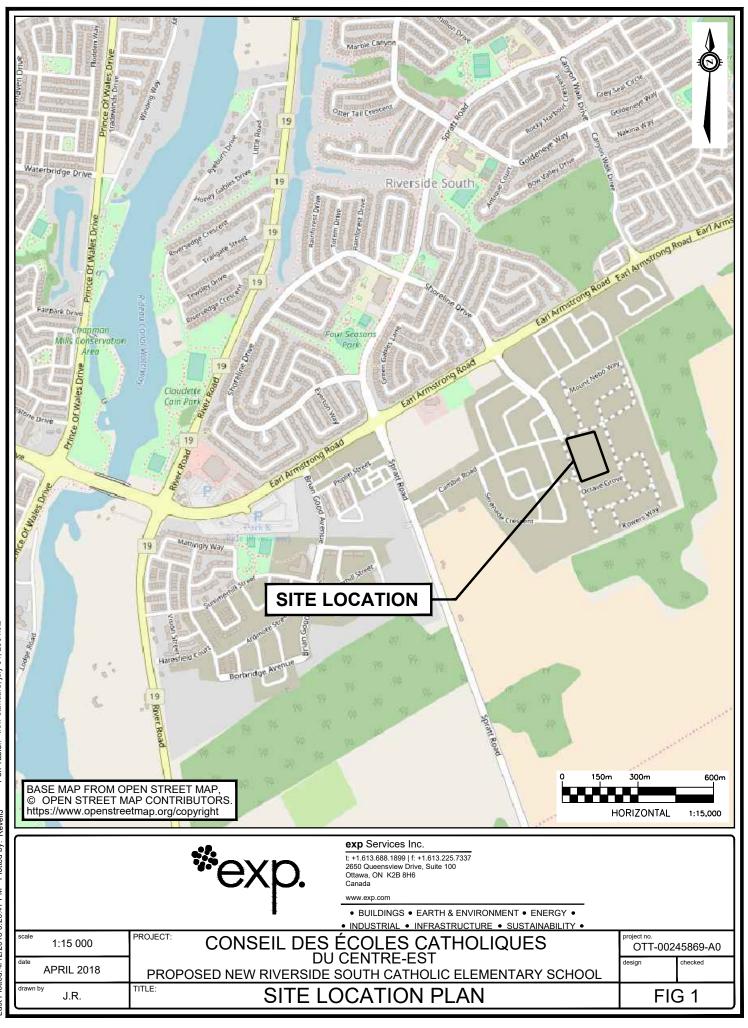
Where EXP has submitted both electronic file and a hard copy of the Report, or any document forming part of the Report, only the signed and sealed hard copy shall be the original documents for record and working purposes. In the event of a dispute or discrepancy, the hard copy shall govern. Electronic files transmitted by EXP utilize specific software and hardware systems. EXP makes no representation about the compatibility of these files with the Client's current or future software and hardware systems. Regardless of format, the documents described herein are EXP's instruments of professional service and shall not be altered without the written consent of EXP.

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Appendices

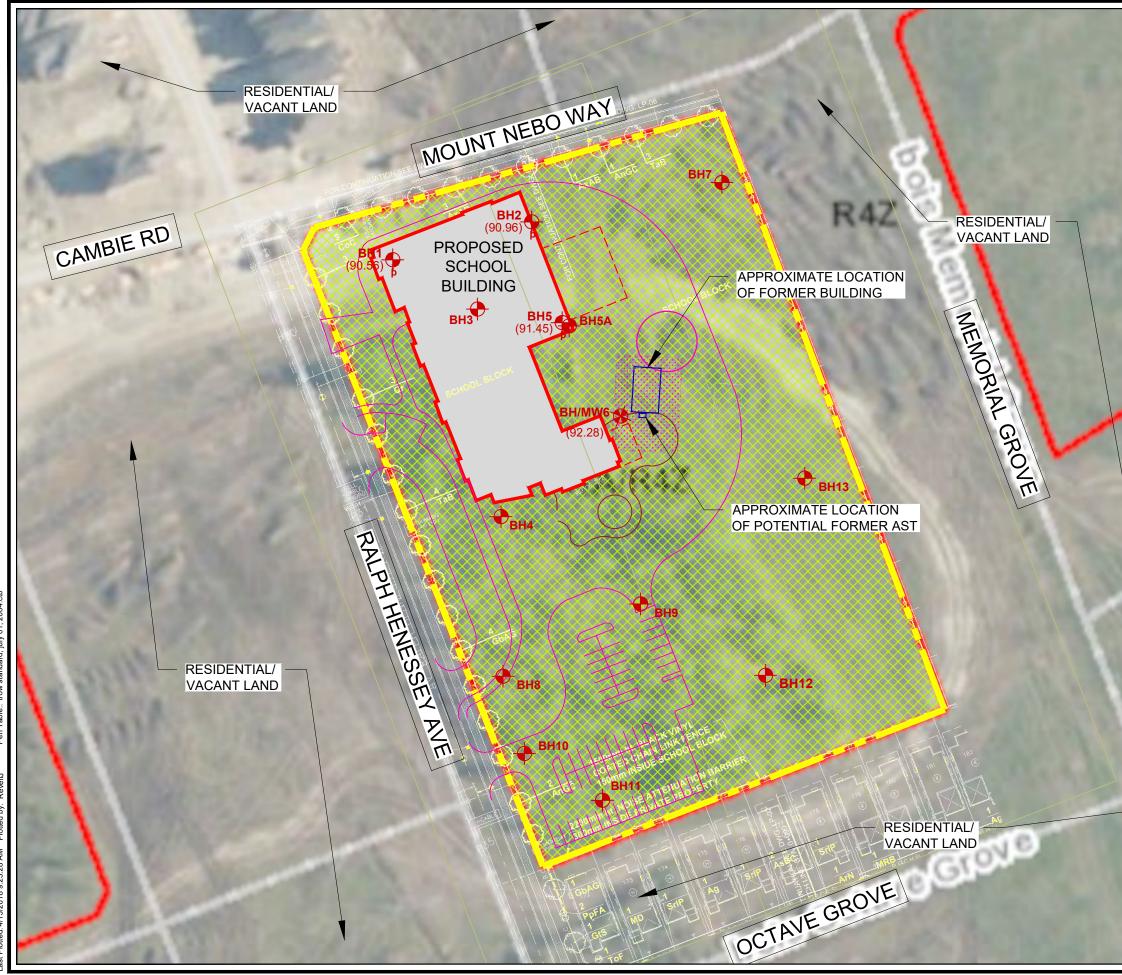
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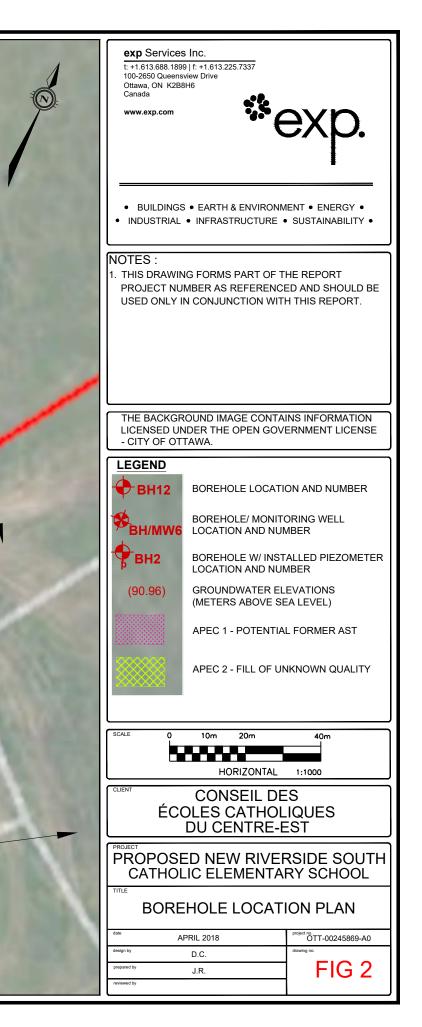
Appendix A: Figures



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Appendix B: Borehole Logs

Explanation of Terms Used on Borehole Records

SOIL DESCRIPTION

Terminology describing common soil genesis:

Topsoil: mixture of soil and humus capable of supporting good vegetative growth.

Peat: fibrous fragments of visible and invisible decayed organic matter.

- Fill: where fill is designated on the borehole log it is defined as indicated by the sample recovered during the boring process. The reader is cautioned that fills are heterogeneous in nature and variable in density or degree of compaction. The borehole description may therefore not be applicable as a general description of site fill materials. All fills should be expected to contain obstruction such as wood, large concrete pieces or subsurface basements, floors, tanks, etc.; none of these may have been encountered in the boreholes. Since boreholes cannot accurately define the contents of the fill, test pits are recommended to provide supplementary information. Despite the use of test pits, the heterogeneous nature of fill will leave some ambiguity as to the exact composition of the fill. Most fills contain pockets, seams, or layers of organically contaminated soil. This organic material can result in the generation of methane gas and/or significant ongoing and future settlements. Fill at this site may have been monitored for the presence of methane gas and, if so, the results are given on the borehole logs. The monitoring process does not indicate the volume of gas that can be potentially generated nor does it pinpoint the source of the gas. These readings are to advise of the presence of gas only, and a detailed study is recommended for sites where any explosive gas/methane is detected. Some fill material may be contaminated by toxic/hazardous waste that renders it unacceptable for deposition in any but designated land fill sites; unless specifically stated the fill on this site has not been tested for contaminants that may be considered toxic or hazardous. This testing and a potential hazard study can be undertaken if requested. In most residential/commercial areas undergoing reconstruction, buried oil tanks are common and are generally not detected in a conventional geotechnical site investigation.
- *Till:* the term till on the borehole logs indicates that the material originates from a geological process associated with glaciation. Because of this geological process the till must be considered heterogeneous in composition and as such may contain pockets and/or seams of material such as sand, gravel, silt or clay. Till often contains cobbles (60 to 200 mm) or boulders (over 200 mm). Contractors may therefore encounter cobbles and boulders during excavation, even if they are not indicated by the borings. It should be appreciated that normal sampling equipment cannot differentiate the size or type of any obstruction. Because of the horizontal and vertical variability of till, the sample description may be applicable to a very limited zone; caution is therefore essential when dealing with sensitive excavations or dewatering programs in till materials.

Terminology describing soil structure:

- Desiccated: having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc.
- *Stratified:* alternating layers of varying material or color with the layers greater than 6 mm thick.
- *Laminated:* alternating layers of varying material or color with the layers less than 6 mm thick.
- *Fissured:* material breaks along plane of fracture.
- *Varved:* composed of regular alternating layers of silt and clay.
- *Slickensided:* fracture planes appear polished or glossy, sometimes striated.
- *Blocky:* cohesive soil that can be broken down into small angular lumps which resist further breakdown.



- inclusion of small pockets of different soil, such as small lenses of sand scattered Lensed: through a mass of clay; not thickness.
- Seam: a thin, confined layer of soil having different particle size, texture, or color from materials above and below.

Homogeneous: same color and appearance throughout.

Well Graded: having wide range in grain sized and substantial amounts of all predominantly on grain size.

Uniformly Graded: predominantly on grain size.

All soil sample descriptions included in this report follow the ASTM D2487-11 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System). The system divides soils into three major categories: (1) coarse grained, (2) fine-grained, and (3) highly organic. The soil is then subdivided based on either gradation or plasticity characteristics. The system provides a group symbol (e.g. SM) and group name (e.g. silty sand) for identification. The classification excludes particles larger than 76 mm. Please note that, with the exception of those samples where a grain size analysis has been made, all samples are classified visually in accordance with ASTM D2488-09a Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Visual classification is not sufficiently accurate to provide exact grain sizing or precise differentiation between size classification systems. Others may use different classification systems; one such system is the ISSMFE Soil Classification.

| | | | | IS | SMFE SOIL | CLASSIFIC | CATION | | | | |
|------|------|--------|--------|------|-----------|-----------|--------|--------|--------|---------|----------|
| CLAY | | SILT | | | SAND | | | GRAVEL | | COBBLES | BOULDERS |
| | FINE | MEDIUM | COARSE | FINE | MEDIUM | COARSE | FINE | MEDIUM | COARSE | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| 0.002 | 0.006 | 0.02 | 0.06 | 0.2 | 0.6 | 2.0 | 6.0 | 20 | 60 | 200 |
|-------|-------|------|------|-----|-----|-----|-----|----|----|-----|
| | 1 | | | | | 1 | I | I | | |

| CLAY (PLASTIC) TO | FINE | MEDIUM | CRS. | FINE | COARSE |
|-------------------|----------------|--------------|--------|------|--------|
| SILT (NONPLASTIC) | | SAND | GRAVEL | | |
| Ĩ | JNIFIED SOIL C | LASSIFICATIO | ON | | |

Terminology describing materials outside the USCS, (e.g. particles larger than 76 mm, visible organic matter, construction debris) is based upon the proportion of these materials present and as described below in accordance with Note 16 in ASTM D2488-09a:

| Table a: F | Percent or Proportion of Soil, Pp |
|------------|--|
| | Criteria |
| Trace | Particles are present but estimated to be less than 5% |
| Few | 5≤Pp≤10% |
| Little | 15≤Pp≤25% |
| Some | 30≤Pp≤45% |
| Mostly | 50≤Pp≤100% |

The standard terminology to describe cohesionless soils includes the compactness as determined by the Standard Penetration Test 'N' value:

| Table b: Apparent Density of | Cohesionless Soil |
|------------------------------|-------------------------|
| | 'N' Value (blows/0.3 m) |
| Very Loose | N<5 |
| Loose | 5≤N<10 |
| Compact | 10≤N<30 |
| Dense | 30≤N<50 |
| Very Dense | 50≤N |

*ex_t

The standard terminology to describe cohesive soils includes consistency, which is based on undrained shear strength as measured by insitu vane tests, penetrometer tests, unconfined compression tests or similar field and laboratory analysis, Standard Penetration Test 'N' values can also be used to provide an approximate indication of the consistency and shear strength of fine grained, cohesive soils:

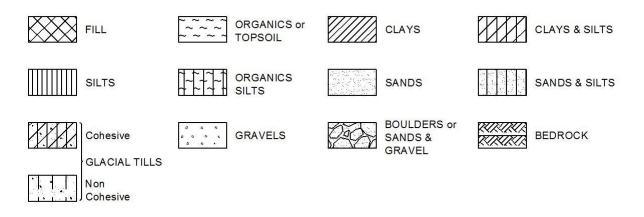
| Consistency | Vane Shear Measurement (kPa) | 'N' Value |
|-------------|------------------------------|-----------|
| Very Soft | <12.5 | <2 |
| Soft | 12.5-25 | 2-4 |
| Firm | 25-50 | 4-8 |
| Stiff | 50-100 | 8-15 |
| Very Stiff | 100-200 | 15-30 |
| Hard | >200 | >30 |

Table c: Consistency of Cohesive Soil

Note: 'N' Value - The Standard Penetration Test records the number of blows of a 140 pound (64kg) hammer falling 30 inches (760mm), required to drive a 2 inch (50.8mm) O.D. split spoon sampler 1 foot (305mm). For split spoon samples where full penetration is not achieved, the number of blows is reported over the sampler penetration in meters (e.g. 50/0.15).

STRATA PLOT

Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols:



WATER LEVEL MEASUREMENT

$\overline{\Delta}$

Open Borehole or Test Pit

Monitoring Well, Piezometer or Standpipe

V



| roject: | Geotechnical Investigation - Proposed No | ew Rivers | ide | e South Catholic E | leme | entary | | igure l | | 3 | _ | |
|------------------|---|-----------------------|-------------|--|------------------|--------|--------------------|-----------------|--------------------------------------|--|---|---------------------|
| ocation: | Ralph Henessey Avenue and Mount Neb | o Way, O | tta | wa, ON. | | | | Pa | ge | 1_of_2 | 2 | |
| ate Drilled: | 'April 2, 2018 | | | Split Spoon Sample | | Б | 3 | Combus | stible Va | pour Reading | ı | |
| rill Type: | CME-75 Track Mount Drill Rig | | | Auger Sample | | ٥ | 0 | Natural | Moisture | Content | , | X |
| atum: | Geodetic Elevation | | | SPT (N) Value Dynamic Cone Test | | | - - | Undrain | rg Limits ed Triaxi | | | —⊖ ⊕ |
| ogged by: | A.N. Checked by: S.P. | | - | Shelby Tube Shear Strength by | | - | ■ + 3 | Shear S | n at Failu Strength t meter Te | ру | | <u>ل</u> |
| | | | _ | Vane Test | | | | | | | | |
| S Y M B | SOIL DESCRIPTION | Geodetic Elevation | D e p | | ation I | | alue 80 | 2 | 50 5 | our Reading (500 750 | , | A M P Unit Wt |
| D L | | | h | Shear Strength 50 100 | 15 | 50 | kPa 200 | | | ture Content % s (% Dry Weig 40 60 | nht) | kN/m ³ |
| Mixtu | : ure of silty sand and silty clay, gravel and d debris, brown and grey, moist, (loose) - | | | | | | | | × | | | $\left(\right)$ |
| | SOIL ~200mm | 92.1 91.9 | | | | | | | | | | |
| | ERED SILTY SAND AND SILTY CLAY | | 1 | 0.000000000000000000000000000000000000 | | | | | | X | | 18.4 |
| soft t | to stiff) | - | | | | | | | | | | |
| | | | | -5 O | | | | | | X | | $\langle $ |
| | - | 90.51 | 2 | | | | | | | | | |
| | - | Ham | ime | er Weight | ··· ·· ··· ·· | •••••• | <u></u> | · · · · · · · · | × | + (+) + (+) + (+) + (+) + (+) + (+) | <u>····</u> ···· | \bigwedge |
| | ~ | 89.8 | 3 | | | | | | | | | |
| CLA Brow | <u>r</u> n, wet, (very soft) | | ime | er Weight | | | | | | * | | Λ |
| <u> </u> | <u>-</u> <u>Y</u> | 89.2 | | 38 | | | | | | | | |
| _Grey | , wet, (firm to stiff) | - | 4 | s=8.0 | | | | | | | | |
| | - | | | 67 | | | | | | | ···· | |
| | | Ham | nme | s = 7.0 ⊕ | | | | | | | ×: | 7 |
| | - | 1 | 5 | | | | | | | | | ~\ F |
| | | 87.2 | | s = 6.5 | :-> -> :-> -> | | ;;; ;;; | | | · · · · · · · · · · · · · · · · · · · | ···· | |
| Silty | <u>CIAL TILL</u> sand to sandy silt, some clay, gravel, | | 6 | | | | | | | | ::::: :::::::::::::::::::::::::::::::: | |
| CODD | les, boulders, grey, wet, (dense) | | | 41 | | | | | | | | 7 |
| | | 86.1 | | | | | | | | | | Δ |
| - cond | amic Cone Penetration Test (DCPT) lucted from 7.0 m to Cone Refusal Depth- | - | 7 | | | | | | | | | |
| of 10 | J.5 M | | | N. | | | | | | | | |
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| ά. | Continued Next Page | | 10 | | | | | |
| O | NOTES: 1. Borehole data requires interpretation by EXP before | WA ⁻ | TER LEVEL RECO | RDS | | CORE D | RILLING RECOR | D |
| BHL | use by others | Elapsed Time | Water Level (m) | Hole Open To (m) | Run No. | Depth (m) | % Rec. | RQD % |
| OF BOREHOLE | 2.A 19 mm diameter standpipe piezometer installed in borehole as shown. | Completion 9 days | 2.7 2.3 | 6.1 | | | | |
| ORE | 3. Field work supervised by an EXP representative. | 9 uays | 2.5 | | | | | |
| OFB | 4. See Notes on Sample Descriptions | | | | | | | |
| POG | 5.Log to be read with EXP Report OTT-00245869-A0 | | | | | | | |

Log of Borehole BH-1



Figure No. Project: Geotechnical Investigation - Proposed New Riverside South Catholic Elementary School

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| G N L | S Y M | | Geodeti | e | | 20 | 4 | | | 80 | 2 | 50 5 | 00 7 | 50 | Ă | Natu |
| v | S Y B O L | SOIL DESCRIPTION | Elevatio | n p t h | Shear | Stren | gth | | | kPa | 1 | | ture Conte s (% Dry V | | SAMPLES | Unit kN/ı |
| | L | | | 10 | | 50 | 10 • • • • • | 00 <u>15</u> | 50 2 ••••• | 200 •••••• | | <u>20</u> | 40 - - : - : - : : | 60 • • • • • • • • • | | |
| | | | 82.3 | | | | \sim | | <u>.</u> | | | | | | | |
| | | Cone Refusal at 10.5 m Dept | th | | | | | | | | | | | | | |
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| | TES: | | WΔT | ERI | EVEL R | ECO | RDS | | | | 00 |)RE DRI | LLING R | ECORD | | |
| 1. | Borehole da use by othei | ta requires interpretation by EXP before | Elapsed | | Water | | | Hole Ope | n | Run | Dep | th | % Re | | R | 2D % |
| | • | ameter standpipe piezometer installed in shown. | Time Completion | L | <u>_evel (m</u> 2.7 |) | - | <u>To (m)</u> 6.1 | | No. | (m |) | | | | |
| | | | 9 days | | 2.3 | | | 0.1 | | | | | | | | |
| | | upervised by an EXP representative. | | | | | | | | | | | | | | |
| | | on Sample Descriptions | | | | | 1 | | | | | | | | | |
| 5. | Log to be re | ad with EXP Report OTT-00245869-A0 | 1 | | | | 1 | | | | | | | | | |

| OI | NOTES: | WA | TER LEVEL RECOR | RDS | | CORE DF | RILLING RECOR | D |
|----------|--|------------|-----------------|---------------|-----|---------|---------------|-------|
| BHL | 1. Borehole data requires interpretation by EXP before use by others | Elapsed | Water | Hole Open | Run | Depth | % Rec. | RQD % |
| щ | 2 A 10 mm diameter standning nigzameter installed in | Time | Level (m) | <u>To (m)</u> | No. | (m) | | |
| BOREHOLE | 2.A 19 mm diameter standpipe piezometer installed in borehole as shown. | Completion | 2.7 | 6.1 | | | | |
| 픲 | | 9 days | 2.3 | | | | | |
| 뜅 | 3. Field work supervised by an EXP representative. | | | | | | | |
| OFB | 4. See Notes on Sample Descriptions | | | | | | | |
| Ö | 5. Log to be read with EXP Report OTT-00245869-A0 | | | | | | | |
| 21 | | | | | | | | |

Project No: <u>OTT-00245869-A0</u>

| oject: | Geotechnical Investigation - Pro | | | | | | holic | Elem | entary | | Figure Pa | | 1_ of | 2 | | I |
|-----------------------|---|----------|-----------------------|-------------|------------------------------|---------------------|-------------|-----------------------|---------------------------------------|---------------------------------------|--------------|---------------------------|------------------------------|-----------------|---------------------|------------------|
| ocation: | Ralph Henessey Avenue and M | ount Neb | o Way, C | Otta | awa, ON | | | | | | | | | | | |
| | 'April 3, 2018 | | | - | Split Spo Auger Sa | | • | е | | | | stible Vap Moisture | | ding | | □ × |
| ill Type: | CME-75 Track Mount Drill Rig | | | - | SPT (N) | Valu | е | | 0 | | Atterbe | rg Limits | | | ⊢ | -O |
| atum: | Geodetic Elevation | | | - | Dynamic Shelby T | | e Tes | st | | | | ned Triaxia n at Failu | | | | \oplus |
| gged by: | A.N. Checked by: | S.P. | | | Shear St Vane Te | | th by | | + s | | | Strength b ometer Te | | | | |
| S Y M B O | SOIL DESCRIPTION | | Geodetic Elevation | D e p |) | andar 20 | d Pen 4(| | Test N Va | lue 80 | Na | atural Moist | i00 7 ture Conte | '50 ent % | i) S A M P | Natura Unit W |
| L | | | m 92.55 | h h | Shear S | Streng | th 10 | 01 | 50 2 | kPa 200 | Atter | berg Limits | s (% Dry V 40 | Veight) 60 | LES | kN/m |
| | re of silty sand, silty clay and top n and dark brown, wet, (compact | | | | .∵.12 .⊙ | | | | | | | × | | | | |
| | SOIL ~100mm | , | 91.9 91.8 | | | | | | | | | | | | | |
| | RED SILTY SAND AND SILTY n, moist, (very loose to loose/soft | CLAY - | - | 1 | 6 .Q | | | | | | | × | | | ΞX | 19.6 |
| firm) | | - | 90.95 | 5 | | | | **** | | | | | | | ÷/ | |
| rootle | ts from 0.8 m to 1.4 m depths | | | | 2 : | | | | | | | × | | | | |
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| | frogmonto from 2.2 m to 2.0 m d | _ | - | | 2: : : : : : Q: : : : : : | • : • : • : • : | <u></u> | <u></u> | · · · · · · · · · · · · · · · · · · · | + + + + + + + + + + + + + + + + + + + | · • • • • • | ×. | + (+) -> (+ + (+) -> (+ | · · · · · · · · | <u>*</u> } | 19.6 |
| | fragments from 2.3 m to 2.9 m d | | 89.6 | 3 | | | | | | | | | | | | |
| <u>CLA</u> Grey, | <u>r</u> wet, (stiff) | | Har | nm | er Weight | | | | | | | | × | | 2 | |
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| | | _ | Har | nm | er Weight- | = 5. | 2 | <u> </u> | | | | | | | | |
| | | | 88.2 | | Ŷ | | | | | | | | | | 2 | |
| Silty : | <u>CIAL TILL</u> sand to sandy silt, some rootlets, | | | | | | | ÷ | 69 | | | | | | | |
| | es, boulders, grey, wet, (compac dense) | t to _ | - | 5 | | | | **** | | | × | | | | <u> </u> | |
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| | equires interpretation by EXP before | Elaps | | RI | LEVEL RE Water | CO | | lole Op | en | Run | C | ORE DRI | LLING RI % Re | | | RQD % |
| A 19 mm diame | eter standpipe piezometer installed in | Comple | ne | | Level (m) 3.0 | | | <u>To (m)</u> 10.1 | | No. | (m 10.1 - | 1) | 100 | | | 33 |
| borehole as sho | own. | 8 da | | | 1.6 | | | | | 2 | 10.4 | | 100 | | | 97 |

Log of Borehole <u>BH-2</u>



Geotechnical Investigation - Proposed New Riverside South Catholic Elementary School

Figure No. 2 _

| Τ | s Y | | Geodetic | De | 5 | Stan | idard Pe | netra | ation T | est N Va | ue | | stible Vapo 50 50 | | ing (ppm) 750 | S A | Natur |
|---|----------------------|---|------------|---------|-------|-------------|---|-------|---------|---------------------------------------|-----------|-------------|-----------------------------|-----------------------|------------------|--------|--------|
| | SYMBOL | SOIL DESCRIPTION | Elevation | p t | Shee | 20 r Str | rength | 40 | 6 | 0 | 30 kPa | Na Atter | tural Moisti berg Limits | ure Conte (% Drv) | ent % Weight) | ΡI | Unit V |
| | Ľ | | m 82.55 | h 10 | | 50 | 1 | 00 | 15 | | 00 | | 20 4 | 0 | | E S | kN/n |
| | | LIMESTONE BEDROCK | 82.5 | 10 | | :: | | ÷ | | | | | | · · · · · · · · | | | Run |
| | X | LIMESTONE BEDROCK Horizontal and vertical fractures, grey, (poor | | | 1:::: | | <u></u> | | | · · · · · · · · · · · · · · · · · · · | | | | • • • • • • • | | - | Tur |
| K | $\langle \rangle$ | and exellent quality) | | | | :: | 1 · · · · · · · · · · · · · · · · · · · | ÷ | | ***** | ***** | | | | | | |
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| | \mathbb{X} | | 80.6 | 12 | | | ··· ·· · | | | ***** | | | | | | | |
| | | Borehole Terminated at 12.0 m Depth | | 12 | | : | * * * * | | :::: | | | | | | | | |
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| LOG | NOTES: 1.Borehole data requires interpretation by EXP before | WAT | TER LEVEL RECOR | RDS | | CORE DF | RILLING RECOR | D |
|-------|---|-----------------|--------------------|---------------------|------------|--------------|---------------|-------|
| BH | use by others | Elapsed Time | Water Level (m) | Hole Open To (m) | Run No. | Depth (m) | % Rec. | RQD % |
| OLE | 2. A 19 mm diameter standpipe piezometer installed in | Completion | 3.0 | 10.1 | 1 | 10.1 - 10.4 | 100 | 33 |
| ΕH | borehole as shown. | 8 days | 1.6 | | 2 | 10.4 - 12 | 100 | 97 |
| ORI | 3. Field work supervised by an EXP representative. | | | | | | | |
| DF B | 4. See Notes on Sample Descriptions | | | | | | | |
| LOG (| 5. Log to be read with EXP Report OTT-00245869-A0 | | | | | | | |

Project:

Project No: <u>OTT-00245869-A0</u>

| | Logo | of Bo | D | rehole | Bł | 1-3 | | | F | vn |
|--------------------------|---|-------------------------------------|-----------------------|---|--------------------------|---------------------------|-------------------------------------|--|-------------|----------|
| Project No: | OTT-00245869-A0 | | | | | | | 5 | C | mp. |
| Project: | Geotechnical Investigation - Proposed Ne | ew Riversi | ide | South Catholic El | lementa | | Figure No. | | | I |
| Location: | Ralph Henessey Avenue and Mount Neb | o Way, O | tta | wa, ON. | | | Page | <u>1</u> of <u>1</u> | - | |
| Date Drilled: | 'April 2, 2018 | | _ | Split Spoon Sample | | \boxtimes | Combustible V | apour Reading | | |
| Drill Type: | CME-75 Track Mount Drill Rig | | _ | Auger Sample SPT (N) Value | | | Natural Moistur Atterberg Limits | | ⊢ | × ⊙ |
| Datum: | Geodetic Elevation | | - | Dynamic Cone Test Shelby Tube | | | Undrained Tria: % Strain at Fail | xial at | - | \oplus |
| Logged by: | A.N. Checked by: S.P. | | | Shear Strength by Vane Test | | + s | Shear Strength Penetrometer 1 | | | ▲ |
| G Y M W B U O L | SOIL DESCRIPTION | Geodetic Elevation m 92.64 | D e p t h | Standard Penetra 20 40 Shear Strength 50 100 | tion Test N 60 150 | Value 80 kPa 200 | 250 Natural Moi | apour Reading (ppr 500 750 isture Content % its (% Dry Weight) 40 60 | A M P | Unit Wt. |
| grav loos | ure of silty sand and silty clay, trace el, roots, brown and grey, wet, (very/ | 92.2 | 1 | 2 | | | × | A. A. A. A. A. A. A. A. A. | X | 19.2 |

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s=4.8 Hammer Weight

53 s=4.4

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87.0

85.9

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Hammer Weight

3 Hammer Weignt

firm)

depths

CLAY Grey, wet, (firm to stiff)

Roots and rootlets from 0.4 m to 1.4 m

CLAY Shell fragments, grey, moist, (very stiff)

Borehole Terminated at 6.7 m Depth

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245869 - RIVERSIDE SOUTH SCHOOL.GPJ TROW OTTAWA.GDT 4/13/18

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| LOG | NOTES: 1. Borehole data requires interpretation by EXP before use by others | WAT | TER LEVEL RECO | RDS | | CORE DF | RILLING RECOR | D |
| | use by others | Elapsed Time | Water Level (m) | Hole Open To (m) | Run No. | Depth (m) | % Rec. | RQD % |
| OLE | 2. Borehole backfilled with cuttings upon completion | Completion | 3.0 | 6.1 | | | | |
| BOREHOL | 3. Field work supervised by an EXP representative. | | | | | | | |
| | 4. See Notes on Sample Descriptions | | | | | | | |
| LOG OF | 5. Log to be read with EXP Report OTT-00245869-A0 | | | | | | | |

| - | Geotechnical Investigation - Pro | | | | | | atholic | Elem | entary | | Figure P | No age | 6 1_ of | | | |
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| | Ralph Henessey Avenue and M | | o way | y, Oti | | | | | | | | | | | | |
| | 'April 3, 2018 | | | | | Spoor San | n Sampl nple | е | | - | | | apour Rea e Content | - | | □ × |
| | CME-75 Track Mount Drill Rig | | | | | (N) Va | alue Cone Tes | .+ | С |) | | erg Limits ned Triax | | I | | - O |
| | Geodetic Elevation | | | | Shel | by Tub | be | | | 1 | % Stra | in at Fail | ure | | | \oplus |
| gged by: | A.N. Checked by: | S.P. | | | | ar Stre Test | ngth by | | + s | - | | Strength ometer T | | | | |
| S Y B O | | | Geod | | De | | | | Fest N Va | | | 250 | | 750 | S A M P | Natura |
| B O L | SOIL DESCRIPTION | | Eleva m 92.2 | | h | 20 ear Stre 50 | 40 ength 10 | | | 80 kPa 200 | Atte | atural Moi erberg Lim 20 | sture Cont its (% Dry ' 40 | ent % Weight) 60 | | Unit W kN/m |
| | I <mark>OIL</mark> ~100mm | | 92.2 92.1 | | 0 4 | | | | | 200 | | | | | Ň | 17.4 |
| Brown | RED SILTY SAND AND SILTY n, moist, (very loose to loose/sof | t to - | - | | | | | ÷ ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; | | | · · · · · · · · · | | | | | 17.2 |
| firm) | | _ | | | 1 5 | | | <u></u> | | | | | | | \mathbb{N} | 170 |
| | | | | | | | | | | | | | | | <u> </u> | 17.9 |
| | | _ | 1 | | 2 | | | | | | | | | | \mathbb{N} | |
| | | | 90.0 | | 2 | | | >120 | | | | * | | | | 4 |
| CLAY Browr | , wet, (very stiff) | _ | | Ham | ner We | ght | | | | | | | | | | |
| | | | 89.2 | | φ | | .77 | | | | | | X | | \mathbb{N} | |
| CLAY | wet, (firm to stiff) | | | Hamr | ³ | ght | s = 8.0 | | | | | | | | | |
| Giey, | | _ | - | | Φ | 48 | | | | | | | | × | X | |
| | | _ | | Hamr | ner We | s = 8. | 0 | | | | | | | | | |
| | | | | | Φ | 53 | | | | | | | | × | X | |
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| | | | | | | | 32 ⊨ | <pre></pre> | | | | |) | | D | 1 |
| <u>CLAY</u> | , | | 86.5 | | | | 0.5 | | | | | | | | | |
| -Silt se | ams, grey, wet, (stiff to very stif | if) – | - | | 6 | | | <u></u> | ····· | | | | | | | |
| _ | | _ | - | Hamr | ner We | $\overline{\cdot}$ | | ***** ****** 7. * * * * | | | | | × | | ΞX | |
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| 1/1/1/1 | Continued Next Page | | | | 10 | •••• | · · · · · · · · · · · · · · · · | | <u></u> | | | | | | | 1 |
| | equires interpretation by EXP before | Elaps | sed | ATER | Wat | er | ORDS | lole Op | | Run | De | pth | RILLING F % Re | | | QD % |
| | led with cuttings upon completion. | Tin Compl | ne | - | Level N/A | | | To (m N/A | | <u>No.</u> 1 | 1) | n) - 11.7 | 100 | | | 31 |
| Field work super | vised by an EXP representative. | | | | | | | | | 2 | 11.7 13.1 | - 13.1 | 64 100 | | | 34 61 |

Log of Borehole <u>BH-4</u>



Figure No. Project: Geotechnical Investigation - Proposed New Riverside South Catholic Elementary School

| s | | Geodetic | P | Sta | andar | d Pe | netration 7 | Fest N V | alue | Comt | ousti | ible Vapo | our Readi | ng (ppm) | ş | |
|---------------------------|--|-----------|-------------|---|----------------|---|--|-----------------|------------------------|--------------------|------------|--------------------------------|-----------------------|---------------------------------------|-----------|--------|
| Y M | SOIL DESCRIPTION | Elevation | D e p | | 20 | 4 | 0 6 | 60 | 80 | | 250 |) 50 | 00 7 | 50 | M | N U |
| SY MBOL | | m | t h | Shear S | | | | | kP | a Atte | | | ure Conte (% Dry V | | SAMPLES | k |
| | CLAY | 82.2 | 10 | - 3 . ↔ i ↔ | 50 | 1 | 00 1 | 50 1 | 200 | :: :::: | 20 | <u>4</u> | 0 6 | 50 • • • • • • • | s | ┢ |
| | Silt seams, grey, wet, (stiff to very stiff) | | | Ŏ:::: | | | | | | | × | \$ | | | ŧχ | |
| | (continued) | 81.7 | | \cdot | <u> </u> | :::: ::::::::::::::::::::::::::::::::: | • • • • • • | · · · · · · | <u></u> | :::::: | : | <u> :::::::</u> | · · · · · · · · · | | \square | |
| | GLACIAL TILL | | | | | | | | ***** | | 1 | } ··· { · } · ? ·:· ? · ? · | | | | , |
| ØŽ/ | Silty sand to sandy silt, some gravel, cobbles | | | | | 5 | 0 for 75 n | nm | | | | | | | ŧV | |
| K | and boulders, grey, wet | | 11 | | | ÷ | | $ \cdot\rangle$ | · · · · · · | | | • • • • • | • • • • • • | $\sim \sim \sim$ | łA | |
| $\forall /$ | LIMESTONE BEDROCK | 80.9 | | | | | | | | | | • • • • • • | | \sim | | |
| \bigotimes | Horizontal and vertical fractures, (poor and | - | | | <u> : : :</u> | <u>:::</u> : | | <u> </u> | : : : : : | ;;;;;;;; | :: | ; :: ; : ; : | | | | |
| $\mathbb{X}//$ | fair quality) | | | | | | | | | | | ; ; .; . ; ; . ; . | | | | |
| \mathbb{N} | | - | 12 | | | | | :::: | ; ; ; ; ; ; | | :: | ;;;;; | | | | |
| $\mathbb{V}/$ | | | | | | | | | ; . | | | ; ; ; ; ; ; | | | 1 | |
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| \bigotimes | | - | 13 | | | | | | | | | | | | | |
| K | | | | 2 | 1:1:3 | : <u>: : :</u> : | | 2221 | 24:22 | ::::::: | 21: | 2 :: : : : : | :::::::: | 2222 | | |
| \bowtie | S | - | | | <u> </u> | · · · · · | | | | ***** | <u>+</u> + | } ↔ (+}+ 1 + + + | | | | |
| K// | | | | | | | | 1.5 2 1 | (†) (÷) | : | :1: | \$ | | 13213 1 | 1 | |
| \bigotimes | | | 14 | | •••• | | | | S | | - | •••••• | | $\langle \cdot, \cdot, \cdot \rangle$ | 1 | |
| Ľ | | | 14 | | | ÷::: | :::::::::::::::::::::::::::::::::::::: | 1221 | <u>.</u> | | ÷ | · · · · · · · | | | | |
| X | | 77.8 | | | | | | | **** | | ÷ - | ;;.;. ;;. | | | | |
| | Borehole Terminated at 14.4 m Depth | | | | | :: | | | | | | | | | | |
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| ĽOĞ | NOTES: 1.Borehole data requires interpretation by EXP before | WAT | ER LEVEL RECOR | RDS | | CORE DF | RILLING RECOR | D |
|--------|---|-----------------|--------------------|---------------------|------------|--------------|---------------|-------|
| BH | use by others | Elapsed Time | Water Level (m) | Hole Open To (m) | Run No. | Depth (m) | % Rec. | RQD % |
| OLE | 2. Borehole backfilled with cuttings upon completion. | Completion | N/A | N/A | 1 | 11.3 - 11.7 | 100 | 31 |
| Ť | 3. Field work supervised by an EXP representative. | | | | 2 | 11.7 - 13.1 | 64 | 34 |
| F BOR | 4. See Notes on Sample Descriptions | | | | 3 | 13.1 - 14.4 | 100 | 61 |
| LOG OI | 5. Log to be read with EXP Report OTT-00245869-A0 | | | | | | | |

Project No: <u>OTT-00245869-A0</u>

| Project No: Project: | OTT-00245869-A0 Geotechnical Investigation - Proposed N | | | | | | | | Figure I | No | 7 | _ | | |
|-------------------------|--|----------------|------------------|----------------------|-------------------|------------|------------|-----------|---------------------|------------|----------------------------|----------------|---|------------------------------|
| Location: | Ralph Henessey Avenue and Mount Net | | | | | | entary | 301001 | Pa | ge | 1_ of | 1 | | |
| | | 0 vvay, O | แล | wa, Or | 4. | | | | | | | | | |
| Date Drilled: | | | | Split Spo Auger S | oon Sam ample | ple | | | | | pour Read e Content | ding | | □ × |
| Orill Type: | CME-75 Track Mount Drill Rig | | | SPT (N) | Value | | С | - | Atterber | g Limits | | F | | -Ð |
| Datum: | Geodetic Elevation | | | Dynamic Shelby 1 | c Cone To Fube | est | | - | Undrain % Strair | n at Failu | ıre | | | \oplus |
| ogged by: | A.N. Checked by: S.P. | | | Shear S Vane Te | trength b st | у | + s | - | Shear S Penetro | | | | | |
| s Y | | Geodetic | D | | andard Pe | enetration | Fest N Va | lue | | | our Readii 500 7 | ng (ppm) 50 | S A P | Natural |
| G M W B L O | SOIL DESCRIPTION | Elevation m | e p t h | Shear | 20 4 Strength | 40 0 | 60 | 80 kPa | | | sture Conte ts (% Dry V | | P L L L L L L L S | Unit Wt kN/m ³ |
| | | 92.97 | 0 | | 50 1 | 00 1 | 50 | 200 | 2 | 20 | 40 6 | 50 | Š | |
| Mixter Mixter | ure of silty sand, silty clay, gravel and oil, brown and dark brown, moist, (loose) - | _ | | •: O | | | | | | × | | | ĽŇ | |
| | SOIL ~150mm | 92.3 92.1 | | | | | | | | | | | F | |
| | ERED SILTY SAND AND SILTY CLAY - e gravel, brown, moist, (very loose to | - | 1 | 0 | | | | | | X | | | X | 19.1 |
| | e/soft to firm) | 91.47 | | | | | | | | | | | | |
| | | | | •5 ••• | | | | | | × | | | X | 18.7 |
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| | - | - | | 2 Q | | | 1.5 č. 1.5 | | | × | | | W | |
| | | 90.0 | | | | | | | | | | | Δ | |
| <u>CLA</u> Grev | Y, wet, (firm to stiff) | | 3 | 1 | | | | | | | | | $\overline{\mathbb{N}}$ | |
| | - | - | | 29 29 | | | | | | | | | | |
| | _ | – Ham | me | s = 4.0 Veignt | | | | | | | | | | |
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| | - | 87.2 | | s ·····s | = 4.4 | | | | | | | | | |
| GLA Silty | CIAL TILL sand to sandy silt, some clay, gravel, | | 6 | | | | | | | 1 | | | | |
| cobt | bles and boulders, grey, wet, (very dense) | | | | | | | | × | | | | Ŵ | |
| | - | | | | | | | | | | | | Δ | |
| | - | - | 7 | | | | | ****** | | | | | | |
| | _ | | | | | | 100 | | | | | | | |
| P/L2 | Auger Refusal at 7.7 m Depth | 85.3 | | | | 60 for | φ | | × | | | | × | |
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| H LOGS - | NOTES: 1. Borehole data requires interpretation by EXP before use by others | WA ⁻ Elapsed | TER LEVEL RECOR | RDS Hole Open | CORE DRILLING RECORD | | | | | |
| LOG OF BOREHOLE B | 2. A 19 mm diameter standpipe piezometer installed in borehole as shown. 3. Field work supervised by an EXP representative. | Time Completion 9 days | Level (m) 3.3 1.5 | <u>To (m)</u> 7.6 | No. | (m) | | | | |
| | 4. See Notes on Sample Descriptions5. Log to be read with EXP Report OTT-00245869-A0 | | | | | | | | | |

| Log of Borehole <u>BH-5A</u> *exr | | | | | | | | | | |
|-----------------------------------|---|--|---|---|-----------------------------------|--|--|--|--|--|
| Project No: | OTT-00245869-A0 | - ` | | | | | | | | |
| Project: | Geotechnical Investigation - Proposed New | Figure No. <u>8</u> pol Page. 1 of 1 | I | | | | | | | |
| Location: | Ralph Henessey Avenue and Mount Nebo | · •••••••••••••••••••••••••••••••••••• | | | | | | | | |
| Date Drilled: | 'April 4, 2018 | | Split Spoon Sample | Combustible Vapour Reading | | | | | | |
| Drill Type: | CME-75 Track Mount Drill Rig | | Auger Sample II SPT (N) Value O | Natural Moisture Content Atterberg Limits | × ──⊖ | | | | | |
| Datum: | Geodetic Elevation | | Dynamic Cone Test Shelby Tube | Undrained Triaxial at % Strain at Failure | \oplus | | | | | |
| Logged by: | A.N. Checked by: S.P. | | Shear Strength by + Vane Test S | Shear Strength by Penetrometer Test | | | | | | |
| G S M B C L | SOIL DESCRIPTION | Geodetic Elevation m 92.97 | D Standard Penetration Test N Value e 20 40 60 80 t Shear Strength k 50 100 150 200 | Pa Combustible Vapour Reading (ppm) 250 500 750 Natural Moisture Content % Atterberg Limits (% Dry Weight) 20 40 60 | S A P Unit Wt. E S | | | | | |
| Pow/ | er Augered to a 1.5 m Depth | | ` | | 4 1 1 | | | | | |

| L | ÕL | | m | h | Shear Streng | ıth | | kPa | | its (% Dry Weight) | LES | kN/m |
|--|------------------------------|--|--------|-----------|--|--|--|---|--|--|------------|------|
| _ | | | 92.97 | 0 | | 100 150 | 20 | 0 | 20 | 40 60 | - Ī | |
| | \otimes | Power Augered to a 1.5 m Depth | | | 13213213 | 211213213 | 3.3.3 | | | ;‡;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;; | 31 | |
| | $\times\!\!\times\!\!\times$ | | | | 13213113 | 211212213 | 333 | | | ::::::::::::::::::::::::::::::::::::::: | 31 | |
| | \otimes | _ | - | | | ******* | **** | · · · · · · · · · · | | ********** | <u>.</u> | |
| | \times | | | | 12212112 | ******* | ÷ • • • • • | • • • • • • • • • | | ********** | <u>::</u> | |
| | $\times\!\!\times\!\!\times$ | | | 1 | 1.2.2.1.2.1.2 | ******* | $\dot{\cdot}$ | | | ******* | ÷- | |
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| | \otimes | | | | | | | | | | 31 | |
| | $\sim\sim$ | | 91.5 | | | | ÷ : · ? · | • • • • • • • • • • • | | | <u></u> | |
| | | Dynamic Cone Penetration Test (DCPT) conducted from 1.8 m to Cone Refusal Depth | | | | | | | | | <u>:</u> : | |
| | | conducted from 1.8 m to Cone Refusal Depth | | | ☆ : : : : + : : : | ***** | ÷ : : : : | ···· | -: : : : -: : : : : | :+:::::: | ÷+ | |
| | - | _of 9.6 m | _ | 2 | H | ****** | <u></u> | | | : : : : : : : : | <u></u> | |
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| | | | | | | 211213213 | 3.1.3 | | | ;‡;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;; | 31 | |
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| | | Cono Bofueal at 0.6 m Donth | 83.4 | _ | | ****** | ÷ : : : | | + : : : : : : : : | ; | | |
| | | Cone Refusal at 9.6 m Depth | | | | | | | | | : | |
| | | | I | I | | | | | | | : | |
| | TES: | | WA | TER L | EVEL RECO | RDS | | CORE DRILLING RECORD | | | D | |
| 1. Borehole data requires interpretation by EXP before Elap use by others Tin | | | | Water | Hole Open | - | Run | Depth | % Rec. | | 2D % | |
| | | ïme | L | _evel (m) | To (m) | | No. | (m) | | | | |
| | Boreho | ble backfilled with cuttings upon completion. | | | | | | | | | | |
| 5.1 | Field w | vork supervised by an EXP representative. | | | | | | | | | | |
| | · | | | | | | | | | | | |

LOG OF BORE 4. See Notes on Sample Descriptions

5. Log to be read with EXP Report OTT-00245869-A0

| Projec | ct: | Geotechnical Investigation - Propo | osed New Rivers | side | e South Cat | holic | Elemen | itary S | | Figure N | - | 9 1 of | - 1 | | I |
|----------|----------------------|---|-----------------------|------------------|--|---------------|---|-------------------|---------------------------------------|------------------------|---------------------------------------|------------------|---|--------------|------------------|
| ocati | ion: | Ralph Henessey Avenue and Mou | nt Nebo Way, C | Otta | awa, ON. | | | | _ | Pag | ye | 1_ of | _1_ | | |
|)ate [| Drilled: | 'April 2, 2018 | | _ | Split Spoon S | Sample | | \boxtimes | | Combus | tible Vap | our Rea | iding | | |
| Drill Ty | /pe: | CME-75 Track Mount Drill Rig | | _ | Auger Samp SPT (N) Valu | | | | | Natural M Atterberg | | Content | ŀ | | × ⊸ |
| Datum | n: | Geodetic Elevation | | _ | Dynamic Cor | | _ | | | Undraine % Strain | - ed Triaxia | | • | | ⊕ |
| .ogge | d by: | A.N. Checked by: S. | P. | | Shelby Tube Shear Streng | th by | | ■ + s | | Shear St Penetror | trength b | У | | | |
| | | | | _ | Vane Test | | | | | | | | | | |
| SY MBO | | SOIL DESCRIPTION | Geodetic Elevation | E e p t |) Standar | d Penet 40 | ration Tes 60 | t N Value 80 | | 25 | | 00 | ing (ppm) 750 ent % | | Natura Unit W |
| | | | | h | Shear Stren 50 | | 150 | 20 | kPa | Atterb | erg Limits | s (% Dry \ 10 | Weight) 60 | LES | kN/m |
| | | ire of silty sand and silty clay, roots, | 92.32 | 2 | .5. ⊙ | | | | | | × | | | X | |
| | 8 S | n and dark brown, moist, (loose) | 91.6 | | | | | | | | | | | | 4 |
| | Brow | ERED SILTY SAND AND SILTY CL m, moist, (very loose to loose/soft to | <u>AY</u> | 1 | 7 | | | | <u></u> | | X | | | \mathbb{N} | |
| | firm) | | | | | | | · · · · · · · | | · · · · · · · · · | · · · · · · · · · · · · · · · · · · · | | | | 4 |
| | | | _ | | 2 | | | | | | | | | \mathbb{N} | |
| | | | 90.1 | 2 | | <u> </u> | • | · · · · · · · · | ··· · · · · · · · · · · · · · · · · · | • • • • • • • • | ····× | | · • · · · · · · · · · · · · · · · · · · | <u>-</u> | , |
| | Brow | <u>Y</u> 'n, moist, (very soft) | _ | | 1 | | | | | · · · · · · · · · | | | | | |
| | | | 89.4 | | 0 | | | | | | ··· X | | | ľ | 18.7 |
| | -CLA Grey | <u>Y</u> , wet, (soft to stiff) | _ | 3 | ∵:S=5.3 | | | | | | | | | | |
| | - | | _ | | | | | | | | | | | · · · | |
| | | | Har | | S = 7.0 | | | | | | | | | | |
| | | | | Ϊ | Ф | | | | | | | | × | | |
| | _ | | Har | | S = 4.0 er vveignt | <u></u> | | | | | | | | | } |
| | | | — — — | 5 | Φ : \cdot | | | | | | | | X | X | |
| | | | | | | | | · · · · · · · | | · · · · · · · · · | • • • • • • • • • • • • • • • • • • • | | | | |
| | | | _ | | S=4. | | | | | | | | | : | |
| | _ CLA | v | 86.2 | 6 | | <u> </u> | • | · · · · · · · · · | · · · · · · · · · · · · | • • • • • • • | • • • • • • • • • • • • | | | | , |
| | | e gravel, grey, wet, (firm) | _ | | .5. ⊙ | | | | | | × | | | X | |
| | Dyna | amic Cone Penetration Test (DCPT) ucted from 7.0 m to Cone Refusal [| 85.6 | | | | | | | | | | | | |
| | - cond of 8.8 | | Depth — | 7 | | | | | | | | | | | |
| | - | | _ | | | | | | | | | | | | |
| | | | _ | 8 | | | | | | | | | | | |
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| | - | | | | ···· | | | ····· | | ···· | · · · · · · · · · · · · · · · · · · · | | | | |
| | | Cone Refusal at 8.8 m Depth | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| IOTES: | | | | | | ::!: | | | | | | 1:::: | 1:::: | | |
| 1.Boreł | nole data r | requires interpretation by EXP before | WATE | RI | LEVEL RECO Water | | le Open | | Run | CO Dept | | LLING F | ECORD | | QD % |
| | y others mm diame | eter monitoring well installed as shown. | Time | | Level (m) 2.4 | | To (m) 6.1 | -+ | No. | (m) | | 70110 | | | v, ترید. |
| | | ervised by an EXP representative. | 9 days | | 0.0 | | ••• | | | | | | | | |

| use by others | Elapsed Time | Water Level (m) | Hole Open To (m) | Run No. | Depth (m) | % Rec. | RQI |
|--|-----------------|--------------------|---------------------|------------|--------------|--------|-----|
| 2.A 50 mm diameter monitoring well installed as shown. | Completion | 2.4 | 6.1 | | | | |
| 3. Field work supervised by an EXP representative. | 9 days | 0.0 | | | | | |
| 4. See Notes on Sample Descriptions | | | | | | | |
| 5. Log to be read with EXP Report OTT-00245869-A0 | | | | | | | |
| | | | | | | | |

| | Log o | f Bo | J | rehole | BH | -7 | | 2 | yn |
|---------------|---|-----------------------|------------------|----------------------------------|-------------------|--------------------|---|------------|---------------------|
| Project No: | OTT-00245869-A0 | | | - | | | 5 10 | | |
| Project: | Geotechnical Investigation - Proposed Net | w Riversi | de | South Catholic Ele | ementar | <u>/ Sc</u> hoo | Figure No. <u>10</u> N Page. 1 of 1 | | I |
| Location: | Ralph Henessey Avenue and Mount Nebo | way, O | ttav | wa, ON. | | | · | | |
| Date Drilled: | 'April 5 2018 | | . : | Split Spoon Sample | [| \triangleleft | Combustible Vapour Reading | | |
| Drill Type: | CME-75 Track Mount Drill Rig | | | Auger Sample SPT (N) Value | - | ∎ ⊃ | Natural Moisture Content Atterberg Limits | ⊢ | × ⊸ |
| Datum: | Geodetic Elevation | | | Dynamic Cone Test Shelby Tube | | - | Undrained Triaxial at % Strain at Failure | | \oplus |
| Logged by: | A.N. Checked by: S.P. | | ; | Shear Strength by Vane Test | - | + s | Shear Strength by Penetrometer Test | | |
| S Y MBO | SOIL DESCRIPTION | Geodetic Elevation | D e p t | Standard Penetratio | on Test N V 60 | /alue 80 kPa | Combustible Vapour Reading (ppm 250 500 750 Natural Moisture Content % Atterberg Limits (% Dry Weight) |) SA PL | Natural Unit Wt. |

| | | Geodetic | e | 2 | h | 40 | 6 | 60 | 80 | 2 | 50 5 | 500 7 | 50 | Â | Natu Unit V |
|---|------------------------------|----------------|--------|---------------|---------------------------------------|-------|---|---------------------------------------|---|-----------------------|-----------------------------|--------------------------|-------------------------------------|------------------------------|----------------|
| SO V M SO | IL DESCRIPTION | Elevation | p t | Shear S | trength | 40 | | 50 | kPa | Atter | tural Mois berg Limit | ture Conte s (% Dry V | nt % Veight) | MPLES | kN/n |
| Ľ | | 0 ^m | n | 5 | | 100 | 1 | 50 2 | 200 | | | | 50 | E S | KIN/II |
| FILL | | v | 0 | | | | | | | | 1 | | 1 | $\langle \rangle$ | |
| Mixture of sand | gravel and clay, brown, wet, | | 2 | | | ::E: | | 12212 | <u>+:::::</u> : | | 1.2.2.2.2 | 1 | 1::::: | VI | |
| | graver and clay, brown, wet, | | l P: | | | | | 1.2.2.2.2 | | | 1.2.2.2.2 | \$::: X | | ΛI | |
| (very loose) | | -0.6 | | | **** | | ***** | 12222 | 1::::: | | 1:2:2:2 | <u> </u> | | \square | |
| <u>x¹/_y</u> <u>TOPSOIL</u> ~200m | ım | -0.8 | | 12 | ···· | : + : | $\cdot \cdot \cdot \cdot \cdot \cdot \cdot$ | $[\cdot;\cdot;\cdot]$ | $+ \cdot \cdot \cdot \cdot \cdot \cdot$ | + $+$ $+$ $+$ $+$ $+$ | $\{\cdot\}\oplus\{\cdot\}$ | $+\cdots$ | $1 \div \cdots \div 1$ | NΛ | |
| FILL | | | | . 🔿 : - | | | | 13333 | | | | X | 133331 | ΥL | |
| Mixture of silty sc | and and silty clay, brown, | - | 1 | | · · · · · · · · · · · · · · · · · · · | :1: | | 1.3 3 3 3 | 1::::: | | 1.3.3.5.3 | 1 | | | |
| | and and silly day, brown, | | | · · · · · · | • • • • • • | | • • • • • | $ \cdot\rangle$ $\langle\cdot\rangle$ | $+ \cdots + \cdots$ | $\dot{\cdot}$ | $1 \cdot 2 \cdot 2 \cdot 2$ | + | $ \cdot \cdot \cdot \cdot \cdot $ | $\left(\rightarrow \right)$ | |
| wet, (loose to cor | npact) | | | 8 | | | | 1.5 3.6 5 | 1 | | 1.5 | 1 | 1.5.5.5.5 | \mathbb{N} | |
| | | - | | :: | • • • • | : : : | | 1 : : : : | + : : : : : | + : : : : | : : : : | + X : : | + : : : : · · · · · | XI | |
| | | -1.8 | | ÷ • • • • • | | 143 | | 1.5 8 1.5 | 1 | | 1.5.5.7.5 | 1 | 1.5.5.54 | / \ | |
| \reworked appeara | ance | | | | ••••• | : : | ••••• | <u> </u> | + : : : : : | + | + | + * * * * * | <u> </u> | | |
| Borehole Ter | minated at 1.8 m Depth | | | | | | | | | | | | | | |
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| 의 | NOTES: 1. Borehole data requires interpretation by EXP before | WA | TER LEVEL RECO | RDS | | CORE D | RILLING RECOR | D |
|---------|--|-----------------|--------------------|---------------------|------------|--------------|---------------|-------|
| E BH | use by others | Elapsed Time | Water Level (m) | Hole Open To (m) | Run No. | Depth (m) | % Rec. | RQD % |
| | 2. Borehole backfilled with cuttings upon completion. | Completion | dry | | | | | |
| BOREHOL | 3. Field work supervised by an EXP representative. | | | | | | | |
| B | 4. See Notes on Sample Descriptions | | | | | | | |
| -0G OF | 5. Log to be read with EXP Report OTT-00245869-A0 | | | | | | | |

| | Loa of | Borehole | BH-8 | | avn |
|---------------|---|-----------------------------------|-------------------|--|-----------------|
| Project No: | OTT-00245869-A0 | | | Figure No. 11 | |
| Project: | Geotechnical Investigation - Proposed New F | Riverside South Catholic El | ementary Schoo | ol | I |
| Location: | Ralph Henessey Avenue and Mount Nebo W | /ay, Ottawa, ON. | | Page. <u>1</u> of <u>1</u> | |
| Date Drilled: | 'April 4, 2018 | Split Spoon Sample | | Combustible Vapour Reading | |
| Drill Type: | CME-75 Track Mount Drill Rig | Auger Sample ——— SPT (N) Value | | Natural Moisture Content Atterberg Limits | × ──⊖ |
| Datum: | Geodetic Elevation | Dynamic Cone Test Shelby Tube | | Undrained Triaxial at % Strain at Failure | \oplus |
| Logged by: | A.N. Checked by: S.P. | Shear Strength by Vane Test | + s | Shear Strength by Penetrometer Test | |
| S | Ge | eodetic D Standard Penetrat | tion Test N Value | Combustible Vapour Reading (ppm) | S A Natural |

| | ~ | S Y | | Geodetic | D | | Sta | Indaro | l Pen | etration 7 | est N Va | ue | Combus 2 | stible Vap 50 5 | our Readir 600 7 | ng (ppm) S 50 M nt % P | | Natural |
|---|-------------|------------------------------|--|-----------|-------------|-----|-------------|--------------|---------------|---|---|----------------------|---------------|--------------------|--------------------------|---|---|-------------------|
| | G W L | SYMBOL | SOIL DESCRIPTION | Elevation | e p t | | | 0 | 40 |) (| 60 | 30 | Nat | ural Mois | ture Conte s (% Dry W | nt % | ι | Jnit Wt |
| | L | PL | | m | h | She | | Streng | th 10 | 0 1 | 50 2 | kPa 200 | | | | 50 S | | kN/m ³ |
| | | | FILL | 92.13 | 0 | | | | | <u></u> | 20 | | | | 40 | | | |
| | | $\times\!\!\times\!\!\times$ | Mixture of silty sand and silty clay, brown, | | | 2 | | • • • • • | | $\dot{\cdot}$ | | | | × | | l::::::IV | 1 | |
| | | \bigotimes | – moist, (very loose) – | 91.5 | | | | | | | | | | | | <u> </u> /\ | | |
| | | $\tilde{\mathbf{x}}$ | TOPSOIL ~150mm | 91.3 | | | | | | | | | | | ***** | | Ż | |
| | | - 1/2 | | 01.0 | | | | :::: | | ::::: | 13333 | | | × | | 1:::::IV | 1 | 19.0 |
| | | | LAYERED SILTY SAND AND SILTY CLAY Brown, moist to wet, (loose/firm to stiff) | 1 | 1 | | | | | ::::: | .:::: | | | | | <u> :::::</u> // | | 13.0 |
| | | | | | | 22 | · · · · · | ::: <u>:</u> | <u>:::</u> | $\therefore \therefore \therefore$ | $ \cdot \cdot \cdot \cdot \cdot \cdot \rangle$ | <u>+ : : : : : :</u> | $\dot{\cdot}$ | 22 ± 22 | <u>+-:::</u> : | 1:::::::::::::::::::::::::::::::::::::: | 7 | |
| | | | | | | | : | • : • : | ···· | $\langle \cdot : \cdot \rangle \langle \cdot \rangle$ | \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot | + : · : · · · · | | | $+\cdots$ | <u> :: : : : </u> | 1 | 19.3 |
| | | | | 90.3 | | 122 | | | ÷:: | $\frac{1}{2}$ | 12212 | łiżżi | | × | łżżżż | <u>leeste l</u> A | | 19.5 |
| | | · | Borobolo Terminated at 1.8 m Denth | 90.3 | | | | | :: | **** | | + : : : : : | | | + • • • • • | | | |
| 245869 - RIVERSIDE SOUTH SCHOOL.GPJ TROW OTTAWA.GDT 4/13/18 | | | Borehole Terminated at 1.8 m Depth | | | | | | | | | | | | | | | |
| | NO | TES: | | | | | | | | | | | | | | | | |

| LOG | NOTES: 1.Borehole data requires interpretation by EXP before use by others | WA | FER LEVEL RECO | RDS | | CORE DF | RILLING RECOR | D |
|----------|--|-----------------|--------------------|---------------------|------------|--------------|---------------|-------|
| | use by others | Elapsed Time | Water Level (m) | Hole Open To (m) | Run No. | Depth (m) | % Rec. | RQD % |
| IOLE | 2. Borehole backfilled with cuttings upon completion. | Completion | dry | | | | | |
| BOREHOLE | 3. Field work supervised by an EXP representative. | | | | | | | |
| | 4. See Notes on Sample Descriptions | | | | | | | |
| LOG OF | 5.Log to be read with EXP Report OTT-00245869-A0 | | | | | | | |

| | Log o | f Bo | rehole l | BH-9 | | evn |
|---------------|--|--------------|----------------------------------|---------------|--|-------------------|
| Project No: | OTT-00245869-A0 | | _ | | Figure No. 12 | CNP |
| Project: | Geotechnical Investigation - Proposed Ne | ew Riverside | South Catholic Elem | nentary Schoo | 5 | I |
| Location: | Ralph Henessey Avenue and Mount Nebo | o Way, Otta | wa, ON. | | | - |
| Date Drilled: | 'April 4, 2018 | | Split Spoon Sample | | Combustible Vapour Reading | |
| Drill Type: | CME-75 Track Mount Drill Rig | | Auger Sample SPT (N) Value | | Natural Moisture Content Atterberg Limits | × ⊢⊸⊖ |
| Datum: | Geodetic Elevation | | Dynamic Cone Test Shelby Tube | | Undrained Triaxial at % Strain at Failure | \oplus |
| Logged by: | A.N. Checked by: S.P. | | Shear Strength by Vane Test | + s | Shear Strength by Penetrometer Test | A |
| S | | Geodetic D | Standard Penetration | Test N Value | Combustible Vapour Reading (ppr | m) S A Natural |

| [| _ | s | | Geodetic | D | D | Sta | andaı | d Pe | netra | tion T | est N Val | ue | Combu | stible V 50 | apour Readi 500 7 | ng (ppm) 50 | S | Natural |
|---|-------------|---------------|--|-----------|--------|--------|-----------|-------------|------|-------|--------|-----------|-------------|-----------|----------------|---------------------------------------|----------------|-----------|-------------------|
| | G W L | SY MBOL | SOIL DESCRIPTION | Elevation | e p | p | 2 | 20 | 4 | 10 | 6 | 0 8 | 30 | Na | tural Mo | isture Conte nits (% Dry V | nt % | SAZ₽_LШS | Unit Wt. |
| | - | 0 L | | 92.4 m | ť | n | hear S | Stren 50 | | 00 | 15 | 50 2 | kPa 00 | | berg Lir 20 | | veigni) 60 | ES | kN/m ³ |
| ł | | <u>× 1/</u> . | TOPSOIL ~400mm | 92.4 | 0 | 0 3 | | Ĩ | | Ĭ | | | <u> </u> | | Ī. | | Ĩ | Ň | |
| | | | | 92.0 | | Ö. | | | | | | | | | 1333 | × | | XI | |
| | - | | -LAYERED SILTY SAND AND SILTY CLAY - | | | 12 | <u></u> | | ÷:- | | | | | [| 1 | | | \square | |
| | | 1/ | Brown, wet, (very loose to loose/soft) | | | 4 | | | ÷ | | ·: :: | •••••• | | | 1.1.1.1 | | | М | |
| | | | | | 1 | 1 | · · · · · | | | | *** | | | | × | · · · · · · · · · · · · · · · · · · · | | XI | 18.6 |
| | | | | | | | | | | | | | ***** | | | | | () | |
| | | | | | | 3 | | | | | | | | ÷ ; ; ; ; | 1.5.5.7 | | | M | |
| | ľ | | | 00.0 | | 0 | | | | | | | | | | * | | M | |
| | ŀ | | Borehole Terminated at 1.8 m Denth | 90.6 | | - | | | | | | | + • • • • • | | | ++++++ | | 4 | |
| 245869 - RIVERSIDE SOUTH SCHOOL. GPJ TROW OTTAWA. GDT 4/13/18 | | | Borehole Terminated at 1.8 m Depth | | | | | | | | | | | | | | | | |
| | NO | TES: | | | | | | | | | | | | | | | | | |

| ĽOĞ | NOTES: 1.Borehole data requires interpretation by EXP before use by others | WAT | TER LEVEL RECOR | RDS | | CORE DF | RILLING RECOR | D |
|----------|--|-----------------|--------------------|---------------------|------------|--------------|---------------|-------|
| | use by others | Elapsed Time | Water Level (m) | Hole Open To (m) | Run No. | Depth (m) | % Rec. | RQD % |
| ÓLE | 2. Borehole backfilled with cuttings upon completion. | Completion | dry | | | | | |
| BOREHOLE | 3. Field work supervised by an EXP representative. | | | | | | | |
| | 4. See Notes on Sample Descriptions | | | | | | | |
| LOG OF | 5. Log to be read with EXP Report OTT-00245869-A0 | | | | | | | |

| Log | of | Bore | eho | le | BH- | 10 |
|-----|----|------|-----|----|-----|----|
| - | | | | _ | | |

Project No: <u>OTT-00245869-A0</u>

| [%] exp. |
|-------------------|
|-------------------|

| Project No: | 011-00245869-A0 | | Figure No. 13 | |
|---------------|---|------------------------------------|--|----------|
| Project: | Geotechnical Investigation - Proposed New Riverside | e South Catholic Elementary Schoo | | I |
| Location: | Ralph Henessey Avenue and Mount Nebo Way, Otta | awa, ON. | Page. <u>1</u> of <u>1</u> | |
| Date Drilled: | 'April 4, 2018 | Split Spoon Sample | Combustible Vapour Reading | |
| Drill Type: | CME-75 Track Mount Drill Rig | Auger Sample SPT (N) Value O | Natural Moisture Content Atterberg Limits | × ⊢⊸ |
| Datum: | Geodetic Elevation | Dynamic Cone Test Shelby Tube | Undrained Triaxial at % Strain at Failure | \oplus |
| Logged by: | A.N. Checked by: S.P. | Shear Strength by + Vane Test S | Shear Strength by Penetrometer Test | A |

| G W L | SY MBO L | SOIL DESCRIPTION | | Dep | | Fest N Value | Combustible Vap 250 | 00 750 | A | Natural Unit Wt. |
|---|----------------|---|--------------|-------------|----------------|---------------|---------------------------------------|----------------|-----------------|---------------------|
| Ľ | B O L | | m .92.56 | p t h | Shear Strength | kPa 50 200 | Natural Mois Atterberg Limit 20 | s (% Dry Weigh | nt) L E S | kN/m ³ |
| | | FILL Mixture of silty sand and silty clay, trace gravel, decayed grass shoots, dark grey and | 92.3 92.1 | | 2 : | | × | | X | |
| | | black, wet, (very loose) | 91.4 | 1 | | | × | | X | 17.5 |
| | | Mixture of silty sand and silty clay, trace gravel, decayed grass shoots, reddish brown to brown, dark grey and black, wet, (loose) | 90.8 | | | | * | | X | |
| - 245869 - RIVERSIDE SOUTH SCHOOL.GPJ TROW OTTAWA.GDT 4/13/18 | | reworked appearance LAYERED SILTY SAND AND SILTY CLAY Rootlets, decayed grass shoots, brown, wet, (toose/firm) Borehole Terminated at 1.8 m Depth | 90.8 | | | | | | | |

| LOG | NOTES: 1. Borehole data requires interpretation by EXP before use by others | WAT | FER LEVEL RECOR | RDS | | CORE DF | RILLING RECOR | D |
|----------|---|-----------------|--------------------|---------------------|------------|--------------|---------------|-------|
| | | Elapsed Time | Water Level (m) | Hole Open To (m) | Run No. | Depth (m) | % Rec. | RQD % |
| ÓLE | 2. Borehole backfilled with cuttings upon completion. | Completion | dry | | | | | |
| BOREHOLE | 3. Field work supervised by an EXP representative. | | | | | | | |
| F BO | 4. See Notes on Sample Descriptions | | | | | | | |
| LOG OF | 5. Log to be read with EXP Report OTT-00245869-A0 | | | | | | | |

| | Log of Boi | rehole BH | I-11 | | exn |
|---------------|--|---------------------------------|-------------|---|----------|
| Project No: | OTT-00245869-A0 | | | Figure No. 14 | CAP. |
| Project: | Geotechnical Investigation - Proposed New Riversid | e South Catholic Elementa | | 5 | 1 |
| Location: | Ralph Henessey Avenue and Mount Nebo Way, Otta | awa, ON. | | Fage. <u>1</u> 01 <u>1</u> | _ |
| Date Drilled: | 'April 4, 2018 | Split Spoon Sample | \boxtimes | Combustible Vapour Reading | |
| Drill Type: | CME-75 Track Mount Drill Rig | Auger Sample | | Natural Moisture Content | × |
| | | SPT (N) Value Dynamic Cone Test | 0 | Atterberg Limits Undrained Triaxial at | Е |
| Datum: | Geodetic Elevation | Shelby Tube | | % Strain at Failure | \oplus |
| Logged by: | A.N. Checked by: S.P. | Shear Strength by Vane Test | + s | Shear Strength by Penetrometer Test | |

| Image: Section of the section of t | G W L | SY MBOL | SOIL DESCRIPTION | Geodetic Elevation | D e p t h | Sta 2 Shear S | 0 4 | netration 1 40 6 | | ue 30 kPa | 25 | stible Vapour 50 500 ural Moisture erg Limits (% | 75 | 50 nt % | SAMPLES | Natural Unit Wt. kN/m ³ |
|---|---|------------|---|-----------------------|-----------------------|---------------------|-----|---------------------|------|-----------------|----|---|----|------------|----------|--|
| Mixture of silty sand, silty clay and topsoil, decayed grass shoots, reddish brown to brown to dark grey to black, wet, (loose) 90.7 Borehole Terminated at 1.8 m Depth | | | | 92.48 | | 5 | 0 1 | 00 1 | 50 2 | 00 | | | | 0 | <u>s</u> | |
| Borehole Terminated at 1.8 m Depth | | | FILL Mixture of silty sand, silty clay and topsoil, decayed grass shoots, reddish brown to brown to dark grey to black, wet, (loose) | | | <u>.</u> | | | | | | × | | | | |
| 2458669 - R | 245869 - RIVERSIDE SOUTH SCHOOL.GPJ TROW OTTAWA.GDT 4/13/18 | | Borehole Terminated at 1.8 m Depth | 90.7 | | | | | | | | | | | · · · · | |

| LOGS | NOTES: 1. Borehole data requires interpretation by EXP before | WA ⁻ | TER LEVEL RECO | RDS | | CORE D | RILLING RECOR | D |
|----------|--|-----------------|--------------------|---------------------|------------|--------------|---------------|-------|
| BH | use by others | Elapsed Time | Water Level (m) | Hole Open To (m) | Run No. | Depth (m) | % Rec. | RQD % |
| OLE | 2. Borehole backfilled with cuttings upon completion. | Completion | dry | | | | | |
| BOREHOLE | 3. Field work supervised by an EXP representative. | | | | | | | |
| BO | 4. See Notes on Sample Descriptions | | | | | | | |
| LOG OF | 5. Log to be read with EXP Report OTT-00245869-A0 | | | | | | | |

| Log of Borehole E | <u>3H-</u> 2 | <u> 2</u> |
|-------------------|--------------|-----------|
|-------------------|--------------|-----------|

Project No: <u>OTT-00245869-A0</u>

| *exp. |
|-------|
|-------|

| Project No. | 011-00245869-A0 | | Figure No. 15 | |
|---------------|---|--|--|---------|
| Project: | Geotechnical Investigation - Proposed New Riverside | e South Catholic Elementary Scho | ol | 1 |
| Location: | Ralph Henessey Avenue and Mount Nebo Way, Otta | awa, ON. | Page. <u>1</u> of <u>1</u> | |
| Date Drilled: | 'April 4, 2018 | Split Spoon Sample | Combustible Vapour Reading | |
| Drill Type: | CME-75 Track Mount Drill Rig | Auger Sample | Natural Moisture Content | × |
| Datum: | Geodetic Elevation | SPT (N) Value O Dynamic Cone Test Shelby Tube | Atterberg Limits Undrained Triaxial at % Strain at Failure | ⊕ |
| Logged by: | A.N. Checked by: S.P. | Shear Strength by + Vane Test S | Shear Strength by Penetrometer Test | |

| G | ; | SY MBOL | SOIL DESCRIPTION | Geodetic | De | | Star 20 | | d Per 4 | | | Test 60 | N Valu 8 | | | 25 | | 500 | 7 | 50 | n) S A M P | Natural |
|--|---|-----------------------|--|----------------|------------------|----------|------------|---------------------------------------|------------|----|-----|------------|---------------|-----|----|----|---------------------|-----|-----------------------------------|-------------------------------|---------------------|-------------------------------|
| G W L | · | B | SOIL DESCRIPTION | Elevation m | e p t h | She | ear St | treng | th | | | | | kPa | At | | ral Moi erg Limi | | | | PLES | Unit Wt. kN/m ³ |
| | ⊹ | L <u>\ 14.</u> · . | TOPSOIL ~300mm | 92.53 | 0 | | 50 | <u>)</u> : | 10 | 00 | 1 | 50 | 2 | 0 | | 20 |) | 40 | ••••• | 50 | <u> </u> | |
| | ŀ | | | 92.2 | | .5. ⊙ | | | < | | | | | | | | | | × | | ÷Χ | 17.7 |
| | | 14 | Brown, wet, (very loose to loose/soft to firm) | | | <u> </u> | | <u></u> | | | | 13 | <u></u> | | | | | | • • • • • | | <u> </u> | |
| | | | | | | .5 | | | | | | | | | | | | | | | \mathbb{R} | |
| | | | roots and rootlets from 0.3 m to 1.2 m depths $$ | | 1 | 0 | | | <u>.</u> | | | | ÷: | | | | | | | × | ÷ΪÅ | 17.8 |
| | | | | | | | | | <u>.</u> | | | | ÷ : · · · | | | | • • • • | | | $ \cdot \cdot \cdot \rangle$ | | |
| | | | | | | 3 | | · · · · · · · · · · · · · · · · · · · | ÷ : · | | *** | | ***** **** | | | | | × | } · · · · · : · · · | | ÷Χ | |
| | Ŀ | | | 90.7 | | 133 | | <u></u> | <u></u> | | | 1.5 | <u></u> | | | | | | <u></u> | | <u> </u> | |
| IS - 245869 - RIVERSIDE SOUTH SCHOOL.GPJ TROW OTTAWA.GDT 4/13/18 | | | Borehole Terminated at 1.8 m Depth | | | | | | | | | | | | | | | | | | | |

| 0 | NOTES: 1. Borehole data requires interpretation by EXP before | WA | FER LEVEL RECOR | RDS | | CORE DF | RILLING RECOR | D |
|--------|--|-----------------|--------------------|---------------------|------------|--------------|---------------|-------|
| BHL | use by others | Elapsed Time | Water Level (m) | Hole Open To (m) | Run No. | Depth (m) | % Rec. | RQD % |
| 10LE | 2. Borehole backfilled with cuttings upon completion. | Completion | dry | | | | | |
| BOREH | 3. Field work supervised by an EXP representative. | | | | | | | |
| | 4. See Notes on Sample Descriptions | | | | | | | |
| LOG OF | 5.Log to be read with EXP Report OTT-00245869-A0 | | | | | | | |

| | Log of Bo | rehole Bł | 13 | 8 🔅 | eyn |
|---------------|---|------------------------------------|---------------|--|----------------|
| Project No: | OTT-00245869-A0 | | | - | CAP. |
| Project: | Geotechnical Investigation - Proposed New Riversi | de South Catholic Elemen | tary Scho | 5 | I |
| Location: | Ralph Henessey Avenue and Mount Nebo Way, O | ttawa, ON. | | | |
| Date Drilled: | 'April 5, 2018 | Split Spoon Sample | \boxtimes | Combustible Vapour Reading | |
| Drill Type: | CME-75 Track Mount Drill Rig | Auger Sample SPT (N) Value | ■ ○ | Natural Moisture Content Atterberg Limits | × ⊢⊸ |
| Datum: | Geodetic Elevation | Dynamic Cone Test – Shelby Tube | | Undrained Triaxial at % Strain at Failure | \oplus |
| Logged by: | A.N. Checked by: S.P. | Shear Strength by Vane Test | + s | Shear Strength by Penetrometer Test | |
| S | Geodetic | Standard Penetration Test | N Value | Combustible Vapour Reading (ppm) | S A Natural |

| | | ş | | Geodetic | D | | andard F | enetration | Test N Val | le | Combu | stible Vap 50 5 | our Readii 00 7 | ng (ppm) 50 | S A | Natural |
|---|----|------------------------------|---|-----------|-------------|----|-------------------|------------|------------|-------|----------|--------------------|------------------------|----------------------|---------|-------------------|
| G W L | ₹. | SY MBOL | SOIL DESCRIPTION | Elevation | e p t | 2 | 20 | 40 | 60 8 | 80 | 2 Nat | tural Moist | ure Conte | nt % | SAMPLES | Unit Wt. |
| | - | ŏ | | m | h | | - | | | kPa | | | | /eight) | E | kN/m ³ |
| | ┥ | | F U | 92.77 | 0 | | 50 1 · · · · · | 100 | 150 2 | 00 | | 204 | 0 | 50 | s | |
| | k | $\times\!\!\times\!\!\times$ | FILL Mixture of sand, gravel and clay, brown, wet, | | | 2: | | | | | | | | | VI | |
| | K | \otimes | (vom (lagga) | | | | | | | ••••• | | | × | , | ΛI | |
| | ŀ | XX | | 92.2 | | | | | | | | 1 | | 1 :: : : : : { | | |
| | ŀ | <u></u> | TOPSOIL ~250mm | 91.9 | | 7 | | | | | | 1 | | | VI | |
| | ŀ | | _LAYERED SILTY SAND AND SILTY CLAY _ | | 1 | | | | 1 | | | 1 | × | <u> : : : : </u> , | ΛI | |
| | ŀ | | Brown, wet, (loose/soft to firm) | | | | | | | | | 1.5.2.5 | | 13333¥ | | |
| | ŀ | | | | | 4 | | | | | | 1 | | :: : : : : \ | VI | |
| | | | | | | 9 | | | | | | × | | | ΛI | |
| | ŀ | · [·] · | Daugh als Taunche de dat 4.0 m Dauth | 91.0 | | | | | | | | 1 | | ľ | 4 | |
| S - 245869 - RIVERSIDE SOUTH SCHOOL.GPJ TROW OTTAWA.GDT 4/13/18 | | | Borehole Terminated at 1.8 m Depth | | | | | | | | | | | | | |

| _ | NOTES: 1. Borehole data requires interpretation by EXP before | WA ⁻ | TER LEVEL RECOR | RDS | | CORE DF | RILLING RECOR | D |
|-------------|--|-----------------|--------------------|---------------------|------------|--------------|---------------|-------|
| E BH | use by others | Elapsed Time | Water Level (m) | Hole Open To (m) | Run No. | Depth (m) | % Rec. | RQD % |
| 1OLE | 2. Borehole backfilled with cuttings upon completion. | Completion | dry | | | | | |
| BOREHOL | 3. Field work supervised by an EXP representative. | | | | | | | |
| | 4. See Notes on Sample Descriptions | | | | | | | |
| LOG OF | 5.Log to be read with EXP Report OTT-00245869-A0 | | | | | | | |

EXP Services Inc.

Centre Des Ecoles Catholiques Du Centre-Est Phase II Environmental Site Assessment Proposed New Riverside South Elementary School Ralph Hennessey Avenue and Mount Nebo Way, Ottawa, Ontario OTT-00245869-A0 April 13, 2018

Appendix C: Analytical Summary Tables

TABLE 1SOIL ANALYTICAL RESULTS (μg/g)PETROLEUM HYDROCARBONS and BTEXProposed Elementary School Riverside South

| Parameter | Table 3' | | MW/BH 6-S30 (dup of MW/BH 6-S3) | |
|---------------------|----------------|-----------|---------------------------------------|--|
| Sample Date (d/m/y) | Institutional/ | 2-Apr-18 | 2-Apr-18 | |
| Sample Depth (mbsg) | residential | 1.5 - 2.1 | 1.5 - 2.1 | |
| Benzene | 0.17 | <0.020 | <0.020 | |
| Toluene | 6 | <0.020 | <0.020 | |
| Ethylbenzene | 15 | <0.020 | <0.020 | |
| m-Xylene & p-Xylene | NV | <0.040 | <0.040 | |
| o-Xylene | NV | <0.020 | <0.020 | |
| Total Xylenes | 25 | <0.040 | <0.040 | |
| PHC F1 | 65 | <10 | <10 | |
| PHC F2 | 150 | <10 | NA | |
| PHC F3 | 1300 | <50 | NA | |
| PHC F4 | 5600 | <50 | NA | |

NOTES:

MOECC Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 3, Use within in a non-potable groundwater, institutional/ residential standards, fine and medium grained soil.

 Shaded
 Concentration exceeds MOECC Table 3 institutional/ residential soil quality standard.

 NA
 Not Analyzed

 NV
 No Value

TABLE 2 SOIL ANALYTICAL RESULTS (μg/g) VOLATILE ORGANIC COMPOUNDS Proposed Elementary School Riverside South

| Parameter | MOECC Table 3 ¹ | MW/BH 6-S1 |
|-----------------------------------|-------------------------------|------------|
| Sample Date (d/m/y) | Institutional/ | 2-Apr-18 |
| Sample Depth (mbsg) | residential | 0 - 0.6 |
| Acetone | 28 | <0.50 |
| Benzene | 0.17 | <0.020 |
| Bromodichloromethane | 13 | <0.050 |
| Bromoform | 0.26 | < 0.050 |
| Bromomethane | 0.05 | < 0.050 |
| Carbon Tetrachloride | 0.12 | < 0.050 |
| Chlorobenzene | 2.7 | < 0.050 |
| Chloroform | 0.18 | < 0.050 |
| Dibromochloromethane | 9.4 | < 0.050 |
| 1,2-Dichlorobenzene | 4.3 | < 0.050 |
| 1,3-Dichlorobenzene | 6 | < 0.050 |
| 1,4-Dichlorobenzene | 0.097 | < 0.050 |
| 1,1-Dichloroethane | 11 | < 0.050 |
| 1,2-Dichloroethane | 0.05 | < 0.050 |
| 1,1-Dichloroethylene | 0.05 | <0.050 |
| Cis-1,2-Dichloroethylene | 30 | < 0.050 |
| Trans-1,2-Dichloroethylene | 0.75 | <0.050 |
| 1,2-Dichloropropane | 0.085 | < 0.050 |
| Cis-1,3-Dichloropropylene | NV | < 0.030 |
| Trans-1,3-Dichloropropylene | NV | <0.000 |
| Ethylbenzene | 15 | <0.020 |
| Ethylene Dibromide | 0.05 | <0.020 |
| Methyl Ethyl Ketone | 44 | < 0.50 |
| Methylene Chloride | 0.96 | < 0.050 |
| Methyl Isobutyl Ketone | 4.3 | < 0.50 |
| Methyl-t-Butyl Ether | 1.4 | < 0.050 |
| Styrene | 2.2 | < 0.050 |
| 1,1,1,2-Tetrachloroethane | 0.05 | <0.050 |
| 1,1,2,2-Tetrachloroethane | 0.05 | < 0.050 |
| Toluene | 6 | <0.020 |
| Tetrachloroethylene | 2.3 | <0.050 |
| 1,1,1-Trichloroethane | 3.4 | <0.050 |
| 1,1,2-Trichloroethane | 0.05 | <0.050 |
| Trichloroethylene | 0.52 | < 0.050 |
| Vinyl Chloride | 0.022 | <0.020 |
| m-Xylene & p-Xylene | NV | <0.020 |
| o-Xylene | NV | <0.020 |
| Total Xylenes | 25 | <0.020 |
| Dichlorodifluoromethane | 25 | <0.050 |
| Hexane(n) | 34 | < 0.050 |
| Trichlorofluoromethane | 5.8 | < 0.050 |
| 1,3-Dichloropropene (cis + trans) | 0.083 | < 0.050 |
| NOTES: | | 0.000 |

NOTES:

1

MOECC Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 3, Use within in a non-potable groundwater, institutional/ residential standards, fine and medium grained soil.

Shaded Concentration exceeds MOECC Table 3 institutional/ residential soil quality standard.

NA Not Analyzed

NV No Value

TABLE 3 SOIL ANALYTICAL RESULTS (µg/g) METALS Proposed Elementary School Riverside South

| Parameter | Table 3 ¹ | | | | |
|---------------------|----------------------|----------|--|--|--|
| Sample Date (d/m/y) | Institutional/ | 2-Apr-18 | | | |
| Sample Depth (mbsg) | residential | 0 - 0.6 | | | |
| Antimony | 7.5 | <0.20 | | | |
| Arsenic | 18 | 1.6 | | | |
| Barium | 390 | 270 | | | |
| Beryllium | 5 | 0.93 | | | |
| Cadmium | 1.2 | 0.24 | | | |
| Chromium | 160 | 61 | | | |
| Cobalt | 22 | 14 | | | |
| Copper | 180 | 29 | | | |
| Lead | 120 | 10 | | | |
| Molybdenum | 6.9 | 1.8 | | | |
| Nickel | 130 | 31 | | | |
| Selenium | 2.4 | <0.50 | | | |
| Silver | 25 | <0.20 | | | |
| Thallium | 1 | 0.26 | | | |
| Vanadium | 86 | 54 | | | |
| Zinc | 340 | 100 | | | |
| Boron (Total) | 120 | 7.2 | | | |
| Uranium | 23 | 3.2 | | | |

NOTES:

Shaded

NA

NV

MOECC Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 3, Use within in a non-potable groundwater, institutional/ residential standards, fine and medium grained soil. Concentration exceeds MOECC Table 3 institutional/ residential soil quality standard. Not Analyzed

No Value

¹

TABLE 4GROUNDWATER ANALYTICAL RESULTS (μg/L)PETROLEUM HYDROCARBONS and BTEXProposed Elementary School Riverside South

| Parameter | MOECC Table 3 ¹ | MW/BH 6 |
|---------------------|-------------------------------|----------|
| Sample Date (d/m/y) | Institutional/ residential | 3-Apr-18 |
| Benzene | 430 | <0.20 |
| Toluene | 18000 | 2 |
| Ethylbenzene | 2300 | <0.20 |
| Total Xylenes | 4200 | <0.40 |
| PHC F1 | 750 | <25 |
| PHC F2 | 150 | <100 |
| PHC F3 | 500 | <200 |
| PHC F4 | 500 | <200 |

NOTES:

 1
 MOECC Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 3, Use within in a non-potable groundwater, institutional/ residential standards, fine and medium grained soil.

 Shaded
 Concentration exceeds MOECC Table 3 institutional/ residential soil quality standard.

 NA
 Not Analyzed

 NV
 No Value

EXP Services Inc.

Centre Des Ecoles Catholiques Du Centre-Est Phase II Environmental Site Assessment Proposed New Riverside South Elementary School Ralph Hennessey Avenue and Mount Nebo Way, Ottawa, Ontario OTT-00245869-A0 April 13, 2018

Appendix D: Laboratory Certificates of Analysis



Your Project #: OTT-00245869-A Your C.O.C. #: 102805

Attention: Mark Devlin

exp Services Inc Ottawa Branch 100-2650 Queensview Drive Ottawa, ON K2B 8H6

> Report Date: 2018/04/10 Report #: R5072713 Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B873851 Received: 2018/04/03, 16:10

Sample Matrix: Water # Samples Received: 1

| | | Date | Date | | |
|---|----------|------------|------------|-------------------|-------------------|
| Analyses | Quantity | Extracted | Analyzed | Laboratory Method | Reference |
| Petroleum Hydro. CCME F1 & BTEX in Water | 1 | N/A | 2018/04/09 | OTT SOP-00002 | CCME CWS |
| Petroleum Hydrocarbons F2-F4 in Water (1) | 1 | 2018/04/05 | 2018/04/05 | OTT SOP-00001 | CCME Hydrocarbons |

Remarks:

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

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

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

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

(1) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.



Your Project #: OTT-00245869-A Your C.O.C. #: 102805

Attention: Mark Devlin

exp Services Inc Ottawa Branch 100-2650 Queensview Drive Ottawa, ON K2B 8H6

> Report Date: 2018/04/10 Report #: R5072713 Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B873851 Received: 2018/04/03, 16:10

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager. Jonathan Urben, Senior Project Manager Email: jurben@maxxam.ca Phone# (613) 274-0573

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

Total Cover Pages : 2 Page 2 of 9



exp Services Inc Client Project #: OTT-00245869-A Sampler Initials: MAD

PETROLEUM HYDROCARBONS (CCME)

| Maxxam ID | | GJO529 | | |
|-------------------------------|-------|------------|------|----------|
| Sampling Date | | 2018/04/03 | | |
| | | 15:00 | | |
| COC Number | | 102805 | | |
| | UNITS | BH6 | RDL | QC Batch |
| BTEX & F1 Hydrocarbons | | | | |
| Benzene | ug/L | <0.20 | 0.20 | 5475300 |
| Toluene | ug/L | 2.0 | 0.20 | 5475300 |
| Ethylbenzene | ug/L | <0.20 | 0.20 | 5475300 |
| o-Xylene | ug/L | <0.20 | 0.20 | 5475300 |
| p+m-Xylene | ug/L | <0.40 | 0.40 | 5475300 |
| Total Xylenes | ug/L | <0.40 | 0.40 | 5475300 |
| F1 (C6-C10) | ug/L | <25 | 25 | 5475300 |
| F1 (C6-C10) - BTEX | ug/L | <25 | 25 | 5475300 |
| F2-F4 Hydrocarbons | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/L | <100 | 100 | 5470767 |
| F3 (C16-C34 Hydrocarbons) | ug/L | <200 | 200 | 5470767 |
| F4 (C34-C50 Hydrocarbons) | ug/L | <200 | 200 | 5470767 |
| Reached Baseline at C50 | ug/L | Yes | | 5470767 |
| Surrogate Recovery (%) | | | | |
| 1,4-Difluorobenzene | % | 105 | | 5475300 |
| 4-Bromofluorobenzene | % | 100 | | 5475300 |
| D10-Ethylbenzene | % | 113 | | 5475300 |
| D4-1,2-Dichloroethane | % | 98 | | 5475300 |
| o-Terphenyl | % | 111 | | 5470767 |
| RDL = Reportable Detection L | imit | | | |
| QC Batch = Quality Control Ba | atch | | | |



Petroleum Hydro. CCME F1 & BTEX in Water

Petroleum Hydrocarbons F2-F4 in Water

Report Date: 2018/04/10

exp Services Inc Client Project #: OTT-00245869-A Sampler Initials: MAD

2018/04/09

2018/04/05

Lyndsey Hart

Fatemeh Habibagahi

TEST SUMMARY

| Maxxam ID: Sample ID: Matrix: | | | | | Shipped: | 2018/04/03 2018/04/03 |
|-------------------------------------|-----------------|-------|-----------|---------------|----------|--------------------------|
| Test Description | Instrumentation | Batch | Extracted | Date Analyzed | Analyst | |

5475300

5470767

N/A

2018/04/05

HSGC/MSFD

GC/FID

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca



Maxxam Job #: B873851 Report Date: 2018/04/10 exp Services Inc Client Project #: OTT-00245869-A Sampler Initials: MAD

GENERAL COMMENTS

| Each te | mperature is the | average of up t |
|---------|-------------------|-----------------|
| I | Package 1 | 5.7°C |
| Cooler | custody seal was | present and int |
| Results | relate only to th | e items tested. |



Maxxam Job #: B873851 Report Date: 2018/04/10

QUALITY ASSURANCE REPORT

exp Services Inc Client Project #: OTT-00245869-A Sampler Initials: MAD

| | | | Matrix | Spike | SPIKED | BLANK | Method E | Blank | RPD | |
|----------|---------------------------|------------|------------|-----------|------------|-----------|----------|-------|-----------|-----------|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits |
| 5470767 | o-Terphenyl | 2018/04/05 | 110 | 30 - 130 | 112 | 30 - 130 | 112 | % | | |
| 5475300 | 1,4-Difluorobenzene | 2018/04/09 | 105 | 70 - 130 | 104 | 70 - 130 | 105 | % | | |
| 5475300 | 4-Bromofluorobenzene | 2018/04/09 | 94 | 70 - 130 | 93 | 70 - 130 | 95 | % | | |
| 5475300 | D10-Ethylbenzene | 2018/04/09 | 116 | 70 - 130 | 112 | 70 - 130 | 114 | % | | |
| 5475300 | D4-1,2-Dichloroethane | 2018/04/09 | 98 | 70 - 130 | 100 | 70 - 130 | 99 | % | | |
| 5470767 | F2 (C10-C16 Hydrocarbons) | 2018/04/05 | 98 | 50 - 130 | 100 | 80 - 120 | <100 | ug/L | NC | 50 |
| 5470767 | F3 (C16-C34 Hydrocarbons) | 2018/04/05 | 98 | 50 - 130 | 100 | 80 - 120 | <200 | ug/L | NC | 50 |
| 5470767 | F4 (C34-C50 Hydrocarbons) | 2018/04/05 | 98 | 50 - 130 | 100 | 80 - 120 | <200 | ug/L | NC | 50 |
| 5475300 | Benzene | 2018/04/09 | 101 | 70 - 130 | 105 | 70 - 130 | <0.20 | ug/L | 7.1 | 40 |
| 5475300 | Ethylbenzene | 2018/04/09 | 95 | 70 - 130 | 96 | 70 - 130 | <0.20 | ug/L | 6.5 | 40 |
| 5475300 | F1 (C6-C10) - BTEX | 2018/04/09 | | | | | <25 | ug/L | 11 | 40 |
| 5475300 | F1 (C6-C10) | 2018/04/09 | 96 | 70 - 130 | 114 | 70 - 130 | <25 | ug/L | 8.1 | 40 |
| 5475300 | o-Xylene | 2018/04/09 | 100 | 70 - 130 | 103 | 70 - 130 | <0.20 | ug/L | 1.1 | 40 |
| 5475300 | p+m-Xylene | 2018/04/09 | 93 | 70 - 130 | 95 | 70 - 130 | <0.40 | ug/L | 3.4 | 40 |
| 5475300 | Toluene | 2018/04/09 | 88 | 70 - 130 | 89 | 70 - 130 | <0.20 | ug/L | 1.2 | 40 |
| 5475300 | Total Xylenes | 2018/04/09 | | | | | <0.40 | ug/L | 2.2 | 40 |

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

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

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

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

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

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



Maxxam Job #: B873851 Report Date: 2018/04/10 exp Services Inc Client Project #: OTT-00245869-A Sampler Initials: MAD

VALIDATION SIGNATURE PAGE

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

Steve Roberts, Ottawa Lab Manager

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

| CAM F | | Report I | nformation | (if diffe | ers from | m invo | oice) | 100 | | CHAIN OF CUSTODY RECORD Project Information (where applicable) | | | | | - | 102805 Page of Turnaround Time (TAT) Required | | | | | | |
|---|---|-------------------------------|------------|---------------|---------------|--------------|-----------|--------------------------|---------------|---|--------|-------------|--------|-------|------|--|-----------|--|-----------------------|-------|---------|-----------------|
| mpany Name: EXP Services 2 | Company | Name: | | | | | | | | Quotation | 100 | 2 38 717 | | 11111 | 33 | - | | R | Regular TAT | - | | |
| ntact Name: Mark Devlin /Do | CONTRACTOR AND A DESCRIPTION OF A DESCRIPTION OF A DESCRIPTION OF A DESCRI | lame: | San | | | | | | | P.O. #/ AFI | E#: | | ~ 1 | Corp | 9-2- | (ince) | | PLE | ASE PROVIDE | ADVAN | NCE NOT | ice for rush pi |
| dress: 100-2650 Quy | | | Jun | <u>~c</u> | | | | | | Project #: | | OT | -+- | 00 | 24 5 | 5 86 | 4-A | | Rush TAT | (Surc | charges | will be applied |
| Dr. ottama | | | | | | | | | | Site Locati | on: | | 1011 | | | | | | 1 Day | 2 | 2 Days | 3-4 Da |
| one: 613 688 1494 Fax: | Phone: | - Constan | | gol: | Fax: | | | | 2 | Site #: | | | | | | | | | 100 | | | |
| all: | Email: | | | - | | | | | | Sampled B | ly: | | M | AD | | | | Date Red | juired: | | | |
| MOE REGULATED DRINKING W | ATER OR WATER INTENDED FO | R HUMAN CONSU | IMPTION M | IUST BI | E SUBN | AITTED | D ON TI | HE MAX | KAM DF | INKING WAT | TER CH | AIN OF CL | JSTODY | | | | | Rush Co | nfirmation # | 1: | | |
| Regulation 153 | Other Reg | | | - | - | - | - | - | - | Analysis | Reque | sted | 1 | - | - | | | | ar a cartair | | TORY U | SE ONLY |
| Table 2 Ind/Comm Coarse | | ry Sewer Bylaw Sewer Bylaw | | | - | 3 | -4 | | | 1.42 | 2 | | | | | | | 1. | ISTODY SEAL Y. / N | | co | OLER TEMPER |
| Table 3 Agri/ Other | PWQO Region | · | | | Hg / CrVI | | | | | 1.6 | | 14 | 1.1 | | | | | Presen | t Intaci | tj i | | |
| Table FOR RSC (PLEASE CIRCLE) Y / N | Other (Specify) | TAT REQUIRED) | | 8 | etals / H | | | NICS | | (8 - SWH | | | | | | | | y | 7 | | 6 | 615 |
| Ide Criteria on Certificate of Analysis: Y / N | | | | IBMITT | CLE) M | | | INORGANICS | ALS | tals, H | | | | | | | YZE | | | | | |
| SAMPLES MUST BE KEPT COOL (< 10 $^\circ$ C) FROM TI | ME OF SAMPLING UNTIL DELIVI | ERY TO MAXXAM | | NERS SI | D (CIRC | | -16 | ALS & I | AS METALS | TALS PMS Me | | | 12.2 | | | | T ANALYZE | | | | ~ | |
| SAMPLE IDENTIFICATION | DATE SAMPLED | TIME SAMPLED | | CONTAIL | IELD FILTERED | STEX/ PHC F1 | -2 - F4 | VOCs REG 153 METALS & | REG 153 ICPMS | 153 MET Cr VI, ICP | 1 | 144 | | | | | DO NOT | COOLING | MEDIA PRESE | INT: | (Y | Y N. |
| SAMPLE IDENTIFICATION | (YYYY/MM/DD) | (HH:MM) | MATRIX | # OF 0 | FIELD | BTEX/ | PHCs F2 - | VOCs REG 1 | REG 1 | REG 1 (Hg. C | | | | | 3 | | ногр- | 1998 | 1.10 | со | OMMEN | ITS |
| BH6 | 2018/04/03 | 3:00pm | GW | 4 | | X | X | | | | | | | | | | | | | | | |
| | | / | | | | | | | | | | | | | | | | | | 1 | 10 1 | 6.10 |
| | | 12.112 | | | | | 1 | | | | | | | | | | | | 03-A | pr-1 | 10 1 | 0.10 |
| | and the second second | | | | | | | | | | | | | | | | | Jona | than U | TDe | | 111 |
| | and the second | Pre Bi | | 24.5 | | | | | | B | FC | ENE | Th IA | 01 | TAM | In | - | 11 18 18 1 | B873 | 851 | 1 | |
| | | | 1 | | | | - | | | | | | | | | | | | | | 001 | 1 |
| | | | N.S. | | | | | | | | | | | 1 | | | | VIV | 6.76.2 | | *2 | Ten ser |
| | Contraction Said | 1.43 | | | | | | | | 1 | | | | | 1 | | | | | | | |
| | State Real | | | | | | | | | | | | 10 | | | | | | | ON | 5 0 | sue |
| | | | 12.0 | | | | | | | | | | | | | 11 | | | | 51 | , | |
| RELINQUISHED BY: (Signature/Print) | DATE: (YYYY/MM/DD) | TIME: (HH:MI | (1) | - | RECE | IVED | BY: (Sig | gnature/ | Print) | 10.0.40 | D | ATE: (YYYY) | /MM/C | D) | TIME | (HH:M | M) | | | MAX | NAXX | OB# |
| A. 1.8-1- | 2018/04/03 | 4:06 | V | | | - | T . | | | 10 | 2 | 18/0 | 4/0 | 3 | 16 | . 10 | 3 | | | | | |

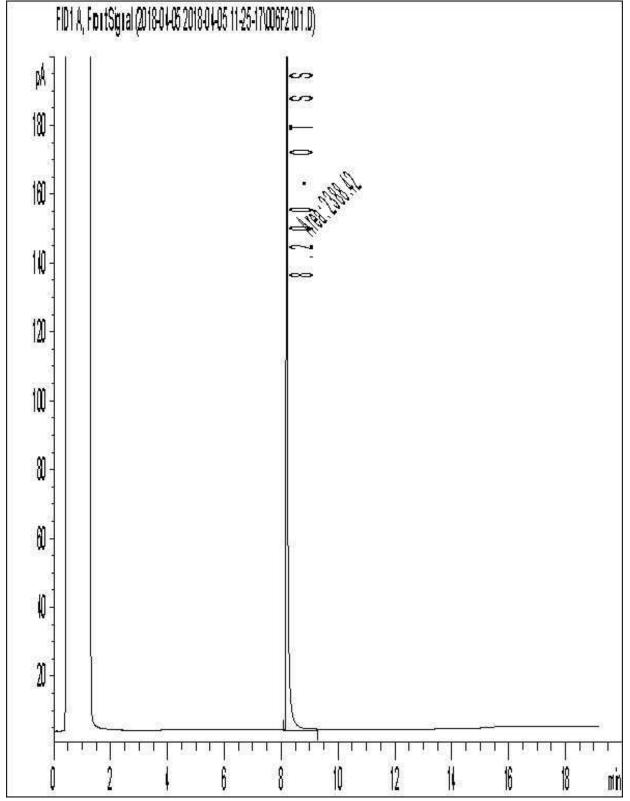
available for viewing at www.maxxam.ca/terms. Sample container, preservation, hold time and packages information can be viewed at http://maxxam.ca/wp-content/uploads/Ontario-COC.pdf.

COC-1004 (03/17)

White: Maxxam - Yellow: Client

exp Services Inc Client Project #: OTT-00245869-A Client ID: BH6

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.



Your Project #: OTT-00245869-AO Site Location: RIVER SIDE SOUTH SCHOOL Your C.O.C. #: 102863

Attention: Daniel Clarke

exp Services Inc Ottawa Branch 100-2650 Queensview Drive Ottawa, ON K2B 8H6

> Report Date: 2018/04/06 Report #: R5067901 Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B871983 Received: 2018/04/02, 13:30

Sample Matrix: Soil # Samples Received: 3

| | | Date | Date | | |
|--|----------|------------|------------|-------------------|----------------------|
| Analyses | Quantity | Extracted | Analyzed | Laboratory Method | Reference |
| 1,3-Dichloropropene Sum (1) | 1 | N/A | 2018/04/05 | | EPA 8260C m |
| Petroleum Hydro. CCME F1 & BTEX in Soil (1, 2) | 2 | N/A | 2018/04/05 | CAM SOP-00315 | CCME PHC-CWS m |
| Petroleum Hydrocarbons F2-F4 in Soil (1, 3) | 1 | 2018/04/04 | 2018/04/05 | CAM SOP-00316 | CCME CWS m |
| Strong Acid Leachable Metals by ICPMS (1) | 1 | 2018/04/04 | 2018/04/04 | CAM SOP-00447 | EPA 6020B m |
| Moisture (1) | 2 | N/A | 2018/04/04 | CAM SOP-00445 | Carter 2nd ed 51.2 m |
| Moisture (1) | 1 | N/A | 2018/04/06 | CAM SOP-00445 | Carter 2nd ed 51.2 m |
| Volatile Organic Compounds in Soil (1) | 1 | N/A | 2018/04/05 | CAM SOP-00228 | EPA 8260C m |

Remarks:

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

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.

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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

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



Your Project #: OTT-00245869-AO Site Location: RIVER SIDE SOUTH SCHOOL Your C.O.C. #: 102863

Attention: Daniel Clarke

exp Services Inc Ottawa Branch 100-2650 Queensview Drive Ottawa, ON K2B 8H6

> Report Date: 2018/04/06 Report #: R5067901 Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B871983

Received: 2018/04/02, 13:30

(1) This test was performed by Maxxam Analytics Mississauga

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

Encryption Key

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Total Cover Pages : 2 Page 2 of 15



exp Services Inc Client Project #: OTT-00245869-AO Site Location: RIVER SIDE SOUTH SCHOOL Sampler Initials: DC

RESULTS OF ANALYSES OF SOIL

| Maxxam ID | | GJF223 | | GJF224 | | GJF225 | | |
|------------------------|-------------|---------------------|----------|---------------------|----------|------------|-----|----------|
| Sampling Date | | 2018/04/02 11:30 | | 2018/04/02 11:40 | | 2018/04/02 | | |
| COC Number | | 102863 | | 102863 | | 102863 | | |
| | UNITS | BH 6-S1 | QC Batch | BH 6-S3 | QC Batch | BH 6-S30 | RDL | QC Batch |
| Inorganics | | | | | | | | |
| Moisture | % | 25 | 5469868 | 29 | 5468703 | 29 | 1.0 | 5472799 |
| RDL = Reportable Dete | ction Limit | | | | | | | |
| QC Batch = Quality Cor | the I Betel | | | | | | | |



exp Services Inc Client Project #: OTT-00245869-AO Site Location: RIVER SIDE SOUTH SCHOOL Sampler Initials: DC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | GJF223 | | |
|----------------------------------|-------|------------|-------|----------|
| Sampling Date | | 2018/04/02 | | |
| | | 11:30 | | |
| COC Number | | 102863 | | |
| | UNITS | BH 6-S1 | RDL | QC Batch |
| Metals | | | | |
| Acid Extractable Antimony (Sb) | ug/g | <0.20 | 0.20 | 5469143 |
| Acid Extractable Arsenic (As) | ug/g | 1.6 | 1.0 | 5469143 |
| Acid Extractable Barium (Ba) | ug/g | 270 | 0.50 | 5469143 |
| Acid Extractable Beryllium (Be) | ug/g | 0.93 | 0.20 | 5469143 |
| Acid Extractable Boron (B) | ug/g | 7.2 | 5.0 | 5469143 |
| Acid Extractable Cadmium (Cd) | ug/g | 0.24 | 0.10 | 5469143 |
| Acid Extractable Chromium (Cr) | ug/g | 61 | 1.0 | 5469143 |
| Acid Extractable Cobalt (Co) | ug/g | 14 | 0.10 | 5469143 |
| Acid Extractable Copper (Cu) | ug/g | 29 | 0.50 | 5469143 |
| Acid Extractable Lead (Pb) | ug/g | 10 | 1.0 | 5469143 |
| Acid Extractable Molybdenum (Mo) | ug/g | 1.8 | 0.50 | 5469143 |
| Acid Extractable Nickel (Ni) | ug/g | 31 | 0.50 | 5469143 |
| Acid Extractable Selenium (Se) | ug/g | <0.50 | 0.50 | 5469143 |
| Acid Extractable Silver (Ag) | ug/g | <0.20 | 0.20 | 5469143 |
| Acid Extractable Thallium (Tl) | ug/g | 0.26 | 0.050 | 5469143 |
| Acid Extractable Uranium (U) | ug/g | 3.2 | 0.050 | 5469143 |
| Acid Extractable Vanadium (V) | ug/g | 54 | 5.0 | 5469143 |
| | ug/g | 100 | 5.0 | 5469143 |



exp Services Inc Client Project #: OTT-00245869-AO Site Location: RIVER SIDE SOUTH SCHOOL Sampler Initials: DC

VOLATILE ORGANICS BY GC/MS (SOIL)

| Maxxam ID | | GJF223 | | |
|-------------------------------------|-------|------------|-------|----------|
| Sampling Date | | 2018/04/02 | | |
| | | 11:30 | | |
| COC Number | | 102863 | | |
| | UNITS | BH 6-S1 | RDL | QC Batch |
| Calculated Parameters | | | | |
| 1,3-Dichloropropene (cis+trans) | ug/g | <0.050 | 0.050 | 5468781 |
| Volatile Organics | • | | | |
| Acetone (2-Propanone) | ug/g | <0.50 | 0.50 | 5467202 |
| Benzene | ug/g | <0.020 | 0.020 | 5467202 |
| Bromodichloromethane | ug/g | <0.050 | 0.050 | 5467202 |
| Bromoform | ug/g | <0.050 | 0.050 | 5467202 |
| Bromomethane | ug/g | <0.050 | 0.050 | 5467202 |
| Carbon Tetrachloride | ug/g | <0.050 | 0.050 | 5467202 |
| Chlorobenzene | ug/g | <0.050 | 0.050 | 5467202 |
| Chloroform | ug/g | <0.050 | 0.050 | 5467202 |
| Dibromochloromethane | ug/g | <0.050 | 0.050 | 5467202 |
| 1,2-Dichlorobenzene | ug/g | <0.050 | 0.050 | 5467202 |
| 1,3-Dichlorobenzene | ug/g | <0.050 | 0.050 | 5467202 |
| 1,4-Dichlorobenzene | ug/g | <0.050 | 0.050 | 5467202 |
| Dichlorodifluoromethane (FREON 12) | ug/g | <0.050 | 0.050 | 5467202 |
| 1,1-Dichloroethane | ug/g | <0.050 | 0.050 | 5467202 |
| 1,2-Dichloroethane | ug/g | <0.050 | 0.050 | 5467202 |
| 1,1-Dichloroethylene | ug/g | <0.050 | 0.050 | 5467202 |
| cis-1,2-Dichloroethylene | ug/g | <0.050 | 0.050 | 5467202 |
| trans-1,2-Dichloroethylene | ug/g | <0.050 | 0.050 | 5467202 |
| 1,2-Dichloropropane | ug/g | <0.050 | 0.050 | 5467202 |
| cis-1,3-Dichloropropene | ug/g | <0.030 | 0.030 | 5467202 |
| trans-1,3-Dichloropropene | ug/g | <0.040 | 0.040 | 5467202 |
| Ethylbenzene | ug/g | <0.020 | 0.020 | 5467202 |
| Ethylene Dibromide | ug/g | <0.050 | 0.050 | 5467202 |
| Hexane | ug/g | <0.050 | 0.050 | 5467202 |
| Methylene Chloride(Dichloromethane) | ug/g | <0.050 | 0.050 | 5467202 |
| Methyl Ethyl Ketone (2-Butanone) | ug/g | <0.50 | 0.50 | 5467202 |
| Methyl Isobutyl Ketone | ug/g | <0.50 | 0.50 | 5467202 |
| Methyl t-butyl ether (MTBE) | ug/g | <0.050 | 0.050 | 5467202 |
| Styrene | ug/g | <0.050 | 0.050 | 5467202 |
| 1,1,1,2-Tetrachloroethane | ug/g | <0.050 | 0.050 | 5467202 |
| 1,1,2,2-Tetrachloroethane | ug/g | <0.050 | 0.050 | 5467202 |
| RDL = Reportable Detection Limit | | | | |
| QC Batch = Quality Control Batch | | | | |



exp Services Inc Client Project #: OTT-00245869-AO Site Location: RIVER SIDE SOUTH SCHOOL Sampler Initials: DC

VOLATILE ORGANICS BY GC/MS (SOIL)

| Maxxam ID | | GJF223 | | |
|---|-------|------------|----------|----------|
| Sampling Date | | 2018/04/02 | | |
| | | 11:30 | | |
| COC Number | | 102863 | | |
| | UNITS | BH 6-S1 | RDL | QC Batch |
| Tetrachloroethylene | ug/g | <0.050 | 0.050 | 5467202 |
| Toluene | ug/g | <0.020 | 0.020 | 5467202 |
| 1,1,1-Trichloroethane | ug/g | <0.050 | 0.050 | 5467202 |
| 1,1,2-Trichloroethane | ug/g | <0.050 | 0.050 | 5467202 |
| Trichloroethylene | ug/g | <0.050 | 0.050 | 5467202 |
| Trichlorofluoromethane (FREON 11) | ug/g | <0.050 | 0.050 | 5467202 |
| Vinyl Chloride | ug/g | <0.020 | 0.020 | 5467202 |
| p+m-Xylene | ug/g | <0.020 | 0.020 | 5467202 |
| o-Xylene | ug/g | <0.020 | 0.020 | 5467202 |
| Total Xylenes | ug/g | <0.020 | 0.020 | 5467202 |
| Surrogate Recovery (%) | | | | |
| 4-Bromofluorobenzene | % | 100 | | 5467202 |
| D10-o-Xylene | % | 134 (1) | | 5467202 |
| D4-1,2-Dichloroethane | % | 96 | | 5467202 |
| D8-Toluene | % | 97 | | 5467202 |
| RDL = Reportable Detection Limit | | | | |
| QC Batch = Quality Control Batch | | | | |
| (1) Recovery or RPD for this parameter i quality control for this analysis meets ac | | | s. The c | overall |



exp Services Inc Client Project #: OTT-00245869-AO Site Location: RIVER SIDE SOUTH SCHOOL Sampler Initials: DC

PETROLEUM HYDROCARBONS (CCME)

| Maxxam ID | | GJF224 | | | GJF225 | | |
|------------------------------|--------|---------------------|-------|----------|------------|-------|-----------|
| | | | | | GJFZZ5 | | |
| Sampling Date | | 2018/04/02 11:40 | | | 2018/04/02 | | |
| COC Number | | 102863 | | | 102863 | | |
| | UNITS | BH 6-S3 | RDL | QC Batch | BH 6-S30 | RDL | QC Batch |
| BTEX & F1 Hydrocarbons | 0.1110 | 5110 00 | | QC Daten | 511 0 000 | | Qe butten |
| Benzene | ug/g | <0.020 | 0.020 | 5469847 | <0.020 | 0.020 | 5469847 |
| Toluene | ug/g | <0.020 | 0.020 | 5469847 | <0.020 | 0.020 | 5469847 |
| Ethylbenzene | ug/g | <0.020 | 0.020 | 5469847 | <0.020 | 0.020 | 5469847 |
| o-Xylene | ug/g | <0.020 | 0.020 | 5469847 | <0.020 | 0.020 | 5469847 |
| p+m-Xylene | ug/g | <0.040 | 0.040 | 5469847 | <0.040 | 0.040 | 5469847 |
| Total Xylenes | ug/g | <0.040 | 0.040 | 5469847 | <0.040 | 0.040 | 5469847 |
| F1 (C6-C10) | ug/g | <10 | 10 | 5469847 | <10 | 10 | 5469847 |
| F1 (C6-C10) - BTEX | ug/g | <10 | 10 | 5469847 | <10 | 10 | 5469847 |
| F2-F4 Hydrocarbons | | | • | | | • | |
| F2 (C10-C16 Hydrocarbons) | ug/g | <10 | 10 | 5469687 | | | |
| F3 (C16-C34 Hydrocarbons) | ug/g | <50 | 50 | 5469687 | | | |
| F4 (C34-C50 Hydrocarbons) | ug/g | <50 | 50 | 5469687 | | | |
| Reached Baseline at C50 | ug/g | Yes | | 5469687 | | | |
| Surrogate Recovery (%) | | | | | | | |
| 1,4-Difluorobenzene | % | 99 | | 5469847 | 100 | | 5469847 |
| 4-Bromofluorobenzene | % | 101 | | 5469847 | 101 | | 5469847 |
| D10-Ethylbenzene | % | 92 | | 5469847 | 96 | | 5469847 |
| D4-1,2-Dichloroethane | % | 105 | | 5469847 | 106 | | 5469847 |
| o-Terphenyl | % | 99 | | 5469687 | | | |
| RDL = Reportable Detection I | imit | | | | | | |
| QC Batch = Quality Control B | atch | | | | | | |
| | | | | | | | |



exp Services Inc Client Project #: OTT-00245869-AO Site Location: RIVER SIDE SOUTH SCHOOL Sampler Initials: DC

TEST SUMMARY

| Maxxam ID: GJF223 Sample ID: BH 6-S1 Matrix: Soil | | | | | Collected: 2018/04/02 Shipped: Received: 2018/04/02 |
|--|-----------------|---------|------------|---------------|---|
| Test Description | Instrumentation | Batch | Extracted | Date Analyzed | Analyst |
| 1,3-Dichloropropene Sum | CALC | 5468781 | N/A | 2018/04/05 | Automated Statchk |
| Strong Acid Leachable Metals by ICPMS | ICP/MS | 5469143 | 2018/04/04 | 2018/04/04 | Daniel Teclu |
| Moisture | BAL | 5469868 | N/A | 2018/04/04 | Prgya Panchal |
| Volatile Organic Compounds in Soil | GC/MS | 5467202 | N/A | 2018/04/05 | Juan Pangilinan |
| Maxxam ID: GJF224 Sample ID: BH 6-S3 Matrix: Soil | | | | | Collected: 2018/04/02 Shipped: Received: 2018/04/02 |
| Test Description | Instrumentation | Batch | Extracted | Date Analyzed | Analyst |
| Petroleum Hydro. CCME F1 & BTEX in Soil | HSGC/MSFD | 5469847 | N/A | 2018/04/05 | Georgeta Rusu |
| Petroleum Hydrocarbons F2-F4 in Soil | GC/FID | 5469687 | 2018/04/04 | 2018/04/05 | Zhiyue (Frank) Zhu |
| Moisture | BAL | 5468703 | N/A | 2018/04/04 | Prgya Panchal |
| Maxxam ID: GJF225 Sample ID: BH 6-S30 Matrix: Soil | | | | | Collected: 2018/04/02 Shipped: Received: 2018/04/02 |
| Test Description | Instrumentation | Batch | Extracted | Date Analyzed | Analyst |
| • | | | | | |
| Petroleum Hydro. CCME F1 & BTEX in Soil | HSGC/MSFD | 5469847 | N/A | 2018/04/05 | Georgeta Rusu |



exp Services Inc Client Project #: OTT-00245869-AO Site Location: RIVER SIDE SOUTH SCHOOL Sampler Initials: DC

GENERAL COMMENTS

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

Package 1 12.3°C

Cooler custody seal was present and intact.

Sample GJF223 [BH 6-S1] : The recovery for the extraction surrogate compound was above the upper control limit for duplicate analyses of the soil sample. Visible loss of methanol was observed in this sample. As a result, there is an increased level of uncertainty associated with the values reported for this sample.

Sample GJF225 [BH 6-S30] : Please add moisture to the vials for this sample.

Results relate only to the items tested.



Maxxam Job #: B871983 Report Date: 2018/04/06

QUALITY ASSURANCE REPORT

exp Services Inc Client Project #: OTT-00245869-AO Site Location: RIVER SIDE SOUTH SCHOOL Sampler Initials: DC

| | | | Matrix | Spike | SPIKED | BLANK | Method | Blank | RP | D |
|----------|---------------------------|------------|------------|-----------|------------|-----------|--------|-------|-----------|-----------|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits |
| 5467202 | 4-Bromofluorobenzene | 2018/04/04 | 101 | 60 - 140 | 103 | 60 - 140 | 101 | % | | |
| 5467202 | D10-o-Xylene | 2018/04/04 | 128 | 60 - 130 | 120 | 60 - 130 | 118 | % | | |
| 5467202 | D4-1,2-Dichloroethane | 2018/04/04 | 95 | 60 - 140 | 102 | 60 - 140 | 103 | % | | |
| 5467202 | D8-Toluene | 2018/04/04 | 100 | 60 - 140 | 97 | 60 - 140 | 95 | % | | |
| 5469687 | o-Terphenyl | 2018/04/05 | 99 | 60 - 130 | 98 | 60 - 130 | 97 | % | | |
| 5469847 | 1,4-Difluorobenzene | 2018/04/04 | 101 | 60 - 140 | 102 | 60 - 140 | 99 | % | | |
| 5469847 | 4-Bromofluorobenzene | 2018/04/04 | 101 | 60 - 140 | 101 | 60 - 140 | 100 | % | | |
| 5469847 | D10-Ethylbenzene | 2018/04/04 | 101 | 60 - 140 | 94 | 60 - 140 | 88 | % | | |
| 5469847 | D4-1,2-Dichloroethane | 2018/04/04 | 107 | 60 - 140 | 107 | 60 - 140 | 104 | % | | |
| 5467202 | 1,1,1,2-Tetrachloroethane | 2018/04/04 | 103 | 60 - 140 | 100 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | 1,1,1-Trichloroethane | 2018/04/04 | 103 | 60 - 140 | 97 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | 1,1,2,2-Tetrachloroethane | 2018/04/04 | 100 | 60 - 140 | 107 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | 1,1,2-Trichloroethane | 2018/04/04 | 98 | 60 - 140 | 102 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | 1,1-Dichloroethane | 2018/04/04 | 100 | 60 - 140 | 98 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | 1,1-Dichloroethylene | 2018/04/04 | 100 | 60 - 140 | 93 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | 1,2-Dichlorobenzene | 2018/04/04 | 103 | 60 - 140 | 99 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | 1,2-Dichloroethane | 2018/04/04 | 97 | 60 - 140 | 103 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | 1,2-Dichloropropane | 2018/04/04 | 99 | 60 - 140 | 100 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | 1,3-Dichlorobenzene | 2018/04/04 | 104 | 60 - 140 | 96 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | 1,4-Dichlorobenzene | 2018/04/04 | 104 | 60 - 140 | 97 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | Acetone (2-Propanone) | 2018/04/04 | 91 | 60 - 140 | 100 | 60 - 140 | <0.50 | ug/g | NC | 50 |
| 5467202 | Benzene | 2018/04/04 | 100 | 60 - 140 | 98 | 60 - 130 | <0.020 | ug/g | NC | 50 |
| 5467202 | Bromodichloromethane | 2018/04/04 | 99 | 60 - 140 | 102 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | Bromoform | 2018/04/04 | 99 | 60 - 140 | 107 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | Bromomethane | 2018/04/04 | 104 | 60 - 140 | 100 | 60 - 140 | <0.050 | ug/g | NC | 50 |
| 5467202 | Carbon Tetrachloride | 2018/04/04 | 103 | 60 - 140 | 97 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | Chlorobenzene | 2018/04/04 | 102 | 60 - 140 | 99 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | Chloroform | 2018/04/04 | 102 | 60 - 140 | 102 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | cis-1,2-Dichloroethylene | 2018/04/04 | 102 | 60 - 140 | 101 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | cis-1,3-Dichloropropene | 2018/04/04 | 92 | 60 - 140 | 94 | 60 - 130 | <0.030 | ug/g | NC | 50 |
| 5467202 | Dibromochloromethane | 2018/04/04 | 100 | 60 - 140 | 103 | 60 - 130 | <0.050 | ug/g | NC | 50 |



Maxxam Job #: B871983 Report Date: 2018/04/06

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc Client Project #: OTT-00245869-AO Site Location: RIVER SIDE SOUTH SCHOOL Sampler Initials: DC

| | | | Matrix | Spike | SPIKED | BLANK | Method I | Blank | RP | D |
|----------|-------------------------------------|------------|------------|-----------|------------|-----------|----------|-------|-----------|-----------|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits |
| 5467202 | Dichlorodifluoromethane (FREON 12) | 2018/04/04 | 107 | 60 - 140 | 98 | 60 - 140 | <0.050 | ug/g | NC | 50 |
| 5467202 | Ethylbenzene | 2018/04/04 | 99 | 60 - 140 | 92 | 60 - 130 | <0.020 | ug/g | NC | 50 |
| 5467202 | Ethylene Dibromide | 2018/04/04 | 101 | 60 - 140 | 108 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | Hexane | 2018/04/04 | 99 | 60 - 140 | 91 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | Methyl Ethyl Ketone (2-Butanone) | 2018/04/04 | 87 | 60 - 140 | 100 | 60 - 140 | <0.50 | ug/g | NC | 50 |
| 5467202 | Methyl Isobutyl Ketone | 2018/04/04 | 88 | 60 - 140 | 102 | 60 - 130 | <0.50 | ug/g | NC | 50 |
| 5467202 | Methyl t-butyl ether (MTBE) | 2018/04/04 | 97 | 60 - 140 | 99 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | Methylene Chloride(Dichloromethane) | 2018/04/04 | 104 | 60 - 140 | 105 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | o-Xylene | 2018/04/04 | 99 | 60 - 140 | 93 | 60 - 130 | <0.020 | ug/g | NC | 50 |
| 5467202 | p+m-Xylene | 2018/04/04 | 98 | 60 - 140 | 91 | 60 - 130 | <0.020 | ug/g | NC | 50 |
| 5467202 | Styrene | 2018/04/04 | 100 | 60 - 140 | 97 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | Tetrachloroethylene | 2018/04/04 | 107 | 60 - 140 | 98 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | Toluene | 2018/04/04 | 100 | 60 - 140 | 95 | 60 - 130 | <0.020 | ug/g | NC | 50 |
| 5467202 | Total Xylenes | 2018/04/04 | | | | | <0.020 | ug/g | NC | 50 |
| 5467202 | trans-1,2-Dichloroethylene | 2018/04/04 | 104 | 60 - 140 | 99 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | trans-1,3-Dichloropropene | 2018/04/04 | 92 | 60 - 140 | 93 | 60 - 130 | <0.040 | ug/g | NC | 50 |
| 5467202 | Trichloroethylene | 2018/04/04 | 106 | 60 - 140 | 102 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | Trichlorofluoromethane (FREON 11) | 2018/04/04 | 103 | 60 - 140 | 95 | 60 - 130 | <0.050 | ug/g | NC | 50 |
| 5467202 | Vinyl Chloride | 2018/04/04 | 100 | 60 - 140 | 94 | 60 - 130 | <0.020 | ug/g | NC | 50 |
| 5468703 | Moisture | 2018/04/04 | | | | | | | 0 | 20 |
| 5469143 | Acid Extractable Antimony (Sb) | 2018/04/04 | 84 | 75 - 125 | 107 | 80 - 120 | <0.20 | ug/g | NC | 30 |
| 5469143 | Acid Extractable Arsenic (As) | 2018/04/04 | 99 | 75 - 125 | 104 | 80 - 120 | <1.0 | ug/g | 5.7 | 30 |
| 5469143 | Acid Extractable Barium (Ba) | 2018/04/04 | NC | 75 - 125 | 98 | 80 - 120 | <0.50 | ug/g | 1.6 | 30 |
| 5469143 | Acid Extractable Beryllium (Be) | 2018/04/04 | 106 | 75 - 125 | 105 | 80 - 120 | <0.20 | ug/g | 4.1 | 30 |
| 5469143 | Acid Extractable Boron (B) | 2018/04/04 | 88 | 75 - 125 | 102 | 80 - 120 | <5.0 | ug/g | 7.0 | 30 |
| 5469143 | Acid Extractable Cadmium (Cd) | 2018/04/04 | 101 | 75 - 125 | 103 | 80 - 120 | <0.10 | ug/g | NC | 30 |
| 5469143 | Acid Extractable Chromium (Cr) | 2018/04/04 | NC | 75 - 125 | 97 | 80 - 120 | <1.0 | ug/g | 1.1 | 30 |
| 5469143 | Acid Extractable Cobalt (Co) | 2018/04/04 | 94 | 75 - 125 | 100 | 80 - 120 | <0.10 | ug/g | 3.3 | 30 |
| 5469143 | Acid Extractable Copper (Cu) | 2018/04/04 | NC | 75 - 125 | 101 | 80 - 120 | <0.50 | ug/g | 0.13 | 30 |
| 5469143 | Acid Extractable Lead (Pb) | 2018/04/04 | 103 | 75 - 125 | 104 | 80 - 120 | <1.0 | ug/g | 0.21 | 30 |
| 5469143 | Acid Extractable Molybdenum (Mo) | 2018/04/04 | 98 | 75 - 125 | 102 | 80 - 120 | <0.50 | ug/g | NC | 30 |

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Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca



Maxxam Job #: B871983 Report Date: 2018/04/06

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc Client Project #: OTT-00245869-AO Site Location: RIVER SIDE SOUTH SCHOOL Sampler Initials: DC

| | | | Matrix | Spike | SPIKED | BLANK | Method E | Blank | RPI |) |
|----------|--------------------------------|------------|------------|-----------|------------|-----------|----------|-------|-----------|-----------|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits |
| 5469143 | Acid Extractable Nickel (Ni) | 2018/04/04 | NC | 75 - 125 | 101 | 80 - 120 | <0.50 | ug/g | 2.4 | 30 |
| 5469143 | Acid Extractable Selenium (Se) | 2018/04/04 | 96 | 75 - 125 | 102 | 80 - 120 | <0.50 | ug/g | NC | 30 |
| 5469143 | Acid Extractable Silver (Ag) | 2018/04/04 | 98 | 75 - 125 | 103 | 80 - 120 | <0.20 | ug/g | NC | 30 |
| 5469143 | Acid Extractable Thallium (TI) | 2018/04/04 | 101 | 75 - 125 | 103 | 80 - 120 | <0.050 | ug/g | 6.0 | 30 |
| 5469143 | Acid Extractable Uranium (U) | 2018/04/04 | 100 | 75 - 125 | 101 | 80 - 120 | <0.050 | ug/g | 0.15 | 30 |
| 5469143 | Acid Extractable Vanadium (V) | 2018/04/04 | NC | 75 - 125 | 100 | 80 - 120 | <5.0 | ug/g | 2.4 | 30 |
| 5469143 | Acid Extractable Zinc (Zn) | 2018/04/04 | NC | 75 - 125 | 103 | 80 - 120 | <5.0 | ug/g | 2.8 | 30 |
| 5469687 | F2 (C10-C16 Hydrocarbons) | 2018/04/05 | 101 | 50 - 130 | 99 | 80 - 120 | <10 | ug/g | NC | 30 |
| 5469687 | F3 (C16-C34 Hydrocarbons) | 2018/04/05 | 105 | 50 - 130 | 105 | 80 - 120 | <50 | ug/g | NC | 30 |
| 5469687 | F4 (C34-C50 Hydrocarbons) | 2018/04/05 | 108 | 50 - 130 | 106 | 80 - 120 | <50 | ug/g | NC | 30 |
| 5469847 | Benzene | 2018/04/04 | 100 | 60 - 140 | 102 | 60 - 140 | <0.020 | ug/g | NC | 50 |
| 5469847 | Ethylbenzene | 2018/04/04 | 98 | 60 - 140 | 98 | 60 - 140 | <0.020 | ug/g | NC | 50 |
| 5469847 | F1 (C6-C10) - BTEX | 2018/04/04 | | | | | <10 | ug/g | NC | 30 |
| 5469847 | F1 (C6-C10) | 2018/04/04 | 101 | 60 - 140 | 99 | 80 - 120 | <10 | ug/g | NC | 30 |
| 5469847 | o-Xylene | 2018/04/04 | 103 | 60 - 140 | 104 | 60 - 140 | <0.020 | ug/g | NC | 50 |
| 5469847 | p+m-Xylene | 2018/04/04 | 99 | 60 - 140 | 100 | 60 - 140 | <0.040 | ug/g | NC | 50 |
| 5469847 | Toluene | 2018/04/04 | 94 | 60 - 140 | 94 | 60 - 140 | <0.020 | ug/g | NC | 50 |
| 5469847 | Total Xylenes | 2018/04/04 | | | | | <0.040 | ug/g | NC | 50 |
| 5469868 | Moisture | 2018/04/04 | | | | | | | 1.5 | 20 |

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

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

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

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

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

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

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



exp Services Inc Client Project #: OTT-00245869-AO Site Location: RIVER SIDE SOUTH SCHOOL Sampler Initials: DC

VALIDATION SIGNATURE PAGE

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

austin Camere

Cristina Carriere, Scientific Service Specialist

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

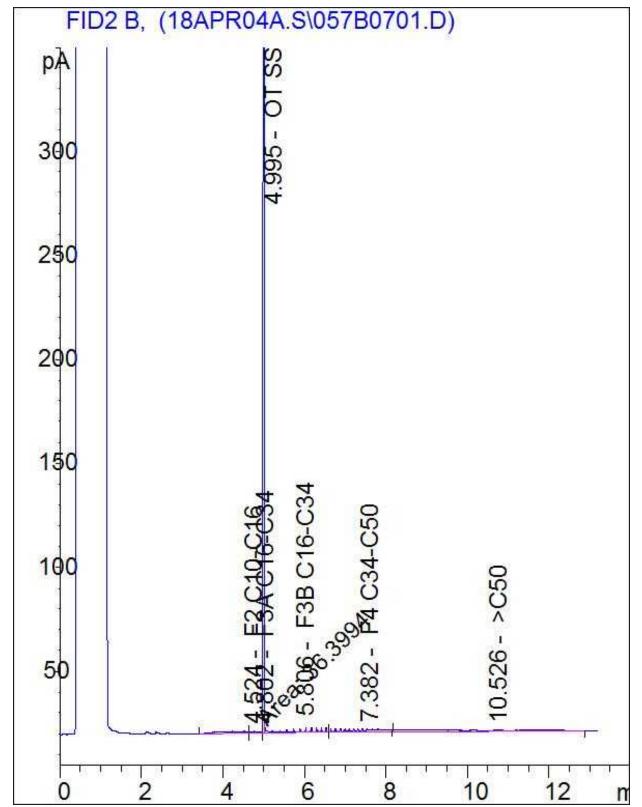
| Invoice Information | | | Report | Information | (if dif | fers fro | om inv | oice) | | | | 10100010 | N OF CUSTOR | 100 10 200 200 | | 102863 Page (of / | | |
|---|------------------------------------|-------------------------|---------------------------|-------------|---------------|--------------------|--------------|--------------|----------|----------------------|----------------------------|----------|--------------------|----------------|-------------|---|--|--|
| ompany Name: CXD | | Company | Name: | SAM- | 0 | | | | | | Quotation #: STIEGM 3 | | | 3 | | Regular TAT (5-7 days) Most analyses | | |
| ontact Name: Daniel Clark | | Contact N | | 111 | | lus. | | | | | P.O. #/ AFE | | | | | PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJEC | | |
| idress: 100-7650 que | | Address: | | | | | | | | | Project #: | | 0TT-0024 | 15869 | 7.40 | Rush TAT (Surcharges will be applied) | | |
| 0 14949 | | | | | | | | 48 | | | Site Location | | R. Ver Sig | | | 2 Days 3-4 Days | | |
| ione: Fax: | | Phone: | | | | Fax: | | | | | Site #: | | | | | ~/ | | |
| nail: Daniel Clark Dexi | 7(4, | Email: | | | | - | | | | | Sampled B | y; | 20 | 4 | | Date Required: | | |
| MOE REGULATED DRINKIN | WATER OR WATER I | INTENDED FOR | HUMAN CONS | SUMPTION M | UST B | IE SUBI | MITTE | D ON T | HE MAX | IXAM E | RINKING WAT | ER CH | HAIN OF CUSTODY | | File | Rush Confirmation #: | | |
| Regulation 153 | ССМЕ | Other Reg | ulations y Sewer Bylaw | | | _ | _ | _ | - | - | Analysis | Reque | ested | | - | LABORATORY USE ONLY | | |
| Table Z Ind/Comm Coarse Table 3 Agri/ Other Table FOR RSC (PLEASE CIRCLE) Y / N | MISA PWQO Other (1 REG 55 | Region Specify) | Sewer Bylaw | | иттер | Metals / Hg / CrVI | | | | TURNICS | , HWS - 8) | | | | | CODLER TEMPERATUR Present Intact | | |
| ude Criteria on Certificate of Analysis: Y / N | | 1. | Start Street | | S SUBN | CIRCLE) | | | | METALS | Metals | | | | ANALYZE | | | |
| SAMPLES MUST BE KEPT COOL (< 10 °C) FROM | TIME OF SAMPLING | UNTIL DELIVE | RY TO MAXXAN | И | AINERS | ERED (C | E | 7 | | PMS N | METALS 1, ICPMS | | | | NOT AI | CODLING MEDIA PRESENT: | | |
| SAMPLE IDENTIFICATION | | 'E SAMPLED (Y/MM/DD) | TIME SAMPLED (HH:MM) | MATRIX | # OF CONTAINE | FIELD FILTERED | BTEX/ PHC F1 | PHCs F2 - F4 | VOCS | REG 153 ICPMS METALS | REG 153 M (Hg, Cr VI, I | | | | ногр- ро | COMMENTS | | |
| BH6-51 | Api | 1-12/18 | 11:30 | 50:1 | 4 | 1 | | | X | X | | | | | | | | |
| BH6=53 | 1, | | 11:40 | 50:1 | 3 | 1 | X | X | | | | | | | | | | |
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COC-1004 (03/17)

exp Services Inc Client Project #: OTT-00245869-AO Project name: RIVER SIDE SOUTH SCHOOL Client ID: BH 6-S3

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.