Phase Two Environmental Site Assessment – 3500 Hawthorne Road, Ottawa, Ontario

Final Report

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Executive Summary

Stantec Consulting Ltd. (Stantec) was retained by 2520333 Ontario Inc. to conduct a Phase Two Environmental Site Assessment (ESA) of the vacant property located at 3500 Hawthorne Road in Ottawa, Ontario, hereinafter referred to as the "Site".

The purpose of the Phase Two ESA was to determine the presence or absence of contamination associated with areas of potential environmental concern (APECs) identified in the Phase One ESA recently completed by Stantec. The Phase Two ESA was completed "in the spirit" of Ontario Regulation 153/04 (O.Reg. 153/04) but it does not contain all the mandatory items specified in O.Reg. 153/04, such as horizontal and vertical delineation of all contaminants in soil and groundwater, a Phase Two ESA Conceptual Site Model, cross-sections, and the Phase Two ESA reporting requirements as specified in Table 1 of Schedule E in O.Reg. 153/04. This Phase Two ESA will not provide sufficient information to support the filing of a Record of Site Condition in accordance with O.Reg. 153/04. However, we understand that a Record of Site Condition has already been filed in the past (i.e., June 2011) for a future commercial land use based on the 2004 standards, prior to new standards and regulatory requirements coming into effect on July 1, 2011. In addition, the Phase Two ESA was completed for 2520333 Ontario Inc. to support the filing of a City of Ottawa Site Plan Control Application for the development of the Site and to provide advice on the management of excess soil during the construction of the future commercial gas station.

The current applicable soil and groundwater standards for the Site are provided in:

- Ministry of the Environment (MOE), *Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act,* April 15, 2011.

However, since the Site has a Record of Site Condition filed in June 2011, the MOE 2004 Table 2 Standards may be grandfathered in for the Site and are assumed to be the most applicable Standards to assess compliance. Thus, although the results were compared to the MOE 2011 Table 6 Standards, the MOE 2004 Table 2 Standards take precedence.

The scope of work for the Phase Two ESA consisted of advancing four boreholes on-Site and installing three monitoring wells (BH17-4, and MW17-1 to MW17-3) on the Site to assess the two APECs identified in the Phase One ESA (i.e., fill material on the southern and central portions of the Site and debris on the northern and southern portions of the Site). Representative soil and groundwater samples were collected from each of the boreholes and monitoring wells and submitted for laboratory analysis of one or more potential contaminants of concern (petroleum hydrocarbon fractions F1 to F4 (PHCs F1 to F4), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), metals and general chemistry).

Based on the results of the Phase Two ESA, Stantec makes the following conclusions:

- The overburden at the Site generally consisted of topsoil underlain by fill or native silty sand / sandy silt. Weathered shale bedrock was encountered in each drilling location during the Phase Two ESA field program at depths ranging from 1.07 to 2.9 m bgs.
- The measured concentrations of the contaminants of concern were below the 2011 Ontario Table 6 standards in all of the soil samples submitted for laboratory analysis.
- The measured concentrations of the contaminants of concern were below the 2011 Ontario Table 1 (background) standards, with the exception of concentrations of hexane in two locations.
- Depth to groundwater measured on October 16, 2017, ranged from 3.61 m bgs in MW17-3 to 5.432 m bgs in MW17-2.
- Shallow groundwater at the Site is generally trending northwesterly on the southern portion of the property and southwesterly on the northern portion of the property, based on the results of the groundwater monitoring completed during this program.
- The measured concentrations of the contaminants of concern were below the 2011 Table 6 and/or 2004 Table 2 standards in all of the groundwater samples submitted for laboratory analysis.

Based on the results of the Phase Two ESA, Stantec makes the following recommendations:

- No further work is required with respect to the applicable 2004 and/or 2011 soil and groundwater standards for the current and future use of the Site.
- Based on Stantec's current understanding of the management of excess soil in Ontario, the on-Site soil is not suitable for re-use as clean fill off-Site due to concentrations of hexane exceeding the Ontario Table 1 Standard. If any any soil is removed from the Site, it should be taken to a landfill for disposal. Prior to removal for off-site disposal, waste classification analysis should be completed on soils to determine that the soil is not leachate toxic (i.e., it is non-hazardous) and therefore can be disposed at a local MOECC-approved non-hazardous solid waste landfill. The process to manage and dispose of excess soil from the Site will change once the new Excess Soil Reuse Regulation is in effect.

- Dewatering may be required during construction activities. Due to the presence of benzene in one groundwater sample, additional laboratory analysis may be required at the time the project is ready to commence to support a City of Ottawa sewer discharge permit, if a permit is required by the City.
- The groundwater monitoring wells should be decommissioned in accordance with O.Reg. 903, as amended, if they are no longer required.

The statements made in this Executive Summary text are subject to the limitations included in Section 6 and are to be read in conjunction with the remainder of this report.

1.0 INTRODUCTION

1.1 GENERAL

Stantec Consulting Ltd. (Stantec) was retained by 2520333 Ontario Inc to conduct a Phase Two Environmental Site Assessment (ESA) of the undeveloped property located at 3500 Hawthorne Road in Ottawa, Ontario, hereinafter referred to as the "Phase Two Property" or "Site". A key plan, illustrating the Site location, is provided on Figure No. 1, **Appendix A.**

The City of Ottawa Property Identification Number (PIN) for the Site is 041650539. Stantec understands that the Phase Two ESA is required for due diligence purposes to determine the presence/absence of contamination due to the two areas of potential environmental concern (APECs) identified in the Phase One ESA completed by Stantec dated April 4, 2017. The Phase Two ESA is also required to confirm the on-Site groundwater quality as observed by Barenco Inc. during a Phase II study completed in 2011. The Phase Two ESA is to be completed in accordance with Ontario Regulation 153/04 (O.Reg. 153/04) and is therefore called a Phase Two ESA, which is different from a Phase II ESA completed in accordance with CSA Standard Z768-01, R2013.

The purpose of the Phase Two ESA was to determine the presence or absence of contamination associated with the areas of potential environmental concern (APECs) identified in the Phase One ESA recently completed by Stantec (fill on the central and southern portions of the Site and debris on the northern and southern portions of the Site). The Phase Two ESA was completed "in the spirit" of Ontario Regulation 153/04 (O.Reg. 153/04) but it does not contain all the mandatory items specified in O.Reg. 153/04, such as horizontal and vertical delineation of all contaminants in soil and groundwater, a Phase Two ESA Conceptual Site Model, cross-sections, and the Phase Two ESA reporting requirements as specified in Table 1 of Schedule E in O.Reg. 153/04. This Phase Two ESA will not provide sufficient information to support the filing of a Record of Site Condition in accordance with O.Reg. 153/04 (as per the amendments that came into effect on July 1, 2011). However, we understand that a Record of Site Condition is not required for this Site.

In addition, the Phase Two ESA was completed for 2520333 Ontario to support the filing of a City of Ottawa Site Plan Control Application for the development of the Site and to provide advice on the management of excess soil during any construction.

1.2 SITE DESCRIPTION

1.2.1 Subject Property

The Phase Two Property occupies the approximate 3,700 m² plot of land described as part of Lot 5, Concession 5, Rideau Front, Geographic Township of Gloucester. The Phase Two Property has civic address of 3500 Hawthorne Road. The Phase Two Property is a vacant lot with low-lying vegetation and some trees. The Phase Two Property can be accessed from Hunt Club Road to the south and Hawthorne Road to the east.

A key plan is provided on Figure No. 1, **Appendix A**. A site plan is provided on Figure No. 2, **Appendix A.**

1.2.2 Previous Reports

Stantec reviewed various reports provided by 2520333 Ontario Inc for the Site. A complete list is provided below:

- *Phase One Environmental Site Assessment – 3500 Hawthorne Road, Ottawa, Ontario. Completed by Stantec Inc., report dated April 4, 2017*
- *Phase I Environmental Site Assessment – 3500 Hawthorne Road, Ottawa, Ontario. Completed by Barenco Inc., report dated May 30, 2011.*
- *Phase II Environmental Site Assessment, 3500 Hawthorne Road, Ottawa, Ontario. Completed by Barenco Inc., report dated June 1, 2011.*

The previous environmental reports were summarized in the Phase One ESA, and information obtained was used to help determine the APECs identified in the Phase One ESA completed by Stantec in 2017.

1.3 PHYSICAL SETTING

1.3.1 Surficial Geology

Geological maps of the area indicate that the native surficial soils in the vicinity of the Site consist of older alluvial deposits consisting of clay, silt, sand and gravel which may contain organic remains. This stratigraphy was confirmed in the historical reports reviewed by Stantec and the Phase Two ESA completed as summarized in this report. Stratigraphy observed during this subsurface investigation is discussed in Section 3.1.1.

1.3.2 Bedrock Geology

Based on information obtained from the Ontario Geological Survey layer in Google EarthPro, entitled *Bedrock Geology Without Lowlands,* bedrock in the area of the Site is reported to consist of shale, limestone, dolostone and siltstone of the Georgian Bay Formation, Blue Mountain Formation, Billings Formation, Collingwood Member and Eastview Member. The depth to bedrock is generally shallow in the area, from less than 5 metres below grade to at bedrock at surface. Bedrock was encountered at depths ranging from 1.0 to 2.9 metres below grade during the present sub-surface investigation.

1.3.3 Site Services

The Phase Two Property is not serviced as the Site is undeveloped.

1.3.4 Topography and Drainage

Based on Natural Resources Canada topographic map 31G/5, - Ottawa, scale 1:50,000, site observations, and topographical mapping of the geoOttawa website (http://maps.ottawa.ca/geoOttawa/), the topography of the Site and surrounding properties is generally flat and at a similar grade to adjoining properties to the east, west, north and south. The regional surface drainage (inferred shallow groundwater flow direction) appears to generally flow in a southeasterly direction on the northern portion of the property and in a northwesterly direction on the southern portion of the property. Historically, the inferred shallow groundwater flow was observed to flow in a northwesterly direction. The inferred shallow groundwater flow direction based on the findings of this subsurface investigation is discussed in Section 3.2.1.

It should be noted that the direction of the shallow groundwater flow in limited areas can also be influenced by the presence of underground utility corridors and is not necessarily a reflection of local groundwater flow or a replica of the Site topography.

The Site is an undeveloped grass and shrub covered lot. Storm water is anticipated to drain either by infiltration or overland flow.

1.4 REGULATORY FRAMEWORK

The Ontario Standards apply in evaluating the extent of impacted soil and groundwater, as required to support the City of Ottawa Site Plan Control Application. The Ontario soil standards were also used to determine if excess soil from any on-Site construction could be disposed off-site as clean fill.

The regulatory framework used to evaluate and compare the soil and groundwater quality data are provided in:

- Ministry of the Environment (MOE), *Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act,* April 15, 2011.

Details regarding the selection of the applicable standards are presented in **Appendix B**.

1.5 SCOPE OF WORK

The following scope of work for the soil and groundwater sampling program was presented in Stantec's Proposal to 2520333 Ontario Inc. dated October 4, 2017. The scope is generally based on the requirements of the Canadian Standards Association (CSA) *Phase II Environmental Site Assessment* (A National Standard of Canada), CAN/CSA-Z769-00, March 2000, reaffirmed 2013, and elements of *Ontario Regulation 153/04*.

The Phase Two ESA program included the following scope of work:

- Coordinate the completion of both public and private utility locates for the Site;
- Advance four boreholes to a maximum depth of approximately 6 to 8 metres below grade surface (m bgs) in the vicinity of the APECs.
- Complete three boreholes as groundwater monitoring wells.
- Collect and submit one soil sample from each test location. The samples were submitted for laboratory analysis of the following parameters:
    - metals and inorganics (Reg. 153/04 full list), petroleum hydrocarbons four fractions (PHC F1 to F4), volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs).
- Collect and submit one representative groundwater sample from each location. The samples were submitted for laboratory analyses of the following parameters:
    - metals and inorganics (Reg. 153/04 full list), PHC F1 to F4, VOCs, PCBs, and PAHs.
- Provide a written report summarizing the sampling work program undertaken, results obtained and conclusions/recommendations (this report).

Based on the observed depth of the shallow groundwater table, the groundwater wells were completed to a maximum depth of approximately 7.6 m bgs.

The three newly installed groundwater monitoring wells, located on-site, were surveyed and monitored for depth to water. Groundwater elevations in the wells were used in determining the inferred shallow groundwater flow direction.

2.0 FIELD INVESTIGATION

2.1 METHODOLOGY

Prior to commencing any field activities, borehole locations were cleared of underground services through consultation with a private utility locate company as well as public utility locate services.

The four boreholes were drilled by Strata Soil Sampling using a Geomachine 100 rig equipped with sampling equipment to assess the soil conditions and air hammer through the bedrock where required. Soil samples were collected from the boreholes at regular depth intervals using a hollow stem auger equipped with split spoon samplers.

Stantec personnel visually classified and logged the subsurface conditions encountered within each of the boreholes at the time of the field work. Collected soil samples were analyzed in the field for combustible and total organic vapour concentrations using an RKI Eagle 2 Sample Draw Gas Monitor calibrated to hexane and isobutylene, respectively, and operated in the methane elimination mode.

The groundwater conditions were recorded at the time of drilling in the open boreholes on completion of drilling each borehole. Groundwater monitoring wells were installed and comprised of 51 mm inside diameter PVC. The newly installed monitoring wells were monitored to determine the depth to the groundwater table, presence/absence of free phase product within the monitoring well, and subsurface vapour concentrations. Prior to sampling, the installed monitoring wells were developed to remove any water added during installation and any fine-grained material from around the screened interval, by purging up to ten well casing volumes of groundwater using Waterra™ tubing and a footvalve. If physical parameters of pH, temperature and conductivity were within 10% during three consecutive readings by the multi-meter, the development of the well was stopped.

Low flow groundwater techniques allow for the collection of samples that are representative by minimizing drawdown of groundwater and minimizing mixing/disturbance of the standing water within the well. Field measurements were also made using a flow-through multi-meter cell, and low flow purging of each monitoring well location continued until the water quality field parameters stabilized at each monitoring well location. A groundwater sample was collected from each well once three successive measurements of temperature, pH and specific conductance indicated stability (i.e., measurements are within ± 10% of the previous measurement).

The soil and groundwater samples were collected in accordance with the protocols established by the Canadian Standards Association's Guideline *Z769-00 Phase II Environmental Site Assessments,* elements of *Ontario Regulation 153/04,* and standard industry practices to ensure that all data collected is of high quality and is representative of site conditions.

The UTM co-ordinates of all sampling locations were obtained using a DGPS Trimble unit accurate vertically and horizontally to 10 cm.

The soil and groundwater laboratory results were then compared against the applicable provincial standards.

The method for this scope of work is further detailed in **Appendix C.**

2.2 LABORATORY ANALYTICAL PROGRAM

The soil and groundwater samples were submitted to Maxxam Analytics (Maxxam) in Ottawa and Mississauga, Ontario, for laboratory analysis on a regular 5 day turnaround time of the contaminants of potential concern identified above. Maxxam is accredited by CALA, the Canadian Association for Laboratory Accreditation Inc., for the required analytical methods, and employs in-house quality assurance and quality control (QA/QC) programs to govern sample analysis, including the analyses of method blanks, spiked blanks, and duplicates (10%) for each sample batch.

In total, five soil samples (four borehole locations and one field duplicate) were submitted for laboratory analysis of metals and inorganics, PHC F1 to F4, VOCs, PCBs, and PAHs.

In total, four groundwater samples (three well locations and one field duplicate) were collected from the Site and submitted for laboratory analysis of metals and inorganics, PHC F1 to F4, VOCs, PCBs, and PAHs. One field blank and one trip blank were also submitted for VOCs.

3.0 RESULTS

3.1 SOIL

3.1.1 Stratigraphy

The overburden at the Site generally consisted of fill or topsoil underlain by silty sand / sandy silt . The thickness of the observed fill/overburden layer during the Phase Two ESA field program ranged from 1.07 to 2.90 m below grade. Based on grain size analysis results completed during previous investigations, the soil at the Site is considered coarse textured. Weathered shale bedrock was encountered in each drilling location during the Phase Two ESA field program. Detailed descriptions of stratigraphy observed are provided on the Borehole and Monitoring Well Logs in **Appendix D**.

3.1.2 Combustible Soil Vapour Concentrations

The combustible soil vapour concentrations measured during the Phase Two ESA are documented on the borehole and monitoring well logs and presented in **Appendix D** for reference. Combustible soil vapour concentrations ranged from non-detect (<5 parts per million by volume (ppmv)) in the majority of locations to 15 ppmv at MW17-1 at a depth of approximately 0 to 1.2 m bgs. Total organic vapour concentrations ranged from non-detect (<0.02 ppmv) in two locations to 3.0 ppmv at MW17-2 at a depth of approximately 0 to 1.07 m bgs.

There are no regulatory criteria for soil vapours; however, elevated vapour concentrations are generally indicative of the presence of volatile parameters. Concentrations vary with parameter type, concentration and age, and it should be noted that the readings are only intended to be used as a field screening tool to provide a qualitative measure of hydrocarbon levels within the subsurface. The readings do not provide a quantitative measure of analytical soil results.

3.1.3 Soil Analytical Results

The analytical results of the soil samples submitted for laboratory analysis of the contaminants of concern were compared to the Ontario Table 6 Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition, Soil (other than sediment), coarse-textured soil, industrial/commercial/community property use, *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*, April 15, 2011. The analytical results were also compared to the Ontario Table 1 Full Depth Background Site Condition Standards residential/parkland/institutional/industrial/ commercial/community property use for soil management purposes during construction. The analytical results are presented in Table E-1 in **Appendix E.** Laboratory Certificates of Analysis are provided in **Appendix F**.

3.1.3.1 Petroleum Hydrocarbons (F1 to F4)

Measured concentrations of PHCs analysed in the soil samples submitted for laboratory analysis were less than the applicable standards.

3.1.3.2 Volatile Organic Compounds (VOCs)

Measured concentrations of VOCs analysed in the soil samples submitted for laboratory analysis were less than the applicable standards, with the exception of concentrations of hexane in MW17-1 SS1 and MW17-2 SS1 (and duplicates) which exceeded the Ontario Table 1 Standard.

3.1.3.3 Polycyclic Aromatic Hydrocarbons (PAHs)

Measured concentrations of PAHs analysed in the soil samples submitted for laboratory analysis were less than the applicable standards.

3.1.3.4 Polychlorinated Biphenyls (PCBs)

Measured concentrations of PCBs analysed in the soil samples submitted for laboratory analysis were less than the applicable standards.

3.1.3.5 Metals and General Chemistry

Measured concentrations of metals and general chemistry parameters/inorganics analysed in the soil samples submitted for laboratory analysis were less than the applicable standards.

3.2 GROUNDWATER

3.2.1 Groundwater Monitoring

Depth to groundwater, vapour concentrations, and thickness of free product, if applicable, were measured in the newly-installed monitoring wells on October 16, 2017. Groundwater monitoring wells installed by others in the past were not found and are presumed to have been destroyed. Groundwater elevations were calculated in the monitoring wells to determine the local shallow groundwater flow direction. Table 3.1 below summarizes the monitoring results.

Table 3-1: On-Site Monitoring Summary - October 16, 2017

Location	Top of casing elevation (m RTD)	Top of ground surface elevation (m RTD)	Groundwater Depth (m bgs)	Groundwater Depth (m btoc)	Groundwater Elevation (m RTD)	Presence / Thickness of Free Product	Combustible Vapour (ppmv)	Total Organic Vapour (ppmv)
MW17-1	99.39	99.49	5.053	4.953	94.437	0	<5	1
MW17-2	100.14	99.36	5.432	6.212	93.928	0	5	<0.02
MW17-3	99.33	99.41	3.611	3.531	95.800	0	20	<0.02

Notes:

m RTD	metres relative to datum (SW corner of SW sewer grate by crosswalk on the SE corner of the lot)
m btoc	metres below top of casing
m bgs	metres below ground surface
ppmv	parts per million by volume

Shallow groundwater at the Site is generally trending northwesterly on the southern portion of the property and southwesterly on the northern portion of the property. The inferred shallow groundwater flow direction is shown on Figure No.3, **Appendix A**.

Groundwater combustible vapour concentrations measured on October 16, 2017, ranged from non-detect (<5 ppmv) to 20 ppmv. No measureable thickness of free product or sheen was observed in any of the monitoring wells.

3.2.2 Groundwater Analytical Results

The analytical results of the groundwater samples submitted for laboratory analysis were compared to the MOE *Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act*, (April 15, 2011), Table 6 Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition, all types of property use. The analytical results are presented in Table E-2 in **Appendix E** and the Laboratory Certificates of Analysis are provided in **Appendix F**.

3.2.2.1 Petroleum Hydrocarbons (F1 to F4)

Measured concentrations of PHCs analysed in the groundwater samples submitted for laboratory analysis were less than the applicable standards.

3.2.2.2 Volatile Organic Compounds (VOCs)

Measured concentrations of VOCs analysed in the groundwater samples submitted for laboratory analysis were less than the applicable standards, with the exception of benzene in MW17-1 which exceeded the Ontario Table 6 Standard.

3.2.2.3 Polycyclic Aromatic Hydrocarbons (PAHs)

Measured concentrations of PAHs analysed in the groundwater samples submitted for laboratory analysis were less than the applicable standards.

3.2.2.4 Polychlorinated Biphenyls (PCBs)

Measured concentrations of PCBs analysed in the groundwater samples submitted for laboratory analysis were less than the applicable standards.

3.2.2.5 Metals and General Chemistry

Measured concentrations of metals and general chemistry parameters/inorganics analysed in the groundwater samples submitted for laboratory analysis were less than the applicable standards, with the exception of chloride and sodium in MW17-1 which exceeded the Ontario Table 6 Standards.

3.3 QUALITY ASSURANCE/QUALITY CONTROL

Blind duplicates are submitted for laboratory analysis to evaluate both laboratory precision and the implemented field sampling and handling procedures, in addition to the sample homogeneity. The relative percent difference (RPD) is defined as the absolute value of the variation between a sample and its duplicate, when compared to the average concentration of the original and the duplicate. It is used to assess the validity of the field and laboratory analytical procedures.

Trip blanks are laboratory prepared samples that are transported to the Site in the same shipping containers used for the transport of the collected groundwater samples. The analysis of trip blanks is completed to determine if sample shipping or storage procedures have possibly influenced the analytical results.

Field blanks are samples prepared in the field to evaluate the potential impact of ambient site conditions on the analytical results. Laboratory containers were filled with laboratory supplied organic free water on-site to determine if any ambient site conditions would impact the laboratory results.

<u>Soil</u>

Based on Maxxam's *Ontario QA/QC Interpretation Guide*, a blind field duplicate has limited use for samples that cannot be homogenized (i.e., VOCs in soils). Also, the RPD calculation is only applicable when concentrations in the sample and its field duplicate are greater than five times the laboratory reportable detection limit (RDL). Finally, the Ontario QA/QC Interpretation Guide specifies that the recommended RPD values for soil samples and their duplicates should be less

than or equal to the following percentages to ensure consistencies in laboratory and field procedures, and sample homogeneity:

- PAHs 40% soil. 30% water
- PHCs 30% soil, 30% water
- metals and inorganics 30% soil, 20% water
- PCBs 40% soil 30% water, and
- VOCs 50% soil, 30% water.

A blind field duplicate soil sample was recovered from MW17-2, sampling depth of 0 – 1.1 m bgs (labelled DUP-20170728-D). The duplicate sample was submitted for laboratory analysis of general inorganics and metals, PHC F1-F4, PCBs, PAHs and VOCs. Since many of the measurable concentrations were less than five times the detection limit, RPD values were not calculated for all parameters.

All of the meaningful RPD values were within the acceptable limit for duplicate samples according to Maxxam's Ontario *QA/QC Interpretation Guide*, with the exception of moisture content which slightly exceeded 30% at 32%. However, dry weight calculations for all the parameters were acceptable and no other RPD exceedances were observed. The RPD values calculated for the duplicate sample ranged between 0% and 32%. Therefore, the calculated RPDs for the soil sample and the duplicate do not suggest inconsistencies in the field collection, the laboratory analysis methods, or the sample homogeneity.

Groundwater

A blind field duplicate ground sample was recovered from MW17-3, labelled QC-1. The duplicate sample was submitted for laboratory analysis of general inorganics and metals, PHC F1-F4, PCBs, PAHs and VOCs. Since many of the measurable concentrations were less than five times the detection limit, RPD values were not calculated for all parameters.

All of the meaningful RPD values were within the acceptable limit for duplicate samples according to Maxxam's *Ontario Environmental QA/QC Interpretation Guide*. The RPD values calculated for the duplicate samples ranged between 0% and 20%. Therefore, the calculated RPDs for the groundwater sample and the duplicate do not suggest inconsistencies in the field collection, the laboratory analysis methods, or the sample homogeneity.

Groundwater Trip and Field Blanks

The concentrations of VOC parameters were less than the laboratory reportable detection limits in the trip blank and field blank samples. Therefore, the results are considered reliable.

3.4 DISCUSSION

Although some of the concentrations of the COPCs measured in soil and groundwater samples submitted in October of 2017 exceeded the current MOE Table 6 Standards, it is noted that a RSC was previously filed for the property in June 2011 for a future commercial land use based on the 2004 standards, prior to new standards and regulatory requirements coming into effect on July 1, 2011. As this is the case, the Site will most likely be allowed to grandfather in the 2004 Table 2 Standards as the most applicable regulatory criteria. Thus, although results of the present study were compared to the 2011 Table 6 Standards, the 2004 Standards will take precedence. A summary of the observed October 2017 exceedances and comparison with the 2004 Standards is as follows:

- Although the benzene concentration measured in the groundwater sample collected from MW17-1 (and duplicate) exceeded the MOECC Table 6 Standard, it did not exceed the 2004 Table 2 Standard. Hence, the observed elevated benzene concentration in groundwater is not a concern and no further work regarding benzene in groundwater is required.
- Although chloride and sodium exceeded the 2011 Table 6 and/or 2004 Table 2 Standards, all exceedances are considered exempt because of the use of salt on nearby roadways. As stipulated in O.Reg. 153/04, as amended, sub-section 48(3): "If, having regard to any phase one and phase two environmental site assessments for a property, a qualified person determines that an applicable site condition standard is exceeded at the property solely because a substance has been used on a highway for the purpose of keeping the highway safe for traffic under conditions of snow or ice or both, as provided for under section 2 of Regulation 339 of the Revised Regulations of Ontario, 1990 (Classes of Contaminants — Exemptions), the applicable site condition standard is deemed not to be exceeded for the purpose of Part XV.1 of the Act. O. Reg. 153/04, s. 48 (3)." Further to this, the MOECC is proposing amendments to O.Reg. 153/04 that are expected in 2018 which will further expand on the salt exemption. Therefore, the elevated chloride and sodium concentrations observed in groundwater are not true exceedances and no further work is required.
- In addition to the above, the MOECC intends to issue a new regulation in 2018 governing the reuse of excess soil. This may impact the redevelopment of the Site, as the new proposed regulation will be very comprehensive and will require detailed sampling at the Site and the receiving location, completion of a soil management plan, implementation of a soil tracking system, creating and updating an on-line soil movement database, etc. The applicability of the regulation and the extent of tasks to be completed will depend on the total volume of soil removed from a property for off-site re-use, with exemptions likely possible for small volumes. The date the new regulation comes into effect, the final contents, and the potential for a transition period are unknown at this time.

4.0 CONCLUSIONS

Based on the results of the Phase Two ESA, Stantec makes the following conclusions:

- Four boreholes were advanced to a maximum depth of 6 to 8 m bgs and three were instrumented as groundwater monitoring wells.
- The overburden at the Site generally consisted of topsoil underlain by fill or native silty sand / sandy silt. Weathered shale bedrock was encountered in each drilling location during the Phase Two ESA field program at depths ranging from 1.07 to 2.9 m bgs.
- The measured concentrations of the contaminants of concern were below the 2011 Ontario Table 6 standards in all of the soil samples submitted for laboratory analysis.
- The measured concentrations of the contaminants of concern were below the 2011 Ontario Table 1 (background) standards, with the exception of concentrations of hexane in two locations.
- Depth to groundwater measured on October 16, 2017, ranged from 3.61 m bgs in MW17-3 to 5.432 m bgs in MW17-2.
- Shallow groundwater at the Site is generally trending northwesterly on the southern portion of the property and southwesterly on the northern portion of the property, based on the results of the groundwater monitoring completed during this program.
- The measured concentrations of the contaminants of concern were below the 2011 Table 6 and/or 2004 Table 2 standards in all of the groundwater samples submitted for laboratory analysis.

5.0 RECOMMENDATIONS

Based on the results of the Phase Two ESA, Stantec makes the following recommendations:

- No further work is required with respect to the applicable 2004 and/or 2011 soil and groundwater standards for the current and future use of the Site.
- Based on Stantec's current understanding of the management of excess soil in Ontario, the on-Site soil is not suitable for re-use as clean fill off-Site due to concentrations of hexane exceeding the Ontario Table 1 Standard.Any soil removed from the Site should be taken to a landfill for disposal. Prior to removal for off-site disposal, waste classification analysis should be completed on soils to determine that the soil is not leachate toxic (i.e., it is non-hazardous) and therefore can be disposed at a local MOECC-approved non-hazardous solid waste landfill. The process to manage and dispose of excess soil from the Site will change once the new Excess Soil Reuse Regulation is in effect.
- Dewatering may be required during construction activities. Due to the presence of benzene in one groundwater sample, additional laboratory analysis may be required at the time the project is ready to commence to support a City of Ottawa sewer discharge permit, if a permit is required by the City.
- The groundwater monitoring wells should be decommissioned in accordance with O.Reg. 903, as amended, if they are no longer required.

6.0 LIMITATIONS

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential liabilities associated with the identified property.

This report provides an evaluation of selected environmental conditions associated with the identified portion of the property that was assessed at the time the work was conducted and is based on information obtained by and/or provided to Stantec at that time. There are no assurances regarding the accuracy and completeness of this information. All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

The opinions in this report can only be relied upon as they relate to the condition of the portion of the identified property that was assessed at the time the work was conducted. Activities at the property subsequent to Stantec's assessment may have significantly altered the property's condition. Stantec cannot comment on other areas of the property that were not assessed.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report, and are based solely on the scope of work described in the report, the limited data available and the results of the work. They are not a certification of the property's environmental condition. This report should not be construed as legal advice.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report.

This report is limited by the following:

1. Conditions observed on-site at the time of the 2017 field work.
2. Regulatory criteria in effect at the time the assessment was completed.

The locations of any utilities, buildings and structures, and property boundaries illustrated in or described within this report, if any, including pole lines, conduits, water mains, sewers and other surface or sub-surface utilities and structures are not guaranteed. Before starting work, the exact location of all such utilities and structures should be confirmed and Stantec assumes no liability for damage to them.

LIMITATIONS
November 8, 2017

The conclusions are based on the site conditions encountered by Stantec at the time the work was performed at the specific testing and/or sampling locations, and conditions may vary among sampling locations. Factors such as areas of potential concern identified in previous studies, site conditions (e.g., utilities) and cost may have constrained the sampling locations used in this assessment. In addition, analysis has been carried out for only a limited number of chemical parameters, and it should not be inferred that other chemical species are not present. Due to the nature of the investigation and the limited data available, Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire site. As the purpose of this report is to identify site conditions which may pose an environmental risk; the identification of non-environmental risks to structures or people on the site is beyond the scope of this assessment.

Should additional information become available which differs significantly from our understanding of conditions presented in this report, Stantec specifically disclaims any responsibility to update the conclusions in this report.

7.0 SIGNATURES

This document entitled Phase Two Environmental Site Assessment – 3500 Hawthorne Road, Ottawa, Ontario, was prepared by Stantec Consulting Ltd. ("Stantec") for the account of 2520333 Ontario Inc. (the "Client"). This document was prepared by Su-Kim Roy, M.Eng., P.Eng., and reviewed by Jane Yaraskavitch, M.Eng., P.Eng., QP$_{ESA}$.

Prepared by _____
(signature)

Su-Kim Roy, M.Eng., P.Eng.

Reviewed by _____
(signature)

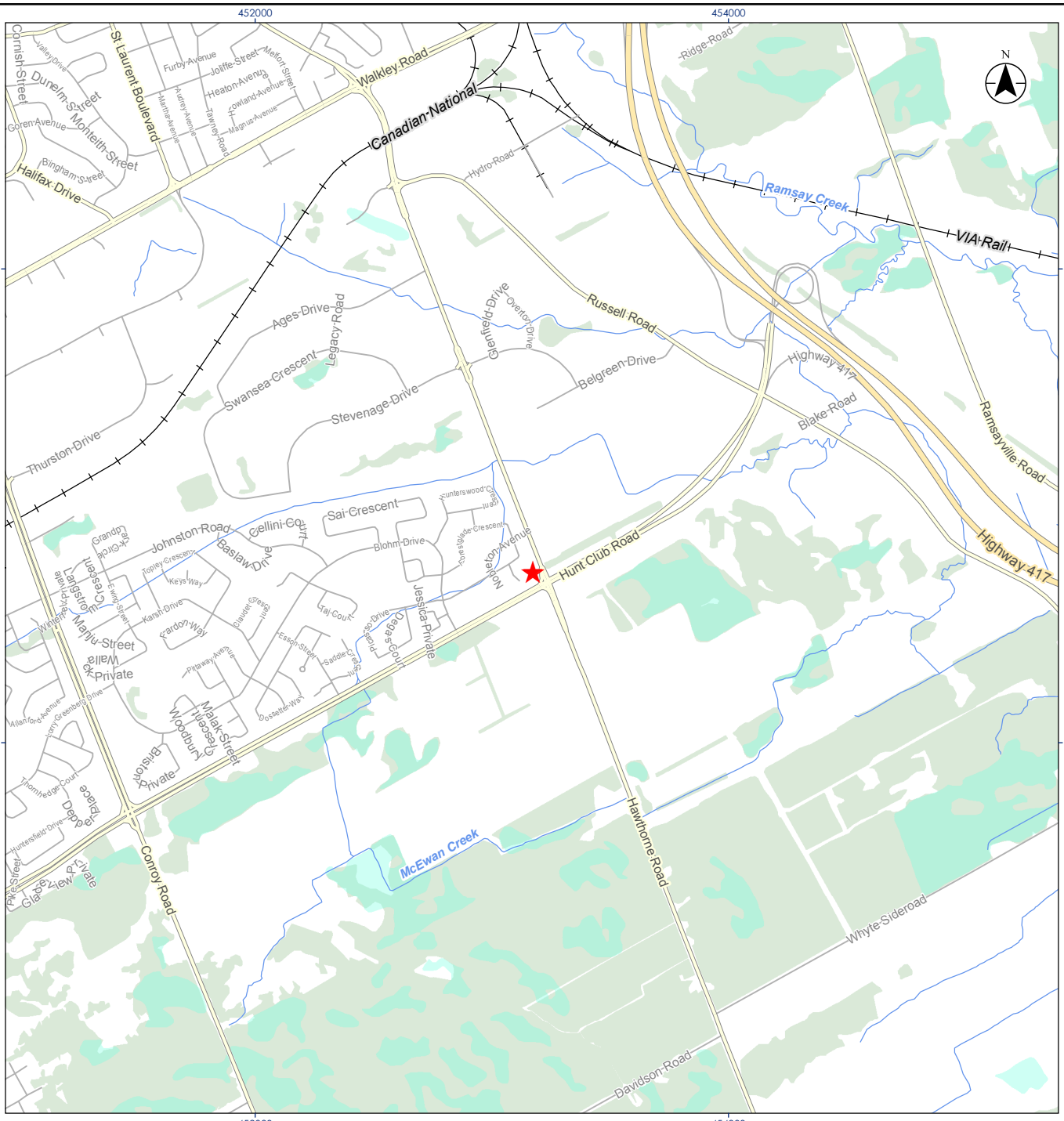
Jane Yaraskavitch, M.Eng., P.Eng., QP$_{ESA}$

LICENSED PROFESSIONAL ENGINEER
J. A. YARASKAVITCH
2017-11-08
PROVINCE OF ONTARIO

Most of the objectives and requirements set out in Ontario Regulation 153/04 for a Phase Two Environmental Site Assessment were applied in carrying out the environmental site assessment and preparing this report, but it does not contain all the mandatory items specified in O.Reg. 153/04, such as horizontal and vertical delineation of all contaminants in soil and groundwater, a Phase Two ESA Conceptual Site Model, cross-sections, and the Phase Two ESA reporting requirements as specified in Table 1 of Schedule E in O.Reg. 153/04. In addition, a current legal survey of the Phase Two Property signed and sealed by an Ontario Land Surveyor has not been included. As such, this report in its current state cannot be used to file a Record of Site Condition.

V:\01221\Active\122170123\05_Report_Deliv\Deliverables\Rpt_Hawthorne_Phase_II_20171108_Fnl.Docx

Appendix A
Figures



Legend

- Site Location
- Railway
- Highway
- Major Road
- Minor Road
- Watercourse
- Wetland, Not evaluated per OWES
- Wooded Area

0 500 1,000 metres

1:25,000 (at original document size of 8.5x11)

Notes

1. Coordinate System: NAD 1983 UTM Zone 18T
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2016.

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Project Location
3500 Hawthorne Road
Ottawa, Ontario

122170123 REVB
Prepared by clee on 2017-10-31
Technical Review by pworsell on 2017-10-31
Independent Review by jyaraskavitch on 2017-10-31

Client/Project
2520333 ONTARIO INC.
PHASE TWO ESA OF 3500 HAWTHORNE ROAD
OTTAWA, ONTARIO

Figure No.
1

Title
Key Plan

Stantec

Legend
- Borehole
- Monitoring Well
- APEC #1 - Fill
- APEC #2 - Debris
- Site Boundary

0 10 20 metres
1:500 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2016.
3. Orthoimagery: City of Ottawa, 2017. Imagery Date, 2015.

Project Location
3500 Hawthorne Road
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Client/Project
2520333 ONTARIO INC.
PHASE TWO ESA OF 3500 HAWTHORNE ROAD
OTTAWA, ONTARIO

Figure No.
2

Title
Site Plan

453100 453150 453200 453250

5024750

5024700

BH17-4

MW17-3
(95.8)

95.5

95.0

94.5

MW17-2
(93.93)

94.0

MW17-1
(94.44)

Foxden Place

Hawthorne Road

Hunt Club Road

N

Stantec

Legend

- Borehole
- Monitoring Well
- Groundwater Elevation Contour
- Interpreted Groundwater Flow Direction
- Site Boundary
- 94.44 Groundwater Elevation in Metres

0 10 20 metres

1:500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
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Client/Project
2520333 ONTARIO INC.
PHASE TWO ESA OF 3500 HAWTHORNE ROAD
OTTAWA, ONTARIO

Figure No.
3

Title
Inferred Shallow Groundwater Contours

Appendix B
Regulatory Review

Appendix B
Regulatory Review
November 8, 2017

1.0 INTRODUCTION

In the province of Ontario, environmental conditions at a potentially contaminated site are typically assessed in the context of Ontario Regulation (O.Reg.) 153/04, which provides guidance for the assessment and remediation of soil, sediment, and groundwater. Soil, sediment, and groundwater quality standards referenced under O.Reg.153/04 are referred to as the Site Condition Standards (SCS), and are provided in Table 1 to Table 9 in the Ministry of the Environment (MOE) document *Soil, Ground Water and Sediment Standards for Use Under Part XV.I of the Environmental Protection Act* dated April 15, 2011. The soil and groundwater SCS are generic risk-based standards derived for various land uses, groundwater use, site-sensitivity, proximity to surface water, and soil-texture. The generic SCS are generally selected as the lowest of the pathway specific exposure criteria developed in the MOE document *Rationale for the Development of Soil and Groundwater Standards for Use at Contaminated Sites in Ontario* dated April 15, 2011. The sediment SCS are the Lowest Effect Levels from the Ministry of Environment and Energy document *Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario*, dated August 1993.

1.1 Site Characterization

As indicated earlier, the selection of applicable standards for comparison to soil and groundwater analytical data is based on a review of various site characteristics. The relevant site characteristics are reviewed in the following sections, and where necessary, reference is made to requirements specific to selection of the SCS under O.Reg. 153/04.

1.1.1 Land Use

Land use at the Site was considered commercial due to the development of a future gas bar and convenience store on the property.

1.1.2 Soil Texture

Section 42(1) of O.Reg.153/04 defines coarse textured soil as "soil that contains 50 percent or more by mass of particles that are larger than 75 micrometres in mean diameter".

Based on sieve analysis of soil samples collected as part of a geotechnical investigation submitted under separate cover, the soils comprising the fill on the Site are considered to be coarse textured. Although some native clay soils have been encountered during some subsurface investigations, the coarse fill material is also present on-site in many locations. Thus, in order to provide a conservative evaluation of the soils on-site a coarse textured condition was assumed to be applicable.

1.1.3 Soil Thickness and Proximity to a Water Body

Section 43.1 of O.Reg.153/04 identifies specific SCS to be applied if any of the following circumstances exist:

(a) the property is a shallow soil property; or

(b) the property includes all or part of a water body or is adjacent to a water body or includes land that is within 30 metres of a water body.

Based on the Phase Two ESA findings, a previous environmental site investigation completed on-site by others, and a geotechnical test pitting investigation completed in May 2017 by Stantec, depth to bedrock is frequently encountered at depths of less than 2 m bgs. Therefore, the Site is a shallow soil property.

No surface water bodies are located within 30 metres of the Site.

1.1.4 Groundwater Use

Potable water to properties north of Hunt Club Road is supplied by municipal water supply. However, based on a search by Ecolog ERIS for the Phase One ESA completed under separate cover, several water supply wells were identified as being within approximately 250 metres of the Site property boundary and it is unknown how far the municipal water supply extends south of Hunt Club Road. Therefore, groundwater in the vicinity of the Site was considered potable. In addition, the groundwater was considered to be potable when a Record of Site Condition was filed for the Site in June 2011.

1.1.5 Environmental Sensitivity

Section 41 of O.Reg.153/04 states that a property is to be considered environmentally sensitive if any of the following circumstances exist:

(1)(a) the property is,
- *(i) within an area of natural significance,*
- *(ii) includes or is adjacent to an area of natural significance or part of such an area, or*
- *(iii) includes land that is within 30 metres of an area of natural significance or part of such an area;*

(b) the soil at the property has a pH value as follows:
- *(i) for surface soil, less than 5 or greater than 9,*
- *(ii) for sub-surface soil, less than 5 or greater than 11; or*

(c) a qualified person is of the opinion that, given the characteristics of the property and the certifications the qualified person would be required to make in a record of site condition in relation to the property as specified in Schedule A, it is appropriate to apply this section to the property.

Based on the samples submitted for analysis during the Phase Two ESA, the pH of the soil at the Site ranges from 7.39 to 7.59 and is within acceptable limits. In addition, the Site is not located within 30 metres of an area of natural significance.

1.2 Generic Criteria Selection

Due to the nature of the soil and groundwater impacts identified at the Site, direct impacts to sediment were considered unlikely. Finally, an evaluation of wildlife tissue residues to provide data for site-specific evaluation of exposure risks was beyond the scope of the investigation. Therefore, only soil and groundwater criteria were selected for use.

1.2.1 Soil Criteria

Based on the site characterization data presented above, the soil sample analytical results were compared to the following criteria/standards:

- MOE, *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act,* April 15, 2011. Ontario Table 1 Full-depth Background Site Condition Standards, residential/parkland/institutional/Industrial/commercial/community land use and coarse-textured soil (to determine off-site reuse as clean fill).
- MOE, *Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act,* April 15, 2011). Ontario Table 6 Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition, Industrial/commercial/community land use and coarse-textured soil (to support the City of Ottawa Site Plan Control Application).

1.2.2 Groundwater Criteria

The groundwater sample analytical results were compared to the following criteria/standards:

- MOE, *Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (*MOE 2011). Ontario Table 6 Generic Site Condition Standards for Shallow Soil in a Potable Ground Water Condition, all types of property use (to support the City of Ottawa Site Plan Control Application).

Appendix C
Field Methodology

Appendix C
Field Methodology
November 8, 2017

FIELD METHODOLOGY

1.0 PRE-DRILLING SITE INVESTIGATIONS

1.1 Service and Utility Locates

The locations of services and utilities were established prior to the drilling and sampling phase of the investigation. The sampling locations were cleared of underground utilities by the public utility companies and a private utility locator.

2.0 DRILLING INVESTIGATION

2.1 Drilling

Four boreholes were advanced to a maximum depth of approximately 8 m below ground surface using a track mounted Geomachine 100 drill with hollow auger sampling by Strata Soil Sampling. Soil samples were collected continuously from each location with the use of a split spoon sampler. Bedrock advancement was completed using a 3 inch air hammer bit.

2.2 Borehole Logging

Materials retrieved from the drilling operation were logged by Stantec personnel. The texture and composition of materials and the presence of combustible vapours or other indications of contamination were recorded.

2.3 Soil Sampling

Soil samples were collected continuously from the split spoon samplers. One half of the sample was field tested for vapours and the other half was placed in laboratory supplied containers for potential laboratory analyses.

2.4 Monitoring Wells

A 51-mm diameter PVC monitoring well was installed in three of the four advanced boreholes. Bentonite sealant was placed around the top of the well to prevent vertical migration of water or contaminants from the surface, or between layers in the subsurface. The monitoring wells were fitted with caps and either stick up or flush mount well casings to protect them from accidental damage and accidental or intentional contamination. Completion details for the wells are included on the Borehole and Monitoring Well Records provided in **Appendix D**.

3.0 BOREHOLE AND WELL SURVEY

3.1 Horizontal and Vertical Survey

The locations and elevations of the newly installed monitoring wells were measured with a Trimble GeoExplorer 6000 (GeoXH) global positioning system (GPS). The GPS has a 10 cm horizontal and 10 cm vertical accuracy.

3.2 Establish Static Elevations and Gradients

The elevations of water were determined under conditions where no pumping or other activity, which would influence water levels, was being conducted. These measurements are necessary for the establishment of potential gradients, which are used in establishing the pattern of contaminant migration.

Water levels were measured using an interface probe. The interface probe was rinsed between monitoring wells using distilled water.

4.0 GROUNDWATER SAMPLING

Each monitoring well was developed using dedicated Waterra tubing. The purpose of well development is to remove drilling fluids, solids or other particulates that may have been introduced during drilling. Development restores the hydraulic conductivity of the aquifer material surrounding the well to as close to pre-boring conditions as possible. At least ten well volumes of water were removed from MW17-3 for development purposes. Since MW17-1 and MW17-2 were observed to have low volume shortly after well installation, these two locations were developed by purging them dry on three consecutive days in between recovery (i.e., on October 11th, 12th and 13th).

Monitoring well MW17-3 was sampled using low-flow sampling techniques as the drawdown of the water column during sampling was less than 10 cm. Monitoring wells MW17-1 and MW17-2 were sampled with bailers as these locations could not be sampled using low flow methods.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

All samples were collected following Stantec sampling procedures. Samples were uniquely labeled and control was maintained through use of chain of custody forms. All samples were collected in laboratory supplied containers and preserved in insulated coolers.

Appendix D

Borehole and Monitoring Well Logs

Monitoring Well: MW17-1

Project:	Phase Two Environmental Site Assessment	**Drilling method:**	Geomachine GM100 (direct Push/Air Hammer)
Client:	2520333 Ontario Inc.	**Date started/completed:**	10-Oct-2017
Location:	3500 Hawthorne Road, Ottawa, ON	**Ground surface elevation:**	99.49 m RTD
Number:	122170123	**Top of casing elevation:**	99.39 m RTD
Field investigator:	T. Ghadieh	**Easting:**	453186
Contractor:	Strata Drilling Group	**Northing:**	5024684

SUBSURFACE PROFILE				SAMPLE DETAILS					INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m RTD) Depth (m BGS)	Sample Number	Sample Type	Recovery	Lab Analyses	%LEL Comb▲ 20 40 60 80 / ppm OTOV / Comb ● 200 400 600 800	Diagram / Description
			Ground Surface	99.49						
			TOPSOIL	0.00						Flushmount protective cover with concrete seal
			black, organics, dry to moist	99.33						
			SILTY SAND brown, dry	0.15 98.88						
			SANDY SILT grey, dry	0.61	SS1	DP	48" 100%	PAH, PCB, PHC F1-F4, VOC, Metals & Inorganics	15 <0.02	
				98.27						50 mm ID PVC pipe backfilled with bentonite
5	2		SHALE (BEDROCK)	1.22						
10	4									
15										50 mm ID slotted PVC pipe backfilled with silica sand
										Groundwater Level: 5.05 m BGS 16-Oct-17
20	6			93.39						
			End of Borehole	6.10						
25	8									

Screen Interval: 3.05 - 6.10 m BGS
Sand Pack Interval: 2.44 - 6.10 m BGS
Well Seal Interval: 0.23 - 2.44 m BGS

Notes:
m BGS - metres below ground surface
DP - direct push sample
ppm - parts per million by volume
n/a - not available

PAH - polycyclic aromatic hydrocarbons
PCB - polychlorinated biphenyl
PHC F1-F4 - petroleum hydrocarbon fractions 1 to 4
VOC - volatile organic compounds

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Drawn By/Checked By: M. Ford

Monitoring Well: MW17-2

Project:	Phase Two Environmental Site Assessment	**Drilling method:**	Geomachine GM100 (direct Push/Air Hammer)
Client:	2520333 Ontario Inc.	**Date started/completed:**	10-Oct-2017
Location:	3500 Hawthorne Road, Ottawa, ON	**Ground surface elevation:**	99.36 m RTD
Number:	122170123	**Top of casing elevation:**	100.14 m RTD
Field investigator:	T. Ghadieh	**Easting:**	453175
Contractor:	Strata Drilling Group	**Northing:**	5024711

SUBSURFACE PROFILE				SAMPLE DETAILS					INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m RTD) Depth (m BGS)	Sample Number	Sample Type	Recovery	Lab Analyses	%LEL Comb▲ 20 40 60 80 / ppm OTOV / Comb ● 200 400 600 800	Diagram / Description
				100.14						
			Ground Surface	99.36						0.78 m stick up with protective monument
0	0		TOPSOIL	0.00						Concrete seal
			black, organics, dry to moist	99.20						
			SILTY SAND brown, with gravel, dry	0.15 98.75	SS1	DP	42" 100%	PAH, PCB, PHC F1-F4, VOC, Metals & Inorganics	<5 ● ○ 3.0	
			SANDY SILT grey, dry	0.61 98.29						
5			SHALE (BEDROCK)	1.07						50 mm ID PVC pipe backfilled with bentonite
	2									
10										
	4									
15										Groundwater Level: 5.43 m BGS 16-Oct-17
20	6									50 mm ID slotted PVC pipe backfilled with silica sand
				91.74						
25			End of Borehole	7.62						
	8									

Screen Interval: 4.57 - 7.62 m BGS
Sand Pack Interval: 3.96 - 7.62 m BGS
Well Seal Interval: 0.23 - 3.96 m BGS

Notes:
m BGS - metres below ground surface
DP - direct push sample
ppm - parts per million by volume
n/a - not available

PAH - polycyclic aromatic hydrocarbons
PCB - polychlorinated biphenyl
PHC F1-F4 - petroleum hydrocarbon fractions 1 to 4
VOC - volatile organic compounds

Stantec

Drawn By/Checked By: M. Ford

Monitoring Well: MW17-3

Project:	Phase Two Environmental Site Assessment	**Drilling method:**	Geomachine GM100 (direct Push/Air Hammer)
Client:	2520333 Ontario Inc.	**Date started/completed:**	10-Oct-2017
Location:	3500 Hawthorne Road, Ottawa, ON	**Ground surface elevation:**	99.41 m RTD
Number:	122170123	**Top of casing elevation:**	99.33 m RTD
Field investigator:	T. Ghadieh	**Easting:**	453160
Contractor:	Strata Drilling Group	**Northing:**	5024735

SUBSURFACE PROFILE				SAMPLE DETAILS					INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m RTD) Depth (m BGS)	Sample Number	Sample Type	Recovery	Lab Analyses	%LEL Comb▲ 20 40 60 80 ppm OTOV Comb ● 200 400 600 800	Diagram / Description
			Ground Surface	99.41						
			TOPSOIL dark brown, organics, some gravel, dry to moist	0.00 98.95						Flushmount protective cover with concrete seal
			SILTY SAND (FILL) brown, with gravel, some clay, frequent cobbles/boulders, dry to moist	0.46	SS1	DP	50" 83%		<5 1.0	
5	2				SS2	DP	42" 78%	PAH, PCB, PHC F1-F4, VOC, Metals & Inorganics	10 <0.02	50 mm ID PVC pipe backfilled with bentonite
				96.58						
10			SHALE (BEDROCK)	2.83						Groundwater Level: 3.61 m BGS 16-Oct-17
	4									
15										
20	6									50 mm ID slotted PVC pipe backfilled with silica sand
				91.79						
25			End of Borehole	7.62						
	8									

Screen Interval: 4.57 - 7.62 m BGS
Sand Pack Interval: 3.96 - 7.62 m BGS
Well Seal Interval: 0.23 - 3.96 m BGS

Notes:
m BGS - metres below ground surface
DP - direct push sample
ppm - parts per million by volume
n/a - not available

PAH - polycyclic aromatic hydrocarbons
PCB - polychlorinated biphenyl
PHC F1-F4 - petroleum hydrocarbon fractions 1 to 4
VOC - volatile organic compounds

Stantec

Drawn By/Checked By: M. Ford

Borehole: BH17-4

Project:	Phase Two Environmental Site Assessment	**Drilling method:**	Geomachine GM100 (direct Push)
Client:	2520333 Ontario Inc.	**Date started/completed:**	10-Oct-2017
Location:	3500 Hawthorne Road, Ottawa, ON	**Ground surface elevation:**	n/a
Number:	122170123	**Top of casing elevation:**	n/a
Field investigator:	T. Ghadieh	**Easting:**	453161
Contractor:	Strata Drilling Group	**Northing:**	5024741

SUBSURFACE PROFILE				SAMPLE DETAILS					INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type	Recovery	Lab Analyses	%LEL Comb▲ 20 40 60 80 ppm OTOV Comb● 200 400 600 800	Diagram	Description
			Ground Surface								
			TOPSOIL dark brown, some gravel, dry to moist	0.00							
			SILTY SAND (FILL) grey-brown, with gravel, some clay, frequent cobbles/boulders, dry to moist	0.23	SS1	DP	45" 75%	PAH, PCB, PHC F1-F4, VOC, Metals & Inorganics	<5 1.0		Backfilled with bentonite
			SHALE (BEDROCK)	0.96							
5	2		End of Borehole	1.52							
10	4										
15											
20	6										
25	8										

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
DP - direct push sample
ppm - parts per million by volume
n/a - not available

PAH - polycyclic aromatic hydrocarbons
PCB - polychlorinated biphenyl
PHC F1-F4 - petroleum hydrocarbon fractions 1 to 4
VOC - volatile organic compounds

Stantec

Drawn By/Checked By: M. Ford

Appendix E
Summary Analytical Tables

Table E-2
Summary of Groundwater Analytical Results
Phase Two ESA
3500 Hawthorne Road, Ottawa, Ontario
2520333 Ontario Inc.

Sample Location			MW17-1			MW17-2		MW17-3						Field Blank	Trip Blank
Sample Date			16-Oct-17	16-Oct-17	18-Oct-17	16-Oct-17	18-Oct-17	16-Oct-17	16-Oct-17		18-Oct-17	18-Oct-17		16-Oct-17	16-Oct-17
Sample ID			MW17-1	MW17-1 Lab-Dup	MW 17-1	MW17-2	MW 17-2	MW17-3	QC-1		MW 17-3	QC-1		FIELD BLANK	TRIP BLANK
Sampling Company			STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC		STANTEC	STANTEC
Laboratory			MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX		MAXX	MAXX		MAXX	MAXX
Laboratory Work Order			B7M9711	B7M9711	B7N0246	B7M9711	B7N0246	B7M9711	B7M9711		B7N0246	B7N0246		B7M9711	B7M9711
Laboratory Sample ID			FIR249	FIR249	FIU563	FIR250	FIU564	FIR251	FIR252		FIU565	FIU566		FIR253	FIR254
Sample Type	Units	Ontario SCS		Lab Replicate					Field Duplicate	RPD (%)		Field Duplicate	RPD (%)	Field Blank	Trip Blank
General Chemistry															
Chloride	mg/L	790[A]	**930[A]**	-	-	38	-	91	90	1%	-	-	-	-	-
Cyanide (Free)	µg/L	52[A]	<1	<1	-	<1	-	<1	<1	nc	-	-	-	-	-
Petroleum Hydrocarbons															
PHC F1 (C6-C10 range)	µg/L	$_{<7}$[A]	<25	-	-	<25	-	<25	<25	nc	-	-	-	-	-
PHC F1 (C6-C10 range) minus BTEX	µg/L	$420_{<7}$[A]	<25	-	-	<25	-	<25	<25	nc	-	-	-	-	-
PHC F2 (>C10-C16 range)	µg/L	150_{s15}[A]	<100	-	-	<100	-	<100	<100	nc	-	-	-	-	-
PHC F3 (>C16-C34 range)	µg/L	500_{s8}[A]	<200	-	-	<200	-	<200	<200	nc	-	-	-	-	-
PHC F4 (>C34-C50 range)	µg/L	500_{s10}[A]	<200	-	-	<200	-	<200	<200	nc	-	-	-	-	-
Chromatogram to baseline at C50	none	n/v	YES	-	-	YES	-	YES	YES	nc	-	-	-	-	-
Metals															
Antimony	µg/L	6[A]	<2.5	-	-	3.7	-	0.65	0.72	nc	-	-	-	-	-
Arsenic	µg/L	25[A]	<5.0	-	-	10	-	1.5	1.3	nc	-	-	-	-	-
Barium	µg/L	1,000[A]	200	-	-	17	-	86	85	1%	-	-	-	-	-
Beryllium	µg/L	4[A]	<2.5	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	-	-
Boron	µg/L	5,000[A]	790	-	-	970	-	690	690	0%	-	-	-	-	-
Cadmium	µg/L	2.1[A]	<0.50	-	-	<0.10	-	<0.10	<0.10	nc	-	-	-	-	-
Chromium	µg/L	50[A]	<25	-	-	<5.0	-	<5.0	<5.0	nc	-	-	-	-	-
Chromium (Hexavalent)	µg/L	25[A]	-	-	<0.50	-	<0.50	-	-	-	<0.50	<0.50	nc	-	-
Cobalt	µg/L	3.8[A]	<2.5	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	-	-
Copper	µg/L	69[A]	<5.0	-	-	<1.0	-	<1.0	<1.0	nc	-	-	-	-	-
Lead	µg/L	10[A]	<2.5	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	-	-
Mercury	µg/L	0.1[A]	-	-	<0.1	-	<0.1	-	-	-	<0.1	<0.1	nc	-	-
Molybdenum	µg/L	70[A]	3.1	-	-	2.6	-	3.1	3.8	20%	-	-	-	-	-
Nickel	µg/L	100[A]	<5.0	-	-	<1.0	-	<1.0	<1.0	nc	-	-	-	-	-
Selenium	µg/L	10[A]	<10	-	-	<2.0	-	<2.0	<2.0	nc	-	-	-	-	-
Silver	µg/L	1.2[A]	<0.50	-	-	<0.10	-	<0.10	<0.10	nc	-	-	-	-	-
Sodium	µg/L	490,000[A]	**1,400,000[A]**	-	-	250,000	-	320,000	320,000	0%	-	-	-	-	-
Thallium	µg/L	2[A]	<0.25	-	-	<0.050	-	<0.050	<0.050	nc	-	-	-	-	-
Uranium	µg/L	20[A]	3.1	-	-	2.0	-	0.79	0.80	1%	-	-	-	-	-
Vanadium	µg/L	6.2[A]	<2.5	-	-	5.4	-	<0.50	<0.50	nc	-	-	-	-	-
Zinc	µg/L	890[A]	<25	-	-	<5.0	-	<5.0	<5.0	nc	-	-	-	-	-
Polychlorinated Biphenyls															
Aroclor 1242	µg/L	$_{<14}$[A]	<0.05	-	-	<0.05	-	<0.05	<0.05	nc	-	-	-	-	-
Aroclor 1248	µg/L	$_{<14}$[A]	<0.05	-	-	<0.05	-	<0.05	<0.05	nc	-	-	-	-	-
Aroclor 1254	µg/L	$_{<14}$[A]	<0.05	-	-	<0.05	-	<0.05	<0.05	nc	-	-	-	-	-
Aroclor 1260	µg/L	$_{s14}$[A]	<0.05	-	-	<0.05	-	<0.05	<0.05	nc	-	-	-	-	-
Polychlorinated Biphenyls (PCBs)	µg/L	0.2_{s14}[A]	<0.05	-	-	<0.05	-	<0.05	<0.05	nc	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons															
Acenaphthene	µg/L	4.1[A]	<0.050	-	-	<0.050	-	<0.050	<0.050	nc	-	-	-	-	-
Acenaphthylene	µg/L	1[A]	<0.050	-	-	<0.050	-	<0.050	<0.050	nc	-	-	-	-	-
Anthracene	µg/L	1[A]	<0.050	-	-	<0.050	-	<0.050	<0.050	nc	-	-	-	-	-
Benzo(a)anthracene	µg/L	1[A]	<0.050	-	-	<0.050	-	<0.050	<0.050	nc	-	-	-	-	-
Benzo(a)pyrene	µg/L	0.01[A]	<0.010	-	-	<0.010	-	<0.010	<0.010	nc	-	-	-	-	-
Benzo(b/j)fluoranthene	µg/L	0.1_{s2}[A]	<0.050	-	-	<0.050	-	<0.050	<0.050	nc	-	-	-	-	-
Benzo(g,h,i)perylene	µg/L	0.2[A]	<0.050	-	-	<0.050	-	<0.050	<0.050	nc	-	-	-	-	-
Benzo(k)fluoranthene	µg/L	0.1[A]	<0.050	-	-	<0.050	-	<0.050	<0.050	nc	-	-	-	-	-
Chrysene	µg/L	0.1[A]	<0.050	-	-	<0.050	-	<0.050	<0.050	nc	-	-	-	-	-
Dibenzo(a,h)anthracene	µg/L	0.2[A]	<0.050	-	-	<0.050	-	<0.050	<0.050	nc	-	-	-	-	-
Fluoranthene	µg/L	0.41[A]	<0.050	-	-	<0.050	-	<0.050	<0.050	nc	-	-	-	-	-
Fluorene	µg/L	120[A]	<0.050	-	-	<0.050	-	<0.050	<0.050	nc	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	µg/L	0.2[A]	<0.050	-	-	<0.050	-	<0.050	<0.050	nc	-	-	-	-	-
Methylnaphthalene (Total)	µg/L	3.2_{s3}[A]	<0.071	-	-	<0.071	-	<0.071	<0.071	nc	-	-	-	-	-
Methylnaphthalene, 1-	µg/L	$_{s3}$[A]	<0.050	-	-	<0.050	-	<0.050	<0.050	nc	-	-	-	-	-
Methylnaphthalene, 2-	µg/L	$_{s3}$[A]	<0.050	-	-	<0.050	-	<0.050	<0.050	nc	-	-	-	-	-
Naphthalene	µg/L	7[A]	<0.050	-	-	<0.050	-	<0.050	<0.050	nc	-	-	-	-	-
Phenanthrene	µg/L	1[A]	<0.030	-	-	<0.030	-	<0.030	<0.030	nc	-	-	-	-	-
Pyrene	µg/L	4.1[A]	<0.050	-	-	<0.050	-	<0.050	<0.050	nc	-	-	-	-	-
Volatile Organic Compounds															
Acetone	µg/L	2,700[A]	<10	-	-	<10	-	<10	<10	nc	-	-	-	<10	<10
Benzene	µg/L	0.5[A]	**0.68[A]**	-	-	0.45	-	0.38	0.40	nc	-	-	-	<0.20	<0.20
Bromodichloromethane	µg/L	16[A]	<0.50	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	<0.50	<0.50
Bromoform (Tribromomethane)	µg/L	5[A]	<1.0	-	-	<1.0	-	<1.0	<1.0	nc	-	-	-	<1.0	<1.0
Bromomethane (Methyl bromide)	µg/L	0.89[A]	<0.50	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	<0.50	<0.50
Carbon Tetrachloride (Tetrachloromethane)	µg/L	0.2[A]	<0.20	-	-	<0.20	-	<0.20	<0.20	nc	-	-	-	<0.20	<0.20
Chlorobenzene (Monochlorobenzene)	µg/L	30[A]	<0.20	-	-	<0.20	-	<0.20	<0.20	nc	-	-	-	<0.20	<0.20
Chloroform (Trichloromethane)	µg/L	2[A]	<0.20	-	-	<0.20	-	<0.20	<0.20	nc	-	-	-	<0.20	<0.20
Dibromochloromethane	µg/L	25[A]	<0.50	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	<0.50	<0.50
Dichlorobenzene, 1,2-	µg/L	3[A]	<0.50	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	<0.50	<0.50
Dichlorobenzene, 1,3-	µg/L	59[A]	<0.50	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	<0.50	<0.50
Dichlorobenzene, 1,4-	µg/L	0.5[A]	<0.50	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	<0.50	<0.50
Dichlorodifluoromethane (Freon 12)	µg/L	590[A]	<1.0	-	-	<1.0	-	<1.0	<1.0	nc	-	-	-	<1.0	<1.0
Dichloroethane, 1,1-	µg/L	5[A]	<0.20	-	-	<0.20	-	<0.20	<0.20	nc	-	-	-	<0.20	<0.20
Dichloroethane, 1,2-	µg/L	0.5[A]	<0.50	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	<0.50	<0.50
Dichloroethene, 1,1-	µg/L	0.5[A]	<0.20	-	-	<0.20	-	<0.20	<0.20	nc	-	-	-	<0.20	<0.20
Dichloroethene, cis-1,2-	µg/L	1.6[A]	<0.50	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	<0.50	<0.50
Dichloroethene, trans-1,2-	µg/L	1.6[A]	<0.50	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	<0.50	<0.50
Dichloropropane, 1,2-	µg/L	0.58[A]	<0.20	-	-	<0.20	-	<0.20	<0.20	nc	-	-	-	<0.20	<0.20
Dichloropropene, 1,3- (sum of isomers cis + trans)	µg/L	0.5_{s11}[A]	<0.50	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	<0.50	<0.50
Dichloropropene, cis-1,3-	µg/L	$_{s11}$[A]	<0.30	-	-	<0.30	-	<0.30	<0.30	nc	-	-	-	<0.30	<0.30
Dichloropropene, trans-1,3-	µg/L	$_{s11}$[A]	<0.40	-	-	<0.40	-	<0.40	<0.40	nc	-	-	-	<0.40	<0.40
Ethylbenzene	µg/L	2.4[A]	<0.20	-	-	<0.20	-	<0.20	<0.20	nc	-	-	-	<0.20	<0.20
Ethylene Dibromide (Dibromoethane, 1,2-)	µg/L	0.2[A]	<0.20	-	-	<0.20	-	<0.20	<0.20	nc	-	-	-	<0.20	<0.20
Hexane (n-Hexane)	µg/L	5[A]	<1.0	-	-	<1.0	-	<1.0	<1.0	nc	-	-	-	<1.0	<1.0
Methyl Ethyl Ketone (MEK) (2-Butanone)	µg/L	1,800[A]	<10	-	-	<10	-	<10	<10	nc	-	-	-	<10	<10
Methyl Isobutyl Ketone (MIBK)	µg/L	640[A]	<5.0	-	-	<5.0	-	<5.0	<5.0	nc	-	-	-	<5.0	<5.0
Methyl tert-butyl ether (MTBE)	µg/L	15[A]	<0.50	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	<0.50	<0.50
Methylene Chloride (Dichloromethane)	µg/L	26[A]	<2.0	-	-	<2.0	-	<2.0	<2.0	nc	-	-	-	<2.0	<2.0
Styrene	µg/L	5.4[A]	<0.50	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	<0.50	<0.50
Tetrachloroethane, 1,1,1,2-	µg/L	1.1[A]	<0.50	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	<0.50	<0.50
Tetrachloroethane, 1,1,2,2-	µg/L	0.5[A]	<0.50	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	<0.50	<0.50
Tetrachloroethene (PCE)	µg/L	0.5[A]	<0.20	-	-	<0.20	-	<0.20	<0.20	nc	-	-	-	<0.20	<0.20
Toluene	µg/L	24[A]	0.96	-	-	0.46	-	0.50	0.53	nc	-	-	-	<0.20	<0.20
Trichloroethane, 1,1,1-	µg/L	23[A]	<0.20	-	-	<0.20	-	<0.20	<0.20	nc	-	-	-	<0.20	<0.20
Trichloroethane, 1,1,2-	µg/L	0.5[A]	<0.50	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	<0.50	<0.50
Trichloroethene (TCE)	µg/L	0.5[A]	<0.20	-	-	<0.20	-	<0.20	<0.20	nc	-	-	-	<0.20	<0.20
Trichlorofluoromethane (Freon 11)	µg/L	150[A]	<0.50	-	-	<0.50	-	<0.50	<0.50	nc	-	-	-	<0.50	<0.50
Vinyl Chloride	µg/L	0.5[A]	<0.20	-	-	<0.20	-	<0.20	<0.20	nc	-	-	-	<0.20	<0.20
Xylene, m & p-	µg/L	$_{s1}$[A]	<0.20	-	-	<0.20	-	<0.20	<0.20	nc	-	-	-	<0.20	<0.20
Xylene, o-	µg/L	$_{s1}$[A]	<0.20	-	-	<0.20	-	<0.20	<0.20	nc	-	-	-	<0.20	<0.20
Xylenes, Total	µg/L	72_{s1}[A]	<0.20	-	-	<0.20	-	<0.20	<0.20	nc	-	-	-	<0.20	<0.20

Notes:

Ontario SCS	Soil, Ground Water and Sediment Standards for Use under Part XV.I of the Environmental Protection Act (MOE, 2011)
[A]	Table 6 - All Types of Property Use - Coarse Textured Soils
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
< 0.50	Laboratory reporting limit was greater than the applicable standard.
< 0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
s1	Standard is applicable to total xylenes, and m & p-xylenes and o-xylenes should be summed for comparison.
s2	Standard is for benzo(b)fluoranthene; however, the analytical laboratory can not distinguish between benzo(b)fluoranthene and benzo(j)fluoranthene, and therefore, the result is a combination of the two isomers, against which the standard has been compared.
s3	Standard is applicable to both 1-methylnaphthalene and 2-methylnaphthalene, with the provision that if both are detected the sum of the two must not exceed the standard.
s7	Standard is applicable to PHC in the F1 range minus BTEX.
s8	Standard is applicable to PHC in the F3 range, minus PAHs (other than naphthalene). If PAHs were not analyzed, the standard is applied to F3.
s10	If baseline is not reached during F4 analysis, then gravimetric analysis is to be performed, and the standard is applied to the higher of the two results.
s11	Standard is applicable to 1,3-Dichloropropene, and the individual isomers (cis + trans) should be added for comparison.
s14	Standard is applicable to total PCBs, and the individual Aroclors should be added for comparison.
s15	Standard is applicable to PHC in the F2 range minus naphthalene. If naphthalene was not analyzed, the standard is applied to F2.
RPD	Relative Percent Difference.
nc	RPD is not calculated if one or more values is non detect or if one or more values is less than five times the reportable detection limit.

Table E-1
Summary of Soil Analytical Results
Phase Two ESA
3500 Hawthorne Road, Ottawa, Ontario
2520333 Ontario Inc.

Sample Location			BH17-4		MW17-1		MW17-2					MW17-3
Sample Date			10-Oct-17	10-Oct-17	10-Oct-17	10-Oct-17	10-Oct-17	10-Oct-17	10-Oct-17		10-Oct-17	10-Oct-17
Sample ID			BH 17-4-SS1	BH 17-4-SS1 Lab-Dup	MW 17-1-SS1	MW 17-1-SS1 Lab-Dup	MW 17-2-SS1	MW 17-2-SS1 Lab-Dup	DUP-1		DUP-1 Lab-Dup	MW 17-3-SS2
Sample Depth			0 - 1.5 m	0 - 1.5 m	0 - 1.2 m	0 - 1.2 m	0 - 1.1 m	0 - 1.1 m	0 - 1.1 m		0 - 1.1 m	1.5 - 2.9 m
Sampling Company			STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC
Laboratory			MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX		MAXX	MAXX
Laboratory Work Order			B7M3522	B7M3522	B7M3522	B7M3522	B7M3522	B7M3522	B7M3522		B7M3522	B7M3522
Laboratory Sample ID			FHI881	FHI881	FHI877	FHI877	FHI878	FHI878	FHI879		FHI879	FHI880
Sample Type	Units	Ontario SCS		Lab Replicate		Lab Replicate		Lab Replicate	Field Duplicate	RPD (%)	Lab Replicate	
General Chemistry												
Available (CaCl2) pH	S.U.	5-9[A]	7.43	-	7.54	7.54	7.55	-	7.59	nc	-	7.39
Cyanide (Free)	µg/g	0.051[AB]	0.01	-	<0.01	-	<0.01	-	<0.01	nc	-	0.02
Electrical Conductivity, Lab	mS/cm	1.4[A] 0.57[B]	0.18	0.18	0.12	-	0.20	-	0.21	5%	-	0.44
Moisture Content	%	n/v	13	-	12	-	12	-	8.7	**32%**	-	12
Sodium Adsorption Ratio (SAR)	none	12[A] 2.4[B]	0.25	-	1.2	-	0.53	-	0.50	nc	-	0.32
Petroleum Hydrocarbons												
PHC F1 (C6-C10 range)	µg/g	$_{s7}$[AB]	12	-	<10	-	<10	-	<10	nc	-	<10
PHC F1 (C6-C10 range) minus BTEX	µg/g	$55_{<7}$[A] $25_{<7}$[B]	12	-	<10	-	<10	-	<10	nc	-	<10
PHC F2 (>C10-C16 range)	µg/g	230_{s15}[A] 10_{s15}[B]	<10	-	<10	-	<10	-	<10	nc	-	<10
PHC F3 (>C16-C34 range)	µg/g	$1,700_{s8}$[A] 240_{s8}[B]	<50	-	<50	-	<50	-	<50	nc	-	<50
PHC F4 (>C34-C50 range)	µg/g	$3,300_{s10}$[A] 120_{s10}[B]	<50	-	<50	-	<50	-	<50	nc	-	<50
Chromatogram to baseline at C50	none	n/v	YES	-	YES	-	YES	-	YES	nc	-	YES
Metals												
Antimony	µg/g	40[A] 1.3[B]	<0.20	-	0.22	-	0.31	-	0.24	nc	-	<0.20
Arsenic	µg/g	18[AB]	5.1	-	5.1	-	5.6	-	5.1	9%	-	4.4
Barium	µg/g	670[A] 220[B]	110	-	79	-	92	-	89	3%	-	110
Beryllium	µg/g	8[A] 2.5[B]	0.67	-	0.93	-	0.77	-	0.75	nc	-	0.68
Boron	µg/g	120_{s1A}[A] 36[B]	<5.0	-	5.3	-	5.4	-	<5.0	nc	-	<5.0
Boron (Available)	µg/g	2_{s16}[A] n/a[B]	0.27	-	0.17	-	0.27	-	0.18	nc	0.19	0.38
Cadmium	µg/g	1.9[A] 1.2[B]	0.19	-	<0.10	-	0.15	-	0.14	nc	-	0.24
Chromium	µg/g	160[A] 70[B]	26	-	31	-	26	-	26	0%	-	27
Chromium (Hexavalent)	µg/g	8[A] 0.66[B]	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	nc	-	<0.2
Cobalt	µg/g	80[A] 21[B]	17	-	18	-	16	-	15	6%	-	13
Copper	µg/g	230[A] 92[B]	30	-	40	-	32	-	29	10%	-	27
Lead	µg/g	120[AB]	20	-	4.4	-	18	-	15	18%	-	20
Mercury	µg/g	3.9[A] 0.27[B]	<0.050	-	<0.050	-	<0.050	-	<0.050	nc	-	<0.050
Molybdenum	µg/g	40[A] 2[B]	1.3	-	0.52	-	1.1	-	0.96	nc	-	1.1
Nickel	µg/g	270[A] 82[B]	33	-	40	-	34	-	33	3%	-	29
Selenium	µg/g	5.5[A] 1.5[B]	<0.50	-	<0.50	-	<0.50	-	<0.50	nc	-	<0.50
Silver	µg/g	40[A] 0.5[B]	<0.20	-	<0.20	-	<0.20	-	<0.20	nc	-	<0.20
Thallium	µg/g	3.3[A] 1[B]	0.21	-	0.10	-	0.15	-	0.13	nc	-	0.17
Uranium	µg/g	33[A] 2.5[B]	0.95	-	0.51	-	0.75	-	0.72	4%	-	0.78
Vanadium	µg/g	86[AB]	33	-	34	-	32	-	32	0%	-	34
Zinc	µg/g	340[A] 290[B]	74	-	69	-	79	-	71	11%	-	76
Polychlorinated Biphenyls												
Aroclor 1242	µg/g	$_{s14}$[AB]	<0.010	-	<0.010	-	<0.010	-	<0.010	nc	-	<0.010
Aroclor 1248	µg/g	$_{s14}$[AB]	<0.010	-	<0.010	-	<0.010	-	<0.010	nc	-	<0.010
Aroclor 1254	µg/g	$_{s14}$[AB]	<0.010	-	<0.010	-	<0.010	-	<0.010	nc	-	<0.010
Aroclor 1260	µg/g	$_{s14}$[AB]	<0.010	-	<0.010	-	<0.010	-	<0.010	nc	-	<0.010
Polychlorinated Biphenyls (PCBs)	µg/g	1.1_{s14}[A] 0.3_{s14}[B]	<0.010	-	<0.010	-	<0.010	-	<0.010	nc	-	<0.010
Polycyclic Aromatic Hydrocarbons												
Acenaphthene	µg/g	21[A] 0.072[B]	<0.0050	-	<0.0050	<0.0050	<0.0050	-	<0.0050	nc	-	<0.0050
Acenaphthylene	µg/g	0.15[A] 0.093[B]	<0.0050	-	<0.0050	<0.0050	0.0053	-	0.0057	nc	-	<0.0050
Anthracene	µg/g	0.67[A] 0.16[B]	<0.0050	-	<0.0050	<0.0050	<0.0050	-	<0.0050	nc	-	<0.0050
Benzo(a)anthracene	µg/g	0.96[A] 0.36[B]	0.014	-	<0.0050	<0.0050	0.014	-	0.013	nc	-	0.021
Benzo(a)pyrene	µg/g	0.3[AB]	0.015	-	<0.0050	<0.0050	0.016	-	0.018	nc	-	0.014
Benzo(b/j)fluoranthene	µg/g	$0.96_{<7}$[A] $0.47_{<7}$[B]	0.019	-	<0.0050	<0.0050	0.022	-	0.023	nc	-	0.019
Benzo(g,h,i)perylene	µg/g	9.6[A] 0.68[B]	0.011	-	0.0058	0.0066	0.017	-	0.016	nc	-	0.0095
Benzo(k)fluoranthene	µg/g	0.96[A] 0.48[B]	0.0079	-	<0.0050	<0.0050	0.0095	-	0.0071	nc	-	0.0058
Chrysene	µg/g	9.6[A] 2.8[B]	0.013	-	<0.0050	<0.0050	0.014	-	0.012	nc	-	0.011
Dibenzo(a,h)anthracene	µg/g	0.1[AB]	<0.0050	-	<0.0050	<0.0050	<0.0050	-	<0.0050	nc	-	<0.0050
Fluoranthene	µg/g	9.6[A] 0.56[B]	0.027	-	<0.0050	<0.0050	0.029	-	0.023	nc	-	0.024
Fluorene	µg/g	62[A] 0.12[B]	<0.0050	-	<0.0050	<0.0050	<0.0050	-	<0.0050	nc	-	<0.0050
Indeno(1,2,3-cd)pyrene	µg/g	0.76[A] 0.23[B]	0.0098	-	<0.0050	<0.0050	0.014	-	0.014	nc	-	0.0074
Methylnaphthalene (Total)	µg/g	$30_{<3}$[A] $0.59_{<3}$[B]	<0.014	-	<0.014	-	<0.014	-	<0.014	nc	-	<0.014
Methylnaphthalene, 1-	µg/g	$_{s3}$[AB]	<0.0050	-	<0.0050	<0.0050	<0.0050	-	<0.0050	nc	-	<0.0050
Methylnaphthalene, 2-	µg/g	$_{s3}$[AB]	<0.0050	-	<0.0050	<0.0050	<0.0050	-	<0.0050	nc	-	<0.0050
Naphthalene	µg/g	9.6[A] 0.09[B]	<0.0050	-	<0.0050	<0.0050	<0.0050	-	<0.0050	nc	-	<0.0050
Phenanthrene	µg/g	12[A] 0.69[B]	0.0098	-	0.0053	0.0061	0.015	-	0.012	nc	-	0.011
Pyrene	µg/g	96[A] 1[B]	0.020	-	<0.0050	<0.0050	0.023	-	0.020	nc	-	0.019
Volatile Organic Compounds												
Acetone	µg/g	16[A] 0.5[B]	<0.50	-	<0.50	-	<0.50	<0.50	<0.50	nc	-	<0.50
Benzene	µg/g	0.32[A] 0.02[B]	<0.020	-	<0.020	-	<0.020	<0.020	<0.020	nc	-	<0.020
Bromodichloromethane	µg/g	1.5[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Bromoform (Tribromomethane)	µg/g	0.61[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Bromomethane (Methyl bromide)	µg/g	0.05[AB]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Carbon Tetrachloride (Tetrachloromethane)	µg/g	0.21[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Chlorobenzene (Monochlorobenzene)	µg/g	2.4[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Chloroform (Trichloromethane)	µg/g	0.47[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Dibromochloromethane	µg/g	2.3[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Dichlorobenzene, 1,2-	µg/g	1.2[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Dichlorobenzene, 1,3-	µg/g	9.6[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Dichlorobenzene, 1,4-	µg/g	0.2[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Dichlorodifluoromethane (Freon 12)	µg/g	16[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Dichloroethane, 1,1-	µg/g	0.47[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Dichloroethane, 1,2-	µg/g	0.05[AB]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Dichloroethene, 1,1-	µg/g	0.064[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Dichloroethene, cis-1,2-	µg/g	1.9[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Dichloroethene, trans-1,2-	µg/g	1.3[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Dichloropropane, 1,2-	µg/g	0.16[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Dichloropropene, 1,3- (sum of isomers cis + trans)	µg/g	$0.059_{<11}$[A] $0.05_{<11}$[B]	<0.050	-	<0.050	-	<0.050	-	<0.050	nc	-	<0.050
Dichloropropene, cis-1,3-	µg/g	$_{<11}$[AB]	<0.030	-	<0.030	-	<0.030	<0.030	<0.030	nc	-	<0.030
Dichloropropene, trans-1,3-	µg/g	$_{s11}$[AB]	<0.040	-	<0.040	-	<0.040	<0.040	<0.040	nc	-	<0.040
Ethylbenzene	µg/g	1.1[A] 0.05[B]	<0.020	-	<0.020	-	<0.020	<0.020	<0.020	nc	-	<0.020
Ethylene Dibromide (Dibromoethane, 1,2-)	µg/g	0.05[AB]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Hexane (n-Hexane)	µg/g	46[A] 0.05[B]	<0.050	-	**0.10[B]**	-	**0.056[B]**	**0.055[B]**	**0.18[B]**	nc	-	<0.050
Methyl Ethyl Ketone (MEK) (2-Butanone)	µg/g	70[A] 0.5[B]	<0.50	-	<0.50	-	<0.50	<0.50	<0.50	nc	-	<0.50
Methyl Isobutyl Ketone (MIBK)	µg/g	31[A] 0.5[B]	<0.50	-	<0.50	-	<0.50	<0.50	<0.50	nc	-	<0.50
Methyl tert-butyl ether (MTBE)	µg/g	1.6[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Methylene Chloride (Dichloromethane)	µg/g	1.6[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Styrene	µg/g	34[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Tetrachloroethane, 1,1,1,2-	µg/g	0.087[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Tetrachloroethane, 1,1,2,2-	µg/g	0.05[AB]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Tetrachloroethene (PCE)	µg/g	1.9[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Toluene	µg/g	6.4[A] 0.2[B]	<0.020	-	<0.020	-	<0.020	<0.020	<0.020	nc	-	<0.020
Trichloroethane, 1,1,1-	µg/g	6.1[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Trichloroethane, 1,1,2-	µg/g	0.05[AB]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Trichloroethene (TCE)	µg/g	0.55[A] 0.05[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Trichlorofluoromethane (Freon 11)	µg/g	4[A] 0.25[B]	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	nc	-	<0.050
Vinyl Chloride	µg/g	0.032[A] 0.02[B]	<0.020	-	<0.020	-	<0.020	<0.020	<0.020	nc	-	<0.020
Xylene, m & p-	µg/g	$_{s1}$[AB]	<0.020	-	0.036	-	<0.020	<0.020	<0.020	nc	-	<0.020
Xylene, o-	µg/g	$_{<1}$[AB]	<0.020	-	<0.020	-	<0.020	<0.020	<0.020	nc	-	<0.020
Xylenes, Total	µg/g	$26_{<1}$[A] $0.05_{<1}$[B]	<0.020	-	0.036	-	<0.020	<0.020	<0.020	nc	-	<0.020

See notes on last page

Table E-1
Summary of Soil Analytical Results
Phase Two ESA
3500 Hawthorne Road, Ottawa, Ontario
2520333 Ontario Inc.

Notes:

Ontario SCS	Soil, Ground Water and Sediment Standards for Use under Part XV.I of the Environmental Protection Act (MOE, 2011)
[A]	Table 6 - Industrial / Commercial / Community Property Use - Coarse Textured Soils
[B]	Table 1 - Residential / Parkland / Institutional / Industrial / Commercial / Community Property Use
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
< 0.50	Laboratory reporting limit was greater than the applicable standard.
< 0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
n/a	Not applicable.
[AB s1]	Standard is applicable to total xylenes, and m & p-xylenes and o-xylenes should be summed for comparison.
[AB s2]	Standard is for benzo(b)fluoranthene; however, the analytical laboratory can not distinguish between benzo(b)fluoranthene and benzo(j)fluoranthene, and therefore, the result is a combination of the two isomers, against which the standard has been compared.
[AB s3]	Standard is applicable to both 1-methylnaphthalene and 2-methylnaphthalene, with the provision that if both are detected the sum of the two must not exceed the standard.
[AB s7]	Standard is applicable to PHC in the F1 range minus BTEX.
[AB s8]	Standard is applicable to PHC in the F3 range, minus PAHs (other than naphthalene). If PAHs were not analyzed, the standard is applied to F3.
[AB s10]	If baseline is not reached during F4 analysis, then gravimetric analysis is to be performed, and the standard is applied to the higher of the two results.
[AB s11]	Standard is applicable to 1,3-Dichloropropene, and the individual isomers (cis + trans) should be added for comparison.
[AB s14]	Standard is applicable to total PCBs, and the individual Aroclors should be added for comparison.
[AB s15]	Standard is applicable to PHC in the F2 range minus naphthalene. If naphthalene was not analyzed, the standard is applied to F2.
[s16]	For surface soil, the boron standard is for hot water soluble extract. For subsurface soil, the standard is for total boron (mixed strong acid digest), as ecological criteria are not considered.
RPD	Relative Percent Difference
nc	RPD is not calculated if one or more values is non detect or if one or more values is less than five times the laboratory reporting limit.
35%	RPD exceeds data quality objective of 10% for Electrical Conductivity; ≤30% of Metals and Inorganics, Mercury; ≤40% of PAH for soil. (source: Maxxam Environmental QA/QC Interpretation Guide Reference COR-FCD-0097 released July 18, 2016.)

Appendix F
Laboratory Certificates of Analysis

Maxxam
A Bureau Veritas Group Company

Your Project #: 122170123
Site#: 3500 Hawthorne Rd.
Site Location: 3500 HAWTHORNE - PHASE II ESA
Your C.O.C. #: 632527-01-01

Attention:Su-kim Roy

Stantec Consulting Ltd
1331 Clyde Avenue
Suite 400
Ottawa, ON
K2C 3G4

Report Date: 2017/10/18
Report #: R4790299
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7M3522
Received: 2017/10/11, 08:55

Sample Matrix: Soil
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum	5	N/A	2017/10/17	CAM SOP-00301	EPA 8270D m
Hot Water Extractable Boron (1)	5	2017/10/16	2017/10/16	CAM SOP-00408	R153 Ana. Prot. 2011
1,3-Dichloropropene Sum (1)	5	N/A	2017/10/16		EPA 8260C m
Free (WAD) Cyanide (1)	5	2017/10/14	2017/10/16	CAM SOP-00457	OMOE E3015 m
Conductivity (1)	5	2017/10/16	2017/10/16	CAM SOP-00414	OMOE E3530 v1 m
Hexavalent Chromium in Soil by IC (1, 2)	5	2017/10/16	2017/10/16	CAM SOP-00436	EPA 3060/7199 m
Petroleum Hydro. CCME F1 & BTEX in Soil (3)	5	N/A	2017/10/13	OTT SOP-00002	CCME CWS
Petroleum Hydrocarbons F2-F4 in Soil (4)	2	2017/10/12	2017/10/15	OTT SOP-00001	CCME CWS
Petroleum Hydrocarbons F2-F4 in Soil (4)	3	2017/10/12	2017/10/16	OTT SOP-00001	CCME CWS
Strong Acid Leachable Metals by ICPMS (1)	5	2017/10/16	2017/10/16	CAM SOP-00447	EPA 6020B m
Moisture	5	N/A	2017/10/13	CAM SOP-00445	McKeague 2nd ed 1978
PAH Compounds in Soil by GC/MS (SIM)	5	2017/10/12	2017/10/13	OTT SOP-00011	EPA 8270D m
Polychlorinated Biphenyl in Soil (1)	5	2017/10/16	2017/10/17	CAM SOP-00309	EPA 8082A m
pH CaCl2 EXTRACT (1)	4	2017/10/16	2017/10/16	CAM SOP-00413	EPA 9045 D m
pH CaCl2 EXTRACT (1)	1	2017/10/17	2017/10/17	CAM SOP-00413	EPA 9045 D m
Sodium Adsorption Ratio (SAR) (1)	5	N/A	2017/10/17	CAM SOP-00102	EPA 6010C
Volatile Organic Compounds in Soil (1)	5	N/A	2017/10/14	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.

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.

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

Your Project #: 122170123
Site#: 3500 Hawthorne Rd.
Site Location: 3500 HAWTHORNE - PHASE II ESA
Your C.O.C. #: 632527-01-01

Attention:Su-kim Roy

Stantec Consulting Ltd
1331 Clyde Avenue
Suite 400
Ottawa, ON
K2C 3G4

Report Date: 2017/10/18
Report #: R4790299
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7M3522
Received: 2017/10/11, 08:55

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) This test was performed by Maxxam Analytics Mississauga
(2) Soils are reported on a dry weight basis unless otherwise specified.
(3) 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.
(4) 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

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.

Maxxam Job #: B7M3522
Report Date: 2017/10/18

Stantec Consulting Ltd
Client Project #: 122170123
Site Location: 3500 HAWTHORNE - PHASE II ESA
Sampler Initials: TG

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		FHI877	FHI877		FHI878	FHI879	FHI879		
Sampling Date		2017/10/10 09:30	2017/10/10 09:30		2017/10/10 11:00	2017/10/10 11:00	2017/10/10 11:00		
COC Number		632527-01-01	632527-01-01		632527-01-01	632527-01-01	632527-01-01		
	UNITS	MW 17-1-SS1	MW 17-1-SS1 Lab-Dup	QC Batch	MW 17-2-SS1	DUP-1	DUP-1 Lab-Dup	RDL	QC Batch
Calculated Parameters									
Sodium Adsorption Ratio	N/A	1.2		5205762	0.53	0.50			5205762
Inorganics									
Conductivity	mS/cm	0.12		5213565	0.20	0.21		0.002	5213565
Available (CaCl2) pH	pH	7.54	7.54	5215250	7.55	7.59			5212673
WAD Cyanide (Free)	ug/g	<0.01		5212456	<0.01	<0.01		0.01	5212456
Chromium (VI)	ug/g	<0.2	<0.2	5213191	<0.2	<0.2		0.2	5213191
Metals									
Hot Water Ext. Boron (B)	ug/g	0.17		5213340	0.27	0.18	0.19	0.050	5213340
Acid Extractable Antimony (Sb)	ug/g	0.22		5213125	0.31	0.24		0.20	5213125
Acid Extractable Arsenic (As)	ug/g	5.1		5213125	5.6	5.1		1.0	5213125
Acid Extractable Barium (Ba)	ug/g	79		5213125	92	89		0.50	5213125
Acid Extractable Beryllium (Be)	ug/g	0.93		5213125	0.77	0.75		0.20	5213125
Acid Extractable Boron (B)	ug/g	5.3		5213125	5.4	<5.0		5.0	5213125
Acid Extractable Cadmium (Cd)	ug/g	<0.10		5213125	0.15	0.14		0.10	5213125
Acid Extractable Chromium (Cr)	ug/g	31		5213125	26	26		1.0	5213125
Acid Extractable Cobalt (Co)	ug/g	18		5213125	16	15		0.10	5213125
Acid Extractable Copper (Cu)	ug/g	40		5213125	32	29		0.50	5213125
Acid Extractable Lead (Pb)	ug/g	4.4		5213125	18	15		1.0	5213125
Acid Extractable Molybdenum (Mo)	ug/g	0.52		5213125	1.1	0.96		0.50	5213125
Acid Extractable Nickel (Ni)	ug/g	40		5213125	34	33		0.50	5213125
Acid Extractable Selenium (Se)	ug/g	<0.50		5213125	<0.50	<0.50		0.50	5213125
Acid Extractable Silver (Ag)	ug/g	<0.20		5213125	<0.20	<0.20		0.20	5213125
Acid Extractable Thallium (Tl)	ug/g	0.10		5213125	0.15	0.13		0.050	5213125
Acid Extractable Uranium (U)	ug/g	0.51		5213125	0.75	0.72		0.050	5213125
Acid Extractable Vanadium (V)	ug/g	34		5213125	32	32		5.0	5213125
Acid Extractable Zinc (Zn)	ug/g	69		5213125	79	71		5.0	5213125
Acid Extractable Mercury (Hg)	ug/g	<0.050		5213125	<0.050	<0.050		0.050	5213125

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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 #: B7M3522
Report Date: 2017/10/18

Stantec Consulting Ltd
Client Project #: 122170123
Site Location: 3500 HAWTHORNE - PHASE II ESA
Sampler Initials: TG

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		FHI880	FHI881	FHI881		
Sampling Date		2017/10/10 12:30	2017/10/10 12:30	2017/10/10 12:30		
COC Number		632527-01-01	632527-01-01	632527-01-01		
	UNITS	MW 17-3-SS2	BH 17-4-SS1	BH 17-4-SS1 Lab-Dup	RDL	QC Batch
Calculated Parameters						
Sodium Adsorption Ratio	N/A	0.32	0.25			5205762
Inorganics						
Conductivity	mS/cm	0.44	0.18	0.18	0.002	5213565
Available (CaCl2) pH	pH	7.39	7.43			5212673
WAD Cyanide (Free)	ug/g	0.02	0.01		0.01	5212456
Chromium (VI)	ug/g	<0.2	<0.2		0.2	5213191
Metals						
Hot Water Ext. Boron (B)	ug/g	0.38	0.27		0.050	5213340
Acid Extractable Antimony (Sb)	ug/g	<0.20	<0.20		0.20	5213125
Acid Extractable Arsenic (As)	ug/g	4.4	5.1		1.0	5213125
Acid Extractable Barium (Ba)	ug/g	110	110		0.50	5213125
Acid Extractable Beryllium (Be)	ug/g	0.68	0.67		0.20	5213125
Acid Extractable Boron (B)	ug/g	<5.0	<5.0		5.0	5213125
Acid Extractable Cadmium (Cd)	ug/g	0.24	0.19		0.10	5213125
Acid Extractable Chromium (Cr)	ug/g	27	26		1.0	5213125
Acid Extractable Cobalt (Co)	ug/g	13	17		0.10	5213125
Acid Extractable Copper (Cu)	ug/g	27	30		0.50	5213125
Acid Extractable Lead (Pb)	ug/g	20	20		1.0	5213125
Acid Extractable Molybdenum (Mo)	ug/g	1.1	1.3		0.50	5213125
Acid Extractable Nickel (Ni)	ug/g	29	33		0.50	5213125
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50		0.50	5213125
Acid Extractable Silver (Ag)	ug/g	<0.20	<0.20		0.20	5213125
Acid Extractable Thallium (Tl)	ug/g	0.17	0.21		0.050	5213125
Acid Extractable Uranium (U)	ug/g	0.78	0.95		0.050	5213125
Acid Extractable Vanadium (V)	ug/g	34	33		5.0	5213125
Acid Extractable Zinc (Zn)	ug/g	76	74		5.0	5213125
Acid Extractable Mercury (Hg)	ug/g	<0.050	<0.050		0.050	5213125

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Maxxam Job #: B7M3522
Report Date: 2017/10/18

Stantec Consulting Ltd
Client Project #: 122170123
Site Location: 3500 HAWTHORNE - PHASE II ESA
Sampler Initials: TG

O.REG 153 PAHS (SOIL)

Maxxam ID		FHI877	FHI877	FHI878	FHI879	FHI880	FHI881		
Sampling Date		2017/10/10 09:30	2017/10/10 09:30	2017/10/10 11:00	2017/10/10 11:00	2017/10/10 12:30	2017/10/10 12:30		
COC Number		632527-01-01	632527-01-01	632527-01-01	632527-01-01	632527-01-01	632527-01-01		
	UNITS	MW 17-1-SS1	MW 17-1-SS1 Lab-Dup	MW 17-2-SS1	DUP-1	MW 17-3-SS2	BH 17-4-SS1	RDL	QC Batch
Calculated Parameters									
Methylnaphthalene, 2-(1-)	ug/g	<0.014		<0.014	<0.014	<0.014	<0.014	0.014	5205885
Polyaromatic Hydrocarbons									
Acenaphthene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	5208064
Acenaphthylene	ug/g	<0.0050	<0.0050	0.0053	0.0057	<0.0050	<0.0050	0.0050	5208064
Anthracene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	5208064
Benzo(a)anthracene	ug/g	<0.0050	<0.0050	0.014	0.013	0.021	0.014	0.0050	5208064
Benzo(a)pyrene	ug/g	<0.0050	<0.0050	0.016	0.018	0.014	0.015	0.0050	5208064
Benzo(b/j)fluoranthene	ug/g	<0.0050	<0.0050	0.022	0.023	0.019	0.019	0.0050	5208064
Benzo(g,h,i)perylene	ug/g	0.0058	0.0066	0.017	0.016	0.0095	0.011	0.0050	5208064
Benzo(k)fluoranthene	ug/g	<0.0050	<0.0050	0.0095	0.0071	0.0058	0.0079	0.0050	5208064
Chrysene	ug/g	<0.0050	<0.0050	0.014	0.012	0.011	0.013	0.0050	5208064
Dibenz(a,h)anthracene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	5208064
Fluoranthene	ug/g	<0.0050	<0.0050	0.029	0.023	0.024	0.027	0.0050	5208064
Fluorene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	5208064
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	<0.0050	0.014	0.014	0.0074	0.0098	0.0050	5208064
1-Methylnaphthalene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	5208064
2-Methylnaphthalene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	5208064
Naphthalene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	5208064
Phenanthrene	ug/g	0.0053	0.0061	0.015	0.012	0.011	0.0098	0.0050	5208064
Pyrene	ug/g	<0.0050	<0.0050	0.023	0.020	0.019	0.020	0.0050	5208064
Surrogate Recovery (%)									
D10-Anthracene	%	68	74	82	75	76	73		5208064
D14-Terphenyl (FS)	%	71	79	87	79	81	76		5208064
D8-Acenaphthylene	%	67	79	89	80	82	76		5208064

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Maxxam Job #: B7M3522
Report Date: 2017/10/18

Stantec Consulting Ltd
Client Project #: 122170123
Site Location: 3500 HAWTHORNE - PHASE II ESA
Sampler Initials: TG

O.REG 153 PCBS (SOIL)

Maxxam ID		FHI877	FHI878	FHI879	FHI880	FHI881		
Sampling Date		2017/10/10 09:30	2017/10/10 11:00	2017/10/10 11:00	2017/10/10 12:30	2017/10/10 12:30		
COC Number		632527-01-01	632527-01-01	632527-01-01	632527-01-01	632527-01-01		
	UNITS	MW 17-1-SS1	MW 17-2-SS1	DUP-1	MW 17-3-SS2	BH 17-4-SS1	RDL	QC Batch
PCBs								
Aroclor 1242	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5214827
Aroclor 1248	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5214827
Aroclor 1254	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5214827
Aroclor 1260	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5214827
Total PCB	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5214827
Surrogate Recovery (%)								
Decachlorobiphenyl	%	90	102	110	103	103		5214827

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Stantec Consulting Ltd
Client Project #: 122170123
Site Location: 3500 HAWTHORNE - PHASE II ESA
Sampler Initials: TG

O.REG 153 PETROLEUM HYDROCARBONS (SOIL)

Maxxam ID		FHI877	FHI878	FHI879	FHI880	FHI881		
Sampling Date		2017/10/10 09:30	2017/10/10 11:00	2017/10/10 11:00	2017/10/10 12:30	2017/10/10 12:30		
COC Number		632527-01-01	632527-01-01	632527-01-01	632527-01-01	632527-01-01		
	UNITS	MW 17-1-SS1	MW 17-2-SS1	DUP-1	MW 17-3-SS2	BH 17-4-SS1	RDL	QC Batch
Inorganics								
Moisture	%	12	12	8.7	12	13	0.2	5208063
BTEX & F1 Hydrocarbons								
F1 (C6-C10)	ug/g	<10	<10	<10	<10	12	10	5208146
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	12	10	5208146
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	<10	<10	10	5208065
F3 (C16-C34 Hydrocarbons)	ug/g	<50	<50	<50	<50	<50	50	5208065
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	<50	<50	<50	50	5208065
Reached Baseline at C50	ug/g	Yes	Yes	Yes	Yes	Yes		5208065
Surrogate Recovery (%)								
1,4-Difluorobenzene	%	111	109	107	107	109		5208146
4-Bromofluorobenzene	%	95	88	92	101	100		5208146
D10-Ethylbenzene	%	120	124	123	115	130		5208146
D4-1,2-Dichloroethane	%	96	91	97	100	99		5208146
o-Terphenyl	%	85	91	80	95	82		5208065

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Stantec Consulting Ltd
Client Project #: 122170123
Site Location: 3500 HAWTHORNE - PHASE II ESA
Sampler Initials: TG

O.REG 153 VOCS BY HS (SOIL)

Maxxam ID		FHI877	FHI878	FHI878	FHI879	FHI880		
Sampling Date		2017/10/10 09:30	2017/10/10 11:00	2017/10/10 11:00	2017/10/10 11:00	2017/10/10 12:30		
COC Number		632527-01-01	632527-01-01	632527-01-01	632527-01-01	632527-01-01		
	UNITS	MW 17-1-SS1	MW 17-2-SS1	MW 17-2-SS1 Lab-Dup	DUP-1	MW 17-3-SS2	RDL	QC Batch
Calculated Parameters								
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	<0.050		<0.050	<0.050	0.050	5205700
Volatile Organics								
Acetone (2-Propanone)	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	5211379
Benzene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	5211379
Bromodichloromethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
Bromoform	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
Bromomethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
Carbon Tetrachloride	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
Chlorobenzene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
Chloroform	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
Dibromochloromethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
1,2-Dichlorobenzene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
1,3-Dichlorobenzene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
1,4-Dichlorobenzene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
1,1-Dichloroethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
1,2-Dichloroethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
1,1-Dichloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
cis-1,2-Dichloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
trans-1,2-Dichloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
1,2-Dichloropropane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
cis-1,3-Dichloropropene	ug/g	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	5211379
trans-1,3-Dichloropropene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	5211379
Ethylbenzene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	5211379
Ethylene Dibromide	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
Hexane	ug/g	0.10	0.056	0.055	0.18	<0.050	0.050	5211379
Methylene Chloride(Dichloromethane)	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	5211379

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Stantec Consulting Ltd
Client Project #: 122170123
Site Location: 3500 HAWTHORNE - PHASE II ESA
Sampler Initials: TG

O.REG 153 VOCS BY HS (SOIL)

Maxxam ID		FHI877	FHI878	FHI878	FHI879	FHI880		
Sampling Date		2017/10/10 09:30	2017/10/10 11:00	2017/10/10 11:00	2017/10/10 11:00	2017/10/10 12:30		
COC Number		632527-01-01	632527-01-01	632527-01-01	632527-01-01	632527-01-01		
	UNITS	MW 17-1-SS1	MW 17-2-SS1	MW 17-2-SS1 Lab-Dup	DUP-1	MW 17-3-SS2	RDL	QC Batch
Methyl Isobutyl Ketone	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	5211379
Methyl t-butyl ether (MTBE)	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
Styrene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
1,1,1,2-Tetrachloroethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
1,1,2,2-Tetrachloroethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
Tetrachloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
Toluene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	5211379
1,1,1-Trichloroethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
1,1,2-Trichloroethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
Trichloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	5211379
Vinyl Chloride	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	5211379
p+m-Xylene	ug/g	0.036	<0.020	<0.020	<0.020	<0.020	0.020	5211379
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	5211379
Total Xylenes	ug/g	0.036	<0.020	<0.020	<0.020	<0.020	0.020	5211379
Surrogate Recovery (%)								
4-Bromofluorobenzene	%	96	97	96	98	96		5211379
D10-o-Xylene	%	88	80	79	84	82		5211379
D4-1,2-Dichloroethane	%	98	99	99	97	99		5211379
D8-Toluene	%	97	98	97	98	97		5211379

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Sampler Initials: TG

O.REG 153 VOCS BY HS (SOIL)

Maxxam ID		FHI881		
Sampling Date		2017/10/10 12:30		
COC Number		632527-01-01		
	UNITS	BH 17-4-SS1	RDL	QC Batch
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	0.050	5205700
Volatile Organics				
Acetone (2-Propanone)	ug/g	<0.50	0.50	5211379
Benzene	ug/g	<0.020	0.020	5211379
Bromodichloromethane	ug/g	<0.050	0.050	5211379
Bromoform	ug/g	<0.050	0.050	5211379
Bromomethane	ug/g	<0.050	0.050	5211379
Carbon Tetrachloride	ug/g	<0.050	0.050	5211379
Chlorobenzene	ug/g	<0.050	0.050	5211379
Chloroform	ug/g	<0.050	0.050	5211379
Dibromochloromethane	ug/g	<0.050	0.050	5211379
1,2-Dichlorobenzene	ug/g	<0.050	0.050	5211379
1,3-Dichlorobenzene	ug/g	<0.050	0.050	5211379
1,4-Dichlorobenzene	ug/g	<0.050	0.050	5211379
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	0.050	5211379
1,1-Dichloroethane	ug/g	<0.050	0.050	5211379
1,2-Dichloroethane	ug/g	<0.050	0.050	5211379
1,1-Dichloroethylene	ug/g	<0.050	0.050	5211379
cis-1,2-Dichloroethylene	ug/g	<0.050	0.050	5211379
trans-1,2-Dichloroethylene	ug/g	<0.050	0.050	5211379
1,2-Dichloropropane	ug/g	<0.050	0.050	5211379
cis-1,3-Dichloropropene	ug/g	<0.030	0.030	5211379
trans-1,3-Dichloropropene	ug/g	<0.040	0.040	5211379
Ethylbenzene	ug/g	<0.020	0.020	5211379
Ethylene Dibromide	ug/g	<0.050	0.050	5211379
Hexane	ug/g	<0.050	0.050	5211379
Methylene Chloride(Dichloromethane)	ug/g	<0.050	0.050	5211379
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	0.50	5211379

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QC Batch = Quality Control Batch

Maxxam Job #: B7M3522
Report Date: 2017/10/18

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Client Project #: 122170123
Site Location: 3500 HAWTHORNE - PHASE II ESA
Sampler Initials: TG

O.REG 153 VOCS BY HS (SOIL)

Maxxam ID		FHI881		
Sampling Date		2017/10/10 12:30		
COC Number		632527-01-01		
	UNITS	BH 17-4-SS1	RDL	QC Batch
Methyl Isobutyl Ketone	ug/g	<0.50	0.50	5211379
Methyl t-butyl ether (MTBE)	ug/g	<0.050	0.050	5211379
Styrene	ug/g	<0.050	0.050	5211379
1,1,1,2-Tetrachloroethane	ug/g	<0.050	0.050	5211379
1,1,2,2-Tetrachloroethane	ug/g	<0.050	0.050	5211379
Tetrachloroethylene	ug/g	<0.050	0.050	5211379
Toluene	ug/g	<0.020	0.020	5211379
1,1,1-Trichloroethane	ug/g	<0.050	0.050	5211379
1,1,2-Trichloroethane	ug/g	<0.050	0.050	5211379
Trichloroethylene	ug/g	<0.050	0.050	5211379
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	0.050	5211379
Vinyl Chloride	ug/g	<0.020	0.020	5211379
p+m-Xylene	ug/g	<0.020	0.020	5211379
o-Xylene	ug/g	<0.020	0.020	5211379
Total Xylenes	ug/g	<0.020	0.020	5211379
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	97		5211379
D10-o-Xylene	%	94		5211379
D4-1,2-Dichloroethane	%	102		5211379
D8-Toluene	%	95		5211379

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Report Date: 2017/10/18

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Client Project #: 122170123
Site Location: 3500 HAWTHORNE - PHASE II ESA
Sampler Initials: TG

TEST SUMMARY

Maxxam ID: FHI877
Sample ID: MW 17-1-SS1
Matrix: Soil

Collected: 2017/10/10
Shipped:
Received: 2017/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5205885	N/A	2017/10/17	Liliana Gaburici
Hot Water Extractable Boron	ICP	5213340	2017/10/16	2017/10/16	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	5205700	N/A	2017/10/16	Automated Statchk
Free (WAD) Cyanide	TECH	5212456	2017/10/14	2017/10/16	Louise Harding
Conductivity	AT	5213565	2017/10/16	2017/10/16	Neil Dassanayake
Hexavalent Chromium in Soil by IC	IC/SPEC	5213191	2017/10/16	2017/10/16	Sally Coughlin
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	5208146	N/A	2017/10/13	Paul Rubinato
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5208065	2017/10/12	2017/10/15	Arezoo Habibagahi
Strong Acid Leachable Metals by ICPMS	ICP/MS	5213125	2017/10/16	2017/10/16	Daniel Teclu
Moisture	BAL	5208063	N/A	2017/10/13	Arezoo Habibagahi
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	5208064	2017/10/12	2017/10/13	Liliana Gaburici
Polychlorinated Biphenyl in Soil	GC/ECD	5214827	2017/10/16	2017/10/17	Sarah Huang
pH CaCl2 EXTRACT	AT	5215250	2017/10/17	2017/10/17	Tahir Anwar
Sodium Adsorption Ratio (SAR)	CALC/MET	5205762	N/A	2017/10/17	Automated Statchk
Volatile Organic Compounds in Soil	GC/MS	5211379	N/A	2017/10/14	Atena Georgescu

Maxxam ID: FHI877 Dup
Sample ID: MW 17-1-SS1
Matrix: Soil

Collected: 2017/10/10
Shipped:
Received: 2017/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hexavalent Chromium in Soil by IC	IC/SPEC	5213191	2017/10/16	2017/10/16	Sally Coughlin
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	5208064	2017/10/12	2017/10/13	Liliana Gaburici
pH CaCl2 EXTRACT	AT	5215250	2017/10/17	2017/10/17	Tahir Anwar

Maxxam ID: FHI878
Sample ID: MW 17-2-SS1
Matrix: Soil

Collected: 2017/10/10
Shipped:
Received: 2017/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5205885	N/A	2017/10/17	Liliana Gaburici
Hot Water Extractable Boron	ICP	5213340	2017/10/16	2017/10/16	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	5205700	N/A	2017/10/16	Automated Statchk
Free (WAD) Cyanide	TECH	5212456	2017/10/14	2017/10/16	Louise Harding
Conductivity	AT	5213565	2017/10/16	2017/10/16	Neil Dassanayake
Hexavalent Chromium in Soil by IC	IC/SPEC	5213191	2017/10/16	2017/10/16	Sally Coughlin
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	5208146	N/A	2017/10/13	Paul Rubinato
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5208065	2017/10/12	2017/10/15	Arezoo Habibagahi
Strong Acid Leachable Metals by ICPMS	ICP/MS	5213125	2017/10/16	2017/10/16	Daniel Teclu
Moisture	BAL	5208063	N/A	2017/10/13	Arezoo Habibagahi
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	5208064	2017/10/12	2017/10/13	Liliana Gaburici
Polychlorinated Biphenyl in Soil	GC/ECD	5214827	2017/10/16	2017/10/17	Sarah Huang
pH CaCl2 EXTRACT	AT	5212673	2017/10/16	2017/10/16	Tahir Anwar
Sodium Adsorption Ratio (SAR)	CALC/MET	5205762	N/A	2017/10/17	Automated Statchk

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Maxxam Job #: B7M3522
Report Date: 2017/10/18

Stantec Consulting Ltd
Client Project #: 122170123
Site Location: 3500 HAWTHORNE - PHASE II ESA
Sampler Initials: TG

TEST SUMMARY

Maxxam ID: FHI878 **Collected:** 2017/10/10
Sample ID: MW 17-2-SS1 **Shipped:**
Matrix: Soil **Received:** 2017/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Volatile Organic Compounds in Soil	GC/MS	5211379	N/A	2017/10/14	Atena Georgescu

Maxxam ID: FHI878 Dup **Collected:** 2017/10/10
Sample ID: MW 17-2-SS1 **Shipped:**
Matrix: Soil **Received:** 2017/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Volatile Organic Compounds in Soil	GC/MS	5211379	N/A	2017/10/14	Atena Georgescu

Maxxam ID: FHI879 **Collected:** 2017/10/10
Sample ID: DUP-1 **Shipped:**
Matrix: Soil **Received:** 2017/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5205885	N/A	2017/10/17	Liliana Gaburici
Hot Water Extractable Boron	ICP	5213340	2017/10/16	2017/10/16	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	5205700	N/A	2017/10/16	Automated Statchk
Free (WAD) Cyanide	TECH	5212456	2017/10/14	2017/10/16	Louise Harding
Conductivity	AT	5213565	2017/10/16	2017/10/16	Neil Dassanayake
Hexavalent Chromium in Soil by IC	IC/SPEC	5213191	2017/10/16	2017/10/16	Sally Coughlin
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	5208146	N/A	2017/10/13	Paul Rubinato
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5208065	2017/10/12	2017/10/16	Arezoo Habibagahi
Strong Acid Leachable Metals by ICPMS	ICP/MS	5213125	2017/10/16	2017/10/16	Daniel Teclu
Moisture	BAL	5208063	N/A	2017/10/13	Arezoo Habibagahi
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	5208064	2017/10/12	2017/10/13	Liliana Gaburici
Polychlorinated Biphenyl in Soil	GC/ECD	5214827	2017/10/16	2017/10/17	Sarah Huang
pH CaCl2 EXTRACT	AT	5212673	2017/10/16	2017/10/16	Tahir Anwar
Sodium Adsorption Ratio (SAR)	CALC/MET	5205762	N/A	2017/10/17	Automated Statchk
Volatile Organic Compounds in Soil	GC/MS	5211379	N/A	2017/10/14	Atena Georgescu

Maxxam ID: FHI879 Dup **Collected:** 2017/10/10
Sample ID: DUP-1 **Shipped:**
Matrix: Soil **Received:** 2017/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	5213340	2017/10/16	2017/10/16	Suban Kanapathippllai

Maxxam ID: FHI880 **Collected:** 2017/10/10
Sample ID: MW 17-3-SS2 **Shipped:**
Matrix: Soil **Received:** 2017/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5205885	N/A	2017/10/17	Liliana Gaburici
Hot Water Extractable Boron	ICP	5213340	2017/10/16	2017/10/16	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	5205700	N/A	2017/10/16	Automated Statchk

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Maxxam Job #: B7M3522
Report Date: 2017/10/18

Stantec Consulting Ltd
Client Project #: 122170123
Site Location: 3500 HAWTHORNE - PHASE II ESA
Sampler Initials: TG

TEST SUMMARY

Maxxam ID: FHI880
Sample ID: MW 17-3-SS2
Matrix: Soil

Collected: 2017/10/10
Shipped:
Received: 2017/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	5212456	2017/10/14	2017/10/16	Louise Harding
Conductivity	AT	5213565	2017/10/16	2017/10/16	Neil Dassanayake
Hexavalent Chromium in Soil by IC	IC/SPEC	5213191	2017/10/16	2017/10/16	Sally Coughlin
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	5208146	N/A	2017/10/13	Paul Rubinato
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5208065	2017/10/12	2017/10/16	Arezoo Habibagahi
Strong Acid Leachable Metals by ICPMS	ICP/MS	5213125	2017/10/16	2017/10/16	Daniel Teclu
Moisture	BAL	5208063	N/A	2017/10/13	Arezoo Habibagahi
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	5208064	2017/10/12	2017/10/13	Liliana Gaburici
Polychlorinated Biphenyl in Soil	GC/ECD	5214827	2017/10/16	2017/10/17	Sarah Huang
pH CaCl2 EXTRACT	AT	5212673	2017/10/16	2017/10/16	Tahir Anwar
Sodium Adsorption Ratio (SAR)	CALC/MET	5205762	N/A	2017/10/17	Automated Statchk
Volatile Organic Compounds in Soil	GC/MS	5211379	N/A	2017/10/14	Atena Georgescu

Maxxam ID: FHI881
Sample ID: BH 17-4-SS1
Matrix: Soil

Collected: 2017/10/10
Shipped:
Received: 2017/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5205885	N/A	2017/10/17	Liliana Gaburici
Hot Water Extractable Boron	ICP	5213340	2017/10/16	2017/10/16	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	5205700	N/A	2017/10/16	Automated Statchk
Free (WAD) Cyanide	TECH	5212456	2017/10/14	2017/10/16	Louise Harding
Conductivity	AT	5213565	2017/10/16	2017/10/16	Neil Dassanayake
Hexavalent Chromium in Soil by IC	IC/SPEC	5213191	2017/10/16	2017/10/16	Sally Coughlin
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	5208146	N/A	2017/10/13	Paul Rubinato
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5208065	2017/10/12	2017/10/16	Arezoo Habibagahi
Strong Acid Leachable Metals by ICPMS	ICP/MS	5213125	2017/10/16	2017/10/16	Daniel Teclu
Moisture	BAL	5208063	N/A	2017/10/13	Arezoo Habibagahi
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	5208064	2017/10/12	2017/10/13	Liliana Gaburici
Polychlorinated Biphenyl in Soil	GC/ECD	5214827	2017/10/16	2017/10/17	Sarah Huang
pH CaCl2 EXTRACT	AT	5212673	2017/10/16	2017/10/16	Tahir Anwar
Sodium Adsorption Ratio (SAR)	CALC/MET	5205762	N/A	2017/10/17	Automated Statchk
Volatile Organic Compounds in Soil	GC/MS	5211379	N/A	2017/10/14	Atena Georgescu

Maxxam ID: FHI881 Dup
Sample ID: BH 17-4-SS1
Matrix: Soil

Collected: 2017/10/10
Shipped:
Received: 2017/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	5213565	2017/10/16	2017/10/16	Neil Dassanayake

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Maxxam Job #: B7M3522
Report Date: 2017/10/18

Stantec Consulting Ltd
Client Project #: 122170123
Site Location: 3500 HAWTHORNE - PHASE II ESA
Sampler Initials: TG

GENERAL COMMENTS

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

Package 1	3.3°C

Cooler custody seal was present and intact.

Sample FHI881 [BH 17-4-SS1] : SAR Analysis: Sodium was not detected. To report SAR the sodium detection limit was used in the calculation. This value represents a maximum ratio.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

Stantec Consulting Ltd
Client Project #: 122170123
Site Location: 3500 HAWTHORNE - PHASE II ESA
Sampler Initials: TG

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5208064	D10-Anthracene	2017/10/13	73	50 - 130	73	50 - 130	78	%		
5208064	D14-Terphenyl (FS)	2017/10/13	76	50 - 130	70	50 - 130	74	%		
5208064	D8-Acenaphthylene	2017/10/13	76	50 - 130	72	50 - 130	75	%		
5208065	o-Terphenyl	2017/10/15	95	30 - 130	95	30 - 130	89	%		
5208146	1,4-Difluorobenzene	2017/10/13	97	60 - 140	99	60 - 140	107	%		
5208146	4-Bromofluorobenzene	2017/10/13	96	60 - 140	79	60 - 140	96	%		
5208146	D10-Ethylbenzene	2017/10/13	81	30 - 130	126	30 - 130	89	%		
5208146	D4-1,2-Dichloroethane	2017/10/13	93	60 - 140	83	60 - 140	98	%		
5211379	4-Bromofluorobenzene	2017/10/14	99	60 - 140	101	60 - 140	97	%		
5211379	D10-o-Xylene	2017/10/14	88	60 - 130	104	60 - 130	98	%		
5211379	D4-1,2-Dichloroethane	2017/10/14	97	60 - 140	101	60 - 140	104	%		
5211379	D8-Toluene	2017/10/14	103	60 - 140	102	60 - 140	94	%		
5214827	Decachlorobiphenyl	2017/10/17	111	60 - 130	89	60 - 130	103	%		
5208063	Moisture	2017/10/13							14	50
5208064	1-Methylnaphthalene	2017/10/13	94	50 - 130	89	50 - 130	<0.0050	ug/g	NC	40
5208064	2-Methylnaphthalene	2017/10/13	88	50 - 130	84	50 - 130	<0.0050	ug/g	NC	40
5208064	Acenaphthene	2017/10/13	99	50 - 130	97	50 - 130	<0.0050	ug/g	NC	40
5208064	Acenaphthylene	2017/10/13	78	50 - 130	73	50 - 130	<0.0050	ug/g	NC	40
5208064	Anthracene	2017/10/13	86	50 - 130	86	50 - 130	<0.0050	ug/g	NC	40
5208064	Benzo(a)anthracene	2017/10/13	97	50 - 130	98	50 - 130	<0.0050	ug/g	NC	40
5208064	Benzo(a)pyrene	2017/10/13	80	50 - 130	82	50 - 130	<0.0050	ug/g	NC	40
5208064	Benzo(b/j)fluoranthene	2017/10/13	81	50 - 130	81	50 - 130	<0.0050	ug/g	NC	40
5208064	Benzo(g,h,i)perylene	2017/10/13	86	50 - 130	98	50 - 130	<0.0050	ug/g	12	40
5208064	Benzo(k)fluoranthene	2017/10/13	85	50 - 130	86	50 - 130	<0.0050	ug/g	NC	40
5208064	Chrysene	2017/10/13	93	50 - 130	102	50 - 130	<0.0050	ug/g	NC	40
5208064	Dibenz(a,h)anthracene	2017/10/13	90	50 - 130	90	50 - 130	<0.0050	ug/g	NC	40
5208064	Fluoranthene	2017/10/13	89	50 - 130	87	50 - 130	<0.0050	ug/g	NC	40
5208064	Fluorene	2017/10/13	100	50 - 130	100	50 - 130	<0.0050	ug/g	NC	40
5208064	Indeno(1,2,3-cd)pyrene	2017/10/13	87	50 - 130	88	50 - 130	<0.0050	ug/g	NC	40
5208064	Naphthalene	2017/10/13	81	50 - 130	73	50 - 130	<0.0050	ug/g	NC	40
5208064	Phenanthrene	2017/10/13	83	50 - 130	82	50 - 130	<0.0050	ug/g	13	40

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5208064	Pyrene	2017/10/13	84	50 - 130	84	50 - 130	<0.0050	ug/g	NC	40
5208065	F2 (C10-C16 Hydrocarbons)	2017/10/16	91	50 - 130	92	80 - 120	<10	ug/g	2.2	50
5208065	F3 (C16-C34 Hydrocarbons)	2017/10/16	91	50 - 130	92	80 - 120	<50	ug/g	22	50
5208065	F4 (C34-C50 Hydrocarbons)	2017/10/16	91	50 - 130	92	80 - 120	<50	ug/g	30	50
5208146	F1 (C6-C10) - BTEX	2017/10/13					<10	ug/g	NC	50
5208146	F1 (C6-C10)	2017/10/13	127	60 - 140	87	80 - 120	<10	ug/g	NC	50
5211379	1,1,1,2-Tetrachloroethane	2017/10/14	102	60 - 140	103	60 - 130	<0.050	ug/g	NC	50
5211379	1,1,1-Trichloroethane	2017/10/14	99	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
5211379	1,1,2,2-Tetrachloroethane	2017/10/14	94	60 - 140	102	60 - 130	<0.050	ug/g	NC	50
5211379	1,1,2-Trichloroethane	2017/10/14	93	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
5211379	1,1-Dichloroethane	2017/10/14	103	60 - 140	103	60 - 130	<0.050	ug/g	NC	50
5211379	1,1-Dichloroethylene	2017/10/14	109	60 - 140	106	60 - 130	<0.050	ug/g	NC	50
5211379	1,2-Dichlorobenzene	2017/10/14	93	60 - 140	93	60 - 130	<0.050	ug/g	NC	50
5211379	1,2-Dichloroethane	2017/10/14	92	60 - 140	96	60 - 130	<0.050	ug/g	NC	50
5211379	1,2-Dichloropropane	2017/10/14	92	60 - 140	93	60 - 130	<0.050	ug/g	NC	50
5211379	1,3-Dichlorobenzene	2017/10/14	98	60 - 140	94	60 - 130	<0.050	ug/g	NC	50
5211379	1,4-Dichlorobenzene	2017/10/14	96	60 - 140	93	60 - 130	<0.050	ug/g	NC	50
5211379	Acetone (2-Propanone)	2017/10/14	91	60 - 140	102	60 - 140	<0.50	ug/g	NC	50
5211379	Benzene	2017/10/14	100	60 - 140	100	60 - 130	<0.020	ug/g	NC	50
5211379	Bromodichloromethane	2017/10/14	94	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
5211379	Bromoform	2017/10/14	99	60 - 140	107	60 - 130	<0.050	ug/g	NC	50
5211379	Bromomethane	2017/10/14	98	60 - 140	98	60 - 140	<0.050	ug/g	NC	50
5211379	Carbon Tetrachloride	2017/10/14	100	60 - 140	98	60 - 130	<0.050	ug/g	NC	50
5211379	Chlorobenzene	2017/10/14	95	60 - 140	95	60 - 130	<0.050	ug/g	NC	50
5211379	Chloroform	2017/10/14	96	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
5211379	cis-1,2-Dichloroethylene	2017/10/14	95	60 - 140	96	60 - 130	<0.050	ug/g	NC	50
5211379	cis-1,3-Dichloropropene	2017/10/14	80	60 - 140	81	60 - 130	<0.030	ug/g	NC	50
5211379	Dibromochloromethane	2017/10/14	99	60 - 140	103	60 - 130	<0.050	ug/g	NC	50
5211379	Dichlorodifluoromethane (FREON 12)	2017/10/14	121	60 - 140	117	60 - 140	<0.050	ug/g	NC	50
5211379	Ethylbenzene	2017/10/14	97	60 - 140	94	60 - 130	<0.020	ug/g	NC	50
5211379	Ethylene Dibromide	2017/10/14	97	60 - 140	101	60 - 130	<0.050	ug/g	NC	50

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5211379	Hexane	2017/10/14	113	60 - 140	108	60 - 130	<0.050	ug/g	2.5	50
5211379	Methyl Ethyl Ketone (2-Butanone)	2017/10/14	93	60 - 140	106	60 - 140	<0.50	ug/g	NC	50
5211379	Methyl Isobutyl Ketone	2017/10/14	90	60 - 140	103	60 - 130	<0.50	ug/g	NC	50
5211379	Methyl t-butyl ether (MTBE)	2017/10/14	94	60 - 140	96	60 - 130	<0.050	ug/g	NC	50
5211379	Methylene Chloride(Dichloromethane)	2017/10/14	100	60 - 140	101	60 - 130	<0.050	ug/g	NC	50
5211379	o-Xylene	2017/10/14	97	60 - 140	96	60 - 130	<0.020	ug/g	NC	50
5211379	p+m-Xylene	2017/10/14	101	60 - 140	98	60 - 130	<0.020	ug/g	NC	50
5211379	Styrene	2017/10/14	98	60 - 140	98	60 - 130	<0.050	ug/g	NC	50
5211379	Tetrachloroethylene	2017/10/14	96	60 - 140	94	60 - 130	<0.050	ug/g	NC	50
5211379	Toluene	2017/10/14	96	60 - 140	95	60 - 130	<0.020	ug/g	NC	50
5211379	Total Xylenes	2017/10/14					<0.020	ug/g	NC	50
5211379	trans-1,2-Dichloroethylene	2017/10/14	100	60 - 140	99	60 - 130	<0.050	ug/g	NC	50
5211379	trans-1,3-Dichloropropene	2017/10/14	82	60 - 140	83	60 - 130	<0.040	ug/g	NC	50
5211379	Trichloroethylene	2017/10/14	96	60 - 140	95	60 - 130	<0.050	ug/g	NC	50
5211379	Trichlorofluoromethane (FREON 11)	2017/10/14	107	60 - 140	104	60 - 130	<0.050	ug/g	NC	50
5211379	Vinyl Chloride	2017/10/14	107	60 - 140	106	60 - 130	<0.020	ug/g	NC	50
5212456	WAD Cyanide (Free)	2017/10/16	96	75 - 125	97	80 - 120	<0.01	ug/g	NC	35
5212673	Available (CaCl2) pH	2017/10/16			100	97 - 103			0.29	N/A
5213125	Acid Extractable Antimony (Sb)	2017/10/16	90	75 - 125	101	80 - 120	<0.20	ug/g	3.5	30
5213125	Acid Extractable Arsenic (As)	2017/10/16	96	75 - 125	101	80 - 120	<1.0	ug/g	2.0	30
5213125	Acid Extractable Barium (Ba)	2017/10/16	NC	75 - 125	99	80 - 120	<0.50	ug/g	2.6	30
5213125	Acid Extractable Beryllium (Be)	2017/10/16	96	75 - 125	95	80 - 120	<0.20	ug/g	8.6	30
5213125	Acid Extractable Boron (B)	2017/10/16	88	75 - 125	94	80 - 120	<5.0	ug/g	4.7	30
5213125	Acid Extractable Cadmium (Cd)	2017/10/16	97	75 - 125	99	80 - 120	<0.10	ug/g	20	30
5213125	Acid Extractable Chromium (Cr)	2017/10/16	96	75 - 125	99	80 - 120	<1.0	ug/g	4.2	30
5213125	Acid Extractable Cobalt (Co)	2017/10/16	96	75 - 125	99	80 - 120	<0.10	ug/g	4.3	30
5213125	Acid Extractable Copper (Cu)	2017/10/16	NC	75 - 125	99	80 - 120	<0.50	ug/g	0.32	30
5213125	Acid Extractable Lead (Pb)	2017/10/16	97	75 - 125	100	80 - 120	<1.0	ug/g	2.2	30
5213125	Acid Extractable Mercury (Hg)	2017/10/16	91	75 - 125	99	80 - 120	<0.050	ug/g	NC	30
5213125	Acid Extractable Molybdenum (Mo)	2017/10/16	98	75 - 125	98	80 - 120	<0.50	ug/g	8.3	30
5213125	Acid Extractable Nickel (Ni)	2017/10/16	100	75 - 125	99	80 - 120	<0.50	ug/g	3.1	30

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 #: B7M3522
Report Date: 2017/10/18

QUALITY ASSURANCE REPORT(CONT'D)

Stantec Consulting Ltd
Client Project #: 122170123
Site Location: 3500 HAWTHORNE - PHASE II ESA
Sampler Initials: TG

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5213125	Acid Extractable Selenium (Se)	2017/10/16	96	75 - 125	101	80 - 120	<0.50	ug/g	NC	30
5213125	Acid Extractable Silver (Ag)	2017/10/16	98	75 - 125	100	80 - 120	<0.20	ug/g	NC	30
5213125	Acid Extractable Thallium (Tl)	2017/10/16	95	75 - 125	98	80 - 120	<0.050	ug/g	14	30
5213125	Acid Extractable Uranium (U)	2017/10/16	100	75 - 125	100	80 - 120	<0.050	ug/g	0.88	30
5213125	Acid Extractable Vanadium (V)	2017/10/16	95	75 - 125	98	80 - 120	<5.0	ug/g	7.3	30
5213125	Acid Extractable Zinc (Zn)	2017/10/16	NC	75 - 125	98	80 - 120	<5.0	ug/g	3.0	30
5213191	Chromium (VI)	2017/10/16	84	75 - 125	92	80 - 120	<0.2	ug/g	NC	35
5213340	Hot Water Ext. Boron (B)	2017/10/16	99	75 - 125	100	75 - 125	<0.050	ug/g	5.9	40
5213565	Conductivity	2017/10/16			100	90 - 110	<0.002	mS/cm	0.16	10
5214827	Aroclor 1242	2017/10/17					<0.010	ug/g	NC	50
5214827	Aroclor 1248	2017/10/17					<0.010	ug/g	NC	50
5214827	Aroclor 1254	2017/10/17					<0.010	ug/g	NC	50
5214827	Aroclor 1260	2017/10/17	123	60 - 130	109	60 - 130	<0.010	ug/g	NC	50
5214827	Total PCB	2017/10/17	123	60 - 130	109	60 - 130	<0.010	ug/g	NC	50
5215250	Available (CaCl2) pH	2017/10/17			100	97 - 103			0.084	N/A

N/A = Not Applicable

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).

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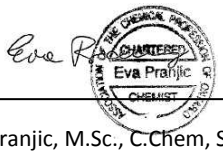
Maxxam Job #: B7M3522
Report Date: 2017/10/18

Stantec Consulting Ltd
Client Project #: 122170123
Site Location: 3500 HAWTHORNE - PHASE II ESA
Sampler Initials: TG

VALIDATION SIGNATURE PAGE

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



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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.

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Maxxam
A Bureau Veritas Group Company

Maxxam Analytics International Corporation o/a Maxxam Analytics
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.maxxam.ca

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#50098 Stantec Consulting Ltd	Company Name:	Stantec Consulting Ltd.	Quotation #:	B75209	Maxxam Job #:	Bottle Order #:
Attention:	Accounts Payable	Attention:	Su-kim Roy	P.O. #:	—		632527
Address:	1331 Clyde Avenue Suite 400 Ottawa ON K2C 3G4	Address:	1331 Clyde Ave. Ste. 400 Ottawa, ON K2C 3G4	Project:	122170123	COC #:	Project Manager:
Tel:	(613) 722-4420 x Fax: (613) 738-0721 x	Tel:	613-722-4420 Fax: —	Project Name:	3500 Hawthorne - Phase II ESA	C#632527-01-01	Jonathan Urben
Email:	accounts.payable.invoices@stantec.com	Email:	su-kim.roy@stantec.com	Site #:	3500 Hawthorne Rd.		
				Sampled By:	Tarek Ghadich		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- [x] Table 1 [ ] Res/Park [ ] Medium/Fine
- [ ] Table 2 [ ] Ind/Comm [ ] Coarse
- [ ] Table 3 [ ] Agri/Other [ ] For RSC
- [ ] Table ___

Other Regulations
- [ ] CCME [ ] Sanitary Sewer Bylaw
- [ ] Reg 558. [ ] Storm Sewer Bylaw
- [ ] MISA Municipality ___
- [ ] PWQO
- [ ] Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? N

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☑
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O.Reg 153 Metals & Inorganics Pkg (Soil)	O.Reg 153 VOCs by HS (Soil)	O.Reg 153 Petroleum Hydrocarbons (Soil)	O.Reg 153 PAHs (Soil)	O.Reg 153 PCBs (Soil)	# of Bottles	Comments
1		MW17-1 SS1	2017/10/10	09:30	SO	—	✓	✓	✓	✓	✓	9	
2		MW17-2 SS1	2017/10/10	11:30	SO	—	✓	✓	✓	✓	✓	9	
3		DUP-1	2017/10/10	11:00	SO	—	✓	✓	✓	✓	✓	9	RECEIVED IN OTTAWA
4		MW17-3 SS2	2017/10/10	12:30	SO	—	✓	✓	✓	✓	✓	9	
5		BH17-4 SS1	2017/10/10	12:30	SO	—	✓	✓	✓	✓	✓	9	on ice
6													
7													
8													
9													
10													

11-Oct-17 08:55
Jonathan Urben
B7M3522
YKV OTT 001

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Tarek Ghadich	17/10/11	08:55	J. Urben / J. Urben	2017/10/11	8:55	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal Present	Yes	No
	4, 5, 1	Intact	✓	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

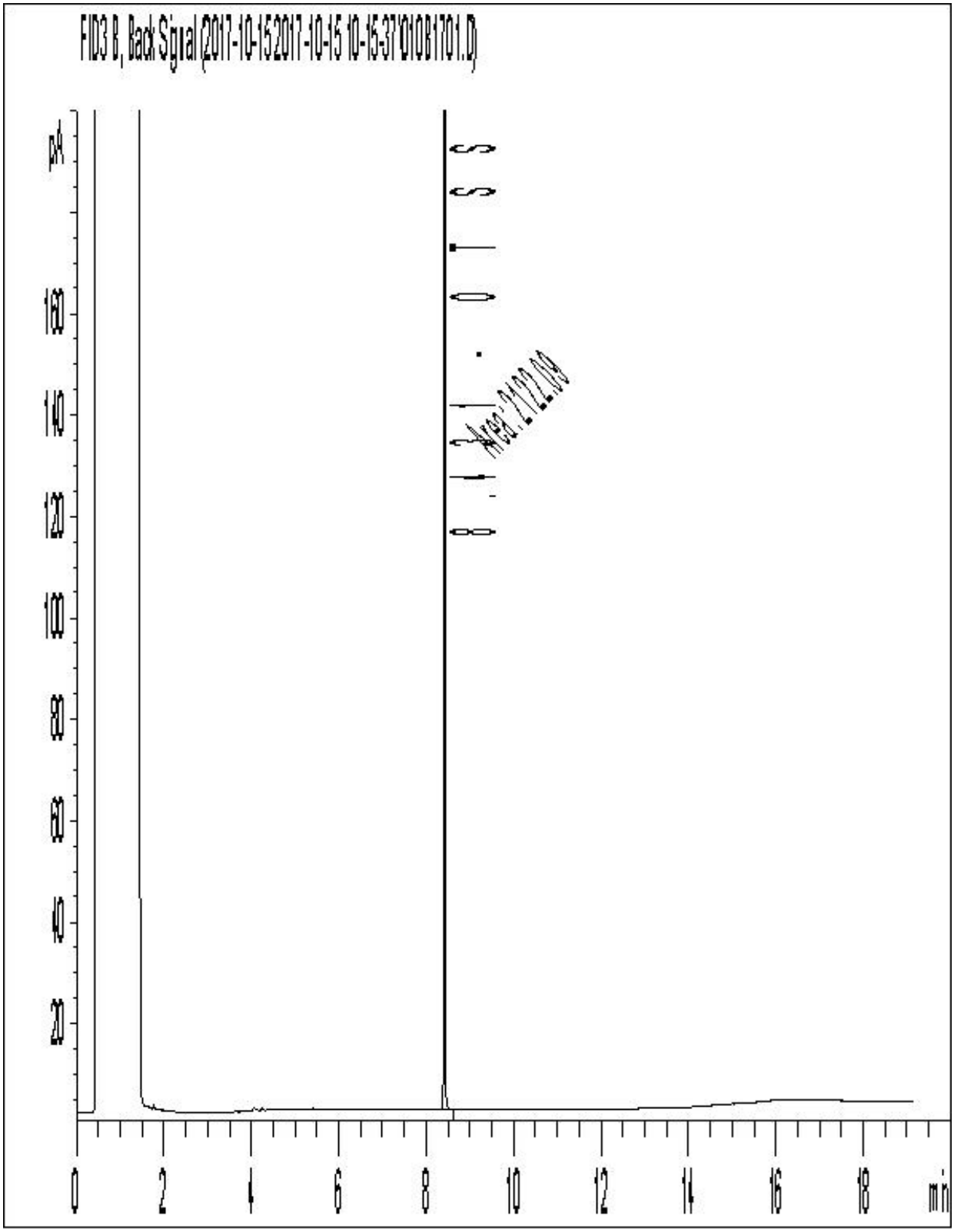
White: Maxxa Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam Job #: B7M3522
Report Date: 2017/10/18
Maxxam Sample: FHI877

Stantec Consulting Ltd
Client Project #: 122170123
Project name: 3500 HAWTHORNE - PHASE II ESA
Client ID: MW 17-1-SS1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

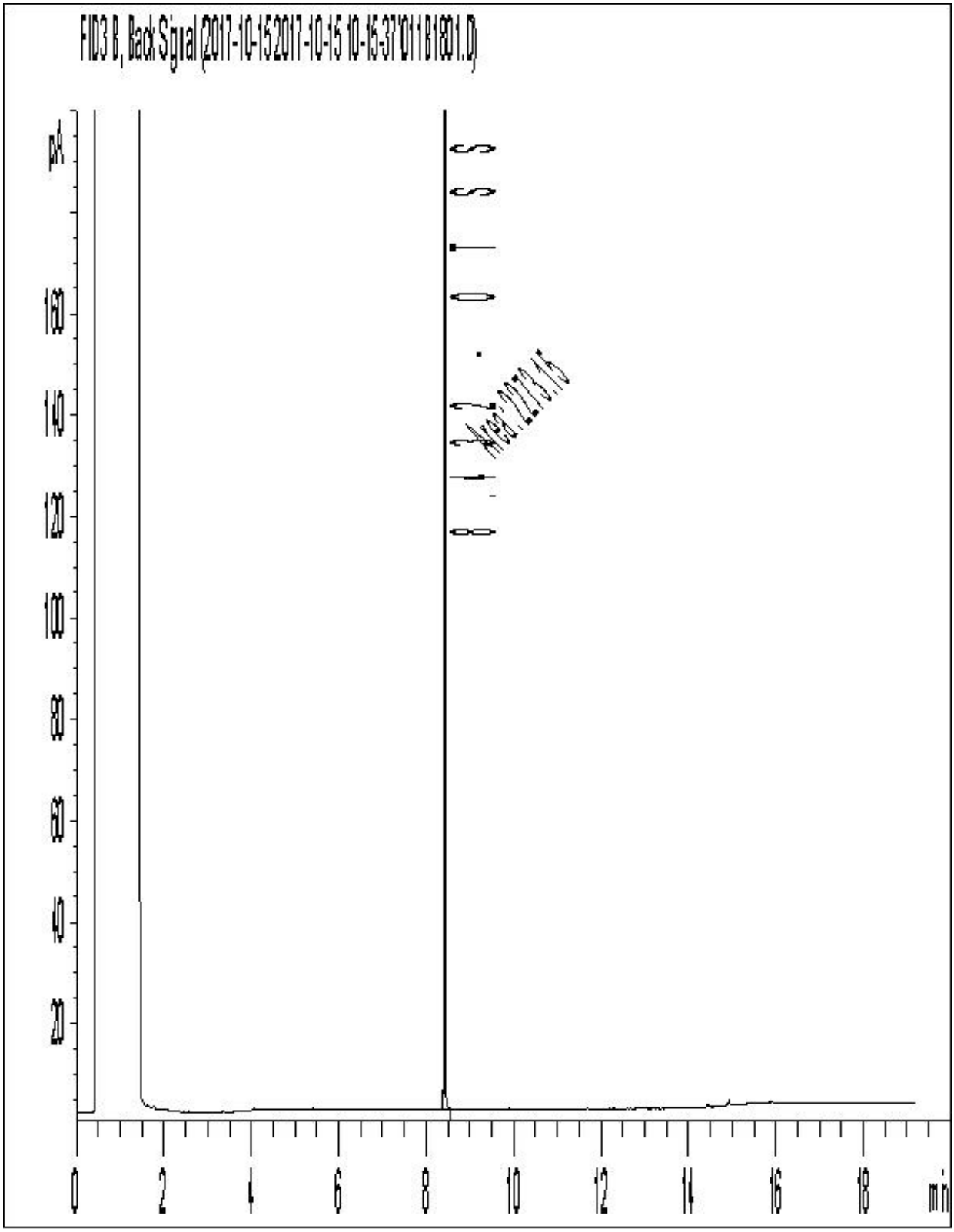


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7M3522
Report Date: 2017/10/18
Maxxam Sample: FHI878

Stantec Consulting Ltd
Client Project #: 122170123
Project name: 3500 HAWTHORNE - PHASE II ESA
Client ID: MW 17-2-SS1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

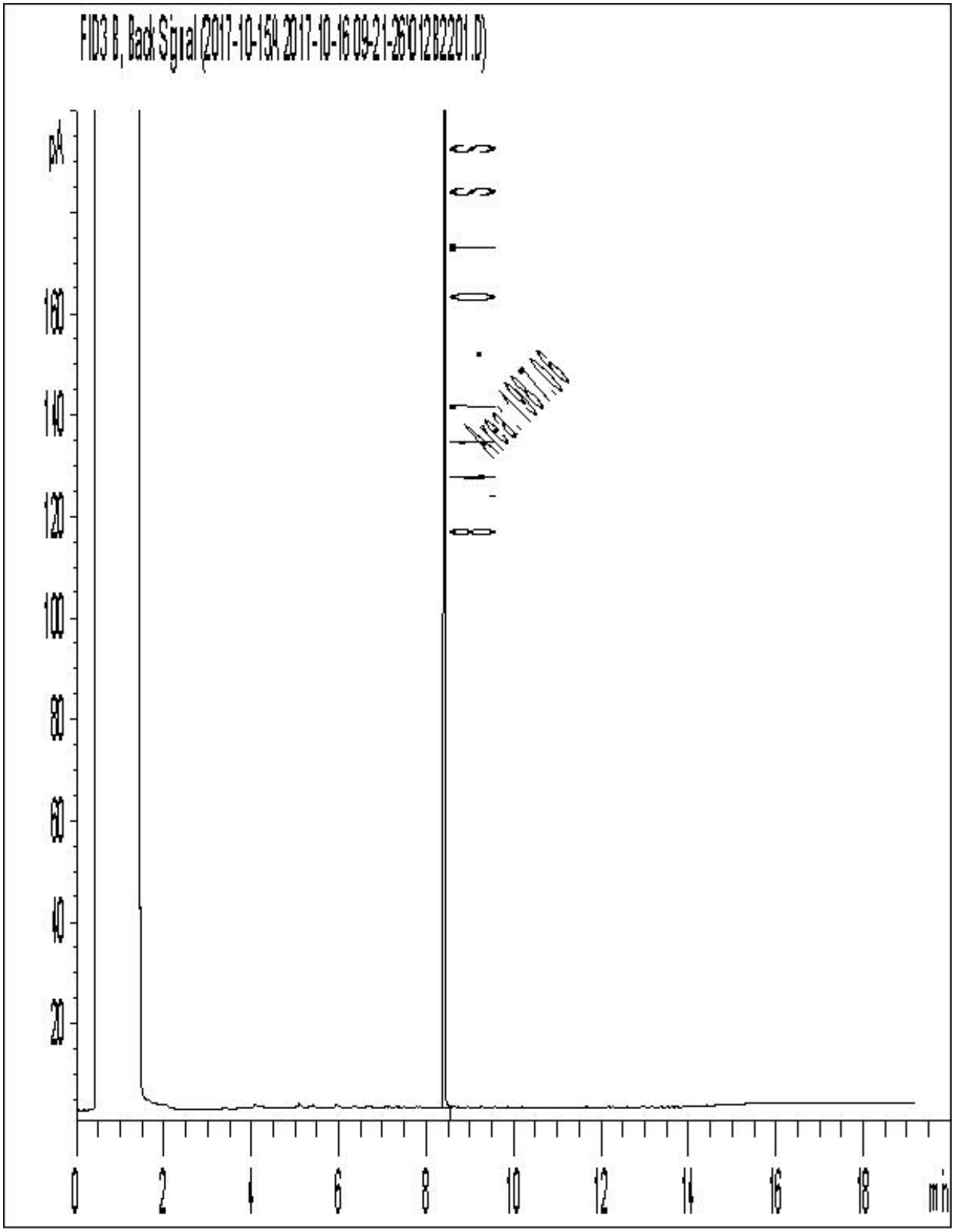


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7M3522
Report Date: 2017/10/18
Maxxam Sample: FHI879

Stantec Consulting Ltd
Client Project #: 122170123
Project name: 3500 HAWTHORNE - PHASE II ESA
Client ID: DUP-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

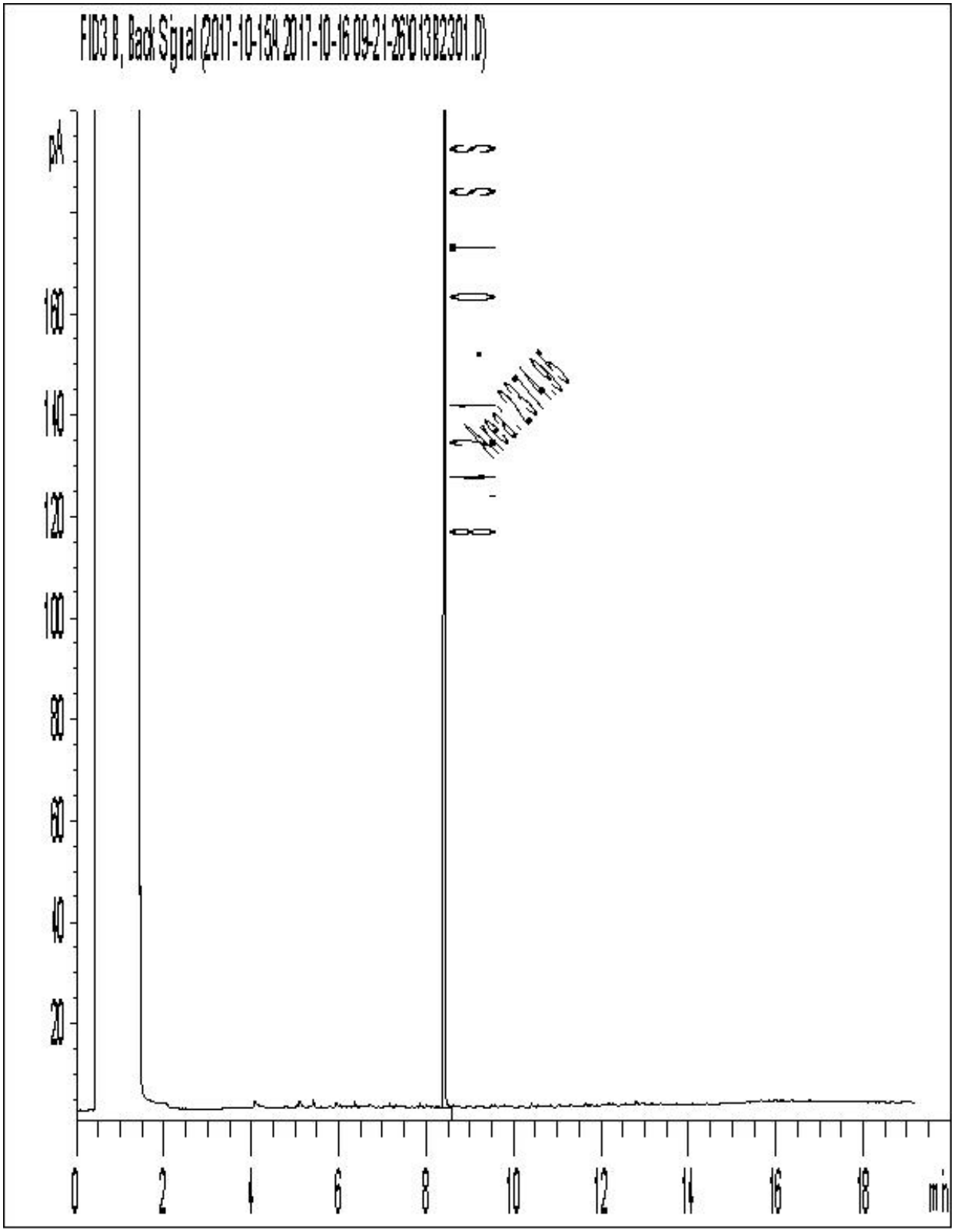


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7M3522
Report Date: 2017/10/18
Maxxam Sample: FHI880

Stantec Consulting Ltd
Client Project #: 122170123
Project name: 3500 HAWTHORNE - PHASE II ESA
Client ID: MW 17-3-SS2

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

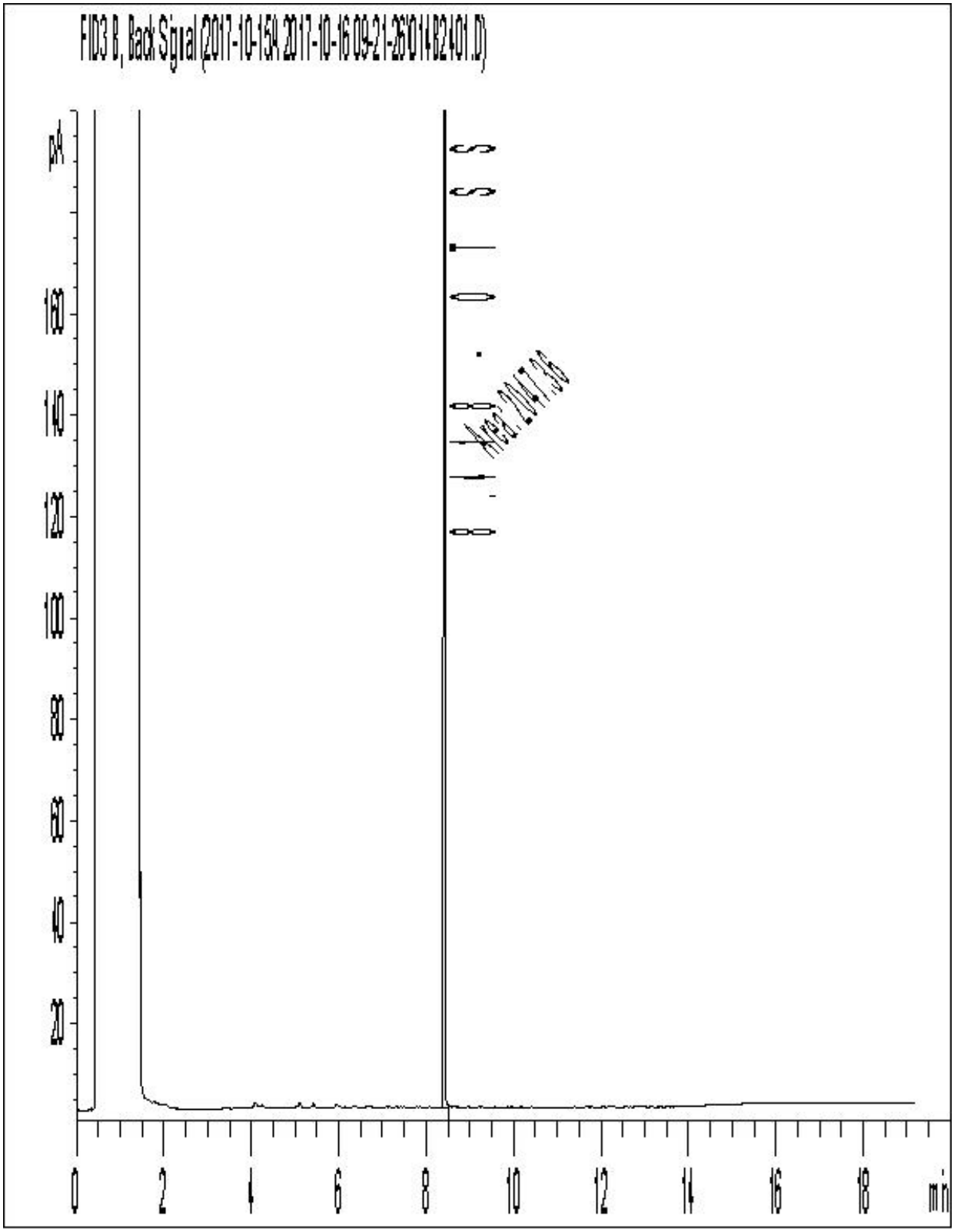


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7M3522
Report Date: 2017/10/18
Maxxam Sample: FHI881

Stantec Consulting Ltd
Client Project #: 122170123
Project name: 3500 HAWTHORNE - PHASE II ESA
Client ID: BH 17-4-SS1

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.

Maxxam
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Your P.O. #: 200.200
Your Project #: 122170123
Site#: 3500 Hawthorne Road
Your C.O.C. #: 633991-01-01

Attention:Su-kim Roy

Stantec Consulting Ltd
1331 Clyde Avenue
Suite 400
Ottawa, ON
K2C 3G4

Report Date: 2017/10/24
Report #: R4800885
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7M9711
Received: 2017/10/16, 18:00

Sample Matrix: Water
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum (1)	4	N/A	2017/10/20	CAM SOP-00301	EPA 8270D m
1,3-Dichloropropene Sum (1)	4	N/A	2017/10/23		EPA 8260C m
1,3-Dichloropropene Sum (1)	2	N/A	2017/10/24		EPA 8260C m
Chloride by Automated Colourimetry (1)	4	N/A	2017/10/23	CAM SOP-00463	EPA 325.2 m
Free (WAD) Cyanide (1)	1	N/A	2017/10/19	CAM SOP-00457	OMOE E3015 m
Free (WAD) Cyanide (1)	3	N/A	2017/10/20	CAM SOP-00457	OMOE E3015 m
Petroleum Hydrocarbons F2-F4 in Water (1, 2)	4	2017/10/19	2017/10/20	CAM SOP-00316	CCME PHC-CWS m
Dissolved Metals by ICPMS (1)	4	N/A	2017/10/20	CAM SOP-00447	EPA 6020B m
PAH Compounds in Water by GC/MS (SIM) (1)	4	2017/10/19	2017/10/20	CAM SOP-00318	EPA 8270D m
Polychlorinated Biphenyl in Water (1)	4	2017/10/19	2017/10/20	CAM SOP-00309	EPA 8082A m
Volatile Organic Compounds and F1 PHCs (1)	1	N/A	2017/10/20	CAM SOP-00230	EPA 8260C m
Volatile Organic Compounds and F1 PHCs (1)	3	N/A	2017/10/21	CAM SOP-00230	EPA 8260C m
Volatile Organic Compounds in Water (1)	2	N/A	2017/10/21	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.

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.

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Your P.O. #: 200.200
Your Project #: 122170123
Site#: 3500 Hawthorne Road
Your C.O.C. #: 633991-01-01

Attention:Su-kim Roy

Stantec Consulting Ltd
1331 Clyde Avenue
Suite 400
Ottawa, ON
K2C 3G4

Report Date: 2017/10/24
Report #: R4800885
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7M9711

Received: 2017/10/16, 18:00

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) This test was performed by Maxxam Analytics Mississauga

(2) 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

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

==========

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Maxxam Job #: B7M9711
Report Date: 2017/10/24

Stantec Consulting Ltd
Client Project #: 122170123
Your P.O. #: 200.200
Sampler Initials: AP

O.REG 153 METALS & INORGANICS PKG (WTR)

Maxxam ID		FIR249	FIR249			FIR250	FIR251	FIR252		
Sampling Date		2017/10/16 14:40	2017/10/16 14:40			2017/10/16 15:10	2017/10/16 16:15	2017/10/16		
COC Number		633991-01-01	633991-01-01			633991-01-01	633991-01-01	633991-01-01		
	UNITS	MW17-1	MW17-1 Lab-Dup	RDL	QC Batch	MW17-2	MW17-3	QC-1	RDL	QC Batch
Inorganics										
WAD Cyanide (Free)	ug/L	<1	<1	1	5218635	<1	<1	<1	1	5221182
Dissolved Chloride (Cl)	mg/L	930		10	5222827	38	91	90	1.0	5222827
Metals										
Dissolved Antimony (Sb)	ug/L	<2.5		2.5	5218409	3.7	0.65	0.72	0.50	5218409
Dissolved Arsenic (As)	ug/L	<5.0		5.0	5218409	10	1.5	1.3	1.0	5218409
Dissolved Barium (Ba)	ug/L	200		10	5218409	17	86	85	2.0	5218409
Dissolved Beryllium (Be)	ug/L	<2.5		2.5	5218409	<0.50	<0.50	<0.50	0.50	5218409
Dissolved Boron (B)	ug/L	790		50	5218409	970	690	690	10	5218409
Dissolved Cadmium (Cd)	ug/L	<0.50		0.50	5218409	<0.10	<0.10	<0.10	0.10	5218409
Dissolved Chromium (Cr)	ug/L	<25		25	5218409	<5.0	<5.0	<5.0	5.0	5218409
Dissolved Cobalt (Co)	ug/L	<2.5		2.5	5218409	<0.50	<0.50	<0.50	0.50	5218409
Dissolved Copper (Cu)	ug/L	<5.0		5.0	5218409	<1.0	<1.0	<1.0	1.0	5218409
Dissolved Lead (Pb)	ug/L	<2.5		2.5	5218409	<0.50	<0.50	<0.50	0.50	5218409
Dissolved Molybdenum (Mo)	ug/L	3.1		2.5	5218409	2.6	3.1	3.8	0.50	5218409
Dissolved Nickel (Ni)	ug/L	<5.0		5.0	5218409	<1.0	<1.0	<1.0	1.0	5218409
Dissolved Selenium (Se)	ug/L	<10		10	5218409	<2.0	<2.0	<2.0	2.0	5218409
Dissolved Silver (Ag)	ug/L	<0.50		0.50	5218409	<0.10	<0.10	<0.10	0.10	5218409
Dissolved Sodium (Na)	ug/L	1400000		500	5218409	250000	320000	320000	100	5218409
Dissolved Thallium (Tl)	ug/L	<0.25		0.25	5218409	<0.050	<0.050	<0.050	0.050	5218409
Dissolved Uranium (U)	ug/L	3.1		0.50	5218409	2.0	0.79	0.80	0.10	5218409
Dissolved Vanadium (V)	ug/L	<2.5		2.5	5218409	5.4	<0.50	<0.50	0.50	5218409
Dissolved Zinc (Zn)	ug/L	<25		25	5218409	<5.0	<5.0	<5.0	5.0	5218409

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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 #: B7M9711
Report Date: 2017/10/24

Stantec Consulting Ltd
Client Project #: 122170123
Your P.O. #: 200.200
Sampler Initials: AP

O.REG 153 PAHS (WATER)

Maxxam ID		FIR249	FIR250	FIR251	FIR252		
Sampling Date		2017/10/16 14:40	2017/10/16 15:10	2017/10/16 16:15	2017/10/16		
COC Number		633991-01-01	633991-01-01	633991-01-01	633991-01-01		
	UNITS	MW17-1	MW17-2	MW17-3	QC-1	RDL	QC Batch
Calculated Parameters							
Methylnaphthalene, 2-(1-)	ug/L	<0.071	<0.071	<0.071	<0.071	0.071	5216131
Polyaromatic Hydrocarbons							
Acenaphthene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	5221263
Acenaphthylene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	5221263
Anthracene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	5221263
Benzo(a)anthracene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	5221263
Benzo(a)pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	5221263
Benzo(b/j)fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	5221263
Benzo(g,h,i)perylene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	5221263
Benzo(k)fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	5221263
Chrysene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	5221263
Dibenz(a,h)anthracene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	5221263
Fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	5221263
Fluorene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	5221263
Indeno(1,2,3-cd)pyrene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	5221263
1-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	5221263
2-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	5221263
Naphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	5221263
Phenanthrene	ug/L	<0.030	<0.030	<0.030	<0.030	0.030	5221263
Pyrene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	5221263
Surrogate Recovery (%)							
D10-Anthracene	%	95	93	93	91		5221263
D14-Terphenyl (FS)	%	65	57	35 (1)	35 (1)		5221263
D8-Acenaphthylene	%	97	97	97	95		5221263

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Surrogate recovery may have been impacted by the amount of sediment that was present in sample.

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Report Date: 2017/10/24

Stantec Consulting Ltd
Client Project #: 122170123
Your P.O. #: 200.200
Sampler Initials: AP

O.REG 153 PCBS (WATER)

Maxxam ID		FIR249	FIR250	FIR251	FIR252		
Sampling Date		2017/10/16 14:40	2017/10/16 15:10	2017/10/16 16:15	2017/10/16		
COC Number		633991-01-01	633991-01-01	633991-01-01	633991-01-01		
	UNITS	MW17-1	MW17-2	MW17-3	QC-1	RDL	QC Batch
PCBs							
Aroclor 1242	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	5221417
Aroclor 1248	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	5221417
Aroclor 1254	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	5221417
Aroclor 1260	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	5221417
Total PCB	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	5221417
Surrogate Recovery (%)							
Decachlorobiphenyl	%	92	87	107	111		5221417

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 VOCS BY HS & F1-F4 (WATER)

Maxxam ID		FIR249	FIR250	FIR251	FIR252		
Sampling Date		2017/10/16 14:40	2017/10/16 15:10	2017/10/16 16:15	2017/10/16		
COC Number		633991-01-01	633991-01-01	633991-01-01	633991-01-01		
	UNITS	MW17-1	MW17-2	MW17-3	QC-1	RDL	QC Batch
Calculated Parameters							
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	5215462
Volatile Organics							
Acetone (2-Propanone)	ug/L	<10	<10	<10	<10	10	5220082
Benzene	ug/L	0.68	0.45	0.38	0.40	0.20	5220082
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	5220082
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	5220082
Bromomethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	5220082
Carbon Tetrachloride	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5220082
Chlorobenzene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5220082
Chloroform	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5220082
Dibromochloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	5220082
1,2-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	5220082
1,3-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	5220082
1,4-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	5220082
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	5220082
1,1-Dichloroethane	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5220082
1,2-Dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	5220082
1,1-Dichloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5220082
cis-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	5220082
trans-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	5220082
1,2-Dichloropropane	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5220082
cis-1,3-Dichloropropene	ug/L	<0.30	<0.30	<0.30	<0.30	0.30	5220082
trans-1,3-Dichloropropene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	5220082
Ethylbenzene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5220082
Ethylene Dibromide	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5220082
Hexane	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	5220082
Methylene Chloride(Dichloromethane)	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	5220082
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	<10	<10	<10	10	5220082
Methyl Isobutyl Ketone	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	5220082
Methyl t-butyl ether (MTBE)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	5220082
Styrene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	5220082

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2017/10/24

Stantec Consulting Ltd
Client Project #: 122170123
Your P.O. #: 200.200
Sampler Initials: AP

O.REG 153 VOCS BY HS & F1-F4 (WATER)

Maxxam ID		FIR249	FIR250	FIR251	FIR252		
Sampling Date		2017/10/16 14:40	2017/10/16 15:10	2017/10/16 16:15	2017/10/16		
COC Number		633991-01-01	633991-01-01	633991-01-01	633991-01-01		
	UNITS	MW17-1	MW17-2	MW17-3	QC-1	RDL	QC Batch
1,1,1,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	5220082
1,1,2,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	5220082
Tetrachloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5220082
Toluene	ug/L	0.96	0.46	0.50	0.53	0.20	5220082
1,1,1-Trichloroethane	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5220082
1,1,2-Trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	5220082
Trichloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5220082
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	5220082
Vinyl Chloride	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5220082
p+m-Xylene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5220082
o-Xylene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5220082
Total Xylenes	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5220082
F1 (C6-C10)	ug/L	<25	<25	<25	<25	25	5220082
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	<25	25	5220082
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	<100	100	5221276
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	<200	<200	200	5221276
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	<200	<200	200	5221276
Reached Baseline at C50	ug/L	Yes	Yes	Yes	Yes		5221276
Surrogate Recovery (%)							
o-Terphenyl	%	95	95	94	96		5221276
4-Bromofluorobenzene	%	87	86	87	87		5220082
D4-1,2-Dichloroethane	%	126	124	127	127		5220082
D8-Toluene	%	89	89	90	90		5220082

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2017/10/24

Stantec Consulting Ltd
Client Project #: 122170123
Your P.O. #: 200.200
Sampler Initials: AP

O.REG 153 VOCS BY HS (WATER)

Maxxam ID		FIR253	FIR254		
Sampling Date		2017/10/16 14:25	2017/10/16		
COC Number		633991-01-01	633991-01-01		
	UNITS	FIELD BLANK	TRIP BLANK	RDL	QC Batch
Calculated Parameters					
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	<0.50	0.50	5215462
Volatile Organics					
Acetone (2-Propanone)	ug/L	<10	<10	10	5215469
Benzene	ug/L	<0.20	<0.20	0.20	5215469
Bromodichloromethane	ug/L	<0.50	<0.50	0.50	5215469
Bromoform	ug/L	<1.0	<1.0	1.0	5215469
Bromomethane	ug/L	<0.50	<0.50	0.50	5215469
Carbon Tetrachloride	ug/L	<0.20	<0.20	0.20	5215469
Chlorobenzene	ug/L	<0.20	<0.20	0.20	5215469
Chloroform	ug/L	<0.20	<0.20	0.20	5215469
Dibromochloromethane	ug/L	<0.50	<0.50	0.50	5215469
1,2-Dichlorobenzene	ug/L	<0.50	<0.50	0.50	5215469
1,3-Dichlorobenzene	ug/L	<0.50	<0.50	0.50	5215469
1,4-Dichlorobenzene	ug/L	<0.50	<0.50	0.50	5215469
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	<1.0	1.0	5215469
1,1-Dichloroethane	ug/L	<0.20	<0.20	0.20	5215469
1,2-Dichloroethane	ug/L	<0.50	<0.50	0.50	5215469
1,1-Dichloroethylene	ug/L	<0.20	<0.20	0.20	5215469
cis-1,2-Dichloroethylene	ug/L	<0.50	<0.50	0.50	5215469
trans-1,2-Dichloroethylene	ug/L	<0.50	<0.50	0.50	5215469
1,2-Dichloropropane	ug/L	<0.20	<0.20	0.20	5215469
cis-1,3-Dichloropropene	ug/L	<0.30	<0.30	0.30	5215469
trans-1,3-Dichloropropene	ug/L	<0.40	<0.40	0.40	5215469
Ethylbenzene	ug/L	<0.20	<0.20	0.20	5215469
Ethylene Dibromide	ug/L	<0.20	<0.20	0.20	5215469
Hexane	ug/L	<1.0	<1.0	1.0	5215469
Methylene Chloride(Dichloromethane)	ug/L	<2.0	<2.0	2.0	5215469
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	<10	10	5215469
Methyl Isobutyl Ketone	ug/L	<5.0	<5.0	5.0	5215469
Methyl t-butyl ether (MTBE)	ug/L	<0.50	<0.50	0.50	5215469
Styrene	ug/L	<0.50	<0.50	0.50	5215469

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 VOCS BY HS (WATER)

Maxxam ID		FIR253	FIR254		
Sampling Date		2017/10/16 14:25	2017/10/16		
COC Number		633991-01-01	633991-01-01		
	UNITS	FIELD BLANK	TRIP BLANK	RDL	QC Batch
1,1,1,2-Tetrachloroethane	ug/L	<0.50	<0.50	0.50	5215469
1,1,2,2-Tetrachloroethane	ug/L	<0.50	<0.50	0.50	5215469
Tetrachloroethylene	ug/L	<0.20	<0.20	0.20	5215469
Toluene	ug/L	<0.20	<0.20	0.20	5215469
1,1,1-Trichloroethane	ug/L	<0.20	<0.20	0.20	5215469
1,1,2-Trichloroethane	ug/L	<0.50	<0.50	0.50	5215469
Trichloroethylene	ug/L	<0.20	<0.20	0.20	5215469
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	<0.50	0.50	5215469
Vinyl Chloride	ug/L	<0.20	<0.20	0.20	5215469
p+m-Xylene	ug/L	<0.20	<0.20	0.20	5215469
o-Xylene	ug/L	<0.20	<0.20	0.20	5215469
Total Xylenes	ug/L	<0.20	<0.20	0.20	5215469
Surrogate Recovery (%)					
4-Bromofluorobenzene	%	92	93		5215469
D4-1,2-Dichloroethane	%	114	108		5215469
D8-Toluene	%	89	87		5215469

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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TEST SUMMARY

Maxxam ID: FIR249
Sample ID: MW17-1
Matrix: Water

Collected: 2017/10/16
Shipped:
Received: 2017/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5216131	N/A	2017/10/20	Automated Statchk
1,3-Dichloropropene Sum	CALC	5215462	N/A	2017/10/23	Automated Statchk
Chloride by Automated Colourimetry	KONE	5222827	N/A	2017/10/23	Deonarine Ramnarine
Free (WAD) Cyanide	SKAL/CN	5218635	N/A	2017/10/19	Louise Harding
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5221276	2017/10/19	2017/10/20	Barbara Wowk
Dissolved Metals by ICPMS	ICP/MS	5218409	N/A	2017/10/20	Thao Nguyen
PAH Compounds in Water by GC/MS (SIM)	GC/MS	5221263	2017/10/19	2017/10/20	Jett Wu
Polychlorinated Biphenyl in Water	GC/ECD	5221417	2017/10/19	2017/10/20	Sarah Huang
Volatile Organic Compounds and F1 PHCs	GC/MSFD	5220082	N/A	2017/10/20	Denis Reid

Maxxam ID: FIR249 Dup
Sample ID: MW17-1
Matrix: Water

Collected: 2017/10/16
Shipped:
Received: 2017/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	SKAL/CN	5218635	N/A	2017/10/19	Louise Harding

Maxxam ID: FIR250
Sample ID: MW17-2
Matrix: Water

Collected: 2017/10/16
Shipped:
Received: 2017/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5216131	N/A	2017/10/20	Automated Statchk
1,3-Dichloropropene Sum	CALC	5215462	N/A	2017/10/23	Automated Statchk
Chloride by Automated Colourimetry	KONE	5222827	N/A	2017/10/23	Deonarine Ramnarine
Free (WAD) Cyanide	SKAL/CN	5221182	N/A	2017/10/20	Louise Harding
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5221276	2017/10/19	2017/10/20	Barbara Wowk
Dissolved Metals by ICPMS	ICP/MS	5218409	N/A	2017/10/20	Thao Nguyen
PAH Compounds in Water by GC/MS (SIM)	GC/MS	5221263	2017/10/19	2017/10/20	Jett Wu
Polychlorinated Biphenyl in Water	GC/ECD	5221417	2017/10/19	2017/10/20	Sarah Huang
Volatile Organic Compounds and F1 PHCs	GC/MSFD	5220082	N/A	2017/10/21	Denis Reid

Maxxam ID: FIR251
Sample ID: MW17-3
Matrix: Water

Collected: 2017/10/16
Shipped:
Received: 2017/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5216131	N/A	2017/10/20	Automated Statchk
1,3-Dichloropropene Sum	CALC	5215462	N/A	2017/10/23	Automated Statchk
Chloride by Automated Colourimetry	KONE	5222827	N/A	2017/10/23	Deonarine Ramnarine
Free (WAD) Cyanide	SKAL/CN	5221182	N/A	2017/10/20	Louise Harding
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5221276	2017/10/19	2017/10/20	Barbara Wowk
Dissolved Metals by ICPMS	ICP/MS	5218409	N/A	2017/10/20	Thao Nguyen
PAH Compounds in Water by GC/MS (SIM)	GC/MS	5221263	2017/10/19	2017/10/20	Jett Wu
Polychlorinated Biphenyl in Water	GC/ECD	5221417	2017/10/19	2017/10/20	Sarah Huang

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Maxxam Job #: B7M9711
Report Date: 2017/10/24

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TEST SUMMARY

Maxxam ID: FIR251
Sample ID: MW17-3
Matrix: Water

Collected: 2017/10/16
Shipped:
Received: 2017/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Volatile Organic Compounds and F1 PHCs	GC/MSFD	5220082	N/A	2017/10/21	Denis Reid

Maxxam ID: FIR252
Sample ID: QC-1
Matrix: Water

Collected: 2017/10/16
Shipped:
Received: 2017/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5216131	N/A	2017/10/20	Automated Statchk
1,3-Dichloropropene Sum	CALC	5215462	N/A	2017/10/23	Automated Statchk
Chloride by Automated Colourimetry	KONE	5222827	N/A	2017/10/23	Deonarine Ramnarine
Free (WAD) Cyanide	SKAL/CN	5221182	N/A	2017/10/20	Louise Harding
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5221276	2017/10/19	2017/10/20	Barbara Wowk
Dissolved Metals by ICPMS	ICP/MS	5218409	N/A	2017/10/20	Thao Nguyen
PAH Compounds in Water by GC/MS (SIM)	GC/MS	5221263	2017/10/19	2017/10/20	Jett Wu
Polychlorinated Biphenyl in Water	GC/ECD	5221417	2017/10/19	2017/10/20	Sarah Huang
Volatile Organic Compounds and F1 PHCs	GC/MSFD	5220082	N/A	2017/10/21	Denis Reid

Maxxam ID: FIR253
Sample ID: FIELD BLANK
Matrix: Water

Collected: 2017/10/16
Shipped:
Received: 2017/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	5215462	N/A	2017/10/24	Automated Statchk
Volatile Organic Compounds in Water	GC/MS	5215469	N/A	2017/10/21	Xueming Jiang

Maxxam ID: FIR254
Sample ID: TRIP BLANK
Matrix: Water

Collected: 2017/10/16
Shipped:
Received: 2017/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	5215462	N/A	2017/10/24	Automated Statchk
Volatile Organic Compounds in Water	GC/MS	5215469	N/A	2017/10/21	Xueming Jiang

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Sampler Initials: AP

GENERAL COMMENTS

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

Package 1	8.7°C
Package 2	9.0°C

Sample FIR249 [MW17-1] : Metal Analysis:Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Results relate only to the items tested.

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Maxxam Job #: B7M9711
Report Date: 2017/10/24

QUALITY ASSURANCE REPORT

Stantec Consulting Ltd
Client Project #: 122170123
Your P.O. #: 200.200
Sampler Initials: AP

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5215469	4-Bromofluorobenzene	2017/10/21	100	70 - 130	98	70 - 130	93	%		
5215469	D4-1,2-Dichloroethane	2017/10/21	108	70 - 130	105	70 - 130	112	%		
5215469	D8-Toluene	2017/10/21	111	70 - 130	107	70 - 130	90	%		
5220082	4-Bromofluorobenzene	2017/10/20	100	70 - 130	102	70 - 130	88	%		
5220082	D4-1,2-Dichloroethane	2017/10/20	110	70 - 130	103	70 - 130	113	%		
5220082	D8-Toluene	2017/10/20	104	70 - 130	106	70 - 130	90	%		
5221263	D10-Anthracene	2017/10/20	102	50 - 130	101	50 - 130	98	%		
5221263	D14-Terphenyl (FS)	2017/10/20	87	50 - 130	89	50 - 130	80	%		
5221263	D8-Acenaphthylene	2017/10/20	103	50 - 130	102	50 - 130	96	%		
5221276	o-Terphenyl	2017/10/19	96	60 - 130	97	60 - 130	93	%		
5221417	Decachlorobiphenyl	2017/10/20	105	60 - 130	94	60 - 130	94	%		
5215469	1,1,1,2-Tetrachloroethane	2017/10/21	112	70 - 130	111	70 - 130	<0.50	ug/L	NC	30
5215469	1,1,1-Trichloroethane	2017/10/21	100	70 - 130	99	70 - 130	<0.20	ug/L	NC	30
5215469	1,1,2,2-Tetrachloroethane	2017/10/21	95	70 - 130	108	70 - 130	<0.50	ug/L	NC	30
5215469	1,1,2-Trichloroethane	2017/10/21	114	70 - 130	107	70 - 130	<0.50	ug/L	NC	30
5215469	1,1-Dichloroethane	2017/10/21	108	70 - 130	106	70 - 130	<0.20	ug/L	NC	30
5215469	1,1-Dichloroethylene	2017/10/21	105	70 - 130	104	70 - 130	<0.20	ug/L	NC	30
5215469	1,2-Dichlorobenzene	2017/10/21	101	70 - 130	96	70 - 130	<0.50	ug/L	NC	30
5215469	1,2-Dichloroethane	2017/10/21	108	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
5215469	1,2-Dichloropropane	2017/10/21	102	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
5215469	1,3-Dichlorobenzene	2017/10/21	100	70 - 130	93	70 - 130	<0.50	ug/L	NC	30
5215469	1,4-Dichlorobenzene	2017/10/21	99	70 - 130	91	70 - 130	<0.50	ug/L	NC	30
5215469	Acetone (2-Propanone)	2017/10/21	108	60 - 140	99	60 - 140	<10	ug/L	10	30
5215469	Benzene	2017/10/21	109	70 - 130	103	70 - 130	<0.20	ug/L	NC	30
5215469	Bromodichloromethane	2017/10/21	106	70 - 130	101	70 - 130	<0.50	ug/L	NC	30
5215469	Bromoform	2017/10/21	116	70 - 130	110	70 - 130	<1.0	ug/L	NC	30
5215469	Bromomethane	2017/10/21	91	60 - 140	85	60 - 140	<0.50	ug/L	NC	30
5215469	Carbon Tetrachloride	2017/10/21	99	70 - 130	99	70 - 130	<0.20	ug/L	NC	30
5215469	Chlorobenzene	2017/10/21	101	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
5215469	Chloroform	2017/10/21	105	70 - 130	101	70 - 130	<0.20	ug/L	NC	30

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5215469	cis-1,2-Dichloroethylene	2017/10/21	103	70 - 130	98	70 - 130	<0.50	ug/L	NC	30
5215469	cis-1,3-Dichloropropene	2017/10/21	75	70 - 130	63 (1)	70 - 130	<0.30	ug/L	NC	30
5215469	Dibromochloromethane	2017/10/21	113	70 - 130	108	70 - 130	<0.50	ug/L	NC	30
5215469	Dichlorodifluoromethane (FREON 12)	2017/10/21	69	60 - 140	77	60 - 140	<1.0	ug/L	NC	30
5215469	Ethylbenzene	2017/10/21	92	70 - 130	90	70 - 130	<0.20	ug/L	NC	30
5215469	Ethylene Dibromide	2017/10/21	116	70 - 130	107	70 - 130	<0.20	ug/L	NC	30
5215469	Hexane	2017/10/21	105	70 - 130	109	70 - 130	<1.0	ug/L	NC	30
5215469	Methyl Ethyl Ketone (2-Butanone)	2017/10/21	108	60 - 140	98	60 - 140	<10	ug/L	NC	30
5215469	Methyl Isobutyl Ketone	2017/10/21	118	70 - 130	98	70 - 130	<5.0	ug/L	NC	30
5215469	Methyl t-butyl ether (MTBE)	2017/10/21	99	70 - 130	95	70 - 130	<0.50	ug/L	NC	30
5215469	Methylene Chloride(Dichloromethane)	2017/10/21	112	70 - 130	106	70 - 130	<2.0	ug/L	NC	30
5215469	o-Xylene	2017/10/21	89	70 - 130	93	70 - 130	<0.20	ug/L	NC	30
5215469	p+m-Xylene	2017/10/21	96	70 - 130	94	70 - 130	<0.20	ug/L	NC	30
5215469	Styrene	2017/10/21	71	70 - 130	73	70 - 130	<0.50	ug/L	NC	30
5215469	Tetrachloroethylene	2017/10/21	98	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
5215469	Toluene	2017/10/21	105	70 - 130	98	70 - 130	<0.20	ug/L	6.2	30
5215469	Total Xylenes	2017/10/21					<0.20	ug/L	NC	30
5215469	trans-1,2-Dichloroethylene	2017/10/21	102	70 - 130	96	70 - 130	<0.50	ug/L	NC	30
5215469	trans-1,3-Dichloropropene	2017/10/21	82	70 - 130	64 (1)	70 - 130	<0.40	ug/L	NC	30
5215469	Trichloroethylene	2017/10/21	124	70 - 130	93	70 - 130	<0.20	ug/L	NC	30
5215469	Trichlorofluoromethane (FREON 11)	2017/10/21	97	70 - 130	98	70 - 130	<0.50	ug/L	NC	30
5215469	Vinyl Chloride	2017/10/21	92	70 - 130	93	70 - 130	<0.20	ug/L	NC	30
5218409	Dissolved Antimony (Sb)	2017/10/20	109	80 - 120	105	80 - 120	<0.50	ug/L	NC	20
5218409	Dissolved Arsenic (As)	2017/10/20	104	80 - 120	101	80 - 120	<1.0	ug/L	NC	20
5218409	Dissolved Barium (Ba)	2017/10/20	105	80 - 120	100	80 - 120	<2.0	ug/L	3.1	20
5218409	Dissolved Beryllium (Be)	2017/10/20	106	80 - 120	102	80 - 120	<0.50	ug/L	NC	20
5218409	Dissolved Boron (B)	2017/10/20	NC	80 - 120	102	80 - 120	<10	ug/L	4.5	20
5218409	Dissolved Cadmium (Cd)	2017/10/20	103	80 - 120	101	80 - 120	<0.10	ug/L	NC	20
5218409	Dissolved Chromium (Cr)	2017/10/20	101	80 - 120	99	80 - 120	<5.0	ug/L	NC	20
5218409	Dissolved Cobalt (Co)	2017/10/20	98	80 - 120	99	80 - 120	<0.50	ug/L	4.0	20

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5218409	Dissolved Copper (Cu)	2017/10/20	103	80 - 120	103	80 - 120	<1.0	ug/L	5.7	20
5218409	Dissolved Lead (Pb)	2017/10/20	95	80 - 120	97	80 - 120	<0.50	ug/L	NC	20
5218409	Dissolved Molybdenum (Mo)	2017/10/20	107	80 - 120	102	80 - 120	<0.50	ug/L	7.5	20
5218409	Dissolved Nickel (Ni)	2017/10/20	98	80 - 120	98	80 - 120	<1.0	ug/L	5.4	20
5218409	Dissolved Selenium (Se)	2017/10/20	101	80 - 120	99	80 - 120	<2.0	ug/L	NC	20
5218409	Dissolved Silver (Ag)	2017/10/20	90	80 - 120	97	80 - 120	<0.10	ug/L	NC	20
5218409	Dissolved Sodium (Na)	2017/10/20	NC	80 - 120	100	80 - 120	<100	ug/L	3.1	20
5218409	Dissolved Thallium (Tl)	2017/10/20	95	80 - 120	97	80 - 120	<0.050	ug/L	NC	20
5218409	Dissolved Uranium (U)	2017/10/20	96	80 - 120	97	80 - 120	<0.10	ug/L	3.0	20
5218409	Dissolved Vanadium (V)	2017/10/20	103	80 - 120	99	80 - 120	<0.50	ug/L	NC	20
5218409	Dissolved Zinc (Zn)	2017/10/20	97	80 - 120	99	80 - 120	<5.0	ug/L	4.0	20
5218635	WAD Cyanide (Free)	2017/10/19	94	80 - 120	106	80 - 120	<1	ug/L	NC	20
5220082	1,1,1,2-Tetrachloroethane	2017/10/20	106	70 - 130	103	70 - 130	<0.50	ug/L	NC	30
5220082	1,1,1-Trichloroethane	2017/10/20	94	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
5220082	1,1,2,2-Tetrachloroethane	2017/10/20	112	70 - 130	102	70 - 130	<0.50	ug/L	NC	30
5220082	1,1,2-Trichloroethane	2017/10/20	108	70 - 130	101	70 - 130	<0.50	ug/L	NC	30
5220082	1,1-Dichloroethane	2017/10/20	106	70 - 130	104	70 - 130	<0.20	ug/L	NC	30
5220082	1,1-Dichloroethylene	2017/10/20	99	70 - 130	101	70 - 130	<0.20	ug/L	NC	30
5220082	1,2-Dichlorobenzene	2017/10/20	95	70 - 130	91	70 - 130	<0.50	ug/L	NC	30
5220082	1,2-Dichloroethane	2017/10/20	106	70 - 130	99	70 - 130	<0.50	ug/L	NC	30
5220082	1,2-Dichloropropane	2017/10/20	98	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
5220082	1,3-Dichlorobenzene	2017/10/20	94	70 - 130	93	70 - 130	<0.50	ug/L	NC	30
5220082	1,4-Dichlorobenzene	2017/10/20	91	70 - 130	90	70 - 130	<0.50	ug/L	NC	30
5220082	Acetone (2-Propanone)	2017/10/20	108	60 - 140	96	60 - 140	<10	ug/L	NC	30
5220082	Benzene	2017/10/20	101	70 - 130	100	70 - 130	<0.20	ug/L	NC	30
5220082	Bromodichloromethane	2017/10/20	102	70 - 130	98	70 - 130	<0.50	ug/L	NC	30
5220082	Bromoform	2017/10/20	111	70 - 130	102	70 - 130	<1.0	ug/L	NC	30
5220082	Bromomethane	2017/10/20	102	60 - 140	101	60 - 140	<0.50	ug/L	NC	30
5220082	Carbon Tetrachloride	2017/10/20	93	70 - 130	94	70 - 130	<0.20	ug/L	NC	30
5220082	Chlorobenzene	2017/10/20	95	70 - 130	95	70 - 130	<0.20	ug/L	NC	30

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A Bureau Veritas Group Company

Maxxam Job #: B7M9711
Report Date: 2017/10/24

QUALITY ASSURANCE REPORT(CONT'D)

Stantec Consulting Ltd
Client Project #: 122170123
Your P.O. #: 200.200
Sampler Initials: AP

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5220082	Chloroform	2017/10/20	100	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
5220082	cis-1,2-Dichloroethylene	2017/10/20	101	70 - 130	98	70 - 130	<0.50	ug/L	NC	30
5220082	cis-1,3-Dichloropropene	2017/10/20	94	70 - 130	89	70 - 130	<0.30	ug/L	NC	30
5220082	Dibromochloromethane	2017/10/20	107	70 - 130	102	70 - 130	<0.50	ug/L	NC	30
5220082	Dichlorodifluoromethane (FREON 12)	2017/10/20	76	60 - 140	82	60 - 140	<1.0	ug/L	NC	30
5220082	Ethylbenzene	2017/10/20	84	70 - 130	88	70 - 130	<0.20	ug/L	NC	30
5220082	Ethylene Dibromide	2017/10/20	111	70 - 130	102	70 - 130	<0.20	ug/L	NC	30
5220082	F1 (C6-C10) - BTEX	2017/10/20					<25	ug/L	NC	30
5220082	F1 (C6-C10)	2017/10/20	95	60 - 140	100	60 - 140	<25	ug/L	NC	30
5220082	Hexane	2017/10/20	95	70 - 130	100	70 - 130	<1.0	ug/L	NC	30
5220082	Methyl Ethyl Ketone (2-Butanone)	2017/10/20	114	60 - 140	101	60 - 140	<10	ug/L	NC	30
5220082	Methyl Isobutyl Ketone	2017/10/20	103	70 - 130	90	70 - 130	<5.0	ug/L	NC	30
5220082	Methyl t-butyl ether (MTBE)	2017/10/20	90	70 - 130	87	70 - 130	<0.50	ug/L	NC	30
5220082	Methylene Chloride(Dichloromethane)	2017/10/20	119	70 - 130	114	70 - 130	<2.0	ug/L	NC	30
5220082	o-Xylene	2017/10/20	88	70 - 130	90	70 - 130	<0.20	ug/L	NC	30
5220082	p+m-Xylene	2017/10/20	86	70 - 130	89	70 - 130	<0.20	ug/L	NC	30
5220082	Styrene	2017/10/20	89	70 - 130	89	70 - 130	<0.50	ug/L	NC	30
5220082	Tetrachloroethylene	2017/10/20	94	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
5220082	Toluene	2017/10/20	96	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
5220082	Total Xylenes	2017/10/20					<0.20	ug/L	NC	30
5220082	trans-1,2-Dichloroethylene	2017/10/20	100	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
5220082	trans-1,3-Dichloropropene	2017/10/20	106	70 - 130	97	70 - 130	<0.40	ug/L	NC	30
5220082	Trichloroethylene	2017/10/20	94	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
5220082	Trichlorofluoromethane (FREON 11)	2017/10/20	94	70 - 130	97	70 - 130	<0.50	ug/L	NC	30
5220082	Vinyl Chloride	2017/10/20	96	70 - 130	98	70 - 130	<0.20	ug/L	NC	30
5221182	WAD Cyanide (Free)	2017/10/20	100	80 - 120	100	80 - 120	<1	ug/L	NC	20
5221263	1-Methylnaphthalene	2017/10/20	120	50 - 130	108	50 - 130	<0.050	ug/L	2.4	30
5221263	2-Methylnaphthalene	2017/10/20	111	50 - 130	99	50 - 130	<0.050	ug/L	1.6	30
5221263	Acenaphthene	2017/10/20	109	50 - 130	99	50 - 130	<0.050	ug/L	1.8	30
5221263	Acenaphthylene	2017/10/20	106	50 - 130	95	50 - 130	<0.050	ug/L	0.53	30

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5221263	Anthracene	2017/10/20	99	50 - 130	89	50 - 130	<0.050	ug/L	17	30
5221263	Benzo(a)anthracene	2017/10/20	107	50 - 130	104	50 - 130	<0.050	ug/L	11	30
5221263	Benzo(a)pyrene	2017/10/20	88	50 - 130	103	50 - 130	<0.010	ug/L	10	30
5221263	Benzo(b/j)fluoranthene	2017/10/20	93	50 - 130	103	50 - 130	<0.050	ug/L	9.0	30
5221263	Benzo(g,h,i)perylene	2017/10/20	74	50 - 130	100	50 - 130	<0.050	ug/L	13	30
5221263	Benzo(k)fluoranthene	2017/10/20	87	50 - 130	102	50 - 130	<0.050	ug/L	11	30
5221263	Chrysene	2017/10/20	92	50 - 130	101	50 - 130	<0.050	ug/L	11	30
5221263	Dibenz(a,h)anthracene	2017/10/20	73	50 - 130	99	50 - 130	<0.050	ug/L	17	30
5221263	Fluoranthene	2017/10/20	108	50 - 130	95	50 - 130	<0.050	ug/L	14	30
5221263	Fluorene	2017/10/20	110	50 - 130	99	50 - 130	<0.050	ug/L	4.4	30
5221263	Indeno(1,2,3-cd)pyrene	2017/10/20	77	50 - 130	97	50 - 130	<0.050	ug/L	12	30
5221263	Naphthalene	2017/10/20	107	50 - 130	95	50 - 130	<0.050	ug/L	6.9	30
5221263	Phenanthrene	2017/10/20	111	50 - 130	99	50 - 130	<0.030	ug/L	11	30
5221263	Pyrene	2017/10/20	106	50 - 130	95	50 - 130	<0.050	ug/L	14	30
5221276	F2 (C10-C16 Hydrocarbons)	2017/10/20	85	50 - 130	87	60 - 130	<100	ug/L	NC	30
5221276	F3 (C16-C34 Hydrocarbons)	2017/10/20	84	50 - 130	91	60 - 130	<200	ug/L	NC	30
5221276	F4 (C34-C50 Hydrocarbons)	2017/10/20	82	50 - 130	87	60 - 130	<200	ug/L	NC	30
5221417	Aroclor 1242	2017/10/20					<0.05	ug/L	NC	30
5221417	Aroclor 1248	2017/10/20					<0.05	ug/L	NC	30
5221417	Aroclor 1254	2017/10/20					<0.05	ug/L	NC	30
5221417	Aroclor 1260	2017/10/20	116	60 - 130	98	60 - 130	<0.05	ug/L	NC	30
5221417	Total PCB	2017/10/20	116	60 - 130	98	60 - 130	<0.05	ug/L	NC	40

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5222827	Dissolved Chloride (Cl)	2017/10/23	NC	80 - 120	102	80 - 120	<1.0	mg/L	1.1	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).

(1) The recovery was below the lower control limit. This may represent a low bias in some results for this specific analyte.

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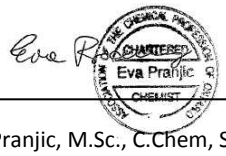
Maxxam Job #: B7M9711
Report Date: 2017/10/24

Stantec Consulting Ltd
Client Project #: 122170123
Your P.O. #: 200.200
Sampler Initials: AP

VALIDATION SIGNATURE PAGE

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



Ewa Pranjic, M.Sc., C.Chem, Scientific 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.

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16-Oct-17 18:00

Jonathan Urben

B7M9711

MAF ENV-1290

Presence of Visible Particulate/Sediment

Maxxam Analytics
CAM FCD-01013/5
Page 1 of 1

When there is >1cm of visible particulate/sediment, the amount will be recorded in the field below

			Bottle Types																														
			Inorganics					Organics													Hydrocarbons							Volatiles				Other
	Sample ID	All	CrVI	CN	General	Hg	Metals (Diss.)	Organic 1 of 2	Organic 2 of 2	PCB 1 of 2	PCB 2 of 2	Pest/ Herb 1 of 2	Pest/ Herb 2 of 2	SVOC/ ABN 1 of 2	SVOC/ ABN 2 of 2	PAH 1 of 2	PAH 2 of 2	Dioxin /Furan	F1 Vial 1	F1 Vial 2	F1 Vial 3	F1 Vial 4	F2-F4 1 of 2	F2-F4 2 of 2	F4G	VOC Vial 1	VOC Vial 2	VOC Vial 3	VOC Vial 4	
1	MW7-1		TS	TS	TS	TS				TS	TS												TS	TS		TS	TS	TS		
2	MW7-2		TS	TS	TS	TS				TS	TS												TS	TS		TS	TS	TS		
3	MW7-3		TS	TS	TS	TS				TS	TS												TS	TS		S	S	S		
4	QC-1		TS	TS	TS	TS				TS	TS												S	S		S	S	S		
5																																	
6																																	
7																																	
8																																	
9																																	
10																																	

Comments:

Legend:	
P	Suspended Particulate
TS	Trace Settled Sediment (just covers bottom of container or less)
S	Sediment greater than (>) Trace, but less than (<) 1 cm

Recorded By: (signature/print)

Maxxam
A Bureau Veritas Group Company

Maxxam Analytics International Corporation o/a Maxxam Analytics
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.maxxam.ca

IMMEDIATE

16-Oct-17 18:00
Jonathan Urben
B7M9711
MAF ENV-1290
C#633991-01-01

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:	
Company Name:	#50098 Stantec Consulting Ltd	Company Name:		Quotation #:	B75209
Attention:	Accounts Payable	Attention:	Su-kim Roy	P.O. #:	200,200
Address:	1331 Clyde Avenue Suite 400 Ottawa ON K2C 3G4	Address:		Project:	122170123
				Project Name:	
Tel:	(613) 722-4420 x Fax: (613) 738-0721 x	Tel:	Fax:	Site #:	3500 Hawthorne Road
Email:	accounts.payable.invoices@stantec.com	Email:	su-kim.roy@stantec.com	Sampled By:	A. Potts

Bottle Order #: 633991
Project Manager: Jonathan Urben

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- [ ] Table 1 [ ] Res/Park [ ] Medium/Fine
- [ ] Table 2 [ ] Ind/Comm [ ] Coarse
- [ ] Table 3 [ ] Agri/Other [ ] For RSC
- [x] Table 6

Other Regulations
- [ ] CCME [ ] Sanitary Sewer Bylaw
- [ ] Reg 558 [ ] Storm Sewer Bylaw
- [ ] MISA Municipality
- [ ] PWQO
- [ ] Other

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)?

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O.Reg 153 Metals & Inorganics Pkg (Wtr)	O.Reg 153 VOCs by HS & F1-F4 (Water)	O.Reg 153 PAHs (Water)	O.Reg 153 PCBs (Water)	O.Reg 153 VOCs by HS (Water)	# of Bottles	Comments
1		MW17-1	16 Oct 2017	1440	GW	Y	X	X	X	X	X	12	
2		MW17-2	↓	1510	↓	Y	X	X	X	X	X	12	
3		MW17-3	↓	1615	↓	Y	X	X	X	X	X	12	
4		QC-1	↓	—	↓	Y	X	X	X	X	X	12	
5		Field Blank	↓	1425	↓	—		X				3	RECEIVED IN OTTAWA
6		Trip Blank	↓	—	↓	—		X				2	
7													
8													On ice
9													
10													

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: [x]
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required:
Rush Confirmation Number: (call lab for #)

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Andrew Potts	17/10/16	1800	Mariana Tanan Kaaran	2017/10/16	18:00	
			Envish Tanuitsinu	2017/10/16	22:40	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	8,9,9	Present		
		Intact		

White: Maxxam Yellow: Client

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

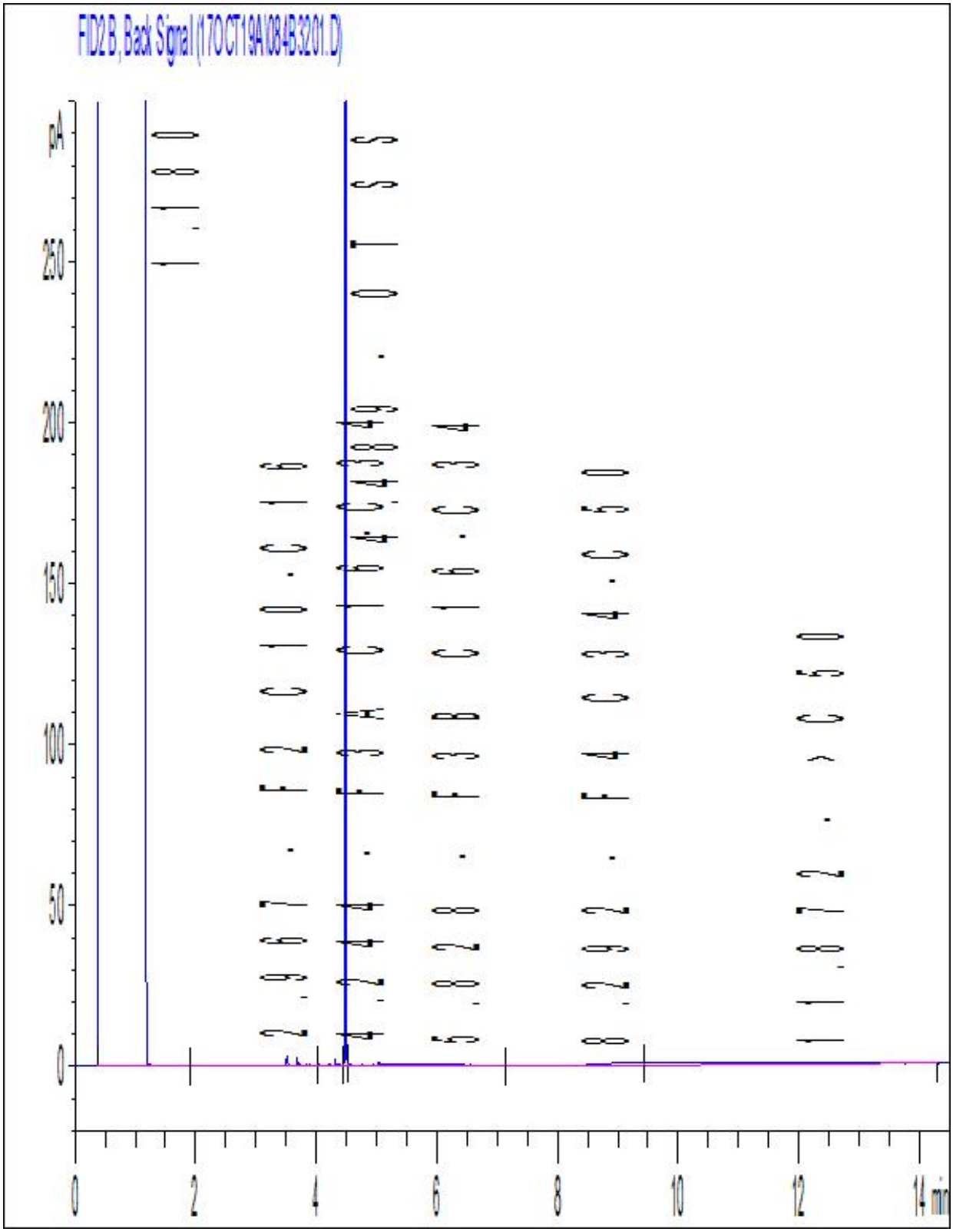
6/4/3 8/4/6 9,9,9

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam Job #: B7M9711
Report Date: 2017/10/24
Maxxam Sample: FIR249

Stantec Consulting Ltd
Client Project #: 122170123
Client ID: MW17-1

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

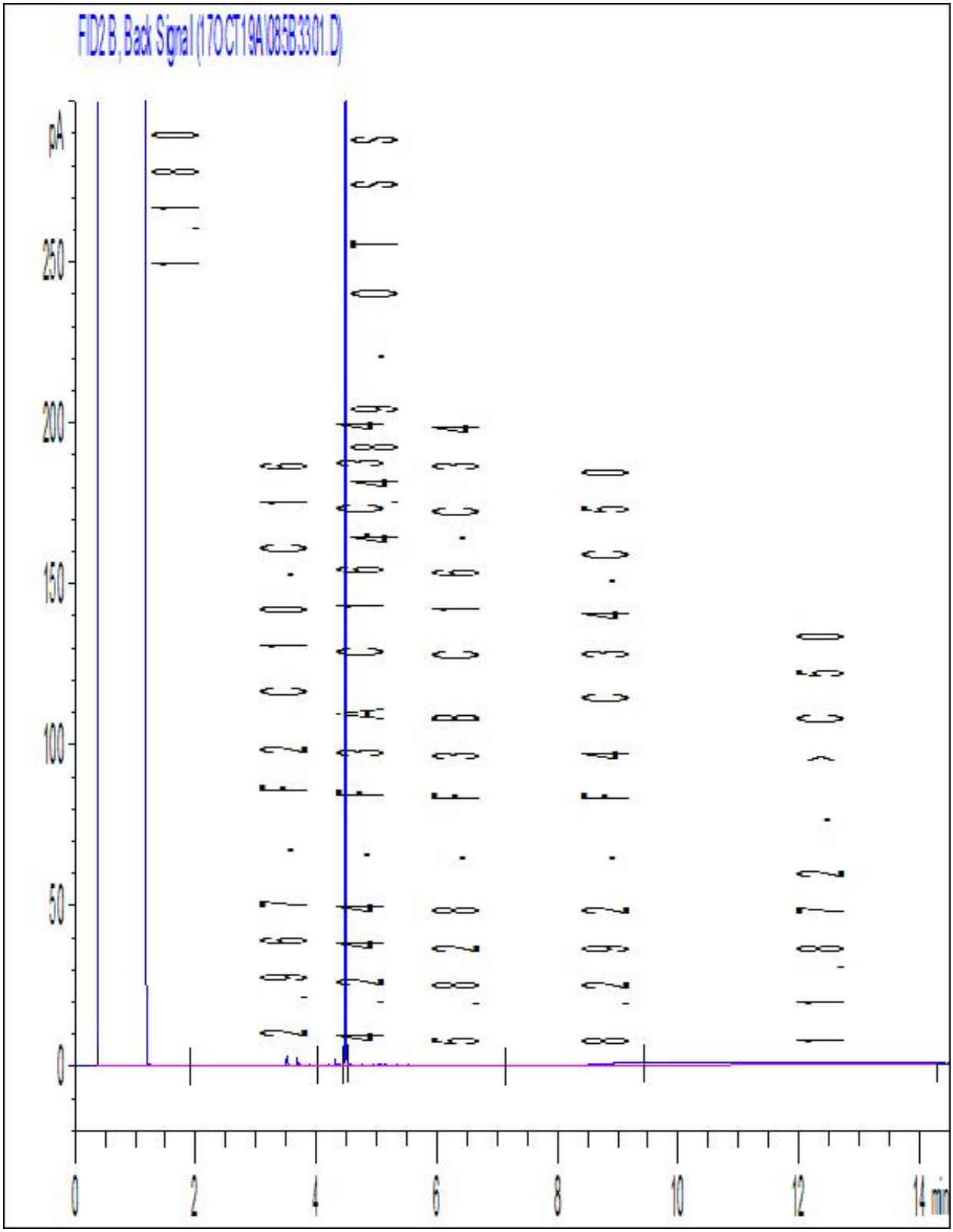


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7M9711
Report Date: 2017/10/24
Maxxam Sample: FIR250

Stantec Consulting Ltd
Client Project #: 122170123
Client ID: MW17-2

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

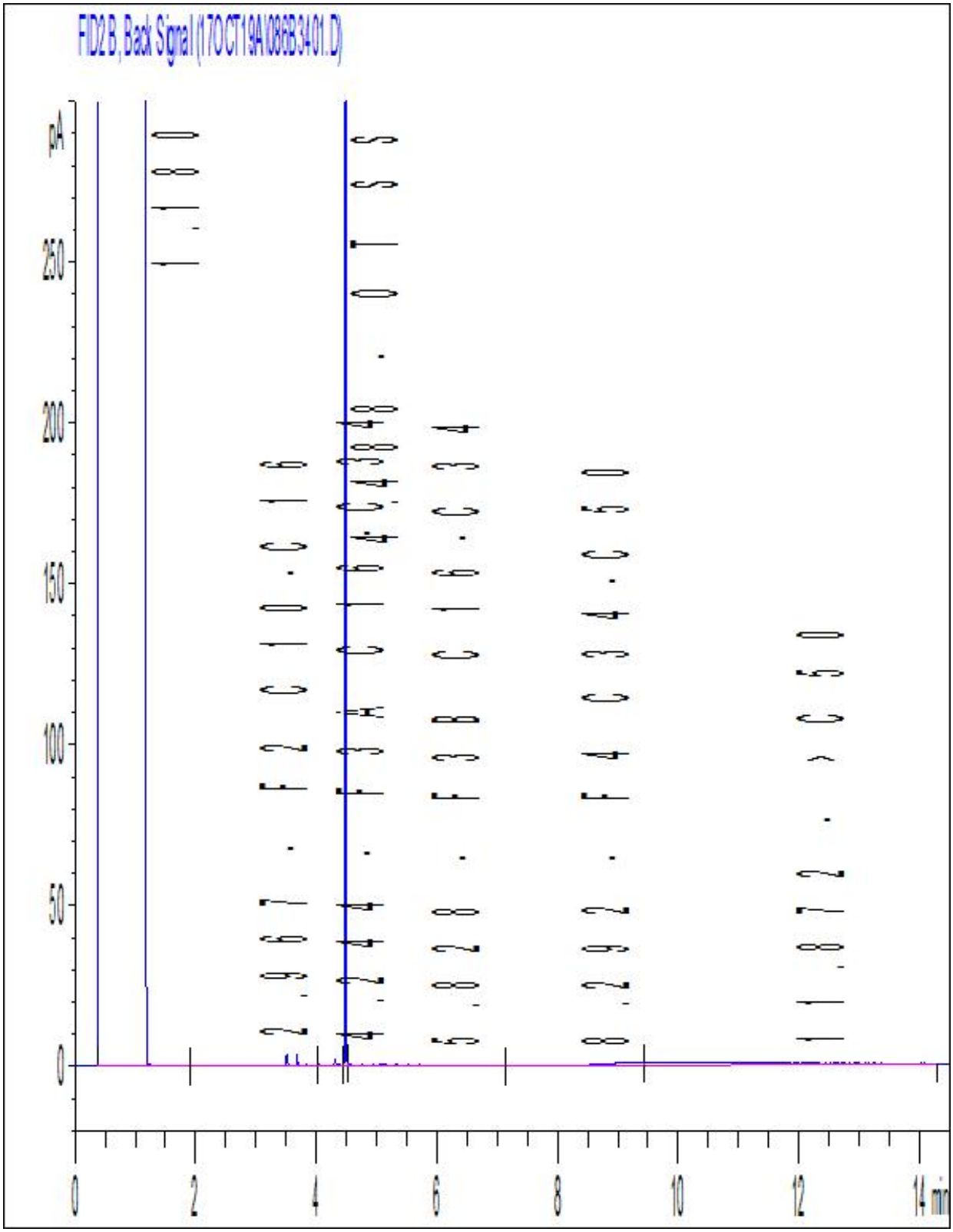


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7M9711
Report Date: 2017/10/24
Maxxam Sample: FIR251

Stantec Consulting Ltd
Client Project #: 122170123
Client ID: MW17-3

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

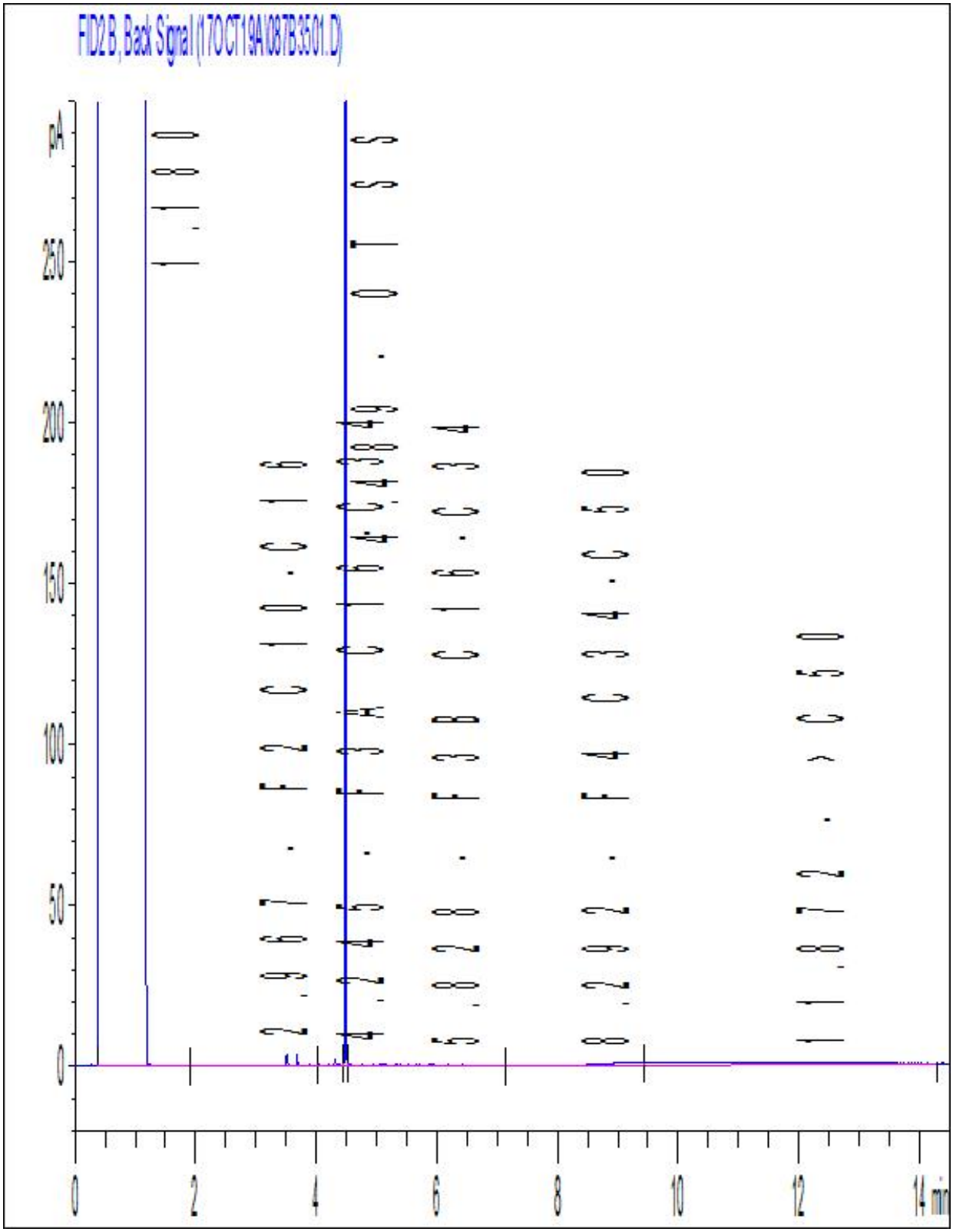


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7M9711
Report Date: 2017/10/24
Maxxam Sample: FIR252

Stantec Consulting Ltd
Client Project #: 122170123
Client ID: QC-1

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.

Maxxam
A Bureau Veritas Group Company

Your P.O. #: 200.200
Your Project #: 122170123
Site#: 3500 Hawthorne Road
Your C.O.C. #: 634518-01-01

Attention:Su-kim Roy

Stantec Consulting Ltd
1331 Clyde Avenue
Suite 400
Ottawa, ON
K2C 3G4

Report Date: 2017/10/25
Report #: R4802482
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7N0246
Received: 2017/10/18, 09:25

Sample Matrix: Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Chromium (VI) in Water (1)	4	N/A	2017/10/20	CAM SOP-00436	EPA 7199 m
Mercury (1)	1	2017/10/20	2017/10/23	CAM SOP-00453	EPA 7470A m
Mercury (1)	3	2017/10/21	2017/10/24	CAM SOP-00453	EPA 7470A 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.

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.

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) This test was performed by Maxxam Analytics Mississauga

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

Your P.O. #: 200.200
Your Project #: 122170123
Site#: 3500 Hawthorne Road
Your C.O.C. #: 634518-01-01

Attention:Su-kim Roy

Stantec Consulting Ltd
1331 Clyde Avenue
Suite 400
Ottawa, ON
K2C 3G4

Report Date: 2017/10/25
Report #: R4802482
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7N0246
Received: 2017/10/18, 09:25

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.

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 #: B7N0246
Report Date: 2017/10/25

Stantec Consulting Ltd
Client Project #: 122170123
Your P.O. #: 200.200
Sampler Initials: AP

O.REG 153 METALS & INORGANICS PKG (WTR)

Maxxam ID		FIU563	FIU564		FIU565		FIU566		
Sampling Date		2017/10/18 08:30	2017/10/18 08:35		2017/10/18 08:40		2017/10/18		
COC Number		634518-01-01	634518-01-01		634518-01-01		634518-01-01		
	UNITS	MW 17-1	MW 17-2	QC Batch	MW 17-3	QC Batch	QC-1	RDL	QC Batch
Metals									
Chromium (VI)	ug/L	<0.50	<0.50	5221231	<0.50	5221231	<0.50	0.50	5221231
Mercury (Hg)	ug/L	<0.1	<0.1	5224733	<0.1	5223870	<0.1	0.1	5224733

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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 #: B7N0246
Report Date: 2017/10/25

Stantec Consulting Ltd
Client Project #: 122170123
Your P.O. #: 200.200
Sampler Initials: AP

TEST SUMMARY

Maxxam ID: FIU563 **Collected:** 2017/10/18
Sample ID: MW 17-1 **Shipped:**
Matrix: Water **Received:** 2017/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chromium (VI) in Water	IC	5221231	N/A	2017/10/20	Lang Le
Mercury	CV/AA	5224733	2017/10/21	2017/10/24	Ron Morrison

Maxxam ID: FIU564 **Collected:** 2017/10/18
Sample ID: MW 17-2 **Shipped:**
Matrix: Water **Received:** 2017/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chromium (VI) in Water	IC	5221231	N/A	2017/10/20	Lang Le
Mercury	CV/AA	5224733	2017/10/21	2017/10/24	Ron Morrison

Maxxam ID: FIU565 **Collected:** 2017/10/18
Sample ID: MW 17-3 **Shipped:**
Matrix: Water **Received:** 2017/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chromium (VI) in Water	IC	5221231	N/A	2017/10/20	Lang Le
Mercury	CV/AA	5223870	2017/10/20	2017/10/23	Ron Morrison

Maxxam ID: FIU566 **Collected:** 2017/10/18
Sample ID: QC-1 **Shipped:**
Matrix: Water **Received:** 2017/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chromium (VI) in Water	IC	5221231	N/A	2017/10/20	Lang Le
Mercury	CV/AA	5224733	2017/10/21	2017/10/24	Ron Morrison

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 #: B7N0246
Report Date: 2017/10/25

Stantec Consulting Ltd
Client Project #: 122170123
Your P.O. #: 200.200
Sampler Initials: AP

GENERAL COMMENTS

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

Package 1	13.3°C

Cooler custody seal was present and intact.

Results relate only to the items tested.

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 #: B7N0246
Report Date: 2017/10/25

QUALITY ASSURANCE REPORT

Stantec Consulting Ltd
Client Project #: 122170123
Your P.O. #: 200.200
Sampler Initials: AP

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5221231	Chromium (VI)	2017/10/20	102	80 - 120	103	80 - 120	<0.50	ug/L	NC	20
5223870	Mercury (Hg)	2017/10/23	97	75 - 125	93	80 - 120	<0.1	ug/L	NC	20
5224733	Mercury (Hg)	2017/10/24	98	75 - 125	102	80 - 120	<0.1	ug/L	NC	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.

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).

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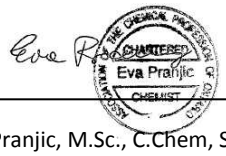
Maxxam Job #: B7N0246
Report Date: 2017/10/25

Stantec Consulting Ltd
Client Project #: 122170123
Your P.O. #: 200.200
Sampler Initials: AP

VALIDATION SIGNATURE PAGE

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



Ewa Pranjic, M.Sc., C.Chem, Scientific 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.

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Maxxam Analytics International Corporation o/a Maxxam Analytics
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.maxxam.ca

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#50098 Stantec Consulting Ltd	Company Name:		Quotation #:	B75209	Maxxam Job #:	Bottle Order #:
Attention:	Accounts Payable	Attention:	Su-kim Roy	P.O. #:	200.200		634518
Address:	1331 Clyde Avenue Suite 400 Ottawa ON K2C 3G4	Address:		Project:	122170123	COC #:	Project Manager:
Tel:	(613) 722-4420 x Fax: (613) 738-0721 x	Tel:	Fax:	Project Name:		C#634518-01-01	Jonathan Urben
Email:	accounts.payable.invoices@stantec.com	Email:	su-kim.roy@stantec.com	Site #:	3500 Hawthorne Road		
				Sampled By:	A.Bibs		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- [ ] Table 1 [ ] Res/Park [ ] Medium/Fine
- [ ] Table 2 [ ] Ind/Comm [ ] Coarse
- [ ] Table 3 [ ] Agri/Other [ ] For RSC
- [x] Table 6

Other Regulations
- [ ] CCME [ ] Sanitary Sewer Bylaw
- [ ] Reg 558. [ ] Storm Sewer Bylaw
- [ ] MISA Municipality
- [ ] PWQO
- [ ] Other

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)?

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: (will be applied if Rush TAT is not specified): [x]
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required:
Rush Confirmation Number: (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Mercury	Chromium (VI) in Water	# of Bottles	Comments
1		MW17-1	18 Oct 2017	0830	GW	Y	X	X		
2		MW17-2		0835		Y	X	X		
3		MW17-3		0840		Y	X	X		
4		QC-1		—		Y	X	X		
5										
6										
7										
8										
9										
10										

18-Oct-17 09:25
Jonathan Urben
B7N0246
KIV OTT-001

RECEIVED IN OTTAWA

ON Ice

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Andrew Pibbs /	17/10/18	0925		2017/10/18	9:25	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	13, 14, 13	Present	X	
		Intact	X	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

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** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics