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**Phase II Environmental Site
Assessment
Canadian Coast Guard
Southside Base, Berth 28
Southside Road
St. John's, NL**

Prepared for

Environmental Services
Public Works and
Government Services Canada
10 Barters Hill
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Final Report

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EXECUTIVE SUMMARY

Stantec Consulting Ltd. (Stantec) was retained by Public Works and Government Services Canada (PWGSC) to carry out a Phase II Environmental Site Assessment (ESA) at the Canadian Coast Guard (CCG) Southside Base located off Southside Road in St. John's, Newfoundland and Labrador (NL). Refer to Drawing No. 121412551-EE-01, Appendix A. The Phase II ESA was completed in conjunction with a Geotechnical Investigation which was reported under separate cover (Stantec Project No. 121412551, dated March 22, 2013 in Draft) for Public Works and Government Services Canada. The purpose of the Phase II ESA was to confirm the absence/presence of environmental impacts in soil and groundwater on the subject property.

The Phase II ESA was carried out between February 20, 2013 and March 28, 2013 and included the drilling of fifteen (15) boreholes complete with monitor wells at the site. Twelve (12) geotechnical/environmental boreholes (*i.e.*, BH1 to BH12) were placed on the eastern portion of the site at locations selected by PWGSC and provided to Stantec. On the western portion of the site, three (3) additional environmental boreholes complete as monitor wells (*i.e.*, BH13 to BH15) were installed. All sampling locations are shown on Drawing No. 121412551-EE-02, Appendix A. The results of the Phase II ESA are as follows:

1. Fill materials were encountered underlying the surficial layer of asphalt or reinforced concrete slab at all borehole locations. The thickness of the fill ranged from 0.6 m in borehole BH11 to as much as 6.9 m in BH2. Underlying the fill layer was a stratum of very loose to compact, brown to black, silty sand with gravel with trace to frequent amounts of organic matter consistent with a marine depositional environment (*i.e.*, marine sediment). This stratum was encountered in boreholes BH1 to BH4, BH6, BH7, BH13 and BH14; and ranged in thickness from 0.13 m in borehole BH14 to as much as 3.7 m in borehole BH1. A native glacial till layer was encountered underlying the fill or marine sediment in all boreholes except in BH8 and BH10 to BH12. The till ranged in thickness from 0.3 m in borehole BH07 to 4.1 m in borehole BH2. Bedrock was encountered in all boreholes except boreholes BH13 to BH15, where these were advanced to a predetermined depth of about 4.5 m for the installation of groundwater monitoring wells. Depth of bedrock varied from about 0.8 m in borehole BH11 to 11.6 m in borehole BH2.
2. The depths to groundwater in the boreholes and monitor wells, as measured between February 24, 2013 and March 12, 2013 during groundwater sampling, ranged from 0.50 mbgs in monitor well BH10 to 2.42 mbgs in monitor well BH15. Groundwater levels within these monitor wells are expected to vary seasonally and in response to individual precipitation events.
3. Based on the local topography and the measured groundwater levels, the inferred direction of local groundwater flow at the site is towards the St. John's Harbour to the northwest.

4. Free liquid phase petroleum hydrocarbons were not observed on soil or groundwater in any of the monitor wells.
5. Petroleum Hydrocarbons
 - a. The concentrations of F1, F2 and F3 PHC and/or BTEX detected in soil samples from boreholes BH1 to BH4 and BH6 on the eastern portion of the site and boreholes BH13 to BH15 on the western portion of the site exceeded the applicable guidelines.
 - b. The concentrations of F1, F2 and/or F3 PHC detected in groundwater samples from boreholes BH6, BH8 and BH11 on the eastern portion of the site and borehole BH15 on the western portion of the site exceeded the applicable guidelines.
6. Metals
 - a. The detected concentrations of one (1) or more metal parameters in soil samples from boreholes BH2, BH3 and BH4 on the eastern portion of the site and boreholes BH14 and BH15 on the western portion of the site exceeded the applicable guidelines.
 - b. The detected concentrations of one (1) or more metal parameters in groundwater samples from boreholes BH1, BH2, BH4, BH5, BH7, BH8 and BH11 on the eastern portion of the site and boreholes BH13 and BH15 on the western portion of the site exceeded the applicable guidelines.
7. PAHs
 - a. The detected concentrations of one (1) or more PAH parameters in soil samples from boreholes BH4 and BH5 on the eastern portion of the site and borehole BH14 on the western portion of the site exceeded the applicable guidelines.
 - b. The detected concentrations of one (1) or more PAH parameters in groundwater samples from boreholes BH1, BH2, BH5, BH6, BH8 and BH11 on the eastern portion of the site exceeded the applicable guidelines. However, it was noted during the laboratory analysis that the groundwater samples contained sediment. Because sediment was present in the groundwater samples, it is possible that the PAHs concentrations were influenced by PAH impacted sediment in the groundwater, rather than PAHs in solution in the groundwater.
8. See Drawing No. 121412551-EE-03 in Appendix A for the approximate extent of PHCs, metals and/or PAH concentrations in soil and groundwater exceeding applicable guidelines.
9. Polychlorinated Biphenyls (PCBs) - Concentrations of PCBs were not detected in the soil or groundwater samples analyzed.
10. Total Oil and Grease - Concentrations of total oil and grease were detected in the soil samples analyzed from boreholes BH2, BH5, BH6 and BH8 on the eastern portion of the site and boreholes BH13 and BH15 on the western portion of the site.

11. Leachate in Soil - Leachability for petroleum hydrocarbons, lead, fluoranthene, naphthalene and phenanthrene was carried out on four (4) soil samples (*i.e.*, BH6-SS4, BH14-SS3, BH14-AS3C and BH15-SS3). Concentrations of lead were detected in the leachate from the tested samples, but they did not exceed the regulatory guideline (*i.e.*, 5,000 µg/L). Note that there are no regulatory guidelines for petroleum hydrocarbons, lead, fluoranthene, naphthalene and phenanthrene in leachate.
12. General Chemistry in Groundwater - The measured pH in groundwater samples from boreholes BH2, BH4, BH5, BH6, BH8 and BH11 on the eastern portion of the site was not within the applicable guideline.
13. Radon
 - a. Preliminary radon gas monitoring (*i.e.*, a screening survey) was carried out on March 28, 2012 from one borehole/monitor well (*i.e.*, BH6) to assess whether radon gas was present at the site.
 - b. Radon concentrations from the borehole/monitor well ranged from 291 becquerels per cubic metre (Bq/m³) to 837 Bq/m³, with an average over four (4) hours of 558 Bq/m³. Because subsurface soil gas vapours were measured, any predicted indoor air concentration would be expected to be much less due to dilution with ambient air; however there is no known correlation between soil gas measurements pre-construction and an indoor concentration. There is also no known federal environmental guideline for radon in soil gas or for radon in ambient air within a commercial property. As a reference, Health Canada recommends remedial measures within a residential property whenever the average annual radon concentration exceeds 200 Bq/m³ in the normal occupancy area.

Based on the conclusions of the current Phase II ESA, Stantec offers the following recommendations:

1. It is possible that the PAHs concentrations in groundwater were influenced by PAH impacted sediment, rather than PAHs in solution in the groundwater. Collect additional groundwater samples from monitor wells BH1, BH2, BH5, BH6, BH8 and BH11 using a low flow pump to reduce sediment interference and submit for laboratory analysis of PAHs. Request that the laboratory decant the groundwater sample prior to analysis to further reduce sediment interference.
2. Identify any data gaps present and conduct a Human Health and Ecological Risk Assessment (HHERA) to evaluate potential risks to human and ecological receptors associated with residual chemical contamination on the subject site.
3. Identify the requirements for remediation and/or risk management based on the results of the risk assessments.
4. Any personnel engaged in construction and/or excavation on the site should be advised of the potential risks associated with dermal contact or ingestion of soil that contains contaminants of potential concern. A risk management plan (RMP) should be

implemented prior to excavation activities. The RMP will outline the personal protective equipment (PPE) requirements (gloves, closed toed boots and coveralls) and will discuss the recommended actions to follow if exposed (washing with soap and water, cleaning of PPE, etc.).

5. Because petroleum hydrocarbons and metal exceedances were detected in site soil, should the property be redeveloped, any excess soil generated by the redevelopment should be tested prior to leaving the site to determine soil disposal options.
6. If site conditions or land uses change (e.g., residential usage, potable groundwater or if further development takes place on the site), the results of the on-site risk assessment may need to be revisited to ensure that there are no additional or increased risks to potential receptors, on-site or off-site.
7. It is our understanding that there is no current groundwater use for potable drinking water. The assumption is made that prior to any future use of groundwater for potable drinking water or other human use (i.e., showering, washing), the groundwater will be tested to demonstrate that groundwater quality is within the Guidelines for Canadian Drinking Water Quality.
8. Based on the detected radon concentrations in short-term monitoring of soil gas on the site, the following is recommended:
 - a. Follow the recommendations for radon preventative construction methods for new construction found in the Canadian National Building Code 2010 such as controlling air leakage with a sub-slab seamless vapour barrier and providing a ventilation system. These construction methods should mitigate the ingress of airborne radon from the ground. Another useful guide for construction is the United States Environmental Protection Agency (EPA) "EPA/625/R-92/016 Radon Prevention in the Design and Construction of Schools and Other Large Buildings, 1994".
 - b. A long term sampling program is recommended within the building post construction to determine actual indoor air radon concentrations. Follow the guidance found in the "Health Canada Guide for Radon Measurements in Public Buildings (Schools, Hospitals, Care Facilities, Detention Centres), 2008". Health Canada recommends that the radon test performed in a home or public building be a long-term measurement. Health Canada does not recommend a test of duration less than one (1) month, a minimum of three (3) months is recommended and twelve (12) months is optimum.

The statements made in the Executive Summary are subject to the same limitations included in the Closure Section 5.0 and are to be read in conjunction with the remainder of this report.

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1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) was retained by Public Works and Government Services Canada (PWGSC) to carry out a Phase II Environmental Site Assessment (ESA) at the Canadian Coast Guard (CCG) Southside Base, Berth 28 located off Southside Road in St. John's, Newfoundland and Labrador (NL). Refer to Drawing No. 121412551-EE-01, Appendix A. The Phase II ESA was completed in conjunction with a Geotechnical Investigation, which was reported under separate cover (Stantec Project No. 121412551, dated March 22, 2013 in Draft) for Public Works and Government Services Canada. The purpose of the Phase II ESA was to confirm the absence/presence of environmental impacts in soil and groundwater on the subject property.

This report is presented in six sections. Section 1 presents background information about the site, describes the scope of work, and explains the regulatory guidelines and their applicability. Section 2 summarizes the methodology used for the Phase II ESA. Section 3 provides results of the Phase II ESA and laboratory analyses. Section 4 provides the conclusions and the recommendations of the report. Limitations of the work are discussed in Section 5 and references are provided in Section 6. Supporting information is provided in the appendices at the end of this report.

This report was prepared specifically and solely for the above project. The report presents all of the factual findings and laboratory results of the Phase II ESA and presents Stantec's comments on the environmental status of the site.

1.1 Site Description

Based on information provided in PWGSC's project Terms of Reference (TOR) dated December 20, 2013, the CCG Southside Base Site is located on the Southside Road in St. John's, NL. The site currently consists of the Administration Building, the Buoy Maintenance Facility, Berth 28 and the Hazardous Materials Storage Area. The area of current study (*i.e.*, this Phase II ESA) is the area adjacent to the Buoy Maintenance Facility known as Berth 28 (Pier 28).

Berth 28 is currently being used as an equipment storage yard and parking area for the CCG Southside Base. The site is intended to be the future location of the CCG Southside Base office tower. The office tower will be located on the eastern portion of the site between the property boundary and the City of St. John's sewer outfall. Although the final design is unknown, it will be a multi-story office tower with a footprint of approximately 1,000 m² to 2,000 m². Design of the building is planned to begin in 2013 and construction will commence following any site remediation.

The subject site is located in an industrial area along the southside of the St. John's Harbour front. The CCG Buoy Maintenance Facility of the CCG Southside Base (Pier 29) is located adjacent to the southwest of the site. To the northeast of the site is HMCS Cabot (Pier 27).

Southside Road is located to the southeast of the site and the waters of St. John's Harbour are to the northwest.

The Berth 28 property is approximately 1 ha in area consisting of the concrete deck/wharf and the land up-gradient of the wharf. Southside Road, which borders the property to the southeast, provides site access.

Based on existing data for the area, the principal natural overburden material, beneath surficial fill material, is considered to be glacial till, which directly overlies bedrock. The characteristic permeability of these soils is moderate. Based on the local topography and the groundwater levels noted in the monitor wells placed for this assessment, the direction of groundwater flow at the site is to the northwest towards St. John's Harbour. The direction of regional groundwater flow is also towards the northwest. Groundwater on the Site and in the general area of the Site is not utilized as a source of drinking water.

1.2 Background

The following is a list of previous environmental reports that have been completed either at the subject site or nearby sites and provided to Stantec by PWGSC for review as part of the current investigation:

- Environmental and Geotechnical Assessment, HMCS Cabot Armoury, Pier 27, St. John's, NL, Newfoundland Geosciences Limited, March 1999. (NGL Project 5691);
- Phase II Environmental Site Assessment at Canadian Coast Guard Base, Berth 28, Southside, St. John's Harbour, St. John's, NL, MGI Limited, November 2001;
- Phase II/II Environmental Site Assessment, CCG South Side Base, Administration Building, Buoy Maintenance Facility, Berth 28 and Hazardous Materials Storage Area, St. John's, NL, AMEC Earth & Environmental, March 2002;
- Phase II Environmental Site Assessment, Water Lot Sediment Sampling, Canadian Coast Guard Southside Base, St. John's, NL, AMEC Earth & Environmental, April 2002;
- Groundwater Monitoring Program, Canadian Coast Guard Southside Base, Administration Building, Buoy Maintenance Facility, Berth 28 and Hazardous Materials Storage Area, St. John's, NL, AMEC Earth & Environmental, March 2004;
- Groundwater Monitoring Program, Canadian Coast Guard Southside Base, Administration Building, Buoy Maintenance Facility, Berth 28 and Hazardous Materials Storage Area, St. John's, NL, AMEC Earth & Environmental, October 2005; and,
- Groundwater Monitoring Program, Canadian Coast Guard Southside Base, Administration Building, Buoy Maintenance Facility, Berth 28 and Hazardous Materials Storage Area, St. John's, NL, AMEC Earth & Environmental, March 2007.

In 1999, an Environmental and Geotechnical Assessment was completed on the adjacent HMCS Cabot Armoury property to the northeast of the subject site. This was completed during the site preparation phase for the construction of a new building. The investigation involved the

placement of eight (8) test pits and a test excavation on the site. The overlying soils encountered throughout the site consisted of fill (with some debris and wood), marine soils and glacial till. The analytical results of the soil samples identified petroleum hydrocarbon and polycyclic aromatic hydrocarbons (PAHs) impacts exceeding regulatory guidelines. Contaminated soils exceeding guidelines were removed and disposed of, but areas of contaminated soil were left along the harbor side of the site due to close proximity to St. John's Harbour. During the excavation and removal of unsuitable material on the site, a pocket of soil was encountered with an organic odour. The area (Pier 27) was reportedly used in the past to handle or process seal oil. Analytical testing of the soil found that the non-petroleum oil and grease fraction of the samples could be attributed to seal oil.

In 2001, a Phase II ESA was completed at the CCG Base, Berth 28 (the subject site for this assessment). The investigation involved the placement of ten (10) test pits on the site. Refer to Drawing No. 121412551-EE-02 in Appendix A for the locations of the test pits. Samples collected from the test pits were analyzed for petroleum hydrocarbons (*i.e.*, total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene and xylenes (BTEX)), metals and PAHs. Petroleum hydrocarbons were detected in all of the test pits, with four (4) test pits (*i.e.*, TP104, TP106, TP107 and TP110) having concentrations that exceeded applicable guidelines at that time. Metals were detected in all of the test pits, with six (6) test pits (*i.e.*, TP101 to TP103, TP105, TP106 and TP107) having concentrations that exceeded applicable guidelines at that time. PAHs were detected in the six test pits that were sampled, with five (5) test pits (*i.e.*, TP101, TP103, TP105, TP106 and TP107) having concentrations that exceeded applicable guidelines at that time.

In 2002, a Phase II/III ESA was completed on the adjacent CCG Southside Base to the southwest of the subject site. The investigation involved the placement of monitor wells and associated soil and groundwater sampling for petroleum hydrocarbons, total oil and grease, mineral oil and grease, metals, PAHs and PCBs. At the Administration Building, there were petroleum hydrocarbon and PAH impacts in one (1) soil sample that exceeded applicable guidelines at that time. Total oil and grease were detected in the six (6) monitor wells near the Administration Building. PAH impacts in groundwater exceeding guidelines were found in five (5) monitor wells and metal impacts in groundwater exceeding guidelines were found in six (6) monitor wells near the Administration Building. At the Buoy Maintenance Facility, petroleum hydrocarbon impacts exceeding guidelines were found in one (1) monitor well and total oil and grease were detected in two (2) monitor wells. PAH and metal impacts in groundwater exceeding guidelines were found in two (2) monitor wells near the Buoy Maintenance Facility. Total oil and grease were detected in the three (3) monitor wells near the Hazardous Materials Storage Area. Metal impacts in groundwater exceeding guidelines were found in three (3) monitor wells near the Hazardous Materials Storage Area.

In 2002, Waterlot Sediment Sampling was conducted at the CCG Southside Base. The scope of work included the collection of 10 ocean bottom sediment samples and the laboratory analysis for petroleum hydrocarbons, metals, PAHs and PCBs. Concentrations of TPH in the samples ranged from 3.6 mg/kg to 6,900 mg/kg. Concentrations of various metal parameters in all of the sediment samples and PAH parameters in nine (9) samples exceeded the applicable guidelines. Concentrations of PCBs in one (1) sample exceeded the applicable guideline.

In 2004, Groundwater Monitoring was carried out at the CCG Southside Base to the southwest of the subject site. The field program included the monitoring and sampling of ten (10) monitor wells at the site (one was not accessible). Selected groundwater samples were submitted for the laboratory analysis of petroleum hydrocarbons, metals, PAHs and PCBs. Metal impacts in groundwater exceeding guidelines were found in five (5) monitor wells and PAH impacts in groundwater exceeding guidelines were found in one (1) monitor well near the Administration Building. Metal impacts in groundwater exceeding guidelines were found in two (2) monitor wells near the Buoy Maintenance Facility. Metal impacts in groundwater exceeding guidelines were found in three (3) monitor wells near the Hazardous Materials Storage Area.

In 2005, Groundwater Monitoring was carried out again at the CCG Southside Base to the southwest of the subject site. The field program included the monitoring and sampling of eleven (11) monitor wells at the site. Selected groundwater samples were submitted for the laboratory analysis of petroleum hydrocarbons, metals, PAHs and PCBs. Metal impacts in groundwater exceeding guidelines were found in five (5) monitor wells and PAH impacts in groundwater exceeding guidelines were found in three (3) monitor wells near the Administration Building. Metal impacts in groundwater exceeding guidelines were found in two (2) monitor wells near the Buoy Maintenance Facility. Metal impacts in groundwater exceeding guidelines were found in two (2) monitor wells near the Hazardous Materials Storage Area.

In 2007, Groundwater Monitoring was carried out again at the CCG Southside Base to the southwest of the subject site. The field program included the monitoring and sampling of ten (10) monitor wells at the site (one was not accessible). Selected groundwater samples were submitted for the laboratory analysis of petroleum hydrocarbons, metals, PAHs and PCBs. Metal impacts in groundwater exceeding guidelines were found in four (4) monitor wells and PAH impacts in groundwater exceeding guidelines were found in five (5) monitor wells near the Administration Building. Metal impacts in groundwater exceeding guidelines were found in two (2) monitor wells and PAH impacts in groundwater exceeding guidelines were found in one (1) monitor well near the Buoy Maintenance Facility. Metal impacts in groundwater exceeding guidelines were found in three (3) monitor wells and PAH impacts in groundwater exceeding guidelines were found in one (1) monitor well near the Hazardous Materials Storage Area.

1.3 Objectives

The objectives of the proposed program for the subject site as per the project's Terms of Reference (TOR) are summarized as follows:

1. Conduct a document review to determine any data gaps and to develop a plan for further assessment.
2. Complete a detailed intrusive investigation to delineate the horizontal and vertical extent of contamination in all impact media.
3. Complete a geotechnical study during the completion of the detailed intrusive investigation (completed under separate cover).
4. Complete all the work within the required time frame.

1.4 Scope of Work

Stantec understood that the primary goal of the current project was to be the first step in determining what remediation may be required at the site to allow the construction of a new office tower. The investigation focused on two separate areas as follows:

1. Eastern portion of the property between the boundary with the HMCS Cabot property to the east and the City of St. John's sewer outfall where the proposed office tower will be constructed. As part of the current program, both a geotechnical study and an environmental site assessment were completed in this portion of the property.
2. Western portion of the property between the boundary with the existing CCG Southside Base property to the east and the City of St. John's sewer outfall. As part of the current program, study in this area was limited to environmental assessment only.

The current Phase II ESA was conducted concurrently with the Geotechnical Investigation and involved the placement of fifteen (15) boreholes (with all completed as monitor wells) at the subject site and associated soil and groundwater sampling and analysis. The purpose of the Phase II ESA was to confirm the presence or absence of contamination at the site in the areas of the intrusive investigation. Specifically, the scope of work for the current Phase II ESA carried out by Stantec on the subject property included the following components of work:

1. Determine the appropriate locations and install up to fifteen (15) boreholes complete with monitor wells (5) at the site. Twelve (12) geotechnical/environmental boreholes (*i.e.*, BH1 to BH12) were placed on the eastern portion of the site at locations selected by PWGSC and provided to Stantec. Boreholes were drilled through overburden and up to 6 m into bedrock for geotechnical and environmental purposes. On the western portion of the site, three (3) additional environmental boreholes complete as monitor wells (*i.e.*, BH13 to BH15) were installed to a depth of approximately 5 m for environmental purposes only.
2. Collect soil samples from the fifteen (15) boreholes for laboratory analysis;
3. Carry out head space vapour screening to select soil samples for laboratory analysis;
4. Collect groundwater samples from the fifteen (15) groundwater monitor wells;
5. Submit selected soil and groundwater samples for laboratory analysis of petroleum hydrocarbons, including TPH and BTEX parameters, fractionated petroleum hydrocarbons, metals, PAHs, PCBs, total oil and grease as well as general chemistry, as required;
6. Carry out radon soil gas monitoring in one monitor well completed on the eastern portion of the site using an ALPHA II Radon Monitor; and,
7. Evaluate observations and results of the investigation and present in a Phase II ESA report, which includes drawings and monitor well logs and outlines the methodology, results, conclusions and recommendations from the investigation.

1.5 Regulatory Framework

1.5.1 Petroleum Hydrocarbons in Soil

As the site is federally-owned, federal guidelines for petroleum hydrocarbons have been referenced. The Canadian Council of Ministers of the Environment (CCME) Canada Wide Standard (CWS) for Petroleum Hydrocarbons (PHC) in Soil is a three tiered, risk based remedial standard for contaminated soil. Standards have been developed for four generic land uses – agricultural, residential/parkland, commercial, and industrial. For the purposes of the CWS, PHC are considered to be comprised of four fractions, these being Fraction 1 (F1): C_6-C_{10} , Fraction 2 (F2): $>C_{10}-C_{16}$, Fraction 3 (F3): $>C_{16}-C_{34}$, and Fraction 4 (F4): $>C_{34}-C_{50}$. The CWS is based on a tiered approach to site management. Within this tiered approach, three tiers of increasing technical complexity (Tier I, II and III) are available for the management of impacted sites. The same high level of environmental and human health protection is required at all three tiers. Tier I levels are used when the proponent accepts the base assumptions and parameters in the Tier I exposure scenarios. Tier 2 levels may be generated and used when site conditions exist that significantly modify the exposure and risk scenarios. Tier 3 levels are based on site-specific assessment and management of risks.

As a result of this tiered approach, the clean-up criteria defined under the guidance document allow for greater flexibility in managing contaminated sites.

For a Tier 1 assessment, the most stringent pathway-specific Tier 1 level for petroleum hydrocarbons in surface soil is used (Tables 2 and 3 in the CWS for PHC in Soil, User Guidance, January 2008). These standards are based on default conditions for typical sites and exposure pathways and are classified by land use and soil type. In addition, the petroleum hydrocarbon standards are dependent on the defined four hydrocarbon fractions (*i.e.*, the standards differ for F1, F2, F3, and F4).

Based on the CCME CWS for PHC user guidance document, if site concentrations exceed the Tier 1 CWS for PHC, the site may be remediated to the Tier 1 generic standards. Alternatively, a comparison of the site concentrations to the Management Limit (Tables 2 to 5 in the CWS for PHC in Soil, User Guidance, January 2008) may be conducted. If the PHC concentrations are below the Management Limits for that land use, then a comparison to the exposure pathway specific values (Tables 2 to 5 in the CWS for PHC in Soil, User Guidance, January 2008) may be conducted. If the Management Limits are exceeded, however, there is a need for field quantization of the following factors prior to applying the exposure pathway specific values:

- No free phase formation;
- No exposure of workers in trenches to PHC vapours;
- No fire and explosion hazards;
- No effects on buried infrastructure; and,
- No aesthetic considerations.

The CWS for PHC in soils exclude known carcinogens such as benzene, as well as toluene, ethylbenzene and xylenes (TEX), which are addressed separately as individual target compounds. The concentrations of benzene, toluene, ethylbenzene and xylenes in soil on the Site were compared to the CCME Canadian Soil Quality Guidelines (CSQGs) (CSQG on-line 2013). The CCME CSQGs are developed on the basis of land use. The Site is publicly accessible and adjacent property use includes commercial land. The commercial guidelines are used as initial screening values for this assessment for the Site.

1.5.2 Metals, PAHs, PCBs and General Chemistry in Soil

The applicable federal guidelines for metals and general chemistry in soil are considered to be the CCME Canadian Environmental Quality Guidelines and its associated documents. The CCME guidelines provide limits for contaminants in soil and are intended to maintain, improve, and/or protect environmental quality and human health at contaminated sites in general. These criteria include numerical values for the assessment and remediation of soil in the context of agricultural, residential/parkland, commercial, and industrial land uses. In addition to land use, the CCME include numerical values depending on soil texture (*i.e.*, coarse or fine grained soils). Environmental soil and water quality guidelines are derived using toxicological data to determine the threshold level to key receptors. These criteria include the CCME Canadian Soil Quality Guidelines (CSQGs). The latest update of the CCME CSQGs was obtained on-line at <http://ceqg-rcqe.ccme.ca/>. More specifically, the guidelines for a commercial site and coarse grained soil were selected.

1.5.3 Petroleum Hydrocarbons, Metals, PAHs, PCBs and General Chemistry in Groundwater

The Federal Contaminated Sites Action Plan (FCSAP) was established to help federal departments, agencies and custodians address federal contaminated sites, so as to reduce environmental and human health risks as well as federal financial environmental liability associated with the higher risk federal contaminated sites.

The Environment Canada (EC) Federal Interim Groundwater Quality Guidelines (FIGQGs) last updated November 2012 were developed to assist federal custodians in assessing, remediating/risk managing federal contaminated sites funded under FCSAP. Federal custodians are advised to use these interim guidelines as an interim measure until Canadian groundwater quality guidelines are available. The EC guidelines are interim guidelines that are protective of aquatic life.

The EC guidelines follow a tiered framework, consistent with the Canadian Soil Quality Guidelines development through the CCME. A Tier 1 approach is a direct application of the generic numerical guidelines; specifically, application of the lowest guideline for any exposure pathway. A Tier 2 approach allows for the development of site-specific remediation objectives through the consideration of site-specific conditions, by modifying (within limits) the numerical guidelines based on site-specific conditions and focusing on exposure pathways and receptors that are applicable to the site. Finally, a Tier 3 approach uses the site-specific risk assessment to develop site-specific remediation objectives. Based on the existing site conditions for the

subject site, the FIGQGs for marine life for a site with commercial/industrial land use and coarse-grained soil are applicable at the site for BTEX parameters, metals, PAHs, PCBs and general chemistry parameters.

Stantec has also utilized the Ontario Ministry of the Environment's (MOE) Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 2011, for a full-depth generic site with non-potable groundwater. The MOE groundwater guidelines are protective of aquatic receptors in surface waters which could be affected by the discharge of groundwater. Stantec has applied the MOE guidelines for other environmental investigations where no applicable federal guidelines exist, and has obtained regulatory acceptance.

1.5.4 Leachate

The guideline used for leachability of parameters from soil was the Environment Canada, Interprovincial Movement of Hazardous Waste and Hazardous Recyclable Material Regulations, Schedule 2 (Table of Hazardous Constituents Controlled Under Leachate Test and Regulated Limits), January 2002.

2.0 METHODOLOGY

2.1 Boreholes and Monitor Wells

For this project, a total of fifteen (15) boreholes were completed, labeled consecutively as BH1 to BH15. Groundwater monitoring wells were installed in all boreholes after completion of drilling (MW1 to MW15). As specified in the Terms of Reference, twelve (12) boreholes identified as BH1 to BH12 were advanced on the eastern portion of the site, where practical, up to 6.0 m into bedrock for geotechnical and environmental purposes. On the western portion of the site, three (3) additional environmental boreholes complete as monitor wells (*i.e.*, BH13 to BH15) were installed to a depth of approximately 4.5 m for environmental purposes only.

Borehole locations were selected by the client and located in the field by Stantec personnel referencing known infrastructure. Final as-advanced borehole locations were located with the assistance of Hawco King Renouf/Allnorth Consultants (Allnorth) of St. John's, NL. Final as-advanced borehole locations were surveyed in reference to NAD 83 geodetic datum and MTM Zone 1 coordinate system and are shown on the Sample Location Plan, Drawing No. 121412551-EE-02, Appendix A.

Individual Borehole Records/Monitor Well Records are attached in Appendix B and accompanied with the following explanatory keys; Symbols and Terms Used on Borehole and Test Pit Records, and Symbols and Terms Used on Monitor Well, Water Well and Environmental Records.

The intrusive field investigation work (borehole advancement) was carried out from February 20, 2013 to March 7, 2013. The field work was conducted under the supervision of experienced personnel from Stantec who maintained detailed logs and obtained representative samples of the various soil and rock strata encountered.

The boreholes were drilled using a Model CME-75 all-terrain-vehicle-mounted drill rig equipped for soil sampling and diamond coring of bedrock. The boreholes BH13 to BH15 were advanced using 210 mm outside diameter, continuous flight hollow stem augers (HSA). Boreholes BH1 to BH12 were initially advanced using a 100 mm outside diameter, continuous, solid stem auger for about the first two (2) metres, then advanced using wet-rotary diamond drilling methods using a HQ-sized drill stem of 96 mm outside diameter.

Where possible, soil samples were collected from the boreholes during the performance of the Standard Penetration Test and N values were recorded. Soils were sampled from the boreholes by split spoon methods at approximately 0.6 m intervals. The soil samples were examined for any field evidence of petroleum hydrocarbon impacts at the time of collection. Duplicate soil samples were collected at each sample location, where possible. The samples were placed in new laboratory-supplied glass jars and placed in sample coolers and returned to Stantec's office in St. John's, NL for soil vapour testing. Head space soil vapour concentrations were measured in the duplicate sample jars using a MiniRAE 2000 photo ionization detector (PID). The PID readings are presented on the Monitor Well Records in Appendix B.

Based on the PID readings, site observations and site history, selected soil samples were submitted to Maxxam Analytics in St. John's, NL and Bedford, NS for laboratory analysis of petroleum hydrocarbons (TPH and BTEX), TPH fractionation, available metals, PAHs, PCBs and total oil and grease.

Following drilling, monitor wells were installed within the boreholes. The monitor wells consisted of a 50 mm diameter, flush-threaded, Schedule 40 PVC casing and No. 10 slot screen. Three (3) meters of No. 10 slot screen and 1.5 m of schedule 40 PVC casing were placed in each borehole. No. 3-4 silica sand was placed around the screened section. The screened section was placed to span the water table as measured at the time of drilling. A bentonite seal was placed above the sand pack, followed by backfill material to the surface. A flush-mounted, cast iron or aluminum well head enclosure was installed at each monitor well. Specific well construction details are shown on the Monitor Well Records in Appendix B.

Preliminary radon gas monitoring (*i.e.*, a screening survey) using a radon detector was carried out on March 28, 2012 from one borehole/monitor well (*i.e.*, BH6) to assess whether radon gas was present at the site.

2.2 Groundwater Sampling

Following monitor well installation, each well was developed by pumping approximately forty (40) L to eighty (80) L of groundwater. Monitor well development was completed to reduce any sediment that may have been present in each well during installation and to remove any water that may have been introduced during drilling. Following monitor well development,

groundwater samples were collected on March 12 and 13, 2013 into clean sample bottles and submitted to Maxxam Analytics in St. John's, NL and Bedford, NS for laboratory analysis of petroleum hydrocarbons (TPH and BTEX), TPH fractionation, dissolved metals, PAHs, PCBs and general chemistry.

2.3 Laboratory Analyses

The laboratory analysis of soil and groundwater samples collected during this investigation was conducted by Maxxam Analytics in St. John's, NL and Bedford, NS. Maxxam Analytics is accredited by the Standards Council of Canada (SCC) for each of the analysis methods utilized and has an in-house QA/QC program to govern sample analysis, including replicates. The laboratory analysis schedule completed for this investigation is presented in Table 2.1 (includes laboratory duplicate samples).

Table 2.1 Summary of Laboratory Work

Parameter	Sample Matrix	
	Soil	Groundwater
Petroleum Hydrocarbons (TPH/BTEX)	21	9
Fractionated Petroleum Hydrocarbons (TPH/BTEX)	3	1
Metals	24	9
PAHs	25	9
PCBs	23	9
General Chemistry	-	10
Total Oil and Grease	7	-
Leachate	4	-
Note: The methodologies utilized by Maxxam Analytics in analysis of the soil and groundwater samples are presented on the analytical reports in Appendix D.		

2.4 Quality Assurance/Quality Control (QA/QC) Discussion

In order to minimize cross contamination during sampling, a field Quality Assurance/Quality Control (QA/QC) program was followed, which included the following measures:

- Disposable nitrile surgical gloves (dust free) were worn during all sampling (new gloves for each sample);
- All soil sampling equipment was thoroughly cleaned and rinsed with potable water prior to sampling to ensure that samples were unaffected by cross-contamination from previous samples;
- New laboratory-supplied jars were used to collect soil, groundwater and surface water samples;
- Each sample jar was labeled prior to sampling; and,
- Samples were stored in a cooler with ice/ice packs to keep cool during shipment to the laboratory.

In addition, the Maxxam Analytics laboratories have an extensive QC program in place to ensure that reliable results are consistently obtained. Specific laboratory QC measures include:

- Chain of Custody and sample integrity inspection;
- Strict documentation control and files;
- Trained personnel prepare and analyze samples according to Standard Operating Procedures;
- All analytical methods are based on accepted (e.g., Ontario MOE, US EPA, ASTM) procedures and are fully validated prior to use;
- Precision is monitored by performing replicate analysis of samples within each batch (dependant on batch size);
- Accuracy is verified by analyzing spiked samples and reference materials within each batch (dependant on batch size);
- Instrument calibration integrity is ensured by analyzing calibration check standards within each run sequence;
- Matrix effects in organic analyses are assessed with surrogate fortification of each sample;
- Extensive use is made of reference material for routine procedure evaluation;
- Highest available purity analytical standards;
- Predefined analytical sequences ensure all results are traceable to calibration and QC data;
- Hard copy reports displaying all of the required data are generated for each instrument;
- Analytical results are determined only from instrument responses that fall within the calibration range;
- Acceptable QC performance must be demonstrated prior to data authorization (data are subject to three levels of QC review: chemist, supervisor and manager);
- On-going method and instrument performance records are maintained for all analyses; and,
- Records containing all pertinent data are securely archived for three years.

Laboratory duplicate analyses were carried out on several samples analyzed during the current investigation. Maxxam Analytics laboratory certificates are included in Appendix D. Due to the limited amount of soil collected from the split spoon during drilling and the number of analytes carried out on the soil samples during laboratory analysis, field duplicate samples were not available to be submitted for QA/QC purposes.

3.0 RESULTS OF PHASE II ENVIRONMENTAL SITE ASSESSMENT

The following sections present the results of the Phase II ESA conducted at the site, including a description of the subsurface conditions encountered during the investigation and the characterization of the existence of soil and groundwater impacts at the site.

3.1 Subsurface Conditions

3.1.1 Stratigraphy

Conditions encountered in the monitor wells are described in detail on the Monitor Well Records in Appendix B and are based on the descriptions provided in the Geotechnical Report (Stantec, 2013) completed concurrently with the Phase II ESA.

3.1.1.1 Fill

Asphalt or reinforced concrete slab was encountered at the surface at the borehole locations. The thickness of asphalt was about 100 mm and about 250 mm, for the reinforced concrete slab. Fill materials were encountered underlying the surficial layer of asphalt or reinforced concrete slab at all borehole locations. The thickness of the fill ranged from 0.6 m in borehole BH11 to as much as 6.9 m in BH02.

Based on the geotechnical report, the fill generally can be sub-divided in two (2) layers (BH1 to BH11), an upper and lower layer. The upper layer is described as a dense to very dense, grey to brown to black, silty sand with gravel to well-graded gravel with sand and silt and contained trace amounts of cobbles. This upper fill layer was anywhere from 0.6 m to 2.5 m in thickness and was noted at all borehole locations. This upper fill layer appeared to be consistent in nature with a compacted engineered structural fill material.

The lower fill layer was generally noted to be very loose to dense, grey to black, silty sand with gravel to a poorly graded sand with gravel and silt containing a varying amount of (trace to frequent in content) of one or more of the following; wood debris, wood branches, undifferentiated organic matter, to glass debris. This lower fill layer was generally consistent in nature with material placed in an uncontrolled, non-engineered manner.

It should be noted that only the denser upper layer of fill was encountered at borehole locations BH9 to BH12.

3.1.1.2 Marine Sediments

Underlying the fill layer was a stratum of very loose to compact, brown to black, silty sand with gravel with trace to frequent amounts of organic matter consistent with a marine depositional environment. This stratum was encountered in boreholes BH1 to BH4, BH6, BH7, BH13 and BH14 and ranged in thickness from 0.13 m in borehole BH14 to as much as 3.7 m in borehole BH1.

3.1.1.3 Glacial Till

A native glacial till layer was encountered underlying the fill or marine sediment in all boreholes except in BH8 and BH10 to BH12. The till ranged in thickness from 0.3 m in borehole BH7 to 4.1 m in borehole BH2. The till was generally composed of compact to very dense, brown to grey, silty sand with gravel to poorly or well-graded gravel with silt and sand, and contained trace amounts of cobbles.

3.1.1.4 Bedrock

Bedrock was encountered in all boreholes except boreholes BH13 to BH15, where these were advanced to a predetermined depth of about 4.5 m for the installation of groundwater monitoring wells. Depth of bedrock varied from about 0.8 m in borehole BH11 to 11.6 m in borehole BH2. The bedrock is described as a greyish green to bluish grey, siltstone and sandstone sedimentary rock. The quality of the bedrock was generally very severely fractured at the bedrock surface, becoming to moderately jointed or intact with depth.

3.1.2 Groundwater Observations

The depths to groundwater in the boreholes and monitor wells, as measured between February 24, 2013 and March 12, 2013 during groundwater sampling, ranged from 0.50 mbgs in monitor well BH10 to 2.42 mbgs in monitor well BH15. Groundwater levels within these monitor wells are expected to vary seasonally and in response to individual precipitation events as well as in response to diurnal tidal fluctuations.

Based on the local topography and the measured groundwater levels, the inferred direction of local groundwater flow at the site is towards the St. John's Harbour to the northwest, as shown on Drawing No. 121412551-EE-02 in Appendix A. Groundwater depths for all monitor wells are presented in Table 3.1 and on the Monitor Well Records in Appendix B.

Table 3.1 Groundwater Depths and Elevations

Borehole I.D.	Date Measured	Groundwater Depth (mbgs)	Monitor Well Top of Casing Elevation (m)	Groundwater Elevation (m) ^a
BH1	12-Mar-13	1.64	2.06	0.42
BH2	12-Mar-13	2.30	2.08	-0.22
BH3	6-Mar-13	1.40	2.07	0.67
BH4	12-Mar-13	2.36	2.15	-0.21
BH5	12-Mar-13	1.96	2.21	0.25
BH6	12-Mar-13	2.16	2.14	-0.02
BH7	12-Mar-13	1.89	2.11	0.22
BH8	12-Mar-13	1.38	2.35	0.97
BH9	12-Mar-13	1.48	2.58	1.10
BH10	5-Mar-13	0.50	2.55	2.05
BH11	12-Mar-13	0.70	2.85	2.15
BH12	3-Mar-13	1.20	2.71	1.51
BH13	12-Mar-13	2.19	2.24	0.05
BH14	24-Feb-13	1.90	2.32	0.42
BH15	12-Mar-13	2.42	2.41	-0.01

Notes: mbgs = meters below ground surface.
 a = Elevations based on reference to NAD 83 geodetic datum.

3.1.3 Soil Vapour Concentrations

The soil vapour concentrations measured in soil samples collected from the site are provided on the Monitor Well Records in Appendix B. The soil vapour concentrations measured ranged from 0.0 ppm in three (3) soil samples (*i.e.*, BH5-SS1, BH8-SS1, BH12-SS1) to 890 ppm in soil sample BH6-SS4.

Soil vapour concentrations vary with both fuel type and age, and it should be noted that the readings are intended to provide only a qualitative indication of volatile hydrocarbon levels and are not directly equivalent to soil analytical results.

3.1.4 Liquid Phase Petroleum Hydrocarbons

Free liquid phase petroleum hydrocarbons (*i.e.*, free product) were not observed on the soil or groundwater in any of the boreholes during the current investigation.

3.2 Soil Analytical Results

Results of the laboratory analyses of soil samples for TPH/BTEX, TPH/BTEX fractionation, available metals, PAHs, PCBs, total oil and grease and leachate in soil are presented in Tables C.1 to C.7, Appendix C. The corresponding analytical reports from Maxxam Analytics are presented in Appendix D.

3.2.1 Petroleum Hydrocarbons in Soil

Petroleum hydrocarbon (TPH/BTEX) analysis was conducted on twenty (20) soil samples including one (1) to two (2) soil samples collected from each of the fifteen (15) boreholes/monitor wells (*i.e.*, BH1 to BH15), plus one (1) laboratory duplicate sample of BH15-SS1. Results of the laboratory analysis for TPH/BTEX in soil are presented in Table C.1, Appendix C. Two (2) soil samples collected from the boreholes/monitor wells (*i.e.*, BH6-SS4 and BH15-SS3) and a laboratory duplicate sample of BH15-SS3 were also analyzed for TPH fractionation. TPH fractionation results are presented in Table C.2, Appendix C.

Due to possible organic content, the laboratory was requested to conduct a triple silica gel clean-up on all of the samples prior to laboratory analysis. The silica clean-up was requested to reduce interference from non-petrogenic material (*i.e.*, organics) in the samples. The clean-up procedure, however, does not remove all of the interference. Based on the presence of the organic material, some samples did not return to baseline.

TPH was detected in nineteen (19) soil samples ranging from 16 mg/kg in soil sample BH15-SS1 to 40,000 mg/kg in soil sample BH3-SS4. The laboratory analytical report indicated that petroleum hydrocarbon products impacting the soil samples resembled either weathered fuel oil, lube oil, possibly the lube oil fraction or there was no resemblance to petroleum hydrocarbons in the fuel oil and lube oil range.

Concentrations of F1 PHC were detected in twelve (12) soil samples with concentrations ranging from 3.5 mg/kg in BH13-SS5 to 1,400 mg/kg in BH3-SS4. The concentrations of

F1 PHC detected in three (3) soil samples (*i.e.*, BH3-SS4, BH6-SS4 and BH15-SS3) exceeded the applicable CCME CWS Tier I screening value of 320 mg/kg (eco soil contact and indoor air) for a commercial site with coarse grained soil and the Tier I Management Limit of 700 mg/kg for a commercial site. Two (2) samples (*i.e.*, BH3-SS4 and BH6-SS4) also exceeded the applicable CCME CWS Tier I screening value of 970 mg/kg (protection of groundwater) for a commercial site with coarse grained soil.

Concentrations of F2 PHC were detected in twelve (12) soil samples with concentrations ranging from 19 mg/kg in BH14-AS3C to 24,000 mg/kg in BH3-SS4. The detected F2 PHC concentrations in six (6) samples (*i.e.*, BH2-SS5, BH3-SS4, BH4-SS5, BH6-SS4, BH14-SS3 and BH15-SS3) exceeded the applicable CCME CWS Tier I screening values of 260 mg/kg (eco soil contact) and 380 mg/kg (protection of groundwater) for a commercial site with coarse grained soil and five (5) samples also exceeded the Tier I Management Limit of 1,000 mg/kg for a commercial site.

Concentrations of F3 PHC were detected in twenty (20) soil samples with concentrations ranging from 16 mg/kg in BH15-SS1 to 14,300 mg/kg in BH3-SS4. The detected F3 PHC concentrations in four (4) samples (*i.e.*, BH3-SS4, BH6-SS4, BH14-AS3C and BH15-SS3) exceeded the applicable CCME CWS Tier I screening value of 1,700 mg/kg for a commercial site with coarse-grained soil and one (1) sample (*i.e.*, BH3-SS4) also exceeded the Tier I Management Limit of 3,500 mg/kg for a commercial site.

Benzene was detected in seven (7) soil samples with concentrations ranging from 0.030 mg/kg in BH10-SS1 to 0.83 mg/kg in BH2-SS7. The benzene concentration in six (6) samples (*i.e.*, BH1-SS3, BH2-SS7, BH3-SS4, BH4-SS5, BH13-SS3 and BH14-SS3) exceeded the applicable CCME guideline of 0.03 mg/kg for a commercial site with coarse-grained soil.

Toluene was detected in nine (9) soil samples at concentrations ranging from 0.056 mg/kg in BH10-SS1 to 0.29 mg/kg in BH2-SS7. The toluene concentrations did not exceed the applicable CCME guideline of 0.37 mg/kg for a commercial site with coarse-grained soil.

Ethylbenzene was detected in seven (7) soil samples at concentrations ranging from 0.044 mg/kg in BH14-SS3 to 1.8 mg/kg in BH3-SS4. The ethylbenzene concentration in four (4) samples (*i.e.*, BH2-SS7, BH3-SS4, BH6-SS4 and BH15-SS3) exceeded the applicable CCME guideline of 0.082 mg/kg for a commercial site with coarse-grained soil.

Xylenes were detected in ten (10) soil samples at concentrations ranging from 0.057 mg/kg in BH13-SS5 to 4.0 mg/kg in BH6-SS4. The xylenes concentrations did not exceed the applicable CCME guideline of 11 mg/kg for a commercial site with coarse-grained soil.

3.2.2 Available Metals in Soil

Available metals analysis was conducted on twenty-one (21) soil samples including one (1) to two (2) soil samples collected from each of the fifteen (15) boreholes/monitor wells (*i.e.*, BH1 to BH15), plus two (2) laboratory duplicate samples (*i.e.*, BH2-SS5 and BH6-SS4). Results of the laboratory analysis for available metals in soil are presented in Table C.3, Appendix C.

The detected concentrations of one (1) or more metal parameters in seven (7) soil samples (*i.e.*, BH2-SS5, BH2-SS5 Lab-Dup, BH2-SS7, BH3-SS4, BH4-SS5, BH14-SS3 and BH15-SS3) exceeded the applicable CCME guidelines for soil at a commercial site.

The following exceedances of the CCME guidelines were detected:

- Arsenic (guideline of 12 mg/kg) – BH2-SS5 (19 mg/kg), BH2-SS5 Lab-Dup (20 mg/kg), BH2-SS7 (16 mg/kg), BH4-SS5 (46 mg/kg), BH14-SS3 (15 mg/kg)
- Copper (guideline of 91 mg/kg) – BH2-SS5 Lab-Dup (120 mg/kg), BH3-SS4 (280 mg/kg), BH4-SS5 (130 mg/kg)
- Lead (guideline of 260 mg/kg) – BH2-SS7 (280 mg/kg), BH3-SS4 (390 mg/kg), BH4-SS5 (2,700 mg/kg), BH14-SS3 (340 mg/kg), BH15-SS3 (850 mg/kg)
- Nickel (guideline of 50 mg/kg) – BH4-SS5 (73 mg/kg)
- Tin (guideline of 300 mg/kg) – BH4-SS5 (320 mg/kg)
- Zinc (guideline of 360 mg/kg) – BH4-SS5 (880 mg/kg)

None of the other detected levels of available metals exceeded the applicable CCME guidelines for soil at a commercial site, where such guidelines exist.

3.2.3 PAHs in Soil

PAHs analysis was conducted on twenty-one (21) soil samples including one (1) to two (2) soil samples collected from each of the fifteen (15) boreholes/monitor wells (*i.e.*, BH1 to BH15), plus three (3) laboratory duplicate samples (*i.e.*, BH1-SS3, BH5-SS4 and BH13-SS3). Results of the laboratory analysis for PAHs in soil are presented in Table C.5, Appendix C.

Various PAH parameters were detected in all of the soil samples analyzed and the detected concentrations of one (1) or more PAH parameters in four (4) soil samples (*i.e.*, BH4-SS5, BH5-SS4, BH5-SS4 Lab-Dup and BH14-SS3) exceeded the applicable CCME guidelines for soil at a commercial site.

The following exceedances of the CCME guidelines were detected:

- Fluoranthene (guideline of 9.6 mg/kg) – BH5-SS4 (12 mg/kg), BH5-SS4 Lab-Dup (44 mg/kg), BH14-SS3 (64 mg/kg)
- Naphthalene (guideline of 22 mg/kg) – BH14-SS3 (38 mg/kg)
- Phenanthrene (guideline of 50 mg/kg) – BH14-SS3 (100 mg/kg)
- Benzo[a]anthracene (guideline of 10 mg/kg) – BH5-SS4 Lab-Dup (22 mg/kg), BH14-SS3 (25 mg/kg)
- Benzo[b]fluoranthene (guideline of 10 mg/kg) – BH14-SS3 (11 mg/kg)

- Benzo(a)pyrene TPE (total potency equivalent) concentration (guideline of 5.3 mg/kg) – BH4-SS5 (9.7 mg/kg), BH5-SS4 (7.2 mg/kg), BH5-SS4 Lab-Dup (24.1 mg/kg), BH14-SS3 (23.9 mg/kg)

None of the other detected levels of PAHs exceeded the applicable CCME guidelines for soil at a commercial site, where such guidelines exist.

3.2.4 PCBs in Soil

PCBs analysis was conducted on nineteen (19) soil samples including one (1) to two (2) soil samples collected from each of the fifteen (15) boreholes/monitor wells (*i.e.*, BH1 to BH15), plus four (4) laboratory duplicate samples (*i.e.*, BH1-SS3, BH4-SS5, BH5-SS4 and BH15-SS1). Results of the laboratory analysis for PCBs in soil are presented in Table C.6, Appendix C.

Concentrations of PCBs were not detected in the soil samples analyzed.

3.2.5 Total Oil and Grease in Soil

Total oil and grease analysis was conducted on six (6) soil samples (*i.e.*, BH2-SS5, BH5-SS4, BH6-SS4, BH8-SS4, BH13-SS5 and BH15-SS3), plus one (1) laboratory duplicate sample (*i.e.*, BH8-SS3). Results of the laboratory analysis for total oil and grease in soil are presented in Table C.7, Appendix C.

Concentrations of total oil and grease were detected in all of the soil samples ranging from 480 mg/kg in BH13-SS5 to 5,200 mg/kg in BH6-SS4. There is no known federal regulatory guideline or disposal criteria for total oil and grease in soil.

3.2.6 Leachate in Soil

Leachability for petroleum hydrocarbons, lead, fluoranthene, naphthalene and phenanthrene was carried out on four (4) soil samples (*i.e.*, BH6-SS4, BH14-SS3, BH14-AS3C and BH15-SS3). Leachability for some parameters was also carried out on two (2) laboratory duplicate samples of BH14-SS3 and BH14-AS3C. Note that other leachate requests were made to the laboratory, but they could not be completed due to the lack of sample material remaining. The results are presented in Table C.7 in Appendix C, along with the applicable guidelines. The corresponding analytical report from Maxxam Analytics is presented in Appendix D.

Concentrations of F1 PHC were detected in the leachate from the tested samples ranging from 0.92 µg/L to 1.7 µg/L. A F2 PHC concentration was detected in the leachate from one (1) of the tested samples of 0.46 µg/L (0.47 µg/L in the laboratory duplicate sample). F3 PHC was not detected. Concentrations of lead were detected in the leachate from the tested samples ranging from 10 µg/L to 2,200 µg/L, but they did not exceed the regulatory guideline (*i.e.*, 5,000 µg/L). Concentrations of fluoranthene were detected in the leachate from three (3) tested samples ranging from 0.21 µg/L to 8.5 µg/L. Concentrations of naphthalene were detected in the leachate from two (2) tested samples ranging from 8.4 µg/L to 600 µg/L. Concentrations of phenanthrene were detected in the leachate from four (4) tested samples, plus a laboratory

duplicate, ranging from 0.2 µg/L to 93 µg/L. Note that there are no regulatory guidelines for petroleum hydrocarbons, lead, fluoranthene, naphthalene and phenanthrene in leachate.

3.2.7 Soil Exceedances

The current Phase II ESA identified concentrations of contaminants in soil on the site exceeding the applicable guidelines and are summarized in Table 3.2, as referenced in Section 1.5.

Table 3.2 Soil Sample Exceedances

Monitor Well	Sample No.	Parameter/ Concentration (mg/kg)	Guideline (mg/kg)	Reference
BH1	BH1-SS3	Benzene = 0.16	0.03	CCME CSQGs for commercial land use
BH2	BH2-SS5	F2 PHC = 1,800	260 (eco); 380 (gw); 1,000	Table 3, CCME CWS for PHCs in soil, eco soil contact and protection of groundwater for aquatic life and management limit, commercial site
		Arsenic = 19 & 20 (Lab-Dup)	12	CCME CSQGs for commercial land use
		Copper = 120 (Lab-Dup)	91	
BH2	BH2-SS7	Benzene = 0.83	0.03	CCME CSQGs for commercial land use
		Ethylbenzene = 0.66	0.082	
		Arsenic = 16	12	
		Lead = 280	260	
BH3	BH3-SS4	Benzene = 0.36	0.03	CCME CSQGs for commercial land use
		Ethylbenzene = 1.8	0.082	Table 3, CCME CWS for PHCs in soil, eco soil contact, indoor air and/or protection of groundwater for aquatic life and management limit, commercial site
		F1 PHC = 1,400	320 (eco/indoor); 970 (gw); 700	
		F2 PHC = 24,000	260 (eco); 380 (gw); 1,000	
		F3 PHC = 14,300	1,700 (eco); 1,000	
		Copper = 280	91	CCME CSQGs for commercial land use
		Lead = 390	260	
BH4	BH4-SS5	Benzene = 0.18	0.03	CCME CSQGs for commercial land use
		F2 PHC = 1,300	260 (eco); 380 (gw); 1,000	Table 3, CCME CWS for PHCs in soil, eco soil contact and protection of groundwater for aquatic life and management limit, commercial site
		Benzene = 0.087 (fractionation sample)	0.03	CCME CSQGs for commercial land use
		Arsenic = 46	12	
		Copper = 130	91	
		Lead = 2,700	260	
		Nickel = 73	50	
		Tin = 320	300	
		Zinc = 880	360	
		Benzo(a)pyrene TPE = 9.7	5.3	

Monitor Well	Sample No.	Parameter/ Concentration (mg/kg)	Guideline (mg/kg)	Reference
BH5	BH5-SS4	Benzo[a]anthracene = 22	10	CCME CSQGs for commercial land use
		Benzo(a)pyrene TPE = 7.2 & 24.1 (Lab-Dup)	5.3	
		Fluoranthene = 12 & 44 (Lab-Dup)	9.6	
BH6	BH6-SS4	Ethylbenzene = 0.73 & 0.60 (fractionation sample)	0.082	CCME CSQGs for commercial land use
		F1 PHC = 1,200 & 830 (fractionation sample)	320 (eco/indoor); 970 (gw); 700	Table 3, CCME CWS for PHCs in soil, eco soil contact, indoor air, protection of groundwater for aquatic life and/or management limit, commercial site
		F2 PHC = 4,300 & 3,320 (fractionation sample)	260 (eco); 380 (gw); 1,000	
		F3 PHC = 2,200 & 2,200 (fractionation sample)	1,700 (eco); 1,000	
BH13	BH13-SS5	Benzene = 0.038	0.03	CCME CSQGs for commercial land use
BH14	BH14-SS3	Benzene = 0.033	0.03	CCME CSQGs for commercial land use
		F2 PHC = 670	260 (eco); 380 (gw)	Table 3, CCME CWS for PHCs in soil, eco soil contact and protection of groundwater for aquatic life, commercial site
		Arsenic = 15	12	CCME CSQGs for commercial land use
		Lead = 340	260	
		Fluoranthene = 12	9.6	
		Naphthalene = 38	22	
		Phenanthrene = 100	50	
		Benzo[a]anthracene = 25	10	
		Benzo[b]fluoranthene = 11	10	
		Benzo(a)pyrene TPE = 23.9	5.3	
	BH14-AS3C	F3 PHC = 2,500	1,700 (eco); 1,000	Table 3, CCME CWS for PHCs in soil, eco soil contact and management limit, commercial site
BH15	BH15-SS3	Ethylbenzene = 0.085 & 0.10 (fractionation sample)	0.082	CCME CSQGs for commercial land use
		F1 PHC = 720 & 614 (fractionation sample)	320 (eco/indoor); 700	Table 3, CCME CWS for PHCs in soil, eco soil contact, indoor air, protection of groundwater for aquatic life and/or management limit, commercial site
		F2 PHC = 5,000 & 3,320 (fractionation sample)	260 (eco); 380 (gw); 1,000	
		F3 PHC = 1,800	1,700 (eco); 1,000	
		Lead = 850	260	CCME CSQGs for commercial land use

3.3 Groundwater Analytical Results

Results of the laboratory analyses of groundwater samples for TPH/BTEX, TPH/BTEX fractionation, dissolved metals, PAHs, PCBs and general chemistry are presented in Tables C.8

to C.13, Appendix C. The corresponding analytical reports from Maxxam Analytics are presented in Appendix D.

3.3.1 Petroleum Hydrocarbons in Groundwater

Petroleum hydrocarbon (TPH/BTEX) analysis was conducted on nine (9) groundwater samples (*i.e.*, BH1, BH2, BH4, BH5, BH7, BH8, BH11, BH13 and BH15). Results of the laboratory analysis for TPH/BTEX in groundwater are presented in Table C.8, Appendix C. Two (2) groundwater samples collected from monitor wells BH6 and BH15 were analyzed for TPH fractionation. TPH fractionation results are presented in Table C.9, Appendix C.

TPH was detected in the groundwater samples from monitor wells BH4, BH5, BH6, BH7, BH8, BH11 and BH15. The TPH concentrations ranged from 0.19 mg/L in groundwater sample BH4 to 2.8 mg/L in groundwater sample BH6. The laboratory analytical report indicated that petroleum hydrocarbon products impacting the groundwater samples resembled either gasoline, fuel oil or there was no resemblance to petroleum hydrocarbons in the fuel oil and/or lube oil range. Based on the presence of the organic material, some samples did not return to baseline.

The concentration of F1 PHC in the groundwater sample from BH6 (1.21 mg/L) exceeded the Ontario MOE guideline of 0.42 mg/L for a non-potable site within 30 m of a water body. The concentrations of F2 PHC in the groundwater samples from BH6 (1.25 mg/L), BH8 (1.2 mg/L), BH11 (0.28 mg/L) and BH15 (1.1 mg/L and 1.63 mg/L in fractionation sample) exceeded the Ontario MOE guideline of 0.15 mg/L. The concentrations of the F3 PHC in the groundwater samples from BH8 (0.63 mg/L) and BH15 (0.61 mg/L in fractionation sample) exceeded the Ontario MOE guideline of 0.15 mg/L.

Benzene was detected in three (3) groundwater samples (*i.e.*, BH4, BH6 and BH11); toluene and ethylbenzene were detected in two (2) groundwater samples (*i.e.*, BH6 and BH11); and, xylenes were detected in three (3) groundwater samples (*i.e.*, BH6, BH11 and BH15). These detected concentrations did not exceed the FIGQGs or the Ontario MOE guidelines, where applicable.

3.3.2 Dissolved Metals in Groundwater

Dissolved metals analysis was conducted on ten (10) groundwater samples (*i.e.*, BH1, BH2, BH4, BH5, BH6, BH7, BH8, BH11, BH13 and BH15). Results of the laboratory analysis for dissolved metals in groundwater are presented in Table C.10, Appendix C.

The detected concentrations of one (1) or more metal parameters in nine (9) groundwater samples (*i.e.*, BH1, BH2, BH4, BH5, BH7, BH8, BH11, BH13 and BH15) exceeded the applicable FIGQGs for marine life water use.

The following exceedances of the FIGQGs were detected:

- Barium (guideline of 500 µg/L) – BH11 (750 µg/L)
- Copper (guideline of 2.0 µg/L) – BH7 (3.6 µg/L), BH11 (2.3 µg/L)

- Mercury (guideline of 0.016 µg/L) – BH1 (0.053 µg/L), BH2 (0.05 µg/L), BH5 (0.10 µg/L), BH7 (0.022 µg/L), BH8 (0.35 µg/L), BH11 (0.041 µg/L), BH13 (0.18 µg/L), BH15 (1.3 µg/L)
- Zinc (guideline of 10 µg/L) – BH5 (10.8 µg/L), BH7 (43.6 µg/L), BH13 (23.4 µg/L)

None of the other detected concentrations of dissolved metals exceeded the applicable FIGQGs for marine life water use, where such guidelines exist.

In samples BH8 and BH15, the detected concentrations of mercury (0.35 µg/L and 1.3 µg/L, respectively) also exceeded the Ontario MOE guideline for a non-potable site with coarse grained soil for this parameter (*i.e.*, 0.29 µg/L). The detected concentrations of sodium in six (6) samples ranging from 277,000 µg/L to 1,570,000 µg/L in samples BS1, BH2, BH4, BH7, BH11 and BH13) also exceeded the Ontario MOE guideline for a non-potable site with coarse grained soil for this parameter (*i.e.*, 180,000 µg/L). None of the other detected concentrations of dissolved metals exceeded the applicable Ontario MOE guidelines for a non-potable site within 30 m of a water body, where guidelines exist.

3.3.3 PAHs in Groundwater

PAH analysis was conducted on ten (10) groundwater samples (*i.e.*, BH1, BH2, BH4, BH5, BH6, BH7, BH8, BH11, BH13 and BH15). Results of the laboratory analysis for PAHs in groundwater are presented in Table C.11, Appendix C.

The detected concentrations of naphthalene in three (3) groundwater samples (*i.e.*, BH1 at 6.8 µg/L, BH6 at 13 µg/L and BH11 at 3.6 µg/L) exceeded the applicable FIGQG for marine life water use (*i.e.*, 1.4 µg/L).

The detected concentrations of one (1) or more PAH parameters in four (4) groundwater samples (*i.e.*, BH1, BH2, BH5 and BH8) exceeded the applicable Ontario MOE guidelines for for a non-potable site within 30 m of a water body. The following exceedances of the Ontario MOE guidelines were detected:

- Anthracene (guideline of 1.0 µg/L) – BH1 (9.1 µg/L), BH5 (1.8 µg/L)
- Benzo(a)anthracene (guideline of 1.8 µg/L) – BH1 (12 µg/L), BH5 (3.4 µg/L)
- Benzo(a)pyrene (guideline of 0.81 µg/L) – BH1 (7.9 µg/L), BH5 (2.3 µg/L)
- Benzo(b)fluoranthene (guideline of 0.75 µg/L) – BH1 (5.4 µg/L), BH5 (1.6 µg/L)
- Benzo(g,h,i)perylene (guideline of 0.2 µg/L) – BH1 (3.8 µg/L), BH2 (0.34 µg/L), BH5 (1.0 µg/L), BH8 (0.33 µg/L)
- Benzo(k)fluoranthene (guideline of 0.4 µg/L) – BH1 (3.2 µg/L), BH5 (1.0 µg/L)
- Chrysene (guideline of 0.7 µg/L) – BH1 (11 µg/L), BH5 (3.3 µg/L), BH8 (0.71 µg/L)
- Dibenzo(a,h,)anthracene (guideline of 0.4 µg/L) – BH1 (0.89 µg/L)

- Indeno(1,2,3-c,d) pyrene (guideline of 0.2 µg/L) – BH1 (2.9 µg/L), BH2 (0.25 µg/L), BH5 (0.73 µg/L), BH8 (0.25 µg/L)

None of the other detected concentrations of dissolved metals exceeded the applicable Ontario MOE guidelines for a non-potable site within 30 m of a water body, where guidelines exist.

However, it was noted during the laboratory analysis that the groundwater samples contained sediment. Because sediment was present in the groundwater samples, it is possible that the PAHs concentrations were influenced by PAH impacted sediment in the groundwater, rather than PAHs in solution in the groundwater.

3.3.4 PCBs in Groundwater

PCB analysis was conducted on ten (10) groundwater samples (*i.e.*, BH1, BH2, BH4, BH5, BH6, BH7, BH8, BH11, BH13 and BH15). Results of the laboratory analysis for PCBs in groundwater are presented in Table C.12, Appendix C.

PCBs were not detected in any of the groundwater samples analyzed.

3.3.5 General Chemistry in Groundwater

General chemistry analysis was conducted on ten (10) groundwater samples (*i.e.*, BH1, BH2, BH4, BH5, BH6, BH7, BH8, BH11, BH13 and BH15), plus one (1) laboratory duplicate sample of BH1. Results of the laboratory analysis of general chemistry in groundwater are presented in Table C.13, Appendix C.

The measured pH in six (6) groundwater samples did not fall within the applicable FIGQG for marine life water use as follows:

- pH (guideline of 7.0 – 8.7) – BH2 (6.94), BH4 (6.85), BH5 (6.97), BH6 (6.91), BH8 (6.90), BH11 (8.99)

None of the other detected parameters of general chemistry exceeded the applicable FIGQGs for marine life water use, where guidelines exist.

3.3.6 Groundwater Exceedances

Table 3.3 summarizes the groundwater sample results from the current site investigation that exceed the applicable guidelines, as referenced in Section 1.5.

Table 3.3 Groundwater Sample Exceedances

Sample No.	Parameter/ Concentration (mg/L)	Guideline (mg/L or µg/L)	Reference
BH1	Mercury = 0.053	0.016	Table 3, FIGQGs, Generic Guidelines for Commercial & Industrial Land Uses, Tier 2 for Marine Life Water Use
	Sodium = 414,000	180,000	Table 9, ON MOE Soil, Groundwater and Sediment Standards. Generic site condition standards - within 30 m of a water body, non-potable groundwater condition
	Anthracene = 9.1	1.0	
	Benzo(a)anthracene = 12	1.8	
	Benzo(a)pyrene = 7.9	0.81	
	Benzo(b)fluoranthene = 5.4	0.75	
	Benzo(g,h,i)perylene = 3.8	0.2	
	Benzo(k)fluoranthene = 3.2	0.4	
	Chrysene = 11	0.7	
	Dibenzo(a,h,)anthracene = 0.89	0.4	
	Indeno(1,2,3-c,d) pyrene = 2.9	0.2	
	Naphthalene = 6.8	1.4	Table 3, FIGQGs, Generic Guidelines for Commercial & Industrial Land Uses, Tier 2 for Marine Life Water Use
BH2	Mercury = 0.050	0.016	Table 3, FIGQGs, Generic Guidelines for Commercial & Industrial Land Uses, Tier 2 for Marine Life Water Use
	Sodium = 1,240,000	180,000	Table 9, ON MOE Soil, Groundwater and Sediment Standards. Generic site condition standards - within 30 m of a water body, non-potable groundwater condition
	Benzo(g,h,i)perylene = 0.34	0.2	
	Indeno(1,2,3-c,d) pyrene = 0.25	0.2	Table 3, FIGQGs, Generic Guidelines for Commercial & Industrial Land Uses, Tier 2 for Marine Life Water Use
	pH = 6.94	7.0 – 8.7	
BH4	Sodium = 1,570,000	180,000	Table 9, ON MOE Soil, Groundwater and Sediment Standards. Generic site condition standards - within 30 m of a water body, non-potable groundwater condition
	pH = 6.85	7.0 – 8.7	Table 3, FIGQGs, Generic Guidelines for Commercial & Industrial Land Uses, Tier 2 for Marine Life Water Use
BH5	Mercury = 0.10	0.016	Table 3, FIGQGs, Generic Guidelines for Commercial & Industrial Land Uses, Tier 2 for Marine Life Water Use
	Zinc = 10.8	10	Table 9, ON MOE Soil, Groundwater and Sediment Standards. Generic site condition standards - within 30 m of a water body, non-potable groundwater condition
	Anthracene = 1.8	1.0	
	Benzo(a)anthracene = 3.4	1.8	
	Benzo(a)pyrene = 2.3	0.81	
	Benzo(b)fluoranthene = 1.6	0.75	
	Benzo(g,h,i)perylene = 1.0	0.2	
	Benzo(k)fluoranthene = 1.0	0.4	
	Chrysene = 3.3	0.7	
	Indeno(1,2,3-c,d) pyrene = 0.73	0.2	
	pH = 6.97	7.0 – 8.7	Table 3, FIGQGs, Generic Guidelines for Commercial & Industrial Land Uses, Tier 2 for Marine Life Water Use
BH6	F1 PHC = 1.21	0.42	Table 9, ON MOE Soil, Groundwater and Sediment Standards. Generic site condition standards - within 30 m of a water body, non-potable groundwater condition
	F2 PHC = 1.25	0.15	
	pH = 6.91	7.0 – 8.7	Table 3, FIGQGs, Generic Guidelines for Commercial & Industrial Land Uses, Tier 2 for Marine Life Water Use

Sample No.	Parameter/ Concentration (mg/L)	Guideline (mg/L or µg/L)	Reference
BH7	Copper = 3.6	2.0	Table 3, FIGQGs, Generic Guidelines for Commercial & Industrial Land Uses, Tier 2 for Marine Life Water Use
	Mercury = 0.022	0.016	
	Sodium = 277,000	180,000	Table 9, ON MOE Soil, Groundwater and Sediment Standards. Generic site condition standards - within 30 m of a water body, non-potable groundwater condition
	Zinc = 43.6	10	Table 3, FIGQGs, Generic Guidelines for Commercial & Industrial Land Uses, Tier 2 for Marine Life Water Use
BH8	F2 PHC = 1.2	0.15	Table 9, ON MOE Soil, Groundwater and Sediment Standards. Generic site condition standards - within 30 m of a water body, non-potable groundwater condition
	F3 PHC = 0.63	0.5	
	Mercury = 0.35	0.016; 0.29	Table 3, FIGQGs, Generic Guidelines for Commercial and Industrial Land Uses, Tier 2 for Marine Life Water Use; Table 9, ON MOE Soil, Groundwater and Sediment Standards. Generic site condition standards - within 30 m of a water body, non-potable groundwater condition
	Benzo(g,h,i)perylene = 0.33	0.2	Table 9, ON MOE Soil, Groundwater and Sediment Standards. Generic site condition standards - within 30 m of a water body, non-potable groundwater condition
	Chrysene = 0.71	0.7	
	Indeno(1,2,3-c,d) pyrene = 0.25	0.2	
	pH = 6.90	7.0 – 8.7	Table 3, FIGQGs, Generic Guidelines for Commercial & Industrial Land Uses, Tier 2 for Marine Life Water Use
BH11	F2 PHC = 0.28	0.15	Table 9, ON MOE Soil, Groundwater and Sediment Standards. Generic site condition standards - within 30 m of a water body, non-potable groundwater condition
	Barium = 750	500	Table 3, FIGQGs, Generic Guidelines for Commercial & Industrial Land Uses, Tier 2 for Marine Life Water Use
	Copper = 2.3	2.0	
	Mercury = 0.041	0.016	
	Sodium = 378,000	180,000	Table 9, ON MOE Soil, Groundwater and Sediment Standards. Generic site condition standards - within 30 m of a water body, non-potable groundwater condition
	Naphthalene = 3.6	1.4	Table 3, FIGQGs, Generic Guidelines for Commercial & Industrial Land Uses, Tier 2 for Marine Life Water Use
	pH = 8.99	7.0 – 8.7	
BH13	Mercury = 0.18	0.016	Table 3, FIGQGs, Generic Guidelines for Commercial & Industrial Land Uses, Tier 2 for Marine Life Water Use
	Zinc = 23.4	10	
BH15	F2 PHC = 1.1 & 1.63 (fractionation sample)	0.15	Table 9, ON MOE Soil, Groundwater and Sediment Standards. Generic site condition standards - within 30 m of a water body, non-potable groundwater condition
	F2 PHC = 0.61 (fractionation sample)	0.5	
	Mercury = 1.3	0.016	Table 3, FIGQGs, Generic Guidelines for Commercial & Industrial Land Uses, Tier 2 for Marine Life Water Use
	Sodium = 378,000	180,000	Table 9, ON MOE Soil, Groundwater and Sediment Standards. Generic site condition standards - within 30 m of a water body, non-potable groundwater condition
	Zinc = 23.4	10	Table 3, FIGQGs, Generic Guidelines for Commercial & Industrial Land Uses, Tier 2 for Marine Life Water Use

3.4 Radon

Preliminary radon gas monitoring (*i.e.*, a screening survey) was carried out on March 28, 2012 from one borehole/monitor well (*i.e.*, BH6) to assess whether radon gas was present at the site. The radon gas monitoring was conducted by an environmental technician from Stantec at the monitor well location using a portable, direct-reading radon gas detector (*i.e.*, an Alpha II Radon Detector). Calibration of the radon gas detector was conducted prior to the sampling event to ensure proper function and accurate measurements.

Using a low flow air pump set at 3 L/min, a continuous air sample from a sampling port on the sealed well cap of the borehole was drawn into a sealed container containing the radon detector. The radon detector was operational for a period of four (4) hours with a sample interval time of one (1) hour.

See Table 3.4 for the results of the radon gas monitoring. Radon concentrations from the borehole/monitor well ranged from 291 becquerels per cubic metre (Bq/m³) to 837 Bq/m³, with an average over four (4) hours of 558 Bq/m³. Because subsurface soil gas vapours were measured, any predicted indoor air concentration would be expected to be much less due to dilution with ambient air; however there is no known correlation between soil gas measurements pre-construction and an indoor concentration. There is also no known federal environmental guideline for radon in soil gas or for radon in ambient air within a commercial property. As a reference, Health Canada recommends remedial measures within a residential property whenever the average annual radon concentration exceeds 200 Bq/m³ in the normal occupancy area.

Table 3.4 Radon Gas Monitoring Results

Borehole I.D.	Date Measured	Time Interval (hr)	Radon Concentration (pCi/L)	Radon Concentration (Bq/m ³) ^a
BH6	28-Mar-13	1	7.87	291
		2	13.44	497
		3	22.63	837
		4	17.05	631
		Average	15.08	558

Notes:

a = 1 pCi/L = 37 Bq/m³ (Health Canada http://hc-sc.gc.ca/ewh-semt/radiation/radon/faq_fq-eng.php)

Based on the detected radon concentrations in short-term monitoring of soil gas, the following is recommended:

1. Follow the recommendations for radon preventative construction methods for new construction found in the Canadian National Building Code 2010 such as controlling air leakage with a sub-slab seamless vapour barrier and providing a ventilation system. These construction methods should mitigate the ingress of airborne radon from the ground. Another useful guide for construction is the United States Environmental

Protection Agency (EPA) "EPA/625/R-92/016 Radon Prevention in the Design and Construction of Schools and Other Large Buildings, 1994".

2. A long term sampling program is recommended within the building post construction to determine actual indoor air radon concentrations. Follow the guidance found in the "Health Canada Guide for Radon Measurements in Public Buildings (Schools, Hospitals, Care Facilities, Detention Centres), 2008". Health Canada recommends that the radon test performed in a home or public building be a long-term measurement. Health Canada does not recommend a test of duration less than one (1) month, a minimum of three (3) months is recommended and twelve (12) months is optimum.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

Stantec conducted a Phase II ESA at the Canadian Coast Guard Southside Base located off Southside Road in St. John's, Newfoundland and Labrador NL in conjunction with a Geotechnical Investigation. The Phase II ESA was carried out between February 20, 2013 and March 28, 2013 and included the drilling of fifteen (15) boreholes complete with monitor wells at the site. Twelve (12) geotechnical/environmental boreholes (*i.e.*, BH1 to BH12) were placed on the eastern portion of the site at locations selected by PWGSC and provided to Stantec. On the western portion of the site, three (3) additional environmental boreholes complete as monitor wells (*i.e.*, BH13 to BH15) were installed. All sampling locations are shown on Drawing No. 121412551-EE-02, Appendix A. The results of the Phase II ESA are as follows:

1. Fill materials were encountered underlying the surficial layer of asphalt or reinforced concrete slab at all borehole locations. The thickness of the fill ranged from 0.6 m in borehole BH11 to as much as 6.9 m in BH2. Underlying the fill layer was a stratum of very loose to compact, brown to black, silty sand with gravel with trace to frequent amounts of organic matter consistent with a marine depositional environment (*i.e.*, marine sediment). This stratum was encountered in boreholes BH1 to BH4, BH6, BH7, BH13 and BH14; and ranged in thickness from 0.13 m in borehole BH14 to as much as 3.7 m in borehole BH01. A native glacial till layer was encountered underlying the fill or marine sediment in all boreholes except in BH8 and BH10 to BH12. The till ranged in thickness from 0.3 m in borehole BH7 to 4.1 m in borehole BH2. Bedrock was encountered in all boreholes except boreholes BH13 to BH15, where these were advanced to a predetermined depth of about 4.5 m for the installation of groundwater monitoring wells. Depth of bedrock varied from about 0.8 m in borehole BH11 to 11.6 m in borehole BH2.
2. The depths to groundwater in the boreholes and monitor wells, as measured between February 24, 2013 and March 12, 2013 during groundwater sampling, ranged from 0.50 mbgs in monitor well BH10 to 2.42 mbgs in monitor well BH15. Groundwater levels within these monitor wells are expected to vary seasonally and in response to individual

precipitation events and in response to individual precipitation events as well as in response to diurnal tidal fluctuations.

3. Based on the local topography and the measured groundwater levels, the inferred direction of local groundwater flow at the site is towards the St. John's Harbour to the northwest.
4. Free liquid phase petroleum hydrocarbons were not observed on soil or groundwater in any of the monitor wells.
5. Petroleum Hydrocarbons
 - a. The concentrations of F1, F2 and F3 PHC and/or BTEX detected in soil samples from boreholes BH1 to BH4 and BH6 on the eastern portion of the site and boreholes BH13 to BH15 on the western portion of the site exceeded the applicable guidelines.
 - b. The concentrations of F1, F2 and/or F3 PHC detected in groundwater samples from boreholes BH6, BH8 and BH11 on the eastern portion of the site and borehole BH15 on the western portion of the site exceeded the applicable guidelines.
6. Metals
 - a. The detected concentrations of one (1) or more metal parameters in soil samples from boreholes BH2, BH3 and BH4 on the eastern portion of the site and boreholes BH14 and BH15 on the western portion of the site exceeded the applicable guidelines.
 - b. The detected concentrations of one (1) or more metal parameters in groundwater samples from boreholes BH1, BH2, BH4, BH5, BH7, BH8 and BH11 on the eastern portion of the site and boreholes BH13 and BH15 on the western portion of the site exceeded the applicable guidelines.
7. PAHs
 - a. The detected concentrations of one (1) or more PAH parameters in soil samples from boreholes BH4 and BH5 on the eastern portion of the site and borehole BH14 on the western portion of the site exceeded the applicable guidelines.
 - b. The detected concentrations of one (1) or more PAH parameters in groundwater samples from boreholes BH1, BH2, BH5, BH6, BH8 and BH11 on the eastern portion of the site exceeded the applicable guidelines. However, it was noted during the laboratory analysis that the groundwater samples contained sediment. Because sediment was present in the groundwater samples, it is possible that the PAHs concentrations were influenced by PAH impacted sediment in the groundwater, rather than PAHs in solution in the groundwater.
8. See Drawing No. 121412551-EE-03 in Appendix A for the approximate extent of PHCs, metals and/or PAH concentrations in soil and groundwater exceeding applicable guidelines.

9. PCBs - Concentrations of PCBs were not detected in the soil or groundwater samples analyzed.
10. Total Oil and Grease - Concentrations of total oil and grease were detected in the soil samples analyzed from boreholes BH2, BH5, BH6 and BH8 on the eastern portion of the site and boreholes BH13 and BH15 on the western portion of the site.
11. Leachate in Soil - Leachability for petroleum hydrocarbons, lead, fluoranthene, naphthalene and phenanthrene was carried out on four (4) soil samples (*i.e.*, BH6-SS4, BH14-SS3, BH14-AS3C and BH15-SS3). Concentrations of lead were detected in the leachate from the tested samples, but they did not exceed the regulatory guideline (*i.e.*, 5,000 µg/L). Note that there are no regulatory guidelines for petroleum hydrocarbons, lead, fluoranthene, naphthalene and phenanthrene in leachate.
12. General Chemistry in Groundwater - The measured pH in groundwater samples from boreholes BH2, BH4, BH5, BH6, BH8 and BH11 on the eastern portion of the site was not within the applicable guideline.
13. Radon
 - a. Preliminary radon gas monitoring (*i.e.*, a screening survey) was carried out on March 28, 2012 from one borehole/monitor well (*i.e.*, BH6) to assess whether radon gas was present at the site.
 - b. Radon concentrations from the borehole/monitor well ranged from 291 Bq/m³ to 837 Bq/m³, with an average over four (4) hours of 558 Bq/m³. Because subsurface soil gas vapours were measured, any predicted indoor air concentration would be expected to be much less due to dilution with ambient air; however there is no known correlation between soil gas measurements pre-construction and an indoor concentration. There is also no known federal environmental guideline for radon in soil gas or for radon in ambient air within a commercial property. As a reference, Health Canada recommends remedial measures within a residential property whenever the average annual radon concentration exceeds 200 Bq/m³ in the normal occupancy area.

4.2 Recommendations

Based on the conclusions of the current Phase II ESA, Stantec offers the following recommendations:

1. It is possible that the PAHs concentrations in groundwater were influenced by PAH impacted sediment, rather than PAHs in solution in the groundwater. Collect additional groundwater samples from monitor wells BH1, BH2, BH5, BH6, BH8 and BH11 using a low flow pump to reduce sediment interference and submit for laboratory analysis of PAHs. Request that the laboratory decant the groundwater sample prior to analysis to further reduce sediment interference.
2. Identify any data gaps present and conduct a Human Health and Ecological Risk Assessment (HHERA) to evaluate potential risks to human and ecological receptors associated with residual chemical contamination on the subject site.

3. Identify the requirements for remediation and/or risk management based on the results of the risk assessments.
4. Any personnel engaged in construction and/or excavation on the site should be advised of the potential risks associated with dermal contact or ingestion of soil that contains contaminants of potential concern. A risk management plan (RMP) should be implemented prior to excavation activities. The RMP will outline the personal protective equipment (PPE) requirements (gloves, closed toed boots and coveralls) and will discuss the recommended actions to follow if exposed (washing with soap and water, cleaning of PPE, etc.).
5. Because petroleum hydrocarbons and metal exceedances were detected in site soil, should the property be redeveloped, any excess soil generated by the redevelopment should be tested prior to leaving the site to determine soil disposal options.
6. If site conditions or land uses change (e.g., residential usage, potable groundwater or if further development takes place on the site), the results of the on-site risk assessment may need to be revisited to ensure that there are no additional or increased risks to potential receptors, on-site or off-site.
7. It is our understanding that there is no current groundwater use for potable drinking water. The assumption is made that prior to any future use of groundwater for potable drinking water or other human use (*i.e.*, showering, washing), the groundwater will be tested to demonstrate that groundwater quality is within the Guidelines for Canadian Drinking Water Quality.
8. Based on the detected radon concentrations in short-term monitoring of soil gas on the site, the following is recommended:
 - a. Follow the recommendations for radon preventative construction methods for new construction found in the Canadian National Building Code 2010 such as controlling air leakage with a sub-slab seamless vapour barrier and providing a ventilation system. These construction methods should mitigate the ingress of airborne radon from the ground. Another useful guide for construction is the United States Environmental Protection Agency (EPA) "EPA/625/R-92/016 Radon Prevention in the Design and Construction of Schools and Other Large Buildings, 1994".
 - b. A long term sampling program is recommended within the building post construction to determine actual indoor air radon concentrations. Follow the guidance found in the "Health Canada Guide for Radon Measurements in Public Buildings (Schools, Hospitals, Care Facilities, Detention Centres), 2008". Health Canada recommends that the radon test performed in a home or public building be a long-term measurement. Health Canada does not recommend a test of duration less than one (1) month, a minimum of three (3) months is recommended and twelve (12) months is optimum.

5.0 CLOSURE

This report has been prepared for the sole benefit of Public Works and Government Services Canada on behalf of the Canadian Coast Guard, Fisheries and Oceans Canada. The report may not be used by any other person or entity without the express written consent of Stantec and Public Works and Government Services Canada.

Any use which a third party makes of this report, or any reliance on decisions made based on it, are the responsibility of such third parties. Stantec accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted engineering and scientific practices current at the time the work was performed. Any site-specific information provided by other parties and used or referenced by Stantec has been assumed by Stantec to be accurate. 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 can only be extrapolated to an undefined limited area around these locations. The extent of the limited area depends on the soil and groundwater conditions, as well as the history of the site reflecting natural, construction and other activities. In addition, analysis has been carried out for 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 cannot warrant against undiscovered environmental liabilities. Conclusions presented in this report should not be construed as legal advice.

Should any conditions at the site be observed or discovered that differ from those at the sample locations, or should the land use surrounding the identified hazards change significantly, we request that we be notified immediately to reassess the conclusions provided herein.

This report was prepared by Paula Brennan, M.A.Sc., P.Eng. and reviewed by Carolyn Anstey-Moore, M.Sc., M.A.Sc., P.Geo.

Respectfully submitted,

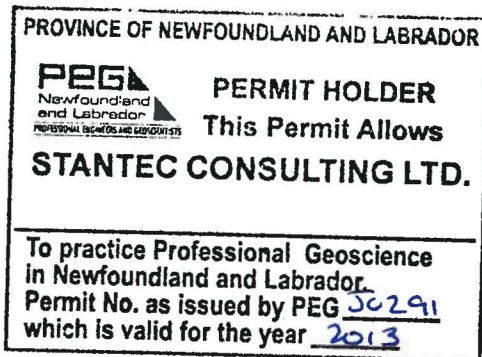
STANTEC CONSULTING LTD.



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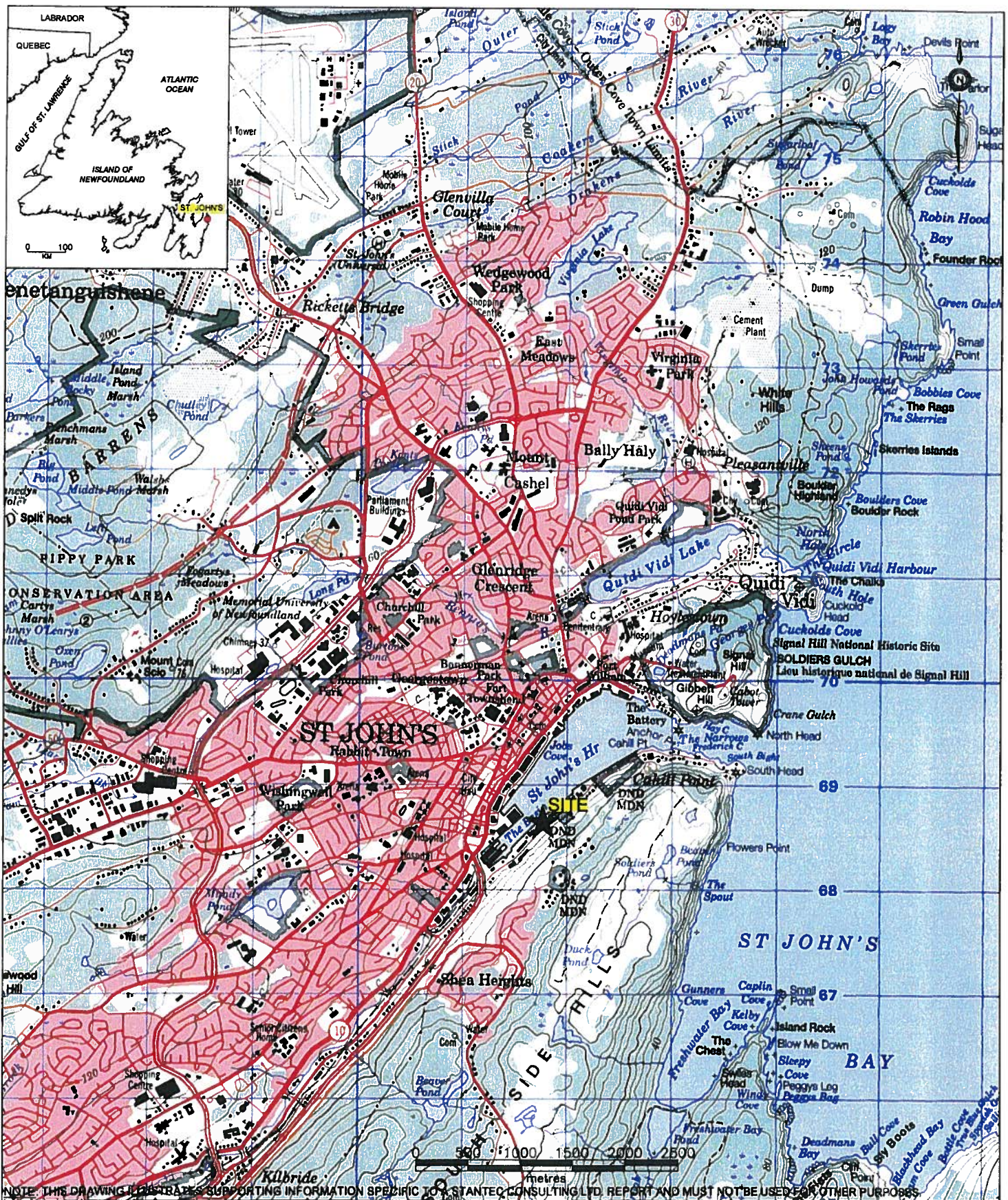


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APPENDIX A

Drawings



CLIENT:

ENVIRONMENTAL SERVICES;
PUBLIC WORKS & GOVERNMENT SERVICES CANADA

PROJECT TITLE:

PHASE II ENVIRONMENTAL SITE ASSESSMENT, CANADIAN
COAST GUARD SOUTHSIDE BASE, BERTH 28, ST. JOHN'S, NL

DRAWING TITLE:

SITE LOCATION PLAN

SCALE:

1:50,000

DATE:

APR. 4, 2013

DRAWN BY:

N.M.

CHECKED BY:

JB

EDITED BY:

-

REV. No.

0

DRAWING No:

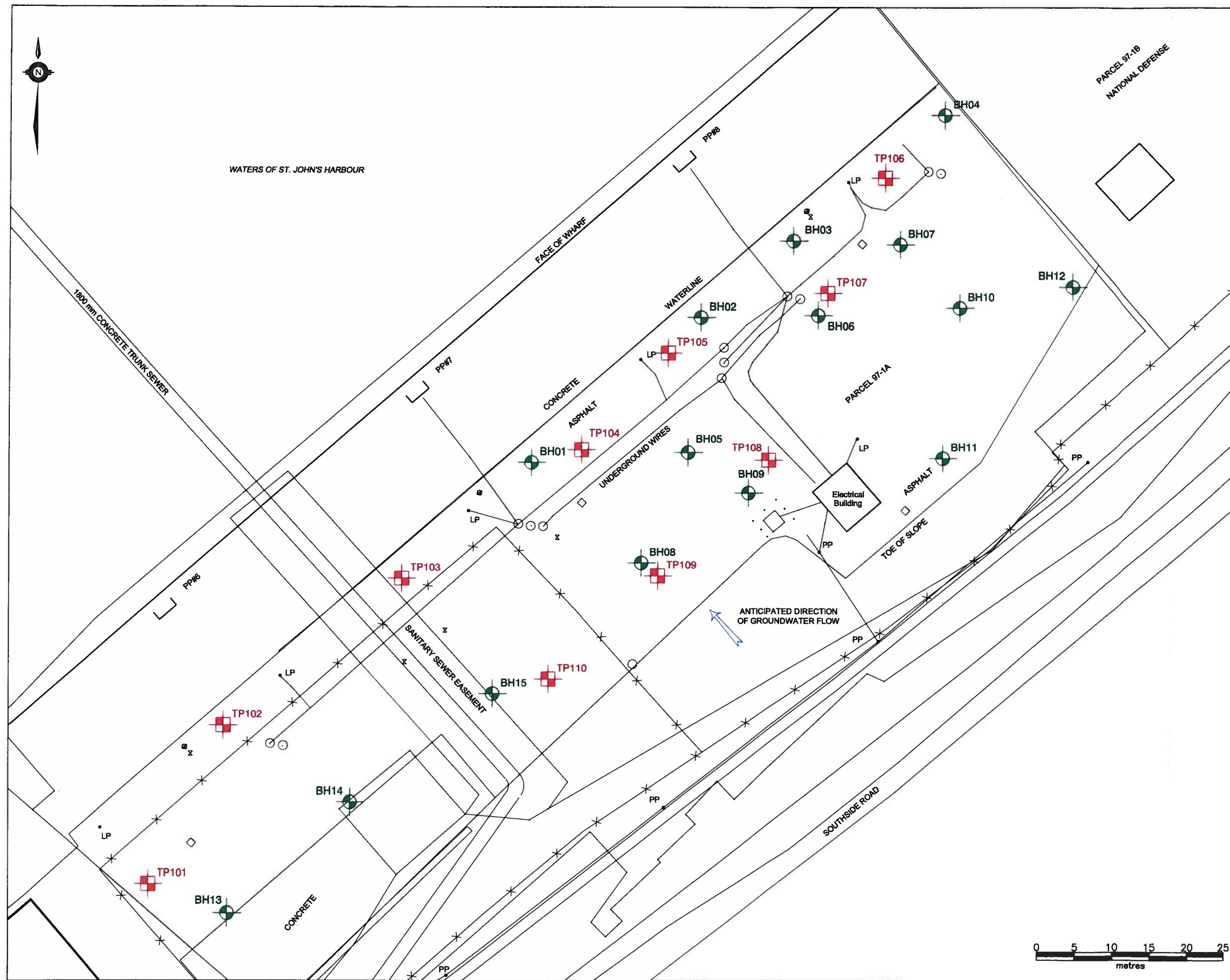
121412551-EE-01

CAD FILE:

121412551-EE-01.DWG



Stantec



LEGEND

STANTEC BOREHOLE/MONITOR WELL LOCATION (2013)

MGI TEST PIT LOCATION (2001)

NOTES:

1) THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

2) DO NOT SCALE FROM DRAWING.

3)AUTOCAD BASEMAP (S-5716-ID.dwg) PROVIDED BY CLIENT, 2013.

4) AS-ADVANCED BOREHOLE COORDINATES PROVIDED BY HAWCO KING RENOUF | ALLNORTH CONSULTANTS OF ST. JOHN'S, NL (2013).

CLIENT:

ENVIRONMENTAL SERVICES;
PUBLIC WORKS & GOVERNMENT
SERVICES CANADA

PROJECT TITLE:

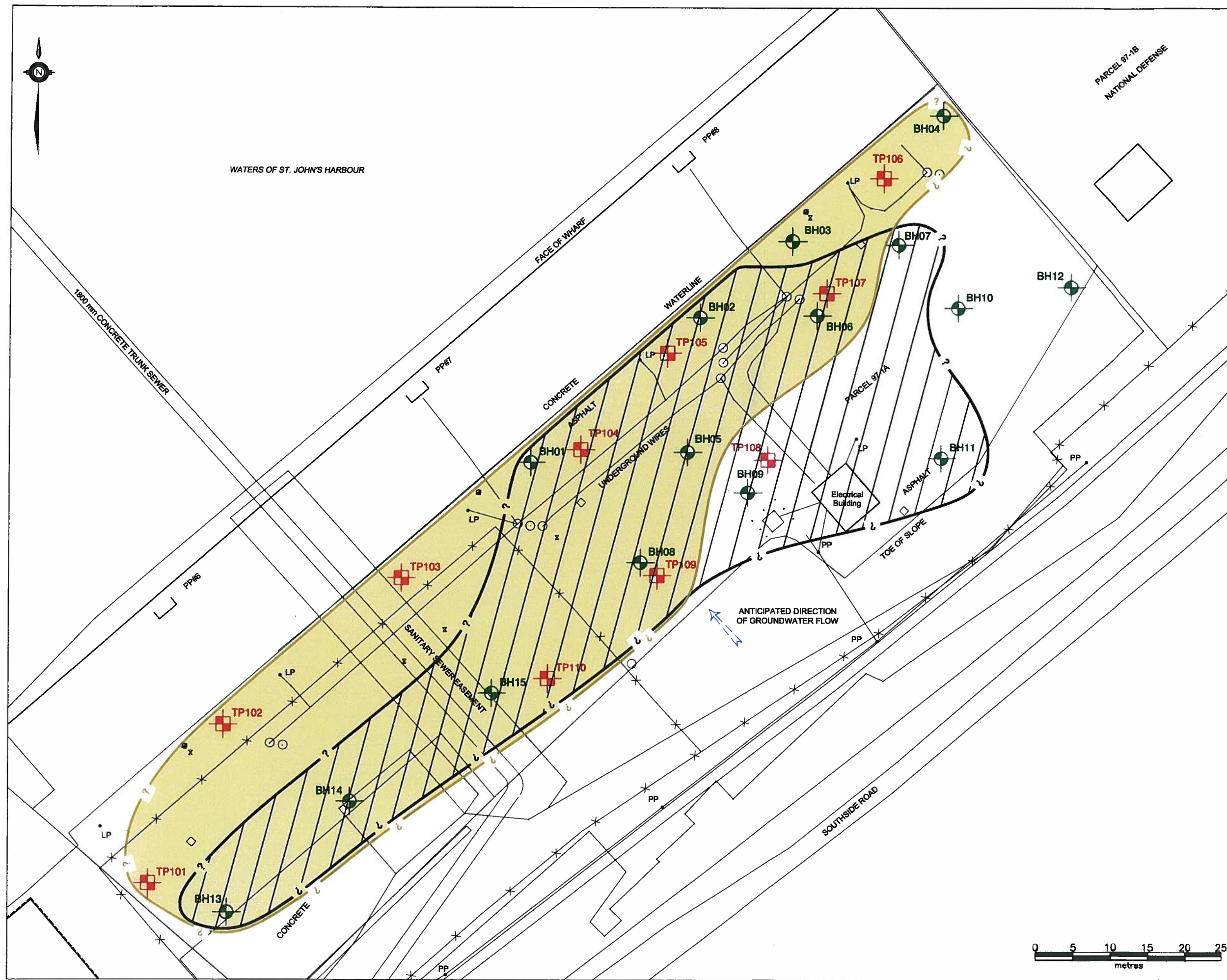
PHASE II ENVIRONMENTAL SITE
ASSESSMENT, CANADIAN COAST GUARD
SOUTHSIDE BASE, BERTH 28, ST. JOHN'S, NL

DRAWING TITLE:

SAMPLE LOCATION PLAN

Stantec Consulting Ltd.

SCALE:	1:500	DATE:	APR. 4, 2013
DRAWN BY:	N.M.	CHECKED BY:	JB
EDITED BY:	-	REV. No.	0
DRAWING No:		121412551-EE-02	
CAD FILE:		121412551-EE-02.DWG	



LEGEND

- STANTEC BOREHOLE/MONITOR WELL LOCATION (2013)
- MGI TEST PIT LOCATION (2001)
- AREA OF SOIL WITH PHC, METALS AND/OR PAH CONCENTRATIONS EXCEEDING APPLICABLE GUIDELINES FOR A COMMERCIAL SITE
- AREA OF GROUNDWATER WITH PHC, METALS AND/OR PAH CONCENTRATIONS EXCEEDING APPLICABLE GUIDELINES FOR A COMMERCIAL SITE

NOTES:

- 1) THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.
- 2) DO NOT SCALE FROM DRAWING.
- 3) AUTOCAD BASEMAP (S-5718-ID.dwg) PROVIDED BY CLIENT, 2013.
- 4) AS-ADVANCED BOREHOLE COORDINATES PROVIDED BY HAWCO KING RENOUF | ALLNORTH CONSULTANTS OF ST. JOHN'S, NL (2013).

CLIENT:

ENVIRONMENTAL SERVICES;
PUBLIC WORKS & GOVERNMENT
SERVICES CANADA


PROJECT TITLE:

PHASE II ENVIRONMENTAL SITE
ASSESSMENT, CANADIAN COAST GUARD
SOUTHSIDE BASE, BERTH 28, ST. JOHN'S, NL

DRAWING TITLE:

DELINEATION PLAN

Stantec Consulting Ltd.



SCALE:	1:500	DATE:	APR. 5, 2013
DRAWN BY:	N.M.	CHECKED BY:	FB
EDITED BY:	-	REV. No.	0
DRAWING No:		121412551-EE-03	
CAD FILE:		121412551-EE-03.DWG	

APPENDIX B

Symbols and Terms

Monitor Well Records

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

SOIL DESCRIPTION

Terminology describing common soil genesis:

<i>Rootmat</i>	- Vegetation, roots and moss with organic matter and topsoil typically forming a mattress at the ground surface
<i>Topsoil</i>	- mixture of soil and humus capable of supporting vegetative growth
<i>Peat</i>	- mixture of visible and invisible fragments of decayed organic matter
<i>Till</i>	- unstratified glacial deposit which may range from clay to boulders
<i>Fill</i>	- material below the surface identified as placed by humans (excluding buried services)

Terminology describing soil structure:

<i>Homogeneous</i>	- same color and consistency throughout
<i>Desiccated</i>	- having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc.
<i>Fissured</i>	- having cracks, and hence a blocky structure
<i>Varved</i>	- composed of regular alternating layers of silt and clay
<i>Stratified</i>	- composed of alternating successions of different soil types, e.g. silt and sand
<i>Layer</i>	- > 75 mm in thickness
<i>Seam</i>	- 2 mm to 75 mm in thickness
<i>Parting</i>	- < 2 mm in thickness

Terminology describing soil types:

The classification of soil types are made on the basis of grain size and plasticity in accordance with the Unified Soil Classification System (USCS) (ASTM D 2487 or D 2488). The classification excludes particles larger than 76 mm (3 inches). The USCS provides a group symbol (e.g. SM) and group name (e.g. silty sand) for identification.

Terminology describing cobbles, boulders, and non-matrix materials (organic matter or debris):

Terminology describing materials outside the USCS, (e.g. particles larger than 76 mm, visible organic matter, and construction debris) is based upon the proportion of these materials present:

<i>Trace, or occasional</i>	Less than 10%
<i>Some</i>	10-20%
<i>Frequent</i>	> 20%

Terminology describing compactness of cohesionless soils:

The standard terminology to describe cohesionless soils includes compactness (formerly "relative density"), as determined by the Standard Penetration Test N-Value (also known as N-Index) in accordance with ASTM D1586. A relationship between compactness condition and N-Value is shown in the following table.

Compactness Condition	SPT N-Value
<i>Very Loose</i>	<4
<i>Loose</i>	4-10
<i>Compact</i>	10-30
<i>Dense</i>	30-50
<i>Very Dense</i>	>50

Terminology describing consistency of cohesive soils:

The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by *in situ* vane tests, penetrometer tests, or unconfined compression tests.

Consistency	Undrained Shear Strength		Approximate SPT N-Value
	kips/sq.ft.	kPa	
<i>Very Soft</i>	<0.25	<12.5	<2
<i>Soft</i>	0.25 - 0.5	12.5 - 25	2-4
<i>Firm</i>	0.5 - 1.0	25 - 50	4-8
<i>Stiff</i>	1.0 - 2.0	50 - 100	8-15
<i>Very Stiff</i>	2.0 - 4.0	100 - 200	15-30
<i>Hard</i>	>4.0	>200	>30

ROCK DESCRIPTION

Terminology describing rock quality:

RQD	Rock Mass Quality		
0-25	<i>Very Poor Quality</i>	<i>Very Severely Fractured</i>	<i>Crushed</i>
25-50	<i>Poor Quality</i>	<i>Severely Fractured</i>	<i>Shattered or Very Blocky</i>
50-75	<i>Fair Quality</i>	<i>Fractured</i>	<i>Blocky</i>
75-90	<i>Good Quality</i>	<i>Moderately Jointed</i>	<i>Sound</i>
90-100	<i>Excellent Quality</i>	<i>Intact</i>	<i>Very Sound</i>

The RQD denotes the percentage of intact and sound rock retrieved from a borehole of any orientation. All pieces of intact and sound rock core equal to or greater than 100 mm (4 in.) long are summed and divided by the total length of the core run. RQD determined in accordance with ASTM D6032.

Terminology describing rock with respect to discontinuity spacing:

Spacing (mm)	Discontinuity	Bedding, Laminations, Bands
> 6000	<i>Extremely Wide</i>	-
2000-6000	<i>Very Wide</i>	<i>Very Thick</i>
600-2000	<i>Wide</i>	<i>Thick</i>
200-600	<i>Moderate</i>	<i>Medium</i>
60-200	<i>Close</i>	<i>Thin</i>
20-60	<i>Very Close</i>	<i>Very Thin</i>
<20	<i>Extremely Close</i>	<i>Laminated</i>
<6	-	<i>Thinly Laminated</i>

Terminology describing rock strength:

Strength Classification	Grade	Unconfined Compressive Strength (MPa)
<i>Extremely Weak</i>	R0	< 1
<i>Very Weak</i>	R1	1 – 5
<i>Weak</i>	R2	5 – 25
<i>Medium Strong</i>	R3	25 – 50
<i>Strong</i>	R4	50 – 100
<i>Very Strong</i>	R5	100 – 250
<i>Extremely Strong</i>	R6	> 250

Terminology describing rock weathering:

Term	Symbol	Description
<i>Fresh</i>	W1	No visible signs of rock weathering. Slight discolouration along major discontinuities
<i>Slightly</i>	W2	Discoloration indicates weathering of rock on discontinuity surfaces. All the rock material may be discoloured.
<i>Moderately</i>	W3	Less than half the rock is decomposed and/or disintegrated into soil.
<i>Highly</i>	W4	More than half the rock is decomposed and/or disintegrated into soil.
<i>Completely</i>	W5	All the rock material is decomposed and/or disintegrated into soil. The original mass structure is still largely intact.
<i>Residual Soil</i>	W6	All the rock converted to soil. Structure and fabric destroyed.

Solid Core Recovery (SCR):

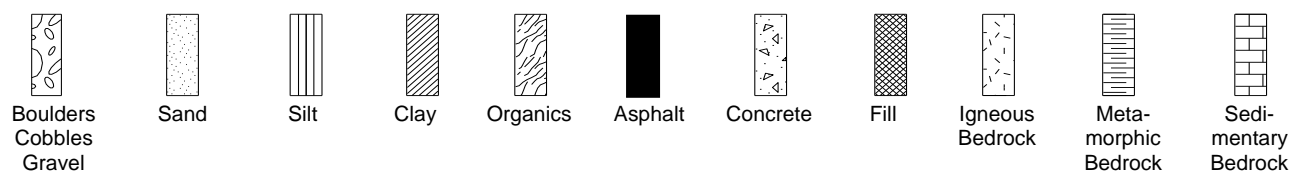
Solid core recovery is defined as the cumulative length of all solid core in the core barrel divided by the length drilled and is recorded as a percentage on a per run basis (i.e. length of core run excluding broken, crushed or rubble zones)

Fracture Index (FI):

Fracture Index is defined as the number of naturally occurring fractures occurring per given length of core. The Fracture Index is reported as a simple count of fractures.

STRATA PLOT

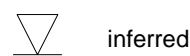
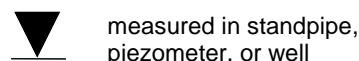
Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols. The dimensions within the strata symbols are not indicative of the particle size, layer thickness, etc.



SAMPLE TYPE

SS	Split spoon sample (obtained by performing the Standard Penetration Test)
ST	Shelby tube or thin wall tube
DP	Direct-Push sample (small diameter tube sampler hydraulically advanced)
PS	Piston sample
BS	Bulk sample
HQ, NQ, BQ, etc.	Core samples obtained with the use of standard size diamond coring bits.

WATER LEVEL MEASUREMENT



RECOVERY

For soil samples, the recovery is recorded as the length of the soil sample recovered. For rock core, recovery (or total core recovery - TCR) is defined as the total cumulative length of all core recovered in the core barrel divided by the length drilled and is recorded as a percentage on a per run basis.

N-VALUE

Numbers in this column are the field results of the Standard Penetration Test: the number of blows of a 140 pound (64 kg) hammer falling 30 inches (762 mm), required to drive a 2 inch (50.8 mm) O.D. split spoon sampler one foot (305 mm) into the soil. In accordance with ASTM D1586, the N-value equals the sum of the number of blows (N) required to drive the sampler over the interval of 6 to 18 in. (152 to 457 mm). However, the number of blows (N) required to drive the sampler over the interval of 12 to 24 in. (305 to 610 mm) may be reported if this value is lower. For split spoon samples where insufficient penetration was achieved and N-values cannot be presented, the total number of blows are reported over sampler penetration in millimeters (e.g., 50/75).

DYNAMIC CONE PENETRATION TEST (DCPT)

Dynamic cone penetration tests are performed using a standard 60 degree apex cone connected to A size drill rods with the same standard fall height and weight as the Standard Penetration Test. The DCPT value is the number of blows of the hammer required to drive the cone one foot (305 mm) into the soil. The DCPT is used as a probe to assess soil variability.

OTHER TESTS

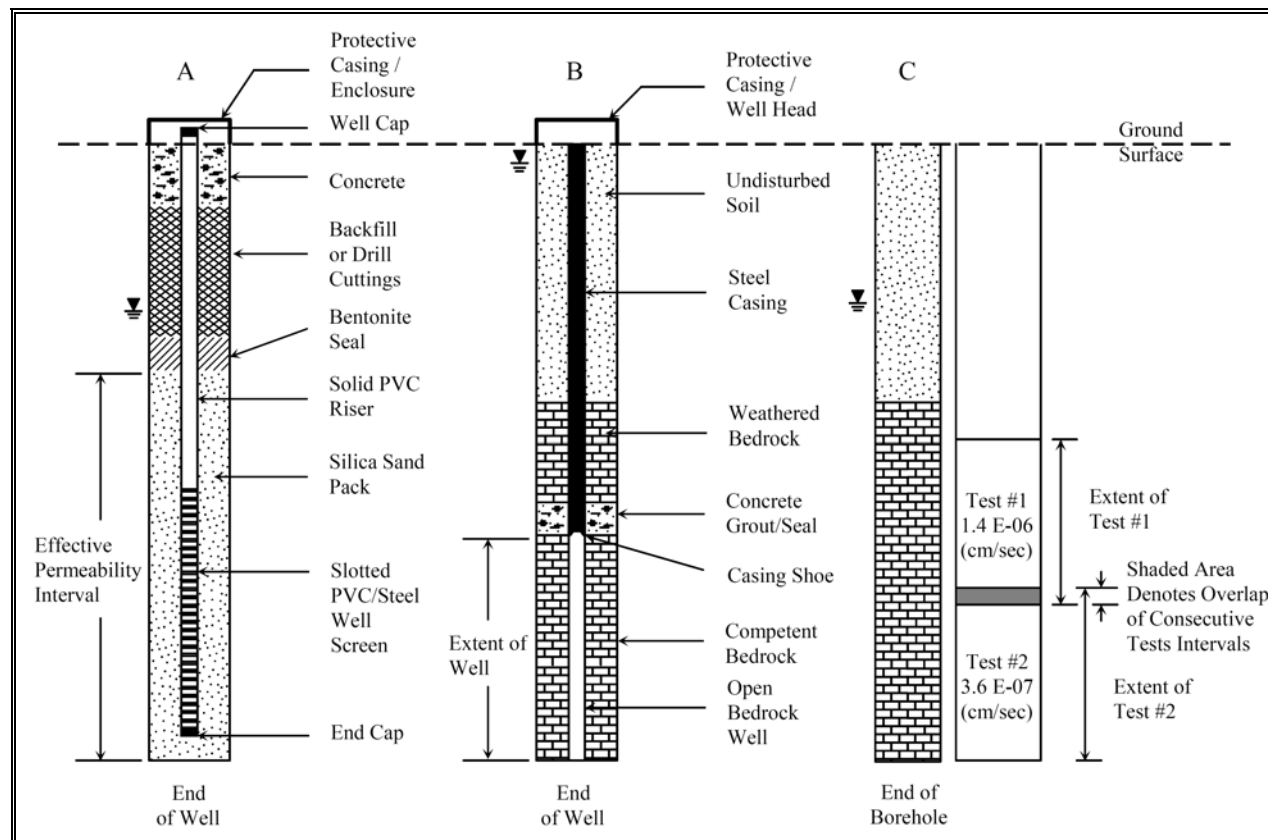
S	Sieve analysis
H	Hydrometer analysis
k	Laboratory permeability
γ	Unit weight
G_s	Specific gravity of soil particles
CD	Consolidated drained triaxial
CU	Consolidated undrained triaxial with pore pressure measurements
UU	Unconsolidated undrained triaxial
DS	Direct Shear
C	Consolidation
Q_u	Unconfined compression
I_p	Point Load Index (I_p on Borehole Record equals $I_p(50)$ in which the index is corrected to a reference diameter of 50 mm)

	Single packer permeability test; test interval from depth shown to bottom of borehole
	Double packer permeability test; test interval as indicated
	Falling head permeability test using casing
	Falling head permeability test using well point or piezometer

SYMBOLS AND TERMS USED ON MONITOR WELL, WATER WELL AND ENVIRONMENTAL RECORDS

Well Construction and Permeability Testing

Basic symbols used in typical monitor or water well and piezometer construction are shown below. The well construction symbols or materials shown below may be combined or altered to suit a particular application. The diagram shows: A) a typical piezometer or monitor well in overburden; B) a typical water well in bedrock; C) borehole permeability test results in bedrock.



Apparent Moisture Content

Terminology used to describe apparent moisture content at the time of borehole drilling or test pit excavation.

Symbol	Description
D	Dry – containing little or no moisture
M	Moist – containing some moisture without having ‘free’ moisture
S	Saturated – ‘free’ moisture can drain from material

Terminology Describing Contamination

Symbol	Description
PID	Photo Ionization Detector (readings in ppm)
TPH	Total Petroleum Hydrocarbon concentration (readings in ppm based on mass)
ppm	Parts Per Million (measurement of concentration, mg/kg or mg/L)
nd	Not Detected – below limit of quantification (LOQ)

Apparent Hydrocarbon Odour

Terminology used to describe apparent hydrocarbon odour at the time of borehole drilling or test pit excavation.

Value	Description
0	No apparent odour
1	Slight odour
2	Moderate odour
3	Strong odour





MONITOR WELL RECORD

BOREHOLE No. **BH01**
PAGE **1** of **2**
PROJECT No. **121412551**
DRILLING METHOD **STA/Dia**
SIZE **96mm (HWT/HQ)**
DATUM **NAD83**

CLIENT **Environmental Services; Public Works & Government Services Canada**
PROJECT **Phase II Environmental Site Assessment**
LOCATION **Canadian Coast Guard Southside Base; St. John's, NL**
DATES (mm-dd-yy): BORING **3-4-13** to **3-6-13** WATER LEVEL **1.64m** **3-12-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	2.06						mm						-0.13 m STICK UP FLUSH MOUNTED STEEL WELL HEAD ENCLOSURE
1	1.96	Asphalt			SS	1	405	56			0.2		BENTONITE
		Dense to very dense, grey to brown, silty GRAVEL with sand (GM): FILL			SS	2	380	47			0.2		50 mm DIAMETER SOLID PVC RISER PIPE in No. 3-4 SILICA SAND PACK
2	0.59	Loose to compact, grey to brown, silty SAND with gravel (SM) to SAND with silt and gravel (SP-SM); some debris (wood matter): FILL			SS	3	280	4			9.3	700	
3					SS	4	610	29			-		
4					SS	5	205	9			0.9		
5	-1.95	Very loose to loose, grey to brown, silty SAND with gravel (SM) to SAND with silt and gravel (SP-SM); with occasional to frequent organic matter [Inferred Marine Sediments]			SS	6	100	26			-		50 mm DIAMETER No. 10 or 20 SLOT PVC SCREEN in No. 3-4 SILICA SAND PACK
6					SS	7	150	6			3.6		
7					SS	8	0	6			-		
8					SS	9	305	3			48.9	150	
9					SS	10	125	4			3.2		
10					SS	11	405	6			26.1		
11	-5.71	Very dense, grey with brown, poorly graded GRAVEL silt and sand (GP-GM) to silty GRAVEL with sand (GM): TILL			SS	12	330	77			26.5		
12					SS	13	305	53			19.7		
13					SS	14	305	52			15.5		
14					SS	15	230	52			4.0		
15	-8.99	Very severely fractured to moderately jointed, fresh to slightly weathered, grey to green to blue, siltstone to sandstone; some infilling of fractures and some quartz partings: BEDROCK			SS	16	255	116/300			12.8		
					SS	17	125	80/280			15.4		
					HQ	18	89%	0%					
					HQ	19	100%	0%					
					HQ	20	100%	37%					
					HQ	21	100%	0%					
					HQ	22	100%	88%					
					HQ	23	100%	78%					



MONITOR WELL RECORD

BOREHOLE No. BH01
PAGE 2 of 2
PROJECT No. 121412551
DRILLING METHOD STA/Dia
SIZE 96mm (HWT/HQ)
DATUM NAD83

CLIENT Environmental Services; Public Works & Government Services Canada
PROJECT Phase II Environmental Site Assessment
LOCATION Canadian Coast Guard Southside Base; St. John's,NL
DATES (mm-dd-yy): BORING 3-4-13 to 3-6-13 WATER LEVEL 1.64m 3-12-13

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
		Continued from Previous Page					mm						
-15													
-16					HQ	24	97%	90%					
-17	-14.70	End of Borehole											END CAP
-18													
-19													
-20													
-21													
-22													
-23													
-24													
-25													
-26													
-27													
-28													
-29													
-30													



MONITOR WELL RECORD

BOREHOLE No. **BH02**
PAGE **1** of **2**
PROJECT No. **121412551**
DRILLING METHOD **STA/Dia**
SIZE **96mm (HWT/HQ)**
DATUM **NAD83**

CLIENT **Environmental Services; Public Works & Government Services Canada**
PROJECT **Phase II Environmental Site Assessment**
LOCATION **Canadian Coast Guard Southside Base; St. John's, NL**
DATES (mm-dd-yy): BORING **2-27-13** to **2-28-13** WATER LEVEL **2.30m** **3-12-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	2.08						mm						-0.1 m STICK UP FLUSH MOUNTED STEEL WELL HEAD ENCLOSURE
1	1.98	Asphalt			SS	1	510	56			0.5		BENTONITE
1	1.27	Very dense, grey to brown, poorly graded GRAVEL with silt and sand (GP-GM): FILL			SS	2	255	18			0.5		50 mm DIAMETER SOLID PVC RISER PIPE in No. 3-4 SILICA SAND PACK
2		Very loose to compact, brown to black, silty SAND with gravel (SM); frequent debris (organic matter): FILL			SS	3	255	6			23.8		
3					SS	4	150	8			320		
4					SS	5	100	12			379	2500	50 mm DIAMETER No. 10 or 20 SLOT PVC SCREEN in No. 3-4 SILICA SAND PACK
5					SS	6	75	19			14.3		
6					SS	7	50	5			78.5	230	
7	-4.93				SS	8	25	2			-		
8	-5.39	Compact, brown, silty SAND with gravel (SM); occasional organic matter [Inferred Marine Sediments]			SS	9	0	5			-		
9		Compact to very dense, brown to grey, silty SAND with gravel (SM) to SAND with silt and gravel (SP-SM): TILL			SS	10	50	7			67.1		
10					SS	11	50	11			2.7		
11					SS	12	175	27			48.9		
12					SS	13	205	105/400			19.4		
13					SS	14	380	46			3.8		
14	-9.50	-Strata of gravel and cobbles encountered at 10.5 m depth below ground surface.											
15		Severely fractured to intact, fresh to slightly weathered, grey to green, siltstone to sandstone; some infilling of fractures and some quartz partings: BEDROCK			SS	17	255	67			26.1		
					HQ	18	60%	25%					
					HQ	19	97%	32%					
					HQ	20	92%	81%					
					HQ	21	100%	83%					
					HQ	22	100%	92%					



MONITOR WELL RECORD

BOREHOLE No. **BH02**
PAGE **2** of **2**
PROJECT No. **121412551**
DRILLING METHOD **STA/Dia**
SIZE **96mm (HWT/HQ)**
DATUM **NAD83**

CLIENT **Environmental Services; Public Works & Government Services Canada**
PROJECT **Phase II Environmental Site Assessment**
LOCATION **Canadian Coast Guard Southside Base; St. John's, NL**
DATES (mm-dd-yy): BORING **2-27-13** to **2-28-13** WATER LEVEL **2.30m** **3-12-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
		Continued from Previous Page					mm						
-15													
-16					HQ	23	98%	90%					
-17					HQ	24	100%	100%					
-18	-16.26				HQ	25	97%	87%					
-19		End of Borehole											END CAP
-20													
-21													
-22													
-23													
-24													
-25													
-26													
-27													
-28													
-29													
-30													



MONITOR WELL RECORD

BOREHOLE No. **BH03**
PAGE **1** of **2**
PROJECT No. **121412551**
DRILLING METHOD **STA/Dia**
SIZE **96mm (HWT/HQ)**
DATUM **NAD83**

CLIENT **Environmental Services; Public Works & Government Services Canada**
PROJECT **Phase II Environmental Site Assessment**
LOCATION **Canadian Coast Guard Southside Base; St. John's, NL**
DATES (mm-dd-yy): BORING **3-6-13** to **3-7-13** WATER LEVEL **1.40m** **3-6-13**


DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	2.07						mm						-0.1 m STICK UP FLUSH MOUNTED STEEL WELL HEAD ENCLOSURE
1	1.97	Asphalt			SS	1	355	68			1.2		BENTONITE 50 mm DIAMETER SOLID PVC RISER PIPE in No. 3-4 SILICA SAND PACK 50 mm DIAMETER No. 10 or 20 SLOT PVC SCREEN in No. 3-4 SILICA SAND PACK
	0.57	Dense to very dense, grey to brown, silty GRAVEL with sand (GM): FILL			SS	2	205	49			1.0		
2		Very loose to compact, grey to black, silty SAND with gravel (SM); occasional debris (wood): FILL			SS	3	100	9			388		
3					SS	4	150	11			678	40000	
4					SS	5	150	9			325		
5					SS	6	0	3			-		
6					SS	7	0	6			-		
7	-3.11	Very loose to compact, brown, silty SAND with gravel (SM); trace to some organic matter (wood): [Inferred Marine Deposits]			SS	8	230	2			24.2		
8					SS	9	0	2			-		
9					SS	10	50	11			-		
10	-5.25	Very dense, grey to brown, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): TILL			SS	11	50	77			51		
11					SS	12	280	95			59.3		
12					SS	13	125	82/260			50.3		
13					SS	14	205	109/360			64.7		
14	-8.88	Moderately jointed to intact, fresh weathering, grey to green to blue, siltstone to sandstone; some infilling of fractures and some quartz partings: BEDROCK - Fractured, weathered zone from 12.24 m to 14.33 m depth			SS	15	75	74/230			10.1		
15					HQ	16	100%	100%					
					HQ	17	94%	86%					
					HQ	18	100%	100%					
					HQ	19	100%	82%					



MONITOR WELL RECORD

BOREHOLE No. **BH03**
PAGE **2** of **2**
PROJECT No. **121412551**
DRILLING METHOD **STA/Dia**
SIZE **96mm (HWT/HQ)**
DATUM **NAD83**

CLIENT **Environmental Services; Public Works & Government Services Canada**
PROJECT **Phase II Environmental Site Assessment**
LOCATION **Canadian Coast Guard Southside Base; St. John's, NL**
DATES (mm-dd-yy): BORING **3-6-13** to **3-7-13** WATER LEVEL **1.40m** **3-6-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
		Continued from Previous Page					mm						
-15													
-16	-13.86				HQ	20	100%	96%					 END CAP
-17		End of Borehole											
-18													
-19													
-20													
-21													
-22													
-23													
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-25													
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-28													
-29													
-30													



MONITOR WELL RECORD

BOREHOLE No. **BH04**
PAGE **1** of **1**
PROJECT No. **121412551**
DRILLING METHOD **STA/Dia**
SIZE **96mm (HWT/HQ)**
DATUM **NAD83**

CLIENT **Environmental Services; Public Works & Government Services Canada**
PROJECT **Phase II Environmental Site Assessment**
LOCATION **Canadian Coast Guard Southside Base; St. John's, NL**
DATES (mm-dd-yy): BORING **2-28-13** to **3-1-13** WATER LEVEL **2.36m** **3-12-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	2.15						mm						-0.1 m STICK UP FLUSH MOUNTED STEEL WELL HEAD ENCLOSURE
1	2.05	Asphalt			SS	1	455	42			0.7		BENTONITE
2		Very loose to very dense, grey to brown, silty SAND with gravel (SM); trace debris and organic matter (wood): FILL			SS	2	305	56			0.3		50 mm DIAMETER SOLID PVC RISER PIPE in No. 3-4 SILICA SAND PACK
3					SS	3	205	44			0.4		
4					SS	4	150	48			3.8		
5					SS	5	175	8			7.8	2400	50 mm DIAMETER No. 10 or 20 SLOT PVC SCREEN in No. 3-4 SILICA SAND PACK
6	-2.50	Very loose to loose, brownish grey to black, silty SAND with gravel (SM); with organic matter: [Inferred Marine Sediments]			SS	6	50	15			1.7		
7					SS	7	50	3			-		
8					SS	8	125	8			3.5		
9					SS	9	150	3			1.9		
10	-4.56	Compact to very dense, grey, well-graded GRAVEL with silt and sand (GW-GM): TILL			SS	10	205	8			3.7		
11					SS	11	280	21			3.9		
12					SS	12	406	61			2.7		
13	-5.88	Very severely fractured to intact, fresh to slight weathering, grey to green to blue, siltstone to sandstone; some infilling of fractures and some quartz partings: BEDROCK			SS	13	50	55/75			5.6		
14					HQ	14	93%	73%					END CAP
15					HQ	15	100%	67%					
16					HQ	16	100%	93%					
17					HQ	17	94%	94%					
18					HQ	18	60%	0%					
19					HQ	19	98%	0%					
20					HQ	20	94%	67%					ROCK stuck in bit, pull HQ rods and set well to where hole stays open
21					HQ	21	81%	50%					
22	-11.77	End of Borehole											
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MONITOR WELL RECORD

BOREHOLE No. **BH05**
PAGE **1** of **1**
PROJECT No. **121412551**
DRILLING METHOD **STA/Dia**
SIZE **96mm (HWT/HQ)**
DATUM **NAD83**

CLIENT **Environmental Services; Public Works & Government Services Canada**
PROJECT **Phase II Environmental Site Assessment**
LOCATION **Canadian Coast Guard Southside Base; St. John's, NL**
DATES (mm-dd-yy): BORING **2-21-13** to **2-21-13** WATER LEVEL **1.96m** **3-12-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	2.21						mm						-0.2 m STICK UP FLUSH MOUNTED STEEL WELL HEAD ENCLOSURE
1	2.11	Asphalt			SS	1	483	33			0.0		BENTONITE
		Compact to dense, grey to brown, silty GRAVEL with sand (GM): FILL			SS	2	177	25			1.2		50 mm
	0.84												DIAMETER SOLID
2		Compact, grey to brown, well-graded SAND with silt and gravel (SW-SM): FILL			SS	3	203	13			1.5		PVC RISER PIPE
					SS	4	203	17			3.5	270	in No. 3-4 SILICA
3													SAND PACK
	-1.30				SS	5	229	23			0.2		50 mm
4		Compact to dense, brown to grey, silty SAND with gravel: TILL			SS	6	152	39			-		DIAMETER No. 10
													or 20 SLOT PVC
5	-2.82				SS	7	229	15			-		SCREEN in No.
		Very severely fractured to intact, fresh to slightly weathered, grey to green to blue, siltstone to sandstone; some infilling of fractures and some quartz partings: BEDROCK			HQ	8	100%	0%					3-4 SILICA SAND
					HQ	9	100%	0%					PACK
6					HQ	10	100%	33%					
7					HQ	11	100%	44%					
8					HQ	12	100%	95%					
9					HQ	13	100%	70%					
					HQ	14	100%	67%					
10					HQ	15	100%	81%					
	-8.61				HQ	16	100%	100%					END CAP
11		End of Borehole											
12													
13													
14													
15													



MONITOR WELL RECORD

BOREHOLE No. **BH07**
PAGE **1** of **1**
PROJECT No. **121412551**
DRILLING METHOD **STA/Dia**
SIZE **96mm (HWT/HQ)**
DATUM **NAD83**

CLIENT **Environmental Services; Public Works & Government Services Canada**
PROJECT **Phase II Environmental Site Assessment**
LOCATION **Canadian Coast Guard Southside Base; St. John's, NL**
DATES (mm-dd-yy): BORING **2-25-13** to **2-25-13** WATER LEVEL **1.89m** **3-12-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	2.11						mm						-0.15 m STICK UP FLUSH MOUNTED STEEL WELL HEAD ENCLOSURE
1	2.01	Asphalt			SS	1	356	53			3.5	32	BENTONITE
		Very dense, grey to brown, silty GRAVEL with sand (GM) to silty SAND with gravel (SM): FILL			SS	2	254	74/305			6.6		50 mm DIAMETER SOLID PVC RISER PIPE in No. 3-4 SILICA SAND PACK
2	0.74				SS	3	229	20			2.5		
		Compact to very dense, grey to brown, silty SAND with gravel (SM) to poorly graded SAND with silt and gravel (SP-SM); trace to some organic matter: FILL			SS	4	0	73/381			-		
3	-0.71				SS	5	203	20			1.9		50 mm DIAMETER No. 10 or 20 SLOT PVC SCREEN in No. 3-4 SILICA SAND PACK
4					SS	6	76	16			32.1	24	
		Compact, grey to brown with black, silty SAND with gravel (SM); trace to some organic matter: [Inferred Marine Sediments]			SS	7	0	21					
5	-2.56				SS	8	127	106/305					
	-2.87				HQ	9	100%	65%					
6		Compact, grey to brown, silty SAND with gravel (SM): TILL			HQ	10	100%	52%					
7					HQ	11	100%	85%					
8		Fractured to intact, fresh to slightly weathered, grey to green to blue, siltstone to sandstone; some infilling of fractures and some quartz partings: BEDROCK			HQ	12	97%	92%					
9					HQ	13	100%	71%					END CAP
10													
11	-9.22												
12		End of Borehole											
13													
14													
15													



MONITOR WELL RECORD

BOREHOLE No. **BH08**
PAGE **1** of **1**
PROJECT No. **121412551**
DRILLING METHOD **STA/Dia**
SIZE **96mm (HWT/HQ)**
DATUM **NAD83**

CLIENT **Environmental Services; Public Works & Government Services Canada**
PROJECT **Phase II Environmental Site Assessment**
LOCATION **Canadian Coast Guard Southside Base; St. John's, NL**
DATES (mm-dd-yy): BORING **2-20-13** to **2-20-13** WATER LEVEL **1.38m** **3-12-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	2.35						mm						-0.08 m STICK UP FLUSH MOUNTED STEEL WELL HEAD ENCLOSURE
1	2.25	Asphalt			SS	1	406	38			0.0		BENTONITE
	1.54	Dense, grey to brown, silty SAND with gravel (SM): FILL			SS	2	0	12			-		50 mm DIAMETER SOLID PVC RISER PIPE in No. 3-4 SILICA SAND PACK
2		Loose to compact, grey to brown, silty SAND with gravel (SM); trace debris (organic matter): FILL			SS	3	51	5			77.4		
3					SS	4	330	28			139	120	
4	-1.71				SS	5	178	25			-		50 mm DIAMETER No. 10 or 20 SLOT PVC SCREEN in No. 3-4 SILICA SAND PACK
5		Very severely fractured to intact, fresh to slightly weathered, grey to green to blue, siltstone to sandstone; some quartz partings: BEDROCK			HQ	7	100%	0%					
6					HQ	8	100%	100%					
7					HQ	9	100%	69%					
8					HQ	10	100%	68%					
9					HQ	11	100%	68%					
10					HQ	12	100%	0%					
					HQ	13	100%	90%					END CAP
-8.14													
		End of Borehole											
-11													
-12													
-13													
-14													
-15													



MONITOR WELL RECORD

BOREHOLE No. **BH09**
PAGE **1** of **1**
PROJECT No. **121412551**
DRILLING METHOD **STA/Dia**
SIZE **96mm (HWT/HQ)**
DATUM **NAD83**

CLIENT **Environmental Services; Public Works & Government Services Canada**
PROJECT **Phase II Environmental Site Assessment**
LOCATION **Canadian Coast Guard Southside Base; St. John's, NL**
DATES (mm-dd-yy): BORING **2-24-13** to **2-24-13** WATER LEVEL **1.48m** **3-12-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	2.58						mm						-0.13 m STICK UP FLUSH MOUNTED STEEL WELL HEAD ENCLOSURE
1	2.48	Asphalt			SS	1	406	46			0.8		<p>BENTONITE</p> <p>50 mm DIAMETER SOLID PVC RISER PIPE in No. 3-4 SILICA SAND PACK</p> <p>50 mm DIAMETER No. 10 or 20 SLOT PVC SCREEN in No. 3-4 SILICA SAND PACK</p> <p>END CAP</p>
	1.06	Dense, grey to brown, poorly graded SAND with silt and gravel (SP-SM) to silty			SS	2	305	40			1.7	nd	
	0.73	GRAVEL with sand (GM): FILL			SS	3	229	71/330			2.0		
2		Dense, brown to grey, silty SAND with gravel (SM): TILL			HQ	4	100%	0%					
3		Very severely fractured to intact, fresh to slightly weathered, grey to green to blue, siltstone to sandstone; some quartz partings: BEDROCK			HQ	5	91%	86%					
4					HQ	6	100%	61%					
5					HQ	7	100%	60%					
6					HQ	8	100%	100%					
7													
8	-5.17	End of Borehole											
9													
10													
11													
12													
13													
14													
15													



MONITOR WELL RECORD

BOREHOLE No. **BH10**
PAGE **1** of **1**
PROJECT No. **121412551**
DRILLING METHOD **STA/Dia**
SIZE **96mm (HWT/HQ)**
DATUM **NAD83**

CLIENT **Environmental Services; Public Works & Government Services Canada**
PROJECT **Phase II Environmental Site Assessment**
LOCATION **Canadian Coast Guard Southside Base; St. John's, NL**
DATES (mm-dd-yy): BORING **3-5-13** to **3-6-13** WATER LEVEL **0.50m** **3-5-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	2.55						mm						-0.08 m STICK UP FLUSH MOUNTED STEEL WELL HEAD ENCLOSURE
0	2.32	Reinforced concrete slab			SS	1	380	62			13.9	210	BENTONITE
1	0.98	Very dense, grey to brown, poorly graded SAND with silt and gravel (SP-SM) to silty GRAVEL with sand (GM): FILL			SS	2	0	50/50			-		50 mm DIAMETER SOLID PVC RISER PIPE in No. 3-4 SILICA SAND PACK
2		Moderately jointed to intact, fresh to slightly weathered, grey to green to blue, siltstone to sandstone; some infilling of fractures and some quartz partings: BEDROCK			HQ	3	100%	100%					50 mm DIAMETER No. 10 or 20 SLOT PVC SCREEN in No. 3-4 SILICA SAND PACK
3					HQ	4	100%	100%					
4					HQ	5	100%	88%					
5					HQ	6	100%	75%					
6					HQ	7	100%	83%					
7													END CAP
8	-5.15	End of Borehole											
9													
10													
11													
12													
13													
14													
15													



MONITOR WELL RECORD

BOREHOLE No. BH11
PAGE 1 of 1
PROJECT No. 121412551
DRILLING METHOD STA/Dia
SIZE 96mm (HWT/HQ)
DATUM NAD83

CLIENT Environmental Services; Public Works & Government Services Canada
PROJECT Phase II Environmental Site Assessment
LOCATION Canadian Coast Guard Southside Base; St. John's, NL
DATES (mm-dd-yy): BORING 3-7-13 to 3-7-13 WATER LEVEL 0.70m 3-12-13

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	2.85						mm						-0.1 m STICK UP FLUSH MOUNTED STEEL WELL HEAD ENCLOSURE
0	2.62	Reinforced concrete slab.			SS	1	356	63			1.2	31	BENTONITE
1	2.01	Very dense, grey to brown, silty SAND with gravel (SM): FILL			HQ	2	93%	93%					50 mm DIAMETER SOLID PVC RISER PIPE in No. 3-4 SILICA SAND PACK
2		Fractured to intact, fresh to slightly weathered, grey to green to blue, siltstone to sandstone; some infilling of fractures and some quartz partings:			HQ	3	91%	91%					
3		BEDROCK			HQ	4	100%	78%					
4					HQ	5	100%	78%					50 mm DIAMETER No. 10 or 20 SLOT PVC SCREEN in No. 3-4 SILICA SAND PACK
5					HQ	6	100%	100%					
6					HQ	7	100%	100%					END CAP
7	-3.91	End of Borehole											
8													
9													
10													
11													
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13													
14													
15													



MONITOR WELL RECORD

BOREHOLE No. BH12
PAGE 1 of 1
PROJECT No. 121412551
DRILLING METHOD STA/Dia
SIZE 96mm (HWT/HQ)
DATUM NAD83

CLIENT Environmental Services; Public Works & Government Services Canada
PROJECT Phase II Environmental Site Assessment
LOCATION Canadian Coast Guard Southside Base; St. John's, NL
DATES (mm-dd-yy): BORING 3-3-13 to 3-3-13 WATER LEVEL 1.20m 3-3-13

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	2.71						mm						-0.15 m STICK UP FLUSH MOUNTED STEEL WELL HEAD ENCLOSURE
1	2.48	Reinforced concrete slab.			SS	1	381	34			0.0		 BENTONITE 50 mm DIAMETER SOLID PVC RISER PIPE in No. 3-4 SILICA SAND PACK 50 mm DIAMETER No. 10 or 20 SLOT PVC SCREEN in No. 3-4 SILICA SAND PACK END CAP
	1.39	Dense, grey to brown, poorly graded SAND with silt and gravel (SP-SM): FILL			SS	2	203	106/305			0.8	140	
					HQ	3	100%	40%					
2		Fractured to intact, fresh to slightly weathered, grey to green to blue, siltstone to sandstone; some quartz partings: BEDROCK			HQ	4	100%	55%					
3					HQ	5	100%	90%					
4					HQ	6	100%	100%					
5					HQ	7	96%	81%					
6													
7	-4.50	End of Borehole											
8													
9													
10													
11													
12													
13													
14													
15													



MONITOR WELL RECORD

BOREHOLE No. BH13
PAGE 1 of 1
PROJECT No. 121412551
DRILLING METHOD Hollow Stem
SIZE 96mm (HWT)
DATUM NAD83

CLIENT Environmental Services; Public Works & Government Services Canada
PROJECT Phase II Environmental Site Assessment
LOCATION Canadian Coast Guard Southside Base; St. John's, NL
DATES (mm-dd-yy): BORING 2-22-13 to 2-22-13 WATER LEVEL 2.19m 3-12-13

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	2.24						mm						FLUSH MOUNTED STEEL WELL HEAD ENCLOSURE
1	2.14	Asphalt			SS	1	405	44			1.1		<p>BENTONITE</p> <p>50 mm DIAMETER SOLID PVC RISER PIPE in No. 3-4 SILICA SAND PACK</p> <p>50 mm DIAMETER No. 10 or 20 SLOT PVC SCREEN in No. 3-4 SILICA SAND</p>
		Dense to loose, brown, silty SAND with gravel (SM): FILL			SS	2	305	37			1.1		
2					SS	3	255	23			1.7		
	-0.30				SS	4	305	7			10.0		
3	-0.91	Compact, black, silty sand (SM); frequent organic matter: [Inferred Marine Sediments]			SS	5	75	13			76.4	320	
4		Loose to compact, grey to brown, silty SAND (SM): TILL			SS	6	150	26			4.9		
	-2.33				SS	7	205	7			5.9		
5		End of borehole at pre-designated termination depth for well installation purposes.											PACK END CAP
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													



MONITOR WELL RECORD

BOREHOLE No. BH14
PAGE 1 of 1
PROJECT No. 121412551
DRILLING METHOD Hollow Stem
SIZE 96mm (HWT)
DATUM NAD83

CLIENT Environmental Services; Public Works & Government Services Canada
PROJECT Phase II Environmental Site Assessment
LOCATION Canadian Coast Guard Southside Base; St. John's, NL
DATES (mm-dd-yy): BORING 2-24-13 to 2-24-13 WATER LEVEL 1.90m 2-24-13

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	2.32						mm						-0.05 m STICK UP FLUSH MOUNTED STEEL WELL HEAD ENCLOSURE
1	2.22	Asphalt			SS	1	406	46			0.8		<p>BENTONITE</p> <p>50 mm DIAMETER SOLID PVC RISER PIPE in No. 3-4 SILICA SAND PACK</p> <p>50 mm DIAMETER No. 10 or 20 SLOT PVC SCREEN in No.</p> <p>3-4 SILICA SAND PACK END CAP</p>
2		Compact to very dense, grey to brown, silty SAND with gravel (SM) to silty GRAVEL with sand (GM); trace to some organic matter at depth: FILL			SS	2	203	59			0.5	2100	
3					SS	3	203	15			9.2		
4	-1.08				SS	4	0	11			-		
5	-1.21	Compact, grey to brown with black, silty SAND with gravel (SM); trace to some organic matter: [Inferred Marine Sediments]			SS	5	381	14			0.7		
6	-2.02	Very dense, brown to grey, silty SAND with gravel (SM): TILL			SS	6	254	97			23.8		
7		End of borehole at pre-designated termination depth for well installation purposes.			SS	7	203	64/203			16.8		
8		Note: Sample BH14-AS3C collected at depth of 2.3 mbgs.											
9													
10													
11													
12													
13													
14													
15													



MONITOR WELL RECORD

BOREHOLE No. **BH15**
PAGE **1** of **1**
PROJECT No. **121412551**
DRILLING METHOD **Hollow Stem**
SIZE **96mm (HWT)**
DATUM **NAD83**

CLIENT **Environmental Services; Public Works & Government Services Canada**
PROJECT **Phase II Environmental Site Assessment**
LOCATION **Canadian Coast Guard Southside Base; St. John's, NL**
DATES (mm-dd-yy): BORING **2-26-13** to **2-26-13** WATER LEVEL **2.42m** **3-12-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	2.41						mm						-0.15 m STICK UP FLUSH MOUNTED STEEL WELL HEAD ENCLOSURE
1	2.31	Asphalt			SS	1	457	82			0.2	16	BENTONITE
2		Loose to very dense, grey to brown, silty SAND with gravel (SM) to silty GRAVEL with sand (GM); trace to some organic matter: FILL			SS	2	356	39			0.9		50 mm DIAMETER SOLID PVC RISER PIPE in No. 3-4 SILICA SAND PACK
3					SS	3	305	17			532	7500	
4	-1.04				SS	4	203	19			57.9		
5		Very dense, brown to grey, silty SAND with gravel: TILL			SS	5	279	9			2.7		50 mm DIAMETER No. 10 or 20 SLOT PVC SCREEN in No.
6	-2.09				SS	6	279	51			1.7		3-4 SILICA SAND PACK
7					SS	7	127	65/150			6.2		END CAP
8		End of borehole at pre-designated termination depth for well installation purposes.											
9													
10													
11													
12													
13													
14													
15													

APPENDIX C

Laboratory Analytical Results Summary Tables

Table C.1 Results of Laboratory Analysis of Petroleum Hydrocarbons in Soil
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Sample ID	Depth (mbgs)	Date	Benzene	Toluene	Ethylbenzene	Xylenes	C ₆ -C ₁₀ F1	C ₁₀ -C ₁₆ F2	C ₁₆ -C ₃₂ ⁵ F3	>C ₃₂ ⁵ F4	Modified TPH - Tier I ⁴	Comments
RDL			0.025	0.025	0.025	0.05	2.5	10	15	-	15	-
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	mg/kg	-
CWS^{1,2}			0.03	0.37	0.082	11	320 (eco/ indoor) 970 (gw)	260 (eco) 380 (gw)	1,700 (eco)	3,300	-	-
CWS Management Limit³			-	-	-	-	700	1,000	3,500	10,000	-	-
BH1-SS3	1.6 - 2.2	4-Mar-13	0.16	0.28	0.052	0.40	17	220	450	-	700*	WFO/LO
BH1-SS9	5.7 - 6.3	4-Mar-13	nd	nd	nd	nd	nd	nd	157	-	150*	NR
BH2-SS5	2.9 - 3.6	27-Feb-13	nd	nd	nd	nd	nd	1,800	730	-	2,500	WFO
BH2-SS7	4.4 - 5.0	27-Feb-13	0.83	0.29	0.66	1.2	190	nd	43	-	230*	NR
BH3-SS4	2.6 - 3.2	6-Mar-13	0.36	0.15	1.8	3.4	1,400	24,000	14,300	-	40,000	WFO
BH4-SS5	2.2 - 2.6	28-Feb-13	0.18	0.18	nd	0.31	10	1,300	1070	-	2,400	WFO
BH5-SS4	2.1 - 2.7	21-Feb-13	nd	0.22	0.045	0.076	5.4	36	230	-	270	NR
BH6-SS4	2.9 - 3.5	25-Feb-13	nd	0.14	0.73	4.0	1,200	4,300	2,170	-	7,700	WFO
BH7-SS1	0.2 - 0.7	25-Feb-13	nd	nd	nd	nd	nd	nd	32	-	32*	PLO
BH7-SS6	3.4 - 4.0	25-Feb-13	nd	nd	nd	nd	nd	nd	24	-	24*	NR
BH8-SS4	2.1 - 2.7	20-Feb-13	nd	nd	nd	nd	18	80	21	-	120	WFO
BH9-SS2	0.8 - 1.4	24-Feb-13	nd	nd	nd	nd	nd	nd	nd	-	nd	-
BH10-SS1	0.4 - 1.2	5-Mar-13	0.030	0.056	nd	0.079	7.1	66	135	-	210	WFO / NR-LO
BH11-SS1	0.3 - 0.8	7-Mar-13	nd	nd	nd	nd	nd	nd	31	-	31*	LO
BH12-SS2	1.0 - 1.3	3-Mar-13	nd	nd	nd	nd	nd	nd	137	-	140	NR
BH13-SS5	2.1 - 3.2	22-Feb-13	0.038	0.079	nd	0.057	3.5	180	138	-	320	WFO
BS14-SS3	1.6 - 2.2	24-Feb-13	0.033	0.10	0.044	0.34	nd	670	1480	-	2,100	NR
BS14-AS3C	2.3	24-Feb-13	nd	nd	nd	nd	nd	19	2,510	-	2,500*	LO
BH15-SS1	0.2 - 0.8	26-Feb-13	nd	nd	nd	nd	nd	nd	16	-	16*	PLO
BH15-SS1 Lab-Dup	-	-	-	-	-	-	-	nd	19	-	-*	-
BH15-SS3	1.6 - 2.2	26-Feb-13	nd	nd	0.085	0.42	720	5,000	1,750	-	7,500	WFO

Notes:

1 = CCME CSQG = Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guidelines (CSQGs) for the Protection of Environmental and Human Health for BTEX (CSQG on-line 2013) - Commercial Site, coarse-grained soil

2 = CCME CWS PHC = CCME Canada Wide Standards (CWS) for Petroleum Hydrocarbons (PHC) in Soil (January 2008) - Commercial Site (eco soil contact, vapour inhalation (indoor) and protection of groundwater for aquatic life) (Table 3)

3 = CCME CWS PHC Management Limit for a Commercial Site (January 2008)

4 = Modified TPH = total petroleum hydrocarbons excluding BTEX

5 = Atlantic PIRI analytical method does not analyse for >C32. Laboratory certificate indicates (Yes or No) whether chromatogram for each sample returns to baseline after C32. Samples are considered to have returned to baseline if the area from C32-C36 is less than 10% of the area from C10-C32.

* = Baseline not reached at C32; sample may contain carbon fractions >C32

Triple silica gel clean-up was used by the laboratory to remove organic interferences from sample extracts.

RDL = Reportable Detection Limit for routine analysis; nd = Not detected above standard RDL; na = Not applicable

FO = Fuel Oil; WFO = weathered fuel oil; LO = Lube Oil; PLO = Possible Lube Oil; NR = no resemblance to petroleum hydrocarbons

mbgs = metres below ground surface

Bold/Shaded = Value exceeds CCME and/or CWS eco/indoor guideline

Italics = Value exceeds CWS gw guideline

Underlined = Value exceeds CWS Management Limit

Table C.2 Results of Laboratory Analysis of Fractionated Petroleum Hydrocarbons in Soil
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Parameters	RDL	Units	CWS ^{1,2}	CWS Mgmt. Limit ³	BH6-SS4	BH15-SS3	BH15-SS3 Lab-Dup
					2.9 - 3.5 mbgs	1.6 - 2.2 mbgs	-
					25-Feb-13	26-Feb-13	-
Benzene	0.025	mg/kg	0.03	-	0.0870	nd	-
Toluene	0.025	mg/kg	0.37	-	0.2	nd	-
Ethylbenzene	0.025	mg/kg	0.082	-	0.60	0.10	-
Xylenes	0.050	mg/kg	11	-	3.6	0.41	-
Aliphatic >C6-C8	2.0	mg/kg	-	-	390	160	-
Aliphatic >C8-C10	4.0	mg/kg	-	-	750	570	-
>C8-C10 Aromatics (-EX)	0.10	mg/kg	-	-	80	44	-
Aliphatic >C10-C12	8.0	mg/kg	-	-	880	1,000	780
Aliphatic >C12-C16	15	mg/kg	-	-	2,100	2,100	1,600
Aliphatic >C16-C21	15	mg/kg	-	-	1,200	790	590
Aliphatic >C21-<C32	15	mg/kg	-	-	260	96	68
Aromatic >C10-C12	4.0	mg/kg	-	-	340	220	240
Aromatic >C12-C16	15	mg/kg	-	-	620	580	570
Aromatic >C16-C21	15	mg/kg	-	-	570	370	330
Aromatic >C21-<C32	15	mg/kg	-	-	180	98	81
C ₆ -C ₁₀ - F1	-	mg/kg	320 (eco/indoor) 970 (gw)	700	<u>1,220</u>	774	-
C ₁₀ -C ₁₆ - F2	-	mg/kg	260 (eco) 380 (gw)	1,000	<u>3,940</u>	<u>3,900</u>	-
C ₁₆ -C ₃₂ ⁵ - F3	-	mg/kg	1,700 (eco)	3,500	2,210	1,354	-
>C ₃₂ ⁵ - F4	-	-	3,300 (eco)	10,000	-	-	-
Modified TPH - Tier 2 ⁴	15	mg/kg	-	-	7,300	6,000	-
Resemblance	-	-	-	-	WFO, LO	WFO, PLO	-

Notes:

1 = CCME CSQG = Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guidelines (CSQGs) for the Protection of Environmental and Human Health for BTEX (CSQG on-line September 2012) - Commercial Site, coarse-grained soil

2 = CCME CWS PHC = CCME Canada Wide Standards (CWS) for Petroleum Hydrocarbons (PHC) in Soil (January 2008) - Commercial Site (eco soil contact, vapour inhalation (indoor) and protection of groundwater for aquatic life) (Table 3)

3 = CCME CWS PHC Management Limit for a Commercial Site (January 2008)

4 = Modified TPH = total petroleum hydrocarbons excluding BTEX

5 = Atlantic PIRI analytical method does not analyse for >C32. Laboratory certificate indicates (Yes or No) whether chromatogram for each sample returns to baseline after C32. Samples are considered to have returned to baseline if the area from C32-C36 is less than 10% of the area from C10-C32.

Triple silica gel clean-up was used by the laboratory to remove organic interferences from sample extracts.

RDL = Reportable Detection Limit for routine analysis; nd = Not detected above standard RDL; na = Not applicable

WFO = weathered fuel oil; LO = Lube Oil; PLO = Possible Lube Oil

mbgs = metres below ground surface

Bold/Shaded = Value exceeds CCME and/or CWS eco/indoor guideline

Italics = Value exceeds CWS gw guideline

Underlined = Value exceeds CWS Management Limit

Table C.3 Results of Laboratory Analysis of Available Metals in Soil
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Parameters	RDL	Units	Guideline ¹	BH1-SS3	BH1-SS9	BH2-SS5	BH2-SS5 Lab-Dup	BH2-SS5 Lab-Dup 2	BH2-SS7	BH3-SS4	BH4-SS5	BH5-SS4
				1.6 - 2.2 mbgs	5.7 - 6.3 mbgs	2.9 - 3.6 mbgs	-	-	4.4 - 5.0 mbgs	2.6 - 3.2 mbgs	2.2 - 2.6 mbgs	2.1 - 2.7 mbgs
				4-Mar-13	4-Mar-13	27-Feb-13	-	-	27-Feb-13	6-Mar-13	28-Feb-13	21-Feb-13
Aluminum	10	mg/kg	-	11,000	12,000	15,000	14,000	-	6,100	11,000	11,000	16,000
Antimony	2.0	mg/kg	40	4	nd	nd	nd	-	nd	nd	4.5	nd
Arsenic	2.0	mg/kg	12	11	5	19	20	-	16	9.6	46	6.8
Barium	5.0	mg/kg	2,000	58	30	54	52	-	52	63	120	41
Beryllium	2.0	mg/kg	8	nd	nd	nd	nd	-	nd	nd	nd	nd
Boron	5.0	mg/kg	-	nd	61	nd	nd	-	nd	nd	nd	nd
Cadmium	0.30	mg/kg	22	0.35	1	nd	nd	-	nd	1	0.88	0.9
Chromium	2.0	mg/kg	87	17	17	28	38	-	15	32	51	22
Cobalt	1.0	mg/kg	300	9.4	6	12	13	-	5.4	11	15	8.5
Copper	2.0	mg/kg	91	38	26	57	120	59	23	280	130	24
Iron	50	mg/kg	-	31,000	21,000	60,000	64,000	-	27,000	170,000	57,000	32,000
Lead	0.50	mg/kg	260	220	18	230	230	-	280	390	2,700	170
Manganese	2.0	mg/kg	-	690	350	760	790	-	370	1,100	360	620
Mercury	0.10	mg/kg	24	0.3	nd	0.22	0.29	-	0.17	0.36	0.72	nd
Molybdenum	2.0	mg/kg	40	3.1	15	7.6	10	-	7.8	18	11	2.2
Nickel	2.0	mg/kg	50	15	15	26	29	-	20	25	73	19
Selenium	2.0	mg/kg	2.9	nd	1.4	nd	nd	-	1.2	nd	2.0	nd
Silver	0.50	mg/kg	40	nd	2.1	0.9	0.77	-	0.76	1.6	nd	nd
Strontium	5.0	mg/kg	-	25	780	31	37	-	23	84	63	11
Thallium	0.10	mg/kg	1	nd	0.28	0.15	0.14	-	0.24	nd	0.37	nd
Tin	2.0	mg/kg	300	12	nd	5.7	6.3	-	3.4	18	320	3.9
Uranium	0.10	mg/kg	33	0.84	10	3.1	3.4	-	1.9	3.6	3.5	0.62
Vanadium	2.0	mg/kg	130	20	30	28	28	-	15	36	45	23
Zinc	5.0	mg/kg	360	120	100	120	130	-	62	200	880	88

Notes:

1 = Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guidelines (CSQG on-line 2013). Commercial land use.

RDL = Reportable Detection Limit for routine analysis

nd = Not detected above standard RDL

mbgs = metres below ground surface

Lab-Dup = Laboratory QA/QC duplicate sample

Bold/Shaded = Value exceeds applicable guideline

Table C.3 Results of Laboratory Analysis of Available Metals in Soil (cont.)
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Parameters	RDL	Units	Guideline ¹	BH6-SS4	BH6-SS4 Lab-Dup	BH7-SS1	BH7-SS6	BH8-SS4	BH9-SS2	BH10-SS1	BH11-SS1
				2.9 - 3.5 mbgs	-	0.2 - 0.7 mbgs	3.4 - 4.0 mbgs	2.1 - 2.7 mbgs	0.8 - 1.4 mbgs	0.4 - 1.2 mbgs	0.3 - 0.8 mbgs
				25-Feb-13	-	25-Feb-13	25-Feb-13	20-Feb-13	24-Feb-13	5-Mar-13	7-Mar-13
Aluminum	10	mg/kg	-	13,000	13,000	7,600	16,000	16,000	11,000	11,000	10,000
Antimony	2.0	mg/kg	40	3.6	nd	nd	nd	nd	nd	nd	nd
Arsenic	2.0	mg/kg	12	7.9	8.0	3.5	3.6	2.9	4.7	4.6	4.8
Barium	5.0	mg/kg	2,000	59	52	36	38	20	34	41	36
Beryllium	2.0	mg/kg	8	nd	nd	nd	nd	nd	nd	nd	nd
Boron	5.0	mg/kg	-	nd	nd	nd	nd	nd	nd	nd	nd
Cadmium	0.30	mg/kg	22	nd	nd	0.46	nd	nd	nd	nd	0.32
Chromium	2.0	mg/kg	87	21	17	12	21	35	9.4	14	21
Cobalt	1.0	mg/kg	300	11	11	6.1	8.8	8.2	8.3	7.9	7.8
Copper	2.0	mg/kg	91	31	30	11	45	20	14	21	25
Iron	50	mg/kg	-	27,000	26,000	17,000	29,000	33,000	20,000	23,000	26,000
Lead	0.50	mg/kg	260	210	200	12	15	42	12	32	12
Manganese	2.0	mg/kg	-	690	680	660	620	630	880	840	820
Mercury	0.10	mg/kg	24	0.11	nd	nd	nd	nd	nd	nd	nd
Molybdenum	2.0	mg/kg	40	3.2	3.3	nd	nd	3.9	nd	nd	nd
Nickel	2.0	mg/kg	50	13	13	7.2	21	21	6.8	12	18
Selenium	2.0	mg/kg	2.9	nd	nd	nd	nd	nd	nd	nd	nd
Silver	0.50	mg/kg	40	0.75	nd	nd	5.3	nd	nd	nd	nd
Strontium	5.0	mg/kg	-	21	20	6.3	21	7.6	19	18	30
Thallium	0.10	mg/kg	1	nd	nd	nd	nd	nd	nd	nd	nd
Tin	2.0	mg/kg	300	4.1	2.5	nd	nd	nd	nd	nd	nd
Uranium	0.10	mg/kg	33	1.4	1.4	0.38	3.7	0.48	0.63	0.42	0.64
Vanadium	2.0	mg/kg	130	19	20	8.9	25	22	13	19	26
Zinc	5.0	mg/kg	360	130	120	45	63	69	54	81	59

Notes:

1 = Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guidelines (CSQG on-line 2013). Commercial land use.

RDL = Reportable Detection Limit for routine analysis

nd = Not detected above standard RDL

mbgs = metres below ground surface

Lab-Dup = Laboratory QA/QC duplicate sample

Table C.3 Results of Laboratory Analysis of Available Metals in Soil (cont.)
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Parameters	RDL	Units	Guideline ¹	BH12-SS2	BH13-SS3	BH13-SS5	BH14-SS3	BH14-AS3C	BH15-SS1	BH15-SS3
				1.0 - 1.3 mbgs	1.3 - 1.9 mbgs	2.1 - 3.2 mbgs	1.6 - 2.2 mbgs	2.3 mbgs	0.2 - 0.8 mbgs	1.6 - 2.2 mbgs
				3-Mar-13	22-Feb-13	22-Feb-13	24-Feb-13	24-Feb-13	26-Feb-13	26-Feb-13
Aluminum	10	mg/kg	-	9,200	14,000	13,000	9,700	6,800	7,800	17,000
Antimony	2.0	mg/kg	40	nd	nd	nd	nd	nd	nd	nd
Arsenic	2.0	mg/kg	12	4.8	5.3	8.7	15	2.9	4.2	12
Barium	5.0	mg/kg	2,000	45	33	72	140	26	21	110
Beryllium	2.0	mg/kg	8	nd	nd	nd	nd	nd	nd	nd
Boron	5.0	mg/kg	-	nd	nd	nd	nd	nd	nd	nd
Cadmium	0.30	mg/kg	22	nd	nd	nd	0.31	nd	nd	nd
Chromium	2.0	mg/kg	87	13	24	24	33	33	7.1	18
Cobalt	1.0	mg/kg	300	7.8	11	9.9	8.7	5.1	6.5	10
Copper	2.0	mg/kg	91	23	24	36	51	15	12	43
Iron	50	mg/kg	-	25,000	29,000	31,000	34,000	16,000	18,000	34,000
Lead	0.50	mg/kg	260	26	27	160	340	11	14	850
Manganese	2.0	mg/kg	-	790	850	800	610	540	730	620
Mercury	0.10	mg/kg	24	nd	nd	0.22	0.65	nd	nd	0.44
Molybdenum	2.0	mg/kg	40	nd	nd	2.8	5	nd	nd	nd
Nickel	2.0	mg/kg	50	12	16	15	18	9.6	6.7	20
Selenium	2.0	mg/kg	2.9	nd	nd	nd	nd	nd	nd	nd
Silver	0.50	mg/kg	40	nd	nd	nd	0.77	nd	nd	nd
Strontium	5.0	mg/kg	-	15	24	31	33	9.7	6.3	30
Thallium	0.10	mg/kg	1	nd	nd	nd	0.11	nd	nd	0.11
Tin	2.0	mg/kg	300	3.8	nd	4.2	15	nd	nd	27
Uranium	0.10	mg/kg	33	0.49	0.56	0.66	0.66	0.38	0.35	0.86
Vanadium	2.0	mg/kg	130	16	26	21	24	30	9.3	23
Zinc	5.0	mg/kg	360	82	78	110	140	53	47	140

Notes:

1 = Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guidelines (CSQG on-line 2013). Commercial land use.

RDL = Reportable Detection Limit for routine analysis

nd = Not detected above standard RDL

mbgs = metres below ground surface

Bold/Shaded = Value exceeds applicable guideline

Table C.4 Results of Laboratory Analysis of Polycyclic Aromatic Hydrocarbons in Soil
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Parameter	RDL	Units	B(a)P PEF	CCME CSQG _{HH} ¹ (All Land Uses)	HH Guidelines - Other Jurisdictions ² (All Land Uses)	CCME CSQG _{EH} ¹ - (Comm.)	BH1-SS3	BH1-SS3 Lab-Dup	BH1-SS9	BH2-SS5	BH2-SS7	BH3-SS4	BH4-SS5
							1.6 - 2.2 mbgs	-	5.7 - 6.3 mbgs	2.9 - 3.6 mbgs	4.4 - 5.0 mbgs	2.6 - 3.2 mbgs	2.2 - 2.6 mbgs
							4-Mar-13	-	4-Mar-13	27-Feb-13	27-Feb-13	6-Mar-13	28-Feb-13
Non-Carcinogenic PAHs													
1-Methylnaphthalene	0.01	mg/kg	-	-	560*	-	0.37	0.26	nd	0.69	0.058	12	0.96
2-Methylnaphthalene	0.01	mg/kg	-	-	560*	-	0.44	0.32	nd	nd	0.031	2.9	0.96
Acenaphthene	0.01	mg/kg	-	-	96*	-	0.067	0.053	nd	nd	0.16	4.3	1.2
Acenaphthylene	0.01	mg/kg	-	-	9.6*	-	nd	nd	nd	nd	0.088	nd	1.7
Anthracene	0.01	mg/kg	-	-	4,200*	32	0.20	0.20	nd	1.5	0.4	nd	2.2
Fluoranthene	0.01	mg/kg	-	-	9.6*	180	1.4	1.8	0.05	3.4	1.6	5.5	17
Fluorene	0.01	mg/kg	-	-	5,600*	-	0.13	0.097	nd	0.55	0.14	3.6	nd
Naphthalene	0.01	mg/kg	-	-	2,800*	22/0.013 ⁴	0.33	0.22	nd	0.48	0.055	2.9	1.5
Perylene	0.01	mg/kg	-	-	2,800**	-	0.18	0.19	0.44	0.17	0.12	0.32	1.3
Phenanthrene	0.01	mg/kg	-	-	3,800**	50/0.046 ⁴	0.73	0.73	nd	1.1	0.64	11	13
Pyrene	0.01	mg/kg	-	-	96*	100	1.2	1.5	0.056	2.8	1.7	5.2	19
Carcinogenic PAHs													
Benzo[a]anthracene	0.01	mg/kg	0.1	-	-	10	0.84	0.99	nd	1.2	0.95	2.0	6.8
Benzo[a]pyrene	0.01	mg/kg	1	-	-	72	0.64	0.67	nd	0.89	0.65	1.5	6.6
Benzo[b]fluoranthene	0.01	mg/kg	0.1	-	-	10	0.64	0.62	nd	0.62	0.40	1.2	4.8
Benzo[ghi]perylene	0.01	mg/kg	0.01	-	-	-	0.54	0.52	nd	0.53	0.33	1.0	4.5
Benzo[j]fluoranthene	0.01	mg/kg	0.1	-	-	10	0.34	0.33	nd	0.39	0.24	0.71	3.1
Benzo[k]fluoranthene	0.01	mg/kg	0.1	-	-	10	0.33	0.33	nd	0.35	0.23	0.67	2.8
Chrysene	0.01	mg/kg	0.01	-	-	-	0.94	1.1	nd	1.2	0.78	2.3	7.3
Indeno[1,2,3-cd]pyrene	0.01	mg/kg	0.1	-	-	10	0.43	0.43	nd	0.37	0.24	0.72	3.4
Dibenz[a,h]anthracene	0.01	mg/kg	1	-	-	10	0.12	0.11	nd	0.12	0.079	0.20	0.9
Benzo(a)pyrene TPE concentration				5.3 ^{1,5}	-	-	1.0	1.1	0.013	1.3	0.9	2.3	9.7

Notes:

1 = Canadian Counsel of Ministers of the Environment (CCME) Soil Quality Guidelines for the Protection of Environmental and Human Health (CSQG on-line 2013). As per CCME recommendations, soil samples are compared against the soil quality guidelines for the protection of human health and environmental health separately. Commercial land use.

2 = Human Health Criteria for non-carcinogenic PAHs in soil. Guidelines from other jurisdictions applied in the absence of applicable CCME guidelines. Source guideline for specific PAH parameter: *Ontario Ministry of the Environment (MOE) Soil, Groundwater and Sediment Standards for Use Under Part XV.I of the Environmental Protection Act April 15, 2011. Soil Components for Table 3 – Full Depth, Non-potable Scenario (lowest applicable human health guideline); **Texas Risk Reduction Program (TRRP) Tier I protective concentration level (PCL), Table 5 (June 2012).

3 = Carcinogenic PAHs assessed as B[a]P TPE for Human Health

4 = Guideline if potential impact to surface water (freshwater)

5 = Based on CCME guidelines for ingestion, inhalation and dermal exposures. Where a parameter is not detected, 1/2 of the RDL is used in the TPE calculation.

B[a]P TPE = Benzo(a)pyrene Total Potency Equivalent concentration. Calculation assumes that soil is not contaminated with coal tar or creosote timbers

B(a)P PEF = Benzo(a)pyrene Potency Equivalent Factor

TPE = Total potency equivalent

RDL = Reportable Detection Limit for routine analysis

nd = not detected above standard RDL

" - " = no guideline available

mbgs = metres below ground surface

Bold/Shaded = Value exceeds applicable guideline

Lab-Dup = Laboratory QA/QC duplicate sample

Table C.4 Results of Laboratory Analysis of Polycyclic Aromatic Hydrocarbons in Soil (cont.)
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Parameter	RDL	Units	B(a)P PEF	CCME CSQG _{HH} ¹ (All Land Uses)	HH Guidelines - Other Jurisdictions ² (All Land Uses)	CCME CSQG _{EH} ¹ - (Comm.)	BH5-SS4	BH5-SS4 Lab-Dup	BH6-SS4	BH7-SS1	BH7-SS6	BH8-SS4	BH9-SS2
							2.1 - 2.7 mbgs	-	2.9 - 3.5 mbgs	0.2 - 0.7 mbgs	3.4 - 4.0 mbgs	2.1 - 2.7 mbgs	0.8 - 1.4 mbgs
							21-Feb-13	-	25-Feb-13	25-Feb-13	25-Feb-13	20-Feb-13	24-Feb-13
Non-Carcinogenic PAHs													
1-Methylnaphthalene	0.01	mg/kg	-	-	560*	-	0.23	0.31	2.5	nd	nd	0.021	nd
2-Methylnaphthalene	0.01	mg/kg	-	-	560*	-	0.19	0.28	1.6	nd	nd	0.033	nd
Acenaphthene	0.01	mg/kg	-	-	96*	-	0.56	1.9	0.2	nd	0.039	0.015	nd
Acenaphthylene	0.01	mg/kg	-	-	9.6*	-	0.085	0.14	0.27	nd	nd	nd	nd
Anthracene	0.01	mg/kg	-	-	4,200*	32	4.3	15	0.35	nd	nd	nd	nd
Fluoranthene	0.01	mg/kg	-	-	9.6*	180	12	44	0.84	0.014	nd	0.065	0.017
Fluorene	0.01	mg/kg	-	-	5,600*	-	1.9	6.7	0.78	nd	0.033	0.024	nd
Naphthalene	0.01	mg/kg	-	-	2,800*	22/0.013 ⁴	0.24	0.39	1.1	nd	nd	0.35	nd
Perylene	0.01	mg/kg	-	-	2,800**	-	1.1	2.7	0.22	nd	0.014	nd	nd
Phenanthrene	0.01	mg/kg	-	-	3,800**	50/0.046 ⁴	8.9	19	1.6	0.026	nd	0.074	0.024
Pyrene	0.01	mg/kg	-	-	96*	100	12	45	0.83	0.014	nd	0.081	0.016
Carcinogenic PAHs													
Benzo[a]anthracene	0.01	mg/kg	0.1	-	-	10	5.8	22	0.52	nd	nd	0.036	nd
Benzo[a]pyrene	0.01	mg/kg	1	-	-	72	5.0	17	0.53	nd	nd	0.040	nd
Benzo[b]fluoranthene	0.01	mg/kg	0.1	-	-	10	3.2	9.8	0.40	nd	nd	0.029	nd
Benzo[ghi]perylene	0.01	mg/kg	0.01	-	-	-	2.1	7.3	0.36	nd	nd	0.028	nd
Benzo[j]fluoranthene	0.01	mg/kg	0.1	-	-	10	2.2	6.9	0.32	nd	nd	0.019	nd
Benzo[k]fluoranthene	0.01	mg/kg	0.1	-	-	10	2.0	6.2	0.25	nd	nd	0.017	nd
Chrysene	0.01	mg/kg	0.01	-	-	-	5.9	21	0.64	0.018	nd	0.042	nd
Indeno[1,2,3-cd]pyrene	0.01	mg/kg	0.1	-	-	10	1.8	5.9	0.31	nd	nd	0.022	nd
Dibenz[a,h]anthracene	0.01	mg/kg	1	-	-	10	0.62	1.7	0.081	nd	nd	nd	nd
Benzo(a)pyrene TPE concentration				5.3 ^{1,5}	-	-	7.2	24.1	0.801	0.013	0.013	0.058	0.013

Notes:

1 = Canadian Council of Ministers of the Environment (CCME) Soil Quality Guidelines for the Protection of Environmental and Human Health (CSQG on-line 2013). As per CCME recommendations, soil samples are compared against the soil quality guidelines for the protection of human health and environmental health separately. Commercial land use.

2 = Human Health Criteria for non-carcinogenic PAHs in soil. Guidelines from other jurisdictions applied in the absence of applicable CCME guidelines. Source guideline for specific PAH parameter: *Ontario Ministry of the Environment (MOE) Soil, Groundwater and Sediment Standards for Use Under Part XV.I of the Environmental Protection Act April 15, 2011. Soil Components for Table 3 – Full Depth, Non-potable Scenario (lowest applicable human health guideline); **Texas Risk Reduction Program (TRRP) Tier I protective concentration level (PCL), Table 5 (June 2012).

3 = Carcinogenic PAHs assessed as B[a]P TPE for Human Health

4 = Guideline if potential impact to surface water (freshwater)

5 = Based on CCME guidelines for ingestion, inhalation and dermal exposures. Where a parameter is not detected, 1/2 of the RDL is used in the TPE calculation.

B[a]P TPE = Benzo(a)pyrene Total Potency Equivalent concentration. Calculation assumes that soil is not contaminated with coal tar or creosote timbers

B(a)P PEF = Benzo(a)pyrene Potency Equivalent Factor

TPE = Total potency equivalent

RDL = Reportable Detection Limit for routine analysis

nd = not detected above standard RDL

" - " = no guideline available

mbgs = metres below ground surface

Bold/Shaded = Value exceeds applicable guideline

Lab-Dup = Laboratory QA/QC duplicate sample

Table C.4 Results of Laboratory Analysis of Polycyclic Aromatic Hydrocarbons in Soil (cont.)
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Parameter	RDL	Units	B(a)P PEF	CCME CSQG _{HH} ¹ (All Land Uses)	HH Guidelines - Other Jurisdictions ² (All Land Uses)	CCME CSQG _{EH} ¹ - (Comm.)	BH10-SS1	BH11-SS1	BH12-SS2	BH13-SS3	BH13-SS3 Lab-Dup	BH13-SS5
							0.4 - 1.2 mbgs	0.3 - 0.8 mbgs	1.0 - 1.3 mbgs	1.3 - 1.9 mbgs	-	2.1 - 3.2 mbgs
							5-Mar-13	7-Mar-13	3-Mar-13	22-Feb-13	-	22-Feb-13
Non-Carcinogenic PAHs												
1-Methylnaphthalene	0.01	mg/kg	-	-	560*	-	0.11	nd	0.34	0.011	0.013	0.054
2-Methylnaphthalene	0.01	mg/kg	-	-	560*	-	0.17	nd	0.42	0.016	0.018	0.097
Acenaphthene	0.01	mg/kg	-	-	96*	-	0.36	nd	1.3	nd	nd	0.087
Acenaphthylene	0.01	mg/kg	-	-	9.6*	-	0.034	nd	0.078	nd	nd	nd
Anthracene	0.01	mg/kg	-	-	4,200*	32	0.51	nd	2.2	0.019	0.024	0.08
Fluoranthene	0.01	mg/kg	-	-	9.6*	180	2.1	0.062	9.3	0.15	0.17	0.5
Fluorene	0.01	mg/kg	-	-	5,600*	-	0.5	nd	1.4	nd	nd	0.069
Naphthalene	0.01	mg/kg	-	-	2,800*	22/0.013 ⁴	0.34	nd	0.58	0.013	0.014	0.057
Perylene	0.01	mg/kg	-	-	2,800**	-	0.089	nd	0.49	0.026	0.029	0.073
Phenanthrene	0.01	mg/kg	-	-	3,800**	50/0.046 ⁴	2.1	0.031	11	0.094	0.1	0.25
Pyrene	0.01	mg/kg	-	-	96*	100	1.6	0.056	7.1	0.13	0.14	0.44
Carcinogenic PAHs												
Benzo[a]anthracene	0.01	mg/kg	0.1	-	-	10	0.59	0.033	4.0	0.076	0.086	0.23
Benzo[a]pyrene	0.01	mg/kg	1	-	-	72	0.380	0.027	2.4	0.095	0.110	0.280
Benzo[b]fluoranthene	0.01	mg/kg	0.1	-	-	10	0.32	0.026	1.7	0.076	0.086	0.22
Benzo[ghi]perylene	0.01	mg/kg	0.01	-	-	-	0.18	0.025	1.0	0.074	0.083	0.21
Benzo[j]fluoranthene	0.01	mg/kg	0.1	-	-	10	0.19	0.015	1.1	0.045	0.051	0.13
Benzo[k]fluoranthene	0.01	mg/kg	0.1	-	-	10	0.18	0.013	1.1	0.042	0.049	0.12
Chrysene	0.01	mg/kg	0.01	-	-	-	0.64	0.047	4.0	0.083	0.09	0.24
Indeno[1,2,3-cd]pyrene	0.01	mg/kg	0.1	-	-	10	0.17	0.017	0.95	0.061	0.07	0.17
Dibenz[a,h]anthracene	0.01	mg/kg	1	-	-	10	0.049	nd	0.32	0.015	0.016	0.045
Benzo(a)pyrene TPE concentration				5.3 ^{1,5}	-	-	0.58	0.043	3.7	0.14	0.16	0.42

Notes:

1 = Canadian Counsel of Ministers of the Environment (CCME) Soil Quality Guidelines for the Protection of Environmental and Human Health (CSQG on-line 2013). As per CCME recommendations, soil samples are compared against the soil quality guidelines for the protection of human health and environmental health separately. Commercial land use.

2 = Human Health Criteria for non-carcinogenic PAHs in soil. Guidelines from other jurisdictions applied in the absence of applicable CCME guidelines. Source guideline for specific PAH parameter: Ontario Ministry of the Environment (MOE) Soil, Groundwater and Sediment Standards for Use Under Part XV.I of the Environmental Protection Act April 15, 2011. Soil Components for Table 3 – Full Depth, Non-potable Scenario (lowest applicable human health guideline); **Texas Risk Reduction Program (TRRP) Tier I protective concentration level (PCL). Table 5 (June 2012).

3 = Carcinogenic PAHs assessed as B[a]P TPE for Human Health

4 = Guideline if potential impact to surface water (freshwater)

5 = Based on CCME guidelines for ingestion, inhalation and dermal exposures. Where a parameter is not detected, 1/2 of the RDL is used in the TPE calculation.

B[a]P TPE = Benzo(a)pyrene Total Potency Equivalent concentration. Calculation assumes that soil is not contaminated with coal tar or creosote timbers

B(a)P PEF = Benzo(a)pyrene Potency Equivalent Factor

TPE = Total potency equivalent

RDL = Reportable Detection Limit for routine analysis

nd = not detected above standard RDL

" - " = no guideline available

mbgs = metres below ground surface

Bold/Shaded = Value exceeds applicable guideline

Lab-Dup = Laboratory QA/QC duplicate sample

Table C.4 Results of Laboratory Analysis of Polycyclic Aromatic Hydrocarbons in Soil (cont.)
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Parameter	RDL	Units	B(a)P PEF	CCME CSQG _{HH} ¹ (All Land Uses)	HH Guidelines - Other Jurisdictions ² (All Land Uses)	CCME CSQG _{EH} ¹ - (Comm.)	BH14-SS3	BH14-AS3C	BH15-SS1	BH15-SS3
							1.6 - 2.2 mbgs	2.3 mbgs	0.2 - 0.8 mbgs	1.6 - 2.2 mbgs
							24-Feb-13	24-Feb-13	26-Feb-13	26-Feb-13
Non-Carcinogenic PAHs										
1-Methylnaphthalene	0.01	mg/kg	-	-	560*	-	8.1	0.011	nd	2.6
2-Methylnaphthalene	0.01	mg/kg	-	-	560*	-	13	0.014	nd	0.13
Acenaphthene	0.01	mg/kg	-	-	96*	-	12	nd	nd	0.36
Acenaphthylene	0.01	mg/kg	-	-	9.6*	-	5.0	nd	nd	0.33
Anthracene	0.01	mg/kg	-	-	4,200*	32	20	nd	nd	0.12
Fluoranthene	0.01	mg/kg	-	-	9.6*	180	64	0.04	nd	0.64
Fluorene	0.01	mg/kg	-	-	5,600*	-	21	0.01	nd	0.78
Naphthalene	0.01	mg/kg	-	-	2,800*	22/0.013 ⁴	38	0.01	nd	0.066
Perylene	0.01	mg/kg	-	-	2,800**	-	3.6	0.035	nd	0.047
Phenanthrene	0.01	mg/kg	-	-	3,800**	50/0.046 ⁴	100	0.04	nd	0.95
Pyrene	0.01	mg/kg	-	-	96*	100	52	0.12	nd	0.65
Carcinogenic PAHs										
Benzo[a]anthracene	0.01	mg/kg	0.1	-	-	10	25	nd	nd	0.28
Benzo[a]pyrene	0.01	mg/kg	1	-	-	72	16	0.044	nd	0.22
Benzo[b]fluoranthene	0.01	mg/kg	0.1	-	-	10	11	nd	nd	0.2
Benzo[ghi]perylene	0.01	mg/kg	0.01	-	-	-	7.5	0.11	nd	0.12
Benzo[j]fluoranthene	0.01	mg/kg	0.1	-	-	10	7.0	nd	nd	0.12
Benzo[k]fluoranthene	0.01	mg/kg	0.1	-	-	10	6.5	nd	nd	0.12
Chrysene	0.01	mg/kg	0.01	-	-	-	23	0.56	0.014	0.32
Indeno[1,2,3-cd]pyrene	0.01	mg/kg	0.1	-	-	10	6.7	nd	nd	0.11
Dibenz[a,h]anthracene	0.01	mg/kg	1	-	-	10	2.0	nd	nd	0.031
Benzo(a)pyrene TPE concentration				5.3 ^{1,5}	-	-	23.9	0.06	0.013	0.34

Notes:

1 = Canadian Counsel of Ministers of the Environment (CCME) Soil Quality Guidelines for the Protection of Environmental and Human Health (CSQG on-line 2013). As per CCME recommendations, soil samples are compared against the soil quality guidelines for the protection of human health and environmental health separately. Commercial land use.

2 = Human Health Criteria for non-carcinogenic PAHs in soil. Guidelines from other jurisdictions applied in the absence of applicable CCME guidelines. Source guideline for specific PAH parameter: *Ontario Ministry of the Environment (MOE) Soil, Groundwater and Sediment Standards for Use Under Part XV.I of the Environmental Protection Act April 15, 2011. Soil Components for Table 3 – Full Depth, Non-potable Scenario (lowest applicable human health guideline); **Texas Risk Reduction Program (TRRP) Tier I protective concentration level (PCL), Table 5 (June 2012).

3 = Carcinogenic PAHs assessed as B[a]P TPE for Human Health

4 = Guideline if potential impact to surface water (freshwater)

5 = Based on CCME guidelines for ingestion, inhalation and dermal exposures. Where a parameter is not detected, 1/2 of the RDL is used in the TPE calculation.

B[a]P TPE = Benzo(a)pyrene Total Potency Equivalent concentration. Calculation assumes that soil is not contaminated with coal tar or creosote timbers

B(a)P PEF = Benzo(a)pyrene Potency Equivalent Factor

TPE = Total potency equivalent

RDL = Reportable Detection Limit for routine analysis

nd = not detected above standard RDL

" - " = no guideline available

mbgs = metres below ground surface

Bold/Shaded = Value exceeds applicable guideline

Table C.5 Results of Laboratory Analysis of Polychlorinated Biphenyls in Soil
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Sample I.D.	Depth (mbgs)	Date	Polychlorinated Biphenyls (PCBs)
BH1-SS3	1.6 - 2.2	4-Mar-13	nd
BH1-SS3 Lab-Dup	-	-	nd
BH1-SS9	5.7 - 6.3	4-Mar-13	nd
BH2-SS5	2.9 - 3.6	27-Feb-13	nd
BH3-SS4	2.6 - 3.2	6-Mar-13	nd
BH4-SS5	2.2 - 2.6	28-Feb-13	nd
BH4-SS5 Lab-Dup	-	-	nd
BH5-SS4	2.1 - 2.7	21-Feb-13	nd
BH5-SS4 Lab-Dup	-	-	nd
BH6-SS4	2.9 - 3.5	25-Feb-13	nd
BH7-SS1	0.2 - 0.7	25-Feb-13	nd
BH7-SS6	3.4 - 4.0	25-Feb-13	nd
BH8-SS4	2.1 - 2.7	20-Feb-13	nd
BH9-SS2	0.8 - 1.4	24-Feb-13	nd
BH10-SS1	0.4 - 1.2	5-Mar-13	nd
BH11-SS1	0.3 - 0.8	7-Mar-13	nd
BS12-SS2	1.0 - 1.3	3-Mar-13	nd
BH13-SS3	1.3 - 1.9	22-Feb-13	nd
BH14-SS3	1.6 - 3.2	24-Feb-13	nd
BH14-AS3C	2.3	24-Feb-13	nd
BH15-SS1	0.2 - 0.8	26-Feb-13	nd
BH15-SS1 Lab-Dup	-	-	nd
BH15-SS3	1.6 - 2.2	26-Feb-13	nd
RDL			0.05
Units			mg/kg
Guideline¹			33

Notes:

1 = Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CSQG on-line 2013). Commercial land use.

RDL = Reportable Detection Limit for routine analysis

nd = Not detected above standard RDL

mbgs = metres below ground surface

Lab-Dup = Laboratory QA/QC duplicate sample

Table C.6 Results of Laboratory Analysis of Total Oil and Grease in Soil
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Sample I.D.	Depth (mbgs)	Date	Total Oil & Grease
BH2-SS5	2.9 - 3.6	27-Feb-13	1,800
BH5-SS4	2.1 - 2.7	21-Feb-13	1,400
BH6-SS4	2.9 - 3.5	25-Feb-13	5,200
BH8-SS4	2.1 - 2.7	20-Feb-13	660
BH8-SS4 Lab-Dup	-	-	600
BH13-SS5	2.1 - 3.2	22-Feb-13	480
BH15-SS3	1.6 - 2.2	26-Feb-13	3,500
RDL			0.05
Units			mg/kg

Notes:

RDL = Reportable Detection Limit for routine analysis

nd = Not detected above standard RDL

mbgs = metres below ground surface

Lab-Dup = Laboratory QA/QC duplicate sample

Table C.7 Results of Laboratory Analysis of Leachate in Soil
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Parameters	Units	Guideline ¹	RDL	BH6-SS4	BH14-SS3	BH14-SS3 Lab-Dup	BH14-AS3C	BH14-AS3C Lab-Dup	BH15-SS3
				2.9 - 3.5 mbgs	1.6 - 2.2 mbgs	-	2.3 mbgs	-	1.6 - 2.2 mbgs
				25-Feb-13	24-Feb-13	-	24-Feb-13	-	26-Feb-13
Leachable >C10-C16 Hydrocarbons	µg/L	-	0.20	1.1	1.7	1.7	nd	-	0.92
Leachable >C16-C21 Hydrocarbons	µg/L	-	0.20	nd	0.46	0.47	nd	-	nd
Leachable >C21-<C32 Hydrocarbons	µg/L	-	0.50	nd	nd	nd	nd	-	nd
Leachable Lead	µg/L	5,000	5.0	410	2,200	-	10	-	540
Leachable Fluoranthene	µg/L	-	0.10	0.21	8.5	-	nd	nd	0.30
Leachable Naphthalene	µg/L	-	2.0	8.4	600	-	nd	nd	nd
Leachable Phenanthrene	µg/L	-	0.10	1.5	93	-	0.20	0.24	1.7

Notes:

1 = Environment Canada, Interprovincial Movement of Hazardous Waste and Hazardous Recyclable Material Regulations, Schedule 2 (Table of Hazardous Constituents Controlled Under Leachate Test and Regulated Limits), January 2002

RDL = Reportable Detection Limit

nd = Not detected above standard RDL

'-' = no applicable guidelines

Lab-Dup = Laboratory QA/QC duplicate sample

Table C.8 Results of Laboratory Analysis of Petroleum Hydrocarbons in Groundwater
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Parameters	RDL	Units	FIGQGs ¹	ON MOE ²	BH1	BH2	BH4	BH5	BH7	BH8	BH11	BH13	BH15
					12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13
Benzene	0.001	mg/L	0.2	0.044	nd	nd	0.002	nd	nd	nd	0.003	nd	nd
Toluene	0.001	mg/L	8.9	14	nd	nd	nd	nd	nd	nd	0.002	nd	nd
Ethylbenzene	0.001	mg/L	11	1.8	nd	nd	nd	nd	nd	nd	0.004	nd	nd
Xylenes	0.002	mg/L	-	3.3	nd	nd	nd	nd	nd	nd	0.011	nd	nd
C ₆ -C ₁₀ - F1	0.01	mg/L	-	0.42	nd	0.017	0.064	nd	nd	0.079	0.2	nd	0.20
C ₁₀ -C ₁₆ - F2	0.05	mg/L	-	0.15	0.085	0.068	0.13	0.055	0.15	<u>1.2</u>	<u>0.28</u>	0.088	<u>1.1</u>
C ₁₆ -C ₃₂ ⁴ - F3	0.1	mg/L	-	0.5	nd	nd	nd	0.165	0.085	<u>0.63</u>	0.061	nd	0.25
>C ₃₂ ⁴ - F4	-	mg/L	-	0.5	-	-	-	-	-	-	-	-	-
Modified TPH - Tier I ³	0.1	mg/L	-	-	nd	nd	0.19	0.22*	0.23	1.9*	0.54	nd	1.5
Resemblance	-	-	-	-	NR FO	G/FO	G/FO	NR FO/LO	FO	FO	G	FO	G/FO

Notes:

1 = Federal Interim Groundwater Quality Guidelines (FIGQGs), Generic Guidelines for Commercial and Industrial Land Uses (November 2012), Tier 2 for Marine Life Water Use (Table 3)

2 = Ontario Ministry of the Environment (MOE) Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*. April 15, 2011. Generic site condition standards for use within 30 m of a water body in a non-potable groundwater condition (Table 9)

3 = Modified TPH - Tier I does not include BTEX

4 = Atlantic PIRI analytical method does not analyse for >C32. Laboratory certificate indicates (Yes or No) whether chromatogram for each sample returns to baseline after C32. Samples are considered to have returned to baseline if the area from C32-C36 is less than 10% of the area from C10-C32.

* = Baseline not reached at C32; sample may contain carbon fractions >C32

Bold/shaded/underlined = exceeds ON MOE criteria

RDL = Reportable Detection Limit

nd = Not detected above standard RDL

na = Not applicable

G = Gasoline; FO = fuel oil; LO = lube oil; NR = no resemblance to petroleum hydrocarbons

Table C.9 Results of Laboratory Analysis of Fractionated Petroleum Hydrocarbons in Groundwater
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Parameters	RDL	Units	FIGQGs ¹	ON MOE ²	BH6	BH6 Lab-Dup	BH15
					12-Mar-13		13-Mar-13
Benzene	0.001	mg/L	0.2	0.044	0.016	-	nd
Toluene	0.001	mg/L	8.9	18	0.0038	-	nd
Ethylbenzene	0.001	mg/L	11	2.3	0.067	-	nd
Xylenes	0.002	mg/L	-	4.2	0.12	-	0.0030
Aliphatic >C6-C8	0.010	mg/L	-	-	0.47	-	0.13
Aliphatic >C8-C10	0.010	mg/L	-	-	0.12	-	0.091
>C8-C10 Aromatics (-EX)	0.010	mg/L	-	-	0.62	-	0.045
Aliphatic >C10-C12	0.010	mg/L	-	-	0.12	0.096	0.35
Aliphatic >C12-C16	0.050	mg/L	-	-	0.26	0.23	0.78
Aliphatic >C16-C21	0.050	mg/L	-	-	0.14	0.13	0.32
Aliphatic >C21-<C32	0.100	mg/L	-	-	nd	nd	nd
Aromatic >C10-C12	0.010	mg/L	-	-	0.54	0.46	0.19
Aromatic >C12-C16	0.050	mg/L	-	-	0.33	0.29	0.31
Aromatic >C16-C21	0.050	mg/L	-	-	0.17	0.15	0.19
Aromatic >C21-<C32	0.100	mg/L	-	-	nd	nd	nd
C ₆ -C ₁₀ - F1	-	mg/L	-	0.75	<u>1.21</u>	-	0.27
C ₁₀ -C ₁₆ - F2	-	mg/L	-	0.15	<u>1.25</u>	-	<u>1.63</u>
C ₁₆ -C ₃₂ ⁴ - F3	-	mg/L	-	0.5	0.41	-	<u>0.61</u>
>C ₃₂ ⁴ - F4	-	mg/L	-	0.5	-	-	-
Modified TPH - Tier 2 ³	0.11	mg/L	-	-	2.8	-	2.4
Resemblance	-	-	-	-	G, WFO	-	WFO

Notes:

1 = Federal Interim Groundwater Quality Guidelines (FIGQGs), Generic Guidelines for Commercial and Industrial Land Uses (November 2012), Tier 2 for Marine Life Water Use (Table 3)

2 = Ontario Ministry of the Environment (MOE) Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*. April 15, 2011. Generic site condition standards for use within 30 m of a water body in a non-potable groundwater condition (Table 9)

3 = Modified TPH - Tier I does not include BTEX

4 = Atlantic PIRI analytical method does not analyse for >C32. Laboratory certificate indicates (Yes or No) whether chromatogram for each sample returns to baseline after C32. Samples are considered to have returned to baseline if the area from C32-C36 is less than 10% of the area from C10-C32.

Bold/shaded/underlined = exceeds ON MOE criteria

RDL = Reportable Detection Limit

nd = Not detected above standard RDL

na = Not applicable

G = Gasoline; WFO = weathered fuel oil

Lab-Dup = Laboratory QA/QC duplicate sample

Table C.10 Results of Laboratory Analysis of Dissolved Metals in Groundwater
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Parameters	RDL	Units	FIGQGs ¹	ON MOE ²	BH1	BH2	BH4	BH5	BH6
					12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13
Aluminum	5.0	ug/L	-	-	nd	nd	nd	11.2	7.6
Antimony	1.0	ug/L	-	16,000	nd	nd	nd	nd	nd
Arsenic	1.0	ug/L	12.5	1,500	nd	1.0	nd	nd	nd
Barium	1.0	ug/L	500	23,000	36.2	264	427	72.9	86.1
Beryllium	1.0	ug/L	100	53	nd	nd	nd	nd	nd
Bismuth	2.0	ug/L	-	-	nd	nd	nd	nd	nd
Boron	50	ug/L	5,000	36,000	150	371	425	nd	nd
Cadmium	0.017	ug/L	0.12	2.1	0.028	nd	nd	0.033	0.017
Calcium	100	ug/L	-	-	35,900	88,300	149,000	11,400	22,400
Chromium	1.0	ug/L	56	640	nd	nd	nd	nd	nd
Cobalt	0.40	ug/L	-	52	1.32	3.15	1.57	1.32	5.67
Copper	2.0	ug/L	2.0	69	nd	nd	nd	nd	nd
Iron	50	ug/L	-	-	nd	8120	15100	nd	1220
Lead	0.50	ug/L	2.0	20	nd	nd	nd	nd	0.53
Magnesium	100	ug/L	-	-	52,500	164,000	215,000	5,490	5,690
Manganese	2.0	ug/L	-	-	395	11900	14500	126	1880
Mercury	0.013	ug/L	0.016	0.29	0.053	0.050	nd	0.10	nd
Molybdenum	2.0	ug/L	-	7,300	2.2	3.1	2.2	nd	nd
Nickel	2.0	ug/L	83	390	3.6	nd	nd	4.1	4.8
Phosphorus	100	ug/L	-	-	nd	nd	nd	nd	nd
Potassium	100	ug/L	-	-	12600	36,900	45,100	2,170	2,940
Selenium	1.0	ug/L	54	50	nd	nd	nd	nd	nd
Silver	0.10	ug/L	1.5	1.2	nd	nd	nd	nd	nd
Sodium	100	ug/L	-	180,000	<u>414,000</u>	<u>1,240,000</u>	<u>1,570,000</u>	75,200	94,400
Strontium	2.0	ug/L	-	-	429	1270	1750	62	91.3
Thallium	0.10	ug/L	-	400	nd	nd	nd	nd	nd
Tin	2.0	ug/L	-	-	nd	nd	nd	nd	nd
Titanium	2.0	ug/L	-	-	nd	nd	nd	nd	nd
Uranium	0.10	ug/L	-	330	nd	0.12	1.76	nd	nd
Vanadium	2.0	ug/L	-	200	nd	nd	nd	nd	nd
Zinc	5.0	ug/L	10	890	6.5	nd	nd	10.8	9.5

Notes:

1 = Federal Interim Groundwater Quality Guidelines (FIGQGs), Generic Guidelines for Commercial and Industrial Land Uses (November 2012), Tier 2 for Marine Life Water Use (Table 3)

2 = Ontario Ministry of the Environment (MOE) Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*. April 15, 2011. Generic site condition standards for use within 30 m of a water body in a non-potable groundwater condition (Table 9)

RDL = Reportable Detection Limit for routine analysis

nd = Not detected above standard RDL

"-" = No applicable guideline

na = Not available

Bold/shaded = exceeds FIGQG criteria

Bold/shaded/underlined = exceeds ON MOE criteria

Table C.10 Results of Laboratory Analysis of Dissolved Metals in Groundwater (cont.)
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Parameters	RDL	Units	FIGQGs ¹	ON MOE ²	BH7	BH8	BH11	BH13	BH15
					12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	13-Mar-13
Aluminum	5.0	ug/L	-	-	14.2	5.9	51.9	nd	11.2
Antimony	1.0	ug/L	-	16,000	nd	nd	1	nd	nd
Arsenic	1.0	ug/L	12.5	1,500	nd	nd	5.9	nd	3.0
Barium	1.0	ug/L	500	23,000	94.4	19.7	750	61.9	10.4
Beryllium	1.0	ug/L	100	53	nd	nd	nd	nd	nd
Bismuth	2.0	ug/L	-	-	nd	nd	nd	nd	nd
Boron	50	ug/L	5,000	36,000	nd	nd	nd	697	nd
Cadmium	0.017	ug/L	0.12	2.1	0.078	nd	nd	0.037	nd
Calcium	100	ug/L	-	-	41,400	11,300	61,400	78,900	10,600
Chromium	1.0	ug/L	56	640	nd	nd	nd	nd	nd
Cobalt	0.40	ug/L	-	52	3.11	1.55	nd	2.63	nd
Copper	2.0	ug/L	2.0	69	3.6	nd	2.3	nd	nd
Iron	50	ug/L	-	-	nd	621	nd	nd	nd
Lead	0.50	ug/L	2.0	20	nd	nd	nd	nd	1.00
Magnesium	100	ug/L	-	-	6,810	2,320	5,160	141,000	3,900
Manganese	2.0	ug/L	-	-	164	389	7.3	1340	234
Mercury	0.013	ug/L	0.016	0.29	0.022	0.35	0.041	0.18	1.3
Molybdenum	2.0	ug/L	-	7,300	nd	2.5	7	nd	nd
Nickel	2.0	ug/L	83	390	10.2	9.9	nd	7.4	nd
Phosphorus	100	ug/L	-	-	nd	nd	103	nd	nd
Potassium	100	ug/L	-	-	4,710	2,020	4,180	46,200	3,130
Selenium	1.0	ug/L	54	50	nd	nd	nd	nd	nd
Silver	0.10	ug/L	1.5	1.2	nd	nd	nd	nd	nd
Sodium	100	ug/L	-	180,000	277,000	52,500	378,000	1,410,000	58,800
Strontium	2.0	ug/L	-	-	163	46	277	860	48.6
Thallium	0.10	ug/L	-	400	nd	nd	nd	nd	nd
Tin	2.0	ug/L	-	-	nd	nd	nd	nd	nd
Titanium	2.0	ug/L	-	-	nd	nd	nd	nd	nd
Uranium	0.10	ug/L	-	330	nd	nd	1.8	0.22	nd
Vanadium	2.0	ug/L	-	200	nd	nd	4.6	nd	nd
Zinc	5.0	ug/L	10	890	43.6	7.2	nd	23.4	5.6

Notes:

1 = Federal Interim Groundwater Quality Guidelines (FIGQGs), Generic Guidelines for Commercial and Industrial Land Uses (November 2012), Tier 2 for Marine Life Water Use (Table 3)

2 = Ontario Ministry of the Environment (MOE) Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*. April 15, 2011. Generic site condition standards for use within 30 m of a water body in a non-potable groundwater condition (Table 9)

RDL = Reportable Detection Limit for routine analysis

nd = Not detected above standard RDL

"-" = No applicable guideline

na = Not available

Bold/shaded = exceeds FIGQG criteria

Bold/shaded/underlined = exceeds ON MOE criteria

Table C.11 Results of Laboratory Analysis of Polycyclic Aromatic Hydrocarbons in Groundwater
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Parameters	RDL	Units	FIGQGs ¹	ON MOE ²	BH1	BH2	BH4	BH5	BH6	BH7	BH8	BH11	BH13	BH15
					12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	13-Mar-13
1-Methylnaphthalene	0.05	ug/L	-	1,500	2.7	0.32	nd	0.13	13	nd	0.14	2.0	0.20	1.7
2-Methylnaphthalene	0.05	ug/L	-	1,500	4.0	0.20	nd	0.15	4.4	nd	nd	1.4	0.081	nd
Acenaphthene	0.01	ug/L	-	600	4.5	0.27	0.3	nd	0.36	0.012	nd	0.28	0.50	0.29
Acenaphthylene	0.01	ug/L	-	1.4	0.74	0.085	nd	0.038	nd	0.021	nd	nd	nd	nd
Anthracene	0.01	ug/L	-	1.0	9.1	0.46	nd	1.8	nd	0.029	nd	nd	0.30	nd
Benzo(a)anthracene	0.01	ug/L	-	1.8	12	0.63	0.011	3.4	0.013	0.12	0.58	0.021	0.25	0.026
Benzo(a)pyrene	0.01	ug/L	-	0.81	7.9	0.53	nd	2.3	nd	0.098	0.53	0.012	0.20	0.021
Benzo(b)fluoranthene	0.01	ug/L	-	0.75	5.4	0.41	nd	1.6	nd	0.079	0.40	0.011	0.16	0.019
Benzo(g,h,i)perylene	0.01	ug/L	-	0.2	3.8	0.34	nd	1.0	nd	0.06	0.33	0.01	0.12	0.015
Benzo(j)fluoranthene	0.01	ug/L	-	na	3.4	0.25	nd	1.0	nd	0.046	0.25	nd	0.094	0.011
Benzo(k)fluoranthene	0.01	ug/L	-	0.4	3.2	0.23	nd	1.0	nd	0.043	0.22	nd	0.086	nd
Chrysene	0.01	ug/L	-	0.7	11	0.67	0.011	3.3	0.018	0.13	0.71	0.03	0.26	0.031
Dibenzo(a,h.)anthracene	0.01	ug/L	-	0.4	0.89	0.085	nd	0.26	nd	0.015	0.077	nd	0.029	nd
Fluoranthene	0.01	ug/L	-	73	30	1.9	0.037	7.7	0.054	0.17	1.3	0.14	1.0	0.13
Fluorene	0.01	ug/L	-	290	6.6	0.41	0.67	1.1	0.97	0.018	0.35	0.46	0.40	0.56
Indeno(1,2,3-c,d) pyrene	0.01	ug/L	-	0.2	2.9	0.25	nd	0.73	nd	0.044	0.25	nd	0.093	0.011
Naphthalene	0.20	ug/L	1.4	1,400	6.8	0.33	nd	0.26	13	nd	nd	3.6	nd	nd
Perylene	0.01	ug/L	-	na	1.7	0.13	nd	0.45	nd	0.023	0.13	nd	0.07	nd
Phenanthrene	0.01	ug/L	-	380	35	0.99	nd	4.6	0.37	0.065	0.73	0.50	1.3	0.14
Pyrene	0.01	ug/L	-	5.7	25	1.6	0.031	7.4	0.052	0.18	1.7	0.12	0.83	0.12

Notes:

1 = Federal Interim Groundwater Quality Guidelines (FIGQGs), Generic Guidelines for Commercial and Industrial Land Uses (November 2012), Tier 2 for Marine Life Water Use (Table 3)

2 = Ontario Ministry of the Environment (MOE) Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*. April 15, 2011. Generic site condition standards for use within 30 m of a water body in a non-potable groundwater condition (Table 9)

RDL = Reportable Detection Limit

nd = Not detected above standard RDL

Bold/shaded = exceeds FIGQG criteria

Bold/shaded/underlined = exceeds ON MOE criteria

Lab report noted that the samples contained sediment.

Table C.12 Results of Laboratory Analysis of Polychlorinated Biphenyls in Groundwater
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Parameter		Polychlorinated Biphenyls (PCBs)
RDL		0.05
Units		ug/L
ON MOE ¹		0.2
BH1	12-Mar-13	nd
BH2	12-Mar-13	nd
BH4	12-Mar-13	nd
BH5	12-Mar-13	nd
BH6	12-Mar-13	nd
BH7	12-Mar-13	nd
BH8	12-Mar-13	nd
BH11	12-Mar-13	nd
BH13	12-Mar-13	nd
BH15	13-Mar-13	nd

Notes:

1 = Ontario Ministry of the Environment (MOE) Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act. April 15, 2011. Generic site condition standards for use within 30 m of a water body in a non-potable groundwater condition (Table 9)

RDL = Reportable Detection Limit for routine analysis

nd = Not detected above standard RDL

Table C.13 Results of Laboratory Analysis of General Chemistry in Groundwater
Phase II Environmental Site Assessment
Canadian Coast Guard Southside Base, Berth 28, Southside Road, St. John's, NL
Stantec Project No. 121412551

Parameters	RDL	Units	Guidelines ¹	BH1	BH1 Lab-Dup	BH2	BH4	BH5	BH6	BH7	BH8	BH11	BH13	BH15
				12-Mar-13	-	12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	13-Mar-13
Alkalinity	1.0	mg/L CaCO ₃	-	22	22	29	23	14	18	20	12	54	72	32
Sulphate	2.0	mg/L	-	71	72	270	280	20	13	25	13	13	380	17
Chloride	50	mg/L	-	580	580	2,100	2,300	140	190	490	110	550	2,500	100
Reactive Silica	0.5	mg/L SiO ₂	-	5.6	6.0	5.2	5.3	5.2	6.0	4.9	5.1	7.0	3.5	7.1
Orthophosphate	0.010	mg/L P	-	nd	nd	nd	nd	nd	nd	0.014	nd	0.066	nd	nd
Nitrate + Nitrite	0.050	mg/L N	-	0.18	-	nd	0.073	0.10	nd	0.15	0.11	0.083	0.10	0.083
Nitrate	0.050	mg/L N	16	0.18	-	nd	0.073	0.1	nd	0.15	0.11	0.083	0.10	0.083
Nitrite	0.010	mg/L	-	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
True Color	5.0	TCU	-	nd	nd	150	240	nd	160	nd	nd	5.8	nd	nd
Total Organic Carbon	5.0	mg/L	-	7.1	-	5.9	2.7	nd	5.5	nd	nd	nd	8.0	19
Turbidity	1.0	NTU	-	560	-	340	210	>1,000	370	>1,000	>1,000	660	380	>1,000
Conductivity	1.0	uS/cm		2,100	2,100	6,900	7,500	520	690	1,700	410	2000	8,200	430
pH	-	Units	7.0 - 8.7	7.02	7.08	6.94	6.85	6.97	6.91	7.09	6.90	8.99	7.24	7.10
Hardness	1.0	mg/L CaCO ₃	-	310	-	900	1300	51	79	130	38	170	780	43
Bicarbonate	1.0	mg/L CaCO ₃	-	22	-	29	23	14	18	20	12	54	72	32
Total Dissolved Solids	1.0	mg/L	-	1,180	-	3,970	4,570	266	345	859	201	1,060	4,550	220

Notes:

1 = Federal Interim Groundwater Quality Guidelines (FIGQGs), Generic Guidelines for Commercial and Industrial Land Uses (November 2012), Tier 2 for Marine Life Water Use

RDL = Reportable Detection Limit

nd = Not detected above standard RDL

"-" = indicates value is not available or does not apply

Lab-Dup = Laboratory QA/QC duplicate sample

Bold/shaded = exceeds FIGQG criteria

APPENDIX D

Laboratory Reports

Your P.O. #: CALLUP #49
Your Project #: R.05663.004
Site Location: SOUTHSIDE CCG BASE
Your C.O.C. #: N/A

Attention: Carolyn Anstey-Moore

Stantec Consulting Ltd.
607 Torbay Road
St. John's, NL
CANADA A1A 4Y6

Report Date: 2013/03/13

This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B328518

Received: 2013/02/26, 10:23

Sample Matrix: Soil
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Soil (PIRI) (1,3)	2	2013/03/05	2013/03/06	ATL SOP-00197	Based on Atl. PIRI
Metals Solids Acid Extr. ICPMS (2)	2	2013/02/28	2013/02/28	ATL SOP 00059	Based on EPA6020A
Moisture (2)	2	N/A	2013/02/27	ATL SOP 00001	MOE Handbook 1983
PAH Compounds by GCMS (SIM) (2,3)	1	2013/02/28	2013/02/28	ATL SOP 00102	Based on EPA8270C
PAH Compounds by GCMS (SIM) (2,3)	1	2013/02/28	2013/03/01	ATL SOP 00102	Based on EPA8270C
PCBs in soil by GC/ECD (2,3)	2	2013/02/28	2013/03/01	ATL SOP 00106	Based on EPA8082
VPH in Soil (PIRI) (2)	2	2013/02/27	2013/02/28	ATL SOP 00119	Based on Atl. PIRI
Total Oil and Grease - Soil (2)	2	2013/02/28	2013/03/01	ATL SOP 00100	Based on EPA9071B
ModTPH (T1) Calc. for Soil (2)	2	2013/02/27	2013/03/06		Based on Atl. PIRI

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

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

- (1) Reported on a dry weight basis.
- (2) This test was performed by Bedford
- (3) Soils are reported on a dry weight basis unless otherwise specified.

Your P.O. #: CALLUP #49
Your Project #: R.05663.004
Site Location: SOUTHSIDE CCG BASE
Your C.O.C. #: N/A

Attention: Carolyn Anstey-Moore

Stantec Consulting Ltd.
607 Torbay Road
St. John's, NL
CANADA A1A 4Y6

Report Date: 2013/03/13

This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

-2-

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Mari Kenny, Project Manager
Email: MKenny@maxxam.ca
Phone# (902) 420-0203 Ext:291

=====

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

Total cover pages: 2

Page 2 of 13

Maxxam Job #: B328518
Report Date: 2013/03/13

Stantec Consulting Ltd.
Client Project #: R.05663.004
Site Location: SOUTHSIDE CCG BASE
Your P.O. #: CALLUP #49
Sampler Initials: CAM

ATLANTIC MUST IN SOIL (SOIL)

Maxxam ID		QR0085	QR0086		
Sampling Date		2013/02/20	2013/02/20		
COC Number		N/A	N/A		
	Units	BH5-SS4	BH8-SS4	RDL	QC Batch

Inorganics					
Moisture	%	22	13	1	3135635
Petroleum Hydrocarbons					
Benzene	mg/kg	ND	ND	0.025	3136725
Toluene	mg/kg	0.22	ND	0.025	3136725
Ethylbenzene	mg/kg	0.045	ND	0.025	3136725
Xylene (Total)	mg/kg	0.076	ND	0.050	3136725
C6 - C10 (less BTEX)	mg/kg	5.4	18	2.5	3136725
>C10-C16 Hydrocarbons	mg/kg	36	80	10	3141028
>C16-C21 Hydrocarbons	mg/kg	150	21	10	3141028
>C21-<C32 Hydrocarbons	mg/kg	80	ND	15	3141028
Modified TPH (Tier1)	mg/kg	270	120	15	3135303
Reached Baseline at C32	mg/kg	Yes	Yes	N/A	3141028
Hydrocarbon Resemblance	mg/kg	SEECOMMENT (1)	SEECOMMENT (2)	N/A	3141028
Surrogate Recovery (%)					
Isobutylbenzene - Extractable	%	111	109		3141028
n-Dotriacontane - Extractable	%	127 (3)	124 (3)		3141028
Isobutylbenzene - Volatile	%	106	99		3136725

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) No resemblance to petroleum products in fuel oil /lube oil range.
(2) Weathered fuel oil fraction.
(3) Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.

Maxxam Job #: B328518
Report Date: 2013/03/13

Stantec Consulting Ltd.
Client Project #: R.05663.004
Site Location: SOUTHSIDE CCG BASE
Your P.O. #: CALLUP #49
Sampler Initials: CAM

RESULTS OF ANALYSES OF SOIL

Maxxam ID		QR0085	QR0086	QR0086		
Sampling Date		2013/02/20	2013/02/20	2013/02/20		
COC Number		N/A	N/A	N/A		
	Units	BH5-SS4	BH8-SS4	BH8-SS4 Lab-Dup	RDL	QC Batch

Petroleum Hydrocarbons						
Total Oil & Grease	mg/kg	1400	660	600	100	3136638

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B328518
Report Date: 2013/03/13

Stantec Consulting Ltd.
Client Project #: R.05663.004
Site Location: SOUTHSIDE CCG BASE
Your P.O. #: CALLUP #49
Sampler Initials: CAM

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		QR0085	QR0086		
Sampling Date		2013/02/20	2013/02/20		
COC Number		N/A	N/A		
	Units	BH5-SS4	BH8-SS4	RDL	QC Batch

Metals					
Acid Extractable Aluminum (Al)	mg/kg	16000	16000	10	3136596
Acid Extractable Antimony (Sb)	mg/kg	ND	ND	2.0	3136596
Acid Extractable Arsenic (As)	mg/kg	6.8	2.9	2.0	3136596
Acid Extractable Barium (Ba)	mg/kg	41	20	5.0	3136596
Acid Extractable Beryllium (Be)	mg/kg	ND	ND	2.0	3136596
Acid Extractable Boron (B)	mg/kg	ND	ND	50	3136596
Acid Extractable Cadmium (Cd)	mg/kg	0.90	ND	0.30	3136596
Acid Extractable Chromium (Cr)	mg/kg	22	35	2.0	3136596
Acid Extractable Cobalt (Co)	mg/kg	8.5	8.2	1.0	3136596
Acid Extractable Copper (Cu)	mg/kg	24	20	2.0	3136596
Acid Extractable Iron (Fe)	mg/kg	32000	33000	50	3136596
Acid Extractable Lead (Pb)	mg/kg	170	42	0.50	3136596
Acid Extractable Manganese (Mn)	mg/kg	620	630	2.0	3136596
Acid Extractable Mercury (Hg)	mg/kg	ND	ND	0.10	3136596
Acid Extractable Molybdenum (Mo)	mg/kg	2.2	3.9	2.0	3136596
Acid Extractable Nickel (Ni)	mg/kg	19	21	2.0	3136596
Acid Extractable Selenium (Se)	mg/kg	ND	ND	1.0	3136596
Acid Extractable Silver (Ag)	mg/kg	ND	ND	0.50	3136596
Acid Extractable Strontium (Sr)	mg/kg	11	7.6	5.0	3136596
Acid Extractable Thallium (Tl)	mg/kg	ND	ND	0.10	3136596
Acid Extractable Tin (Sn)	mg/kg	3.9	ND	2.0	3136596
Acid Extractable Uranium (U)	mg/kg	0.62	0.48	0.10	3136596
Acid Extractable Vanadium (V)	mg/kg	23	22	2.0	3136596
Acid Extractable Zinc (Zn)	mg/kg	88	69	5.0	3136596

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B328518
Report Date: 2013/03/13

Stantec Consulting Ltd.
Client Project #: R.05663.004
Site Location: SOUTHSIDE CCG BASE
Your P.O. #: CALLUP #49
Sampler Initials: CAM

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		QR0085		QR0085		QR0086		
Sampling Date		2013/02/20		2013/02/20		2013/02/20		
COC Number		N/A		N/A		N/A		
	Units	BH5-SS4	RDL	BH5-SS4 Lab-Dup	RDL	BH8-SS4	RDL	QC Batch

Polyaromatic Hydrocarbons								
1-Methylnaphthalene	mg/kg	0.23	0.010	0.31	0.010	0.021	0.010	3136667
2-Methylnaphthalene	mg/kg	0.19	0.010	0.28	0.010	0.033	0.010	3136667
Acenaphthene	mg/kg	0.56	0.010	1.9 (1)	0.010	0.015	0.010	3136667
Acenaphthylene	mg/kg	0.085	0.010	0.14	0.010	ND	0.010	3136667
Anthracene	mg/kg	4.3	0.010	15 (1)	0.10	ND	0.010	3136667
Benzo(a)anthracene	mg/kg	5.8 (2)	0.10	22 (1)	0.10	0.036	0.010	3136667
Benzo(a)pyrene	mg/kg	5.0 (2)	0.10	17 (1)	0.10	0.040	0.010	3136667
Benzo(b)fluoranthene	mg/kg	3.2	0.010	9.8 (1)	0.10	0.029	0.010	3136667
Benzo(g,h,i)perylene	mg/kg	2.1	0.010	7.3 (1)	0.10	0.028	0.010	3136667
Benzo(j)fluoranthene	mg/kg	2.2	0.010	6.9 (1)	0.10	0.019	0.010	3136667
Benzo(k)fluoranthene	mg/kg	2.0	0.010	6.2 (1)	0.10	0.017	0.010	3136667
Chrysene	mg/kg	5.9 (2)	0.10	21 (1)	0.10	0.042	0.010	3136667
Dibenz(a,h)anthracene	mg/kg	0.62	0.010	1.7 (1)	0.010	ND	0.010	3136667
Fluoranthene	mg/kg	12	0.010	44 (1)	0.10	0.065	0.010	3136667
Fluorene	mg/kg	1.9	0.010	6.7 (1)	0.010	0.024	0.010	3136667
Indeno(1,2,3-cd)pyrene	mg/kg	1.8	0.010	5.9 (1)	0.10	0.022	0.010	3136667
Naphthalene	mg/kg	0.24	0.010	0.39	0.010	0.035	0.010	3136667
Perylene	mg/kg	1.1	0.010	2.7 (1)	0.010	ND	0.010	3136667
Phenanthrene	mg/kg	8.9	0.010	19 (1)	0.10	0.074	0.010	3136667
Pyrene	mg/kg	12	0.010	45 (1)	0.10	0.081	0.010	3136667
Surrogate Recovery (%)								
D10-Anthracene	%	105		103		83		3136667
D14-Terphenyl (FS)	%	102		114 (2)		92		3136667
D8-Acenaphthylene	%	94		102		87		3136667

ND = Not detected

N/A = Not Applicable

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) Duplicate: results are outside acceptance limit. Insufficient sample for repeat analysis.

(2) Elevated PAH RDL(s) due to sample dilution.

Maxxam Job #: B328518
Report Date: 2013/03/13

Stantec Consulting Ltd.
Client Project #: R.05663.004
Site Location: SOUTHSIDE CCG BASE
Your P.O. #: CALLUP #49
Sampler Initials: CAM

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		QR0085	QR0085	QR0086		
Sampling Date		2013/02/20	2013/02/20	2013/02/20		
COC Number		N/A	N/A	N/A		
	Units	BH5-SS4	BH5-SS4 Lab-Dup	BH8-SS4	RDL	QC Batch

PCBs						
Total PCB	ug/g	ND	ND	ND	0.050	3136824
Surrogate Recovery (%)						
Decachlorobiphenyl	%	109	99	106		3136824

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B328518
Report Date: 2013/03/13

Stantec Consulting Ltd.
Client Project #: R.05663.004
Site Location: SOUTHSIDE CCG BASE
Your P.O. #: CALLUP #49
Sampler Initials: CAM

Package 1	11.3°C
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Each temperature is the average of up to three cooler temperatures taken at receipt

GENERAL COMMENTS

Report re-issued to include Hg as requested on the chain of custody - 2013/03/12

Results relate only to the items tested.

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: R.05663.004
P.O. #: CALLUP #49
Site Location: SOUTHSIDE CCG BASE

Quality Assurance Report
Maxxam Job Number: ZB328518

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3136596 DLB	Matrix Spike	Acid Extractable Antimony (Sb)	2013/02/28		85	%	75 - 125
		Acid Extractable Arsenic (As)	2013/02/28		100	%	75 - 125
		Acid Extractable Barium (Ba)	2013/02/28		NC	%	75 - 125
		Acid Extractable Beryllium (Be)	2013/02/28		107	%	75 - 125
		Acid Extractable Boron (B)	2013/02/28		92	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/02/28		98	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/02/28		103	%	75 - 125
		Acid Extractable Cobalt (Co)	2013/02/28		105	%	75 - 125
		Acid Extractable Copper (Cu)	2013/02/28		101	%	75 - 125
		Acid Extractable Lead (Pb)	2013/02/28		104	%	75 - 125
		Acid Extractable Manganese (Mn)	2013/02/28		NC	%	75 - 125
		Acid Extractable Mercury (Hg)	2013/02/28		93	%	75 - 125
		Acid Extractable Molybdenum (Mo)	2013/02/28		99	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/02/28		NC	%	75 - 125
		Acid Extractable Selenium (Se)	2013/02/28		100	%	75 - 125
		Acid Extractable Silver (Ag)	2013/02/28		99	%	75 - 125
		Acid Extractable Strontium (Sr)	2013/02/28		100	%	75 - 125
		Acid Extractable Thallium (Tl)	2013/02/28		102	%	75 - 125
		Acid Extractable Tin (Sn)	2013/02/28		101	%	75 - 125
		Acid Extractable Uranium (U)	2013/02/28		107	%	75 - 125
		Acid Extractable Vanadium (V)	2013/02/28		103	%	75 - 125
		Acid Extractable Zinc (Zn)	2013/02/28		NC	%	75 - 125
	Spiked Blank	Acid Extractable Antimony (Sb)	2013/02/28		103	%	75 - 125
		Acid Extractable Arsenic (As)	2013/02/28		102	%	75 - 125
		Acid Extractable Barium (Ba)	2013/02/28		102	%	75 - 125
		Acid Extractable Beryllium (Be)	2013/02/28		105	%	75 - 125
		Acid Extractable Boron (B)	2013/02/28		113	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/02/28		99	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/02/28		102	%	75 - 125
		Acid Extractable Cobalt (Co)	2013/02/28		103	%	75 - 125
		Acid Extractable Copper (Cu)	2013/02/28		100	%	75 - 125
		Acid Extractable Lead (Pb)	2013/02/28		103	%	75 - 125
		Acid Extractable Manganese (Mn)	2013/02/28		100	%	75 - 125
		Acid Extractable Mercury (Hg)	2013/02/28		101	%	75 - 125
		Acid Extractable Molybdenum (Mo)	2013/02/28		101	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/02/28		100	%	75 - 125
		Acid Extractable Selenium (Se)	2013/02/28		102	%	75 - 125
		Acid Extractable Silver (Ag)	2013/02/28		100	%	75 - 125
		Acid Extractable Strontium (Sr)	2013/02/28		100	%	75 - 125
		Acid Extractable Thallium (Tl)	2013/02/28		103	%	75 - 125
		Acid Extractable Tin (Sn)	2013/02/28		105	%	75 - 125
		Acid Extractable Uranium (U)	2013/02/28		103	%	75 - 125
		Acid Extractable Vanadium (V)	2013/02/28		104	%	75 - 125
		Acid Extractable Zinc (Zn)	2013/02/28		103	%	75 - 125
	Method Blank	Acid Extractable Aluminum (Al)	2013/02/28	ND, RDL=10		mg/kg	
		Acid Extractable Antimony (Sb)	2013/02/28	ND, RDL=2.0		mg/kg	
		Acid Extractable Arsenic (As)	2013/02/28	ND, RDL=2.0		mg/kg	
		Acid Extractable Barium (Ba)	2013/02/28	ND, RDL=5.0		mg/kg	
		Acid Extractable Beryllium (Be)	2013/02/28	ND, RDL=2.0		mg/kg	
		Acid Extractable Boron (B)	2013/02/28	ND, RDL=50		mg/kg	
		Acid Extractable Cadmium (Cd)	2013/02/28	ND, RDL=0.30		mg/kg	
		Acid Extractable Chromium (Cr)	2013/02/28	ND, RDL=2.0		mg/kg	
		Acid Extractable Cobalt (Co)	2013/02/28	ND, RDL=1.0		mg/kg	
		Acid Extractable Copper (Cu)	2013/02/28	ND, RDL=2.0		mg/kg	
		Acid Extractable Iron (Fe)	2013/02/28	ND, RDL=50		mg/kg	

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: R.05663.004
P.O. #: CALLUP #49
Site Location: SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB328518

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3136596 DLB	Method Blank	Acid Extractable Lead (Pb)	2013/02/28	ND, RDL=0.50		mg/kg	
		Acid Extractable Manganese (Mn)	2013/02/28	ND, RDL=2.0		mg/kg	
		Acid Extractable Mercury (Hg)	2013/02/28	ND, RDL=0.10		mg/kg	
		Acid Extractable Molybdenum (Mo)	2013/02/28	ND, RDL=2.0		mg/kg	
		Acid Extractable Nickel (Ni)	2013/02/28	ND, RDL=2.0		mg/kg	
		Acid Extractable Selenium (Se)	2013/02/28	ND, RDL=1.0		mg/kg	
		Acid Extractable Silver (Ag)	2013/02/28	ND, RDL=0.50		mg/kg	
		Acid Extractable Strontium (Sr)	2013/02/28	ND, RDL=5.0		mg/kg	
		Acid Extractable Thallium (Tl)	2013/02/28	ND, RDL=0.10		mg/kg	
		Acid Extractable Tin (Sn)	2013/02/28	ND, RDL=2.0		mg/kg	
	RPD	Acid Extractable Uranium (U)	2013/02/28	ND, RDL=0.10		mg/kg	
		Acid Extractable Vanadium (V)	2013/02/28	ND, RDL=2.0		mg/kg	
		Acid Extractable Zinc (Zn)	2013/02/28	ND, RDL=5.0		mg/kg	
		Acid Extractable Aluminum (Al)	2013/02/28	2.1		%	35
		Acid Extractable Antimony (Sb)	2013/02/28	NC		%	35
		Acid Extractable Arsenic (As)	2013/02/28	NC		%	35
		Acid Extractable Barium (Ba)	2013/02/28	2.3		%	35
		Acid Extractable Beryllium (Be)	2013/02/28	NC		%	35
		Acid Extractable Boron (B)	2013/02/28	NC		%	35
		Acid Extractable Cadmium (Cd)	2013/02/28	NC		%	35
		Acid Extractable Chromium (Cr)	2013/02/28	3.8		%	35
		Acid Extractable Cobalt (Co)	2013/02/28	5.8		%	35
		Acid Extractable Copper (Cu)	2013/02/28	5.5		%	35
		Acid Extractable Iron (Fe)	2013/02/28	3.7		%	35
		Acid Extractable Lead (Pb)	2013/02/28	4.2		%	35
		Acid Extractable Manganese (Mn)	2013/02/28	1		%	35
		Acid Extractable Mercury (Hg)	2013/02/28	NC		%	35
		Acid Extractable Molybdenum (Mo)	2013/02/28	NC		%	35
		Acid Extractable Nickel (Ni)	2013/02/28	7.4		%	35
		Acid Extractable Selenium (Se)	2013/02/28	NC		%	35
		Acid Extractable Silver (Ag)	2013/02/28	NC		%	35
		Acid Extractable Strontium (Sr)	2013/02/28	NC		%	35
		Acid Extractable Thallium (Tl)	2013/02/28	NC		%	35
		Acid Extractable Tin (Sn)	2013/02/28	NC		%	35
		Acid Extractable Uranium (U)	2013/02/28	5.3		%	35
		Acid Extractable Vanadium (V)	2013/02/28	5.2		%	35
		Acid Extractable Zinc (Zn)	2013/02/28	2.0		%	35
3136638 CDS	Matrix Spike						
	[QR0086-01]	Total Oil & Grease	2013/03/01		NC	%	30 - 130
	Spiked Blank	Total Oil & Grease	2013/03/01		88	%	30 - 130
	Method Blank	Total Oil & Grease	2013/03/01	ND, RDL=100		mg/kg	
3136667 GTH	RPD [QR0086-01]	Total Oil & Grease	2013/03/04	9.2		%	50
	Matrix Spike [QR0085-01]	D10-Anthracene	2013/03/01		111	%	30 - 130
		D14-Terphenyl (FS)	2013/03/01		101 (1)	%	30 - 130
		D8-Acenaphthylene	2013/03/01		99	%	30 - 130
		1-Methylnaphthalene	2013/03/01		79	%	30 - 130
		2-Methylnaphthalene	2013/03/01		84	%	30 - 130
		Acenaphthene	2013/03/01		76	%	30 - 130
		Acenaphthylene	2013/03/01		90	%	30 - 130
		Anthracene	2013/03/01		NC	%	30 - 130
		Benzo(a)anthracene	2013/03/01		NC	%	30 - 130
		Benzo(a)pyrene	2013/03/01		NC	%	30 - 130
		Benzo(b)fluoranthene	2013/03/01		NC	%	30 - 130
		Benzo(g,h,i)perylene	2013/03/01		NC	%	30 - 130

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: R.05663.004
P.O. #: CALLUP #49
Site Location: SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB328518

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3136667 GTH	Matrix Spike [QR0085-01]	Benzo(j)fluoranthene	2013/03/01		NC	%	30 - 130
		Benzo(k)fluoranthene	2013/03/01		NC	%	30 - 130
		Chrysene	2013/03/01		NC	%	30 - 130
		Dibenz(a,h)anthracene	2013/03/01		73	%	30 - 130
		Fluoranthene	2013/03/01		NC	%	30 - 130
		Fluorene	2013/03/01		NC	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2013/03/01		NC	%	30 - 130
		Naphthalene	2013/03/01		81	%	30 - 130
		Perylene	2013/03/01		80	%	30 - 130
		Phenanthrene	2013/03/01		NC	%	30 - 130
	Spiked Blank	Pyrene	2013/03/01		NC	%	30 - 130
		D10-Anthracene	2013/02/28		95	%	30 - 130
		D14-Terphenyl (FS)	2013/02/28		95	%	30 - 130
		D8-Acenaphthylene	2013/02/28		91	%	30 - 130
		1-Methylnaphthalene	2013/02/28		81	%	30 - 130
		2-Methylnaphthalene	2013/02/28		83	%	30 - 130
		Acenaphthene	2013/02/28		86	%	30 - 130
		Acenaphthylene	2013/02/28		80	%	30 - 130
		Anthracene	2013/02/28		82	%	30 - 130
		Benzo(a)anthracene	2013/02/28		82	%	30 - 130
		Benzo(a)pyrene	2013/02/28		89	%	30 - 130
		Benzo(b)fluoranthene	2013/02/28		87	%	30 - 130
		Benzo(g,h,i)perylene	2013/02/28		85	%	30 - 130
		Benzo(j)fluoranthene	2013/02/28		87	%	30 - 130
		Benzo(k)fluoranthene	2013/02/28		88	%	30 - 130
		Chrysene	2013/02/28		82	%	30 - 130
		Dibenz(a,h)anthracene	2013/02/28		78	%	30 - 130
		Fluoranthene	2013/02/28		84	%	30 - 130
		Fluorene	2013/02/28		86	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2013/02/28		82	%	30 - 130
	Method Blank	Naphthalene	2013/02/28		88	%	30 - 130
		Perylene	2013/02/28		84	%	30 - 130
		Phenanthrene	2013/02/28		91	%	30 - 130
		Pyrene	2013/02/28		84	%	30 - 130
		D10-Anthracene	2013/02/28		94	%	30 - 130
		D14-Terphenyl (FS)	2013/02/28		98	%	30 - 130
		D8-Acenaphthylene	2013/02/28		87	%	30 - 130
		1-Methylnaphthalene	2013/02/28	ND, RDL=0.010		mg/kg	
		2-Methylnaphthalene	2013/02/28	ND, RDL=0.010		mg/kg	
		Acenaphthene	2013/02/28	ND, RDL=0.010		mg/kg	
		Acenaphthylene	2013/02/28	ND, RDL=0.010		mg/kg	
		Anthracene	2013/02/28	ND, RDL=0.010		mg/kg	
		Benzo(a)anthracene	2013/02/28	ND, RDL=0.010		mg/kg	
		Benzo(a)pyrene	2013/02/28	ND, RDL=0.010		mg/kg	
		Benzo(b)fluoranthene	2013/02/28	ND, RDL=0.010		mg/kg	
		Benzo(g,h,i)perylene	2013/02/28	ND, RDL=0.010		mg/kg	
		Benzo(j)fluoranthene	2013/02/28	ND, RDL=0.010		mg/kg	
		Benzo(k)fluoranthene	2013/02/28	ND, RDL=0.010		mg/kg	
		Chrysene	2013/02/28	ND, RDL=0.010		mg/kg	
		Dibenz(a,h)anthracene	2013/02/28	ND, RDL=0.010		mg/kg	
		Fluoranthene	2013/02/28	ND, RDL=0.010		mg/kg	
		Fluorene	2013/02/28	ND, RDL=0.010		mg/kg	
		Indeno(1,2,3-cd)pyrene	2013/02/28	ND, RDL=0.010		mg/kg	
		Naphthalene	2013/02/28	0.015, RDL=0.010		mg/kg	

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: R.05663.004
P.O. #: CALLUP #49
Site Location: SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB328518

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3136667 GTH	Method Blank	Perylene	2013/02/28	ND, RDL=0.010		mg/kg	
		Phenanthrene	2013/02/28	ND, RDL=0.010		mg/kg	
		Pyrene	2013/02/28	ND, RDL=0.010		mg/kg	
	RPD [QR0085-01]	1-Methylnaphthalene	2013/03/01	31.3		%	50
		2-Methylnaphthalene	2013/03/01	41.4		%	50
		Acenaphthene	2013/03/01	108 (2)		%	50
		Acenaphthylene	2013/03/01	46.8		%	50
		Anthracene	2013/03/01	112 (2)		%	50
		Benzo(a)anthracene	2013/03/01	117 (2)		%	50
		Benzo(a)pyrene	2013/03/01	108 (2)		%	50
		Benzo(b)fluoranthene	2013/03/01	102 (2)		%	50
		Benzo(g,h,i)perylene	2013/03/01	111 (2)		%	50
		Benzo(j)fluoranthene	2013/03/01	103 (2)		%	50
		Benzo(k)fluoranthene	2013/03/01	102 (2)		%	50
		Chrysene	2013/03/01	112 (2)		%	50
		Dibenz(a,h)anthracene	2013/03/01	91.7 (2)		%	50
		Fluoranthene	2013/03/01	113 (2)		%	50
		Fluorene	2013/03/01	112 (2)		%	50
		Indeno(1,2,3-cd)pyrene	2013/03/01	106 (2)		%	50
		Naphthalene	2013/03/01	45.5		%	50
		Perylene	2013/03/01	87.3 (2)		%	50
		Phenanthrene	2013/03/01	71.5 (2)		%	50
		Pyrene	2013/03/01	116 (2)		%	50
3136725 ASL	Matrix Spike	Isobutylbenzene - Volatile	2013/02/28		83	%	60 - 140
		Benzene	2013/02/28		72	%	60 - 140
		Toluene	2013/02/28		103	%	60 - 140
		Ethylbenzene	2013/02/28		89	%	60 - 140
		Xylene (Total)	2013/02/28		100	%	60 - 140
	Spiked Blank	Isobutylbenzene - Volatile	2013/02/28		101	%	60 - 140
		Benzene	2013/02/28		85	%	60 - 140
		Toluene	2013/02/28		87	%	60 - 140
		Ethylbenzene	2013/02/28		90	%	60 - 140
	Method Blank	Xylene (Total)	2013/02/28		90	%	60 - 140
		Isobutylbenzene - Volatile	2013/02/28		101	%	60 - 140
		Benzene	2013/02/28	ND, RDL=0.025		mg/kg	
		Toluene	2013/02/28	ND, RDL=0.025		mg/kg	
	RPD	Ethylbenzene	2013/02/28	ND, RDL=0.025		mg/kg	
		Xylene (Total)	2013/02/28	ND, RDL=0.050		mg/kg	
		C6 - C10 (less BTEX)	2013/02/28	ND, RDL=2.5		mg/kg	
		Benzene	2013/02/28	NC		%	50
		Toluene	2013/02/28	NC		%	50
3136824 KJO	Matrix Spike [QR0085-01]	Decachlorobiphenyl	2013/03/01		102	%	30 - 130
		Total PCB	2013/03/01		108	%	70 - 130
	Spiked Blank	Decachlorobiphenyl	2013/03/01		107	%	30 - 130
		Total PCB	2013/03/01		108	%	70 - 130
	Method Blank	Decachlorobiphenyl	2013/03/01		105	%	30 - 130
		Total PCB	2013/03/01	ND, RDL=0.050		ug/g	
	RPD [QR0085-01]	Total PCB	2013/03/01	NC		%	50
3141028 SPI	Matrix Spike	Isobutylbenzene - Extractable	2013/03/06		100	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/06		106	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/06		92	%	30 - 130

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: R.05663.004
P.O. #: CALLUP #49
Site Location: SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB328518

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3141028 SPI	Matrix Spike	>C16-C21 Hydrocarbons	2013/03/06		94	%	30 - 130
		>C21-<C32 Hydrocarbons	2013/03/06		100	%	30 - 130
	Spiked Blank	Isobutylbenzene - Extractable	2013/03/06		108	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/06		128	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/06		99	%	30 - 130
		>C16-C21 Hydrocarbons	2013/03/06		103	%	30 - 130
	Method Blank	>C21-<C32 Hydrocarbons	2013/03/06		104	%	30 - 130
		Isobutylbenzene - Extractable	2013/03/06		104	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/06		108	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/06	ND, RDL=10		mg/kg	
	RPD	>C16-C21 Hydrocarbons	2013/03/06	ND, RDL=10		mg/kg	
		>C21-<C32 Hydrocarbons	2013/03/06	ND, RDL=15		mg/kg	
		>C10-C16 Hydrocarbons	2013/03/06	NC		%	50
		>C16-C21 Hydrocarbons	2013/03/06	NC		%	50
		>C21-<C32 Hydrocarbons	2013/03/06	NC		%	50

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 spiked amount was not sufficiently significant to permit a reliable recovery calculation.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

(1) Elevated PAH RDL(s) due to sample dilution.

(2) Duplicate: results are outside acceptance limit. Insufficient sample for repeat analysis.

Your P.O. #: CALL UP #49
Your Project #: R.053663.004
Site Location: SOUTHSIDE CCG BASE
Your C.O.C. #: ES654312

Attention: Carolyn Anstey-Moore

Stantec Consulting Ltd.
607 Torbay Road
St. John's, NL
CANADA A1A 4Y6

Report Date: 2013/03/13

This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B330332

Received: 2013/03/01, 10:07

Sample Matrix: Soil
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Soil (PIRI) (1,2)	1	2013/03/06	2013/03/07	ATL SOP-00197	Based on Atl. PIRI
Metals Solids Acid Extr. ICPMS	2	2013/03/04	2013/03/04	ATL SOP 00059	Based on EPA6020A
Moisture	2	N/A	2013/03/01	ATL SOP 00001	MOE Handbook 1983
PAH Compounds by GC/MS (SIM) (2)	2	2013/03/04	2013/03/04	ATL SOP 00102	Based on EPA8270C
PCBs in soil by GC/ECD (2)	1	2013/03/04	2013/03/06	ATL SOP 00106	Based on EPA8082
VPH in Soil (PIRI)	1	2013/03/01	2013/03/04	ATL SOP 00119	Based on Atl. PIRI
Total Oil and Grease - Soil	1	2013/03/05	2013/03/07	ATL SOP 00100	Based on EPA9071B
ModTPH (T1) Calc. for Soil	1	2013/03/01	2013/03/07		Based on Atl. PIRI

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

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

(1) Reported on a dry weight basis.

(2) Soils are reported on a dry weight basis unless otherwise specified.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Mari Kenny, Project Manager
Email: MKenny@maxxam.ca
Phone# (902) 420-0203 Ext:291

=====

Your P.O. #: CALL UP #49
Your Project #: R.053663.004
Site Location: SOUTHSIDE CCG BASE
Your C.O.C. #: ES654312

Attention: Carolyn Anstey-Moore

Stantec Consulting Ltd.
607 Torbay Road
St. John's, NL
CANADA A1A 4Y6

Report Date: 2013/03/13

This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

-2-

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

Total cover pages: 2

Maxxam Job #: B330332
Report Date: 2013/03/13

Stantec Consulting Ltd.
Client Project #: R.053663.004
Site Location: SOUTHSIDE CCG BASE
Your P.O. #: CALL UP #49

RESULTS OF ANALYSES OF SOIL

Maxxam ID		QR8777	QR8778		
Sampling Date		2013/02/22	2013/02/22		
COC Number		ES654312	ES654312		
	Units	BH13 SS3	BH13 SS5	RDL	QC Batch

Inorganics					
Moisture	%	6	16	1	3138115
Petroleum Hydrocarbons					
Total Oil & Grease	mg/kg		480	100	3141399
RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: B330332
Report Date: 2013/03/13

Stantec Consulting Ltd.
Client Project #: R.053663.004
Site Location: SOUTHSIDE CCG BASE
Your P.O. #: CALL UP #49

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		QR8777	QR8778		
Sampling Date		2013/02/22	2013/02/22		
COC Number		ES654312	ES654312		
	Units	BH13 SS3	BH13 SS5	RDL	QC Batch

Metals					
Acid Extractable Aluminum (Al)	mg/kg	14000	13000	10	3139913
Acid Extractable Antimony (Sb)	mg/kg	ND	ND	2.0	3139913
Acid Extractable Arsenic (As)	mg/kg	5.3	8.7	2.0	3139913
Acid Extractable Barium (Ba)	mg/kg	33	72	5.0	3139913
Acid Extractable Beryllium (Be)	mg/kg	ND	ND	2.0	3139913
Acid Extractable Boron (B)	mg/kg	ND	ND	50	3139913
Acid Extractable Cadmium (Cd)	mg/kg	ND	ND	0.30	3139913
Acid Extractable Chromium (Cr)	mg/kg	24	24	2.0	3139913
Acid Extractable Cobalt (Co)	mg/kg	11	9.9	1.0	3139913
Acid Extractable Copper (Cu)	mg/kg	24	36	2.0	3139913
Acid Extractable Iron (Fe)	mg/kg	29000	31000	50	3139913
Acid Extractable Lead (Pb)	mg/kg	27	160	0.50	3139913
Acid Extractable Manganese (Mn)	mg/kg	850	800	2.0	3139913
Acid Extractable Mercury (Hg)	mg/kg	ND	0.22	0.10	3139913
Acid Extractable Molybdenum (Mo)	mg/kg	ND	2.8	2.0	3139913
Acid Extractable Nickel (Ni)	mg/kg	16	15	2.0	3139913
Acid Extractable Selenium (Se)	mg/kg	ND	ND	1.0	3139913
Acid Extractable Silver (Ag)	mg/kg	ND	ND	0.50	3139913
Acid Extractable Strontium (Sr)	mg/kg	24	31	5.0	3139913
Acid Extractable Thallium (Tl)	mg/kg	ND	ND	0.10	3139913
Acid Extractable Tin (Sn)	mg/kg	ND	4.2	2.0	3139913
Acid Extractable Uranium (U)	mg/kg	0.56	0.66	0.10	3139913
Acid Extractable Vanadium (V)	mg/kg	26	21	2.0	3139913
Acid Extractable Zinc (Zn)	mg/kg	78	110	5.0	3139913

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B330332
Report Date: 2013/03/13

Stantec Consulting Ltd.
Client Project #: R.053663.004
Site Location: SOUTHSIDE CCG BASE
Your P.O. #: CALL UP #49

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		QR8777	QR8777		QR8778		
Sampling Date		2013/02/22	2013/02/22		2013/02/22		
COC Number		ES654312	ES654312		ES654312		
	Units	BH13 SS3	BH13 SS3 Lab-Dup	RDL	BH13 SS5	RDL	QC Batch

Polyaromatic Hydrocarbons							
1-Methylnaphthalene	mg/kg	0.011	0.013	0.010	0.054	0.010	3139689
2-Methylnaphthalene	mg/kg	0.016	0.018	0.010	0.097	0.010	3139689
Acenaphthene	mg/kg	ND	ND	0.010	0.087	0.010	3139689
Acenaphthylene	mg/kg	ND	ND	0.010	ND (1)	0.030	3139689
Anthracene	mg/kg	0.019	0.024	0.010	0.080	0.010	3139689
Benzo(a)anthracene	mg/kg	0.076	0.086	0.010	0.23	0.010	3139689
Benzo(a)pyrene	mg/kg	0.095	0.11	0.010	0.28	0.010	3139689
Benzo(b)fluoranthene	mg/kg	0.076	0.086	0.010	0.22	0.010	3139689
Benzo(g,h,i)perylene	mg/kg	0.074	0.083	0.010	0.21	0.010	3139689
Benzo(j)fluoranthene	mg/kg	0.045	0.051	0.010	0.13	0.010	3139689
Benzo(k)fluoranthene	mg/kg	0.042	0.049	0.010	0.12	0.010	3139689
Chrysene	mg/kg	0.083	0.090	0.010	0.24	0.010	3139689
Dibenz(a,h)anthracene	mg/kg	0.015	0.016	0.010	0.045	0.010	3139689
Fluoranthene	mg/kg	0.15	0.17	0.010	0.50	0.010	3139689
Fluorene	mg/kg	ND	ND	0.010	0.069	0.010	3139689
Indeno(1,2,3-cd)pyrene	mg/kg	0.061	0.070	0.010	0.17	0.010	3139689
Naphthalene	mg/kg	0.013	0.014	0.010	0.057	0.010	3139689
Perylene	mg/kg	0.026	0.029	0.010	0.073	0.010	3139689
Phenanthrene	mg/kg	0.094	0.10	0.010	0.25	0.010	3139689
Pyrene	mg/kg	0.13	0.14	0.010	0.44	0.010	3139689
Surrogate Recovery (%)							
D10-Anthracene	%	86	86		82		3139689
D14-Terphenyl (FS)	%	94	93		90		3139689
D8-Acenaphthylene	%	75	81		83		3139689

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

Maxxam Job #: B330332
Report Date: 2013/03/13

Stantec Consulting Ltd.
Client Project #: R.053663.004
Site Location: SOUTHSIDE CCG BASE
Your P.O. #: CALL UP #49

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		QR8778		
Sampling Date		2013/02/22		
COC Number		ES654312		
	Units	BH13 SS5	RDL	QC Batch

Petroleum Hydrocarbons				
Benzene	mg/kg	0.038	0.025	3140111
Toluene	mg/kg	0.079	0.025	3140111
Ethylbenzene	mg/kg	ND	0.025	3140111
Xylene (Total)	mg/kg	0.057	0.050	3140111
C6 - C10 (less BTEX)	mg/kg	3.5	2.5	3140111
>C10-C16 Hydrocarbons	mg/kg	180	10	3142728
>C16-C21 Hydrocarbons	mg/kg	80	10	3142728
>C21-<C32 Hydrocarbons	mg/kg	58	15	3142728
Modified TPH (Tier1)	mg/kg	320	15	3137946
Reached Baseline at C32	mg/kg	Yes	N/A	3142728
Hydrocarbon Resemblance	mg/kg	SEECOMMENT (1)	N/A	3142728
Surrogate Recovery (%)				
Isobutylbenzene - Extractable	%	106		3142728
n-Dotriacontane - Extractable	%	126 (2)		3142728
Isobutylbenzene - Volatile	%	98		3140111

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Weathered fuel oil fraction.
(2) Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.

Maxxam Job #: B330332
Report Date: 2013/03/13

Stantec Consulting Ltd.
Client Project #: R.053663.004
Site Location: SOUTHSIDE CCG BASE
Your P.O. #: CALL UP #49

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		QR8777		
Sampling Date		2013/02/22		
COC Number		ES654312		
	Units	BH13 SS3	RDL	QC Batch

PCBs				
Total PCB	ug/g	ND	0.050	3140046
Surrogate Recovery (%)				
Decachlorobiphenyl	%	84		3140046

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B330332
Report Date: 2013/03/13

Stantec Consulting Ltd.
Client Project #: R.053663.004
Site Location: SOUTHSIDE CCG BASE
Your P.O. #: CALL UP #49

Package 1	10.9°C
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Each temperature is the average of up to three cooler temperatures taken at receipt

GENERAL COMMENTS

Insufficient sample to complete PCB analysis

Report re-issued to include Hg as requested on the chain of custody - 2013/03/12

Results relate only to the items tested.

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: R.053663.004
P.O. #: CALL UP #49
Site Location: SOUTHSIDE CCG BASE

Quality Assurance Report
Maxxam Job Number: DB330332

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3139689 GTH	Matrix Spike [QR8777-01]	D10-Anthracene	2013/03/04		87	%	30 - 130
		D14-Terphenyl (FS)	2013/03/04		90	%	30 - 130
		D8-Acenaphthylene	2013/03/04		82	%	30 - 130
		1-Methylnaphthalene	2013/03/04		61	%	30 - 130
		2-Methylnaphthalene	2013/03/04		63	%	30 - 130
		Acenaphthene	2013/03/04		64	%	30 - 130
		Acenaphthylene	2013/03/04		71	%	30 - 130
		Anthracene	2013/03/04		68	%	30 - 130
		Benzo(a)anthracene	2013/03/04		77	%	30 - 130
		Benzo(a)pyrene	2013/03/04		88	%	30 - 130
		Benzo(b)fluoranthene	2013/03/04		85	%	30 - 130
		Benzo(g,h,i)perylene	2013/03/04		89	%	30 - 130
		Benzo(j)fluoranthene	2013/03/04		87	%	30 - 130
		Benzo(k)fluoranthene	2013/03/04		86	%	30 - 130
		Chrysene	2013/03/04		71	%	30 - 130
		Dibenz(a,h)anthracene	2013/03/04		85	%	30 - 130
		Fluoranthene	2013/03/04		72	%	30 - 130
		Fluorene	2013/03/04		70	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2013/03/04		87	%	30 - 130
		Naphthalene	2013/03/04		60	%	30 - 130
	Spiked Blank	Perylene	2013/03/04		86	%	30 - 130
		Phenanthrene	2013/03/04		71	%	30 - 130
		Pyrene	2013/03/04		72	%	30 - 130
		D10-Anthracene	2013/03/04		90	%	30 - 130
		D14-Terphenyl (FS)	2013/03/04		98	%	30 - 130
		D8-Acenaphthylene	2013/03/04		76	%	30 - 130
		1-Methylnaphthalene	2013/03/04		65	%	30 - 130
		2-Methylnaphthalene	2013/03/04		67	%	30 - 130
		Acenaphthene	2013/03/04		74	%	30 - 130
		Acenaphthylene	2013/03/04		66	%	30 - 130
		Anthracene	2013/03/04		76	%	30 - 130
		Benzo(a)anthracene	2013/03/04		81	%	30 - 130
		Benzo(a)pyrene	2013/03/04		103	%	30 - 130
		Benzo(b)fluoranthene	2013/03/04		100	%	30 - 130
		Benzo(g,h,i)perylene	2013/03/04		103	%	30 - 130
		Benzo(j)fluoranthene	2013/03/04		100	%	30 - 130
		Benzo(k)fluoranthene	2013/03/04		100	%	30 - 130
		Chrysene	2013/03/04		80	%	30 - 130
		Dibenz(a,h)anthracene	2013/03/04		99	%	30 - 130
		Fluoranthene	2013/03/04		78	%	30 - 130
	Method Blank	Fluorene	2013/03/04		73	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2013/03/04		100	%	30 - 130
		Naphthalene	2013/03/04		74	%	30 - 130
		Perylene	2013/03/04		97	%	30 - 130
		Phenanthrene	2013/03/04		78	%	30 - 130
		Pyrene	2013/03/04		79	%	30 - 130
		D10-Anthracene	2013/03/04		88	%	30 - 130
		D14-Terphenyl (FS)	2013/03/04		100	%	30 - 130
		D8-Acenaphthylene	2013/03/04		80	%	30 - 130
		1-Methylnaphthalene	2013/03/04	ND, RDL=0.010		mg/kg	
		2-Methylnaphthalene	2013/03/04	ND, RDL=0.010		mg/kg	
		Acenaphthene	2013/03/04	ND, RDL=0.010		mg/kg	
		Acenaphthylene	2013/03/04	ND, RDL=0.010		mg/kg	
		Anthracene	2013/03/04	ND, RDL=0.010		mg/kg	

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: R.053663.004
P.O. #: CALL UP #49
Site Location: SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: DB330332

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3139689 GTH	Method Blank	Benzo(a)anthracene	2013/03/04	ND, RDL=0.010		mg/kg	
		Benzo(a)pyrene	2013/03/04	ND, RDL=0.010		mg/kg	
		Benzo(b)fluoranthene	2013/03/04	ND, RDL=0.010		mg/kg	
		Benzo(g,h,i)perylene	2013/03/04	ND, RDL=0.010		mg/kg	
		Benzo(j)fluoranthene	2013/03/04	ND, RDL=0.010		mg/kg	
		Benzo(k)fluoranthene	2013/03/04	ND, RDL=0.010		mg/kg	
		Chrysene	2013/03/04	ND, RDL=0.010		mg/kg	
		Dibenz(a,h)anthracene	2013/03/04	ND, RDL=0.010		mg/kg	
		Fluoranthene	2013/03/04	ND, RDL=0.010		mg/kg	
		Fluorene	2013/03/04	ND, RDL=0.010		mg/kg	
		Indeno(1,2,3-cd)pyrene	2013/03/04	ND, RDL=0.010		mg/kg	
		Naphthalene	2013/03/04	ND, RDL=0.010		mg/kg	
		Perylene	2013/03/04	ND, RDL=0.010		mg/kg	
		Phenanthrene	2013/03/04	ND, RDL=0.010		mg/kg	
		Pyrene	2013/03/04	ND, RDL=0.010		mg/kg	
	RPD [QR8777-01]	1-Methylnaphthalene	2013/03/04	NC		%	50
		2-Methylnaphthalene	2013/03/04	NC		%	50
		Acenaphthene	2013/03/04	NC		%	50
		Acenaphthylene	2013/03/04	NC		%	50
		Anthracene	2013/03/04	NC		%	50
		Benzo(a)anthracene	2013/03/04	12.6		%	50
		Benzo(a)pyrene	2013/03/04	12.8		%	50
		Benzo(b)fluoranthene	2013/03/04	13.1		%	50
		Benzo(g,h,i)perylene	2013/03/04	11.3		%	50
		Benzo(j)fluoranthene	2013/03/04	NC		%	50
		Benzo(k)fluoranthene	2013/03/04	NC		%	50
		Chrysene	2013/03/04	8.2		%	50
		Dibenz(a,h)anthracene	2013/03/04	NC		%	50
		Fluoranthene	2013/03/04	9.5		%	50
		Fluorene	2013/03/04	NC		%	50
		Indeno(1,2,3-cd)pyrene	2013/03/04	14.1		%	50
		Naphthalene	2013/03/04	NC		%	50
		Perylene	2013/03/04	NC		%	50
		Phenanthrene	2013/03/04	10.6		%	50
		Pyrene	2013/03/04	5.7		%	50
3139913 BAN	Matrix Spike	Acid Extractable Antimony (Sb)	2013/03/04		83	%	75 - 125
		Acid Extractable Arsenic (As)	2013/03/04		NC	%	75 - 125
		Acid Extractable Barium (Ba)	2013/03/04		NC	%	75 - 125
		Acid Extractable Beryllium (Be)	2013/03/04		98	%	75 - 125
		Acid Extractable Boron (B)	2013/03/04		92	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/03/04		97	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/03/04		102	%	75 - 125
		Acid Extractable Cobalt (Co)	2013/03/04		98	%	75 - 125
		Acid Extractable Copper (Cu)	2013/03/04		NC	%	75 - 125
		Acid Extractable Lead (Pb)	2013/03/04		NC	%	75 - 125
		Acid Extractable Manganese (Mn)	2013/03/04		NC	%	75 - 125
		Acid Extractable Mercury (Hg)	2013/03/04		93	%	75 - 125
		Acid Extractable Molybdenum (Mo)	2013/03/04		129 (1)	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/03/04		97	%	75 - 125
		Acid Extractable Selenium (Se)	2013/03/04		99	%	75 - 125
		Acid Extractable Silver (Ag)	2013/03/04		97	%	75 - 125
		Acid Extractable Strontium (Sr)	2013/03/04		99	%	75 - 125
		Acid Extractable Thallium (Tl)	2013/03/04		101	%	75 - 125
		Acid Extractable Tin (Sn)	2013/03/04		NC	%	75 - 125
		Acid Extractable Uranium (U)	2013/03/04		102	%	75 - 125

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: R.053663.004
P.O. #: CALL UP #49
Site Location: SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: DB330332

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3139913 BAN	Matrix Spike	Acid Extractable Vanadium (V)	2013/03/04		102	%	75 - 125
		Acid Extractable Zinc (Zn)	2013/03/04		NC	%	75 - 125
	Spiked Blank	Acid Extractable Antimony (Sb)	2013/03/04		103	%	75 - 125
		Acid Extractable Arsenic (As)	2013/03/04		100	%	75 - 125
		Acid Extractable Barium (Ba)	2013/03/04		102	%	75 - 125
		Acid Extractable Beryllium (Be)	2013/03/04		98	%	75 - 125
		Acid Extractable Boron (B)	2013/03/04		97	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/03/04		98	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/03/04		101	%	75 - 125
		Acid Extractable Cobalt (Co)	2013/03/04		100	%	75 - 125
		Acid Extractable Copper (Cu)	2013/03/04		100	%	75 - 125
		Acid Extractable Lead (Pb)	2013/03/04		103	%	75 - 125
		Acid Extractable Manganese (Mn)	2013/03/04		100	%	75 - 125
		Acid Extractable Mercury (Hg)	2013/03/04		100	%	75 - 125
		Acid Extractable Molybdenum (Mo)	2013/03/04		102	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/03/04		99	%	75 - 125
		Acid Extractable Selenium (Se)	2013/03/04		101	%	75 - 125
		Acid Extractable Silver (Ag)	2013/03/04		100	%	75 - 125
		Acid Extractable Strontium (Sr)	2013/03/04		102	%	75 - 125
		Acid Extractable Thallium (Tl)	2013/03/04		100	%	75 - 125
		Acid Extractable Tin (Sn)	2013/03/04		101	%	75 - 125
		Acid Extractable Uranium (U)	2013/03/04		103	%	75 - 125
		Acid Extractable Vanadium (V)	2013/03/04		102	%	75 - 125
		Acid Extractable Zinc (Zn)	2013/03/04		104	%	75 - 125
	Method Blank	Acid Extractable Aluminum (Al)	2013/03/04	ND, RDL=10		mg/kg	
		Acid Extractable Antimony (Sb)	2013/03/04	ND, RDL=2.0		mg/kg	
		Acid Extractable Arsenic (As)	2013/03/04	ND, RDL=2.0		mg/kg	
		Acid Extractable Barium (Ba)	2013/03/04	ND, RDL=5.0		mg/kg	
		Acid Extractable Beryllium (Be)	2013/03/04	ND, RDL=2.0		mg/kg	
		Acid Extractable Boron (B)	2013/03/04	ND, RDL=50		mg/kg	
		Acid Extractable Cadmium (Cd)	2013/03/04	ND, RDL=0.30		mg/kg	
		Acid Extractable Chromium (Cr)	2013/03/04	ND, RDL=2.0		mg/kg	
		Acid Extractable Cobalt (Co)	2013/03/04	ND, RDL=1.0		mg/kg	
		Acid Extractable Copper (Cu)	2013/03/04	ND, RDL=2.0		mg/kg	
		Acid Extractable Iron (Fe)	2013/03/04	ND, RDL=50		mg/kg	
		Acid Extractable Lead (Pb)	2013/03/04	ND, RDL=0.50		mg/kg	
		Acid Extractable Manganese (Mn)	2013/03/04	ND, RDL=2.0		mg/kg	
		Acid Extractable Mercury (Hg)	2013/03/04	ND, RDL=0.10		mg/kg	
		Acid Extractable Molybdenum (Mo)	2013/03/04	ND, RDL=2.0		mg/kg	
		Acid Extractable Nickel (Ni)	2013/03/04	ND, RDL=2.0		mg/kg	
		Acid Extractable Selenium (Se)	2013/03/04	ND, RDL=1.0		mg/kg	
		Acid Extractable Silver (Ag)	2013/03/04	ND, RDL=0.50		mg/kg	
		Acid Extractable Strontium (Sr)	2013/03/04	ND, RDL=5.0		mg/kg	
		Acid Extractable Thallium (Tl)	2013/03/04	ND, RDL=0.10		mg/kg	
		Acid Extractable Tin (Sn)	2013/03/04	ND, RDL=2.0		mg/kg	
		Acid Extractable Uranium (U)	2013/03/04	ND, RDL=0.10		mg/kg	
		Acid Extractable Vanadium (V)	2013/03/04	ND, RDL=2.0		mg/kg	
		Acid Extractable Zinc (Zn)	2013/03/04	ND, RDL=5.0		mg/kg	
	RPD	Acid Extractable Aluminum (Al)	2013/03/04	1		%	35
		Acid Extractable Antimony (Sb)	2013/03/04	NC		%	35
		Acid Extractable Arsenic (As)	2013/03/04	11.3		%	35
		Acid Extractable Barium (Ba)	2013/03/04	5.6		%	35
		Acid Extractable Beryllium (Be)	2013/03/04	NC		%	35
		Acid Extractable Boron (B)	2013/03/04	NC		%	35
		Acid Extractable Cadmium (Cd)	2013/03/04	NC		%	35

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: R.053663.004
P.O. #: CALL UP #49
Site Location: SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: DB330332

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits	
3139913 BAN	RPD	Acid Extractable Chromium (Cr)	2013/03/04	1.3		%	35	
		Acid Extractable Cobalt (Co)	2013/03/04	7.0		%	35	
		Acid Extractable Copper (Cu)	2013/03/04	9.3		%	35	
		Acid Extractable Iron (Fe)	2013/03/04	6.4		%	35	
		Acid Extractable Lead (Pb)	2013/03/04	11.2		%	35	
		Acid Extractable Manganese (Mn)	2013/03/04	3.5		%	35	
		Acid Extractable Mercury (Hg)	2013/03/04	NC		%	35	
		Acid Extractable Molybdenum (Mo)	2013/03/04	NC		%	35	
		Acid Extractable Nickel (Ni)	2013/03/04	1.7		%	35	
		Acid Extractable Selenium (Se)	2013/03/04	NC		%	35	
		Acid Extractable Silver (Ag)	2013/03/04	NC		%	35	
		Acid Extractable Strontium (Sr)	2013/03/04	NC		%	35	
		Acid Extractable Thallium (Tl)	2013/03/04	NC		%	35	
		Acid Extractable Uranium (U)	2013/03/04	9.8		%	35	
		Acid Extractable Vanadium (V)	2013/03/04	2.9		%	35	
		Acid Extractable Zinc (Zn)	2013/03/04	2.1		%	35	
3140046 KJO	Matrix Spike	Decachlorobiphenyl	2013/03/06		98	%	30 - 130	
		Total PCB	2013/03/06		107	%	70 - 130	
	Spiked Blank	Decachlorobiphenyl	2013/03/06		95	%	30 - 130	
		Total PCB	2013/03/06		106	%	70 - 130	
	Method Blank	Decachlorobiphenyl	2013/03/06		99	%	30 - 130	
		Total PCB	2013/03/06	ND, RDL=0.050		ug/g		
	RPD	Total PCB	2013/03/06	NC		%	50	
	3140111 THL	Matrix Spike	Isobutylbenzene - Volatile	2013/03/04		92	%	60 - 140
			Benzene	2013/03/04		81	%	60 - 140
Toluene			2013/03/04		116	%	60 - 140	
Ethylbenzene			2013/03/04		101	%	60 - 140	
Xylene (Total)			2013/03/04		114	%	60 - 140	
Spiked Blank		Isobutylbenzene - Volatile	2013/03/04		95	%	60 - 140	
		Benzene	2013/03/04		83	%	60 - 140	
		Toluene	2013/03/04		82	%	60 - 140	
		Ethylbenzene	2013/03/04		83	%	60 - 140	
		Xylene (Total)	2013/03/04		83	%	60 - 140	
Method Blank		Isobutylbenzene - Volatile	2013/03/04		100	%	60 - 140	
		Benzene	2013/03/04	ND, RDL=0.025		mg/kg		
		Toluene	2013/03/04	ND, RDL=0.025		mg/kg		
		Ethylbenzene	2013/03/04	ND, RDL=0.025		mg/kg		
		Xylene (Total)	2013/03/04	ND, RDL=0.050		mg/kg		
RPD		C6 - C10 (less BTEX)	2013/03/04	ND, RDL=2.5		mg/kg		
		Benzene	2013/03/04	NC		%	50	
		Toluene	2013/03/04	NC		%	50	
		Ethylbenzene	2013/03/04	NC		%	50	
		Xylene (Total)	2013/03/04	NC		%	50	
	C6 - C10 (less BTEX)	2013/03/04	NC		%	50		
3141399 CDS	Matrix Spike	Total Oil & Grease	2013/03/07		NC	%	30 - 130	
	Spiked Blank	Total Oil & Grease	2013/03/07		71	%	30 - 130	
	Method Blank	Total Oil & Grease	2013/03/07	ND, RDL=100		mg/kg		
	RPD	Total Oil & Grease	2013/03/07	10.7		%	50	
3142728 SPI	Matrix Spike	Isobutylbenzene - Extractable	2013/03/07		95	%	30 - 130	
		n-Dotriacontane - Extractable	2013/03/07		113	%	30 - 130	
		>C10-C16 Hydrocarbons	2013/03/07		93	%	30 - 130	
		>C16-C21 Hydrocarbons	2013/03/07		96	%	30 - 130	
		>C21-<C32 Hydrocarbons	2013/03/07		101	%	30 - 130	
	Spiked Blank	Isobutylbenzene - Extractable	2013/03/07		96	%	30 - 130	
		n-Dotriacontane - Extractable	2013/03/07		112	%	30 - 130	

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: R.053663.004
P.O. #: CALL UP #49
Site Location: SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: DB330332

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3142728 SPI	Spiked Blank	>C10-C16 Hydrocarbons	2013/03/07		90	%	30 - 130
		>C16-C21 Hydrocarbons	2013/03/07		92	%	30 - 130
		>C21-<C32 Hydrocarbons	2013/03/07		97	%	30 - 130
	Method Blank	Isobutylbenzene - Extractable	2013/03/07		97	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/07		102	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/07	ND, RDL=10		mg/kg	
	RPD	>C16-C21 Hydrocarbons	2013/03/07	ND, RDL=10		mg/kg	
		>C21-<C32 Hydrocarbons	2013/03/07	ND, RDL=15		mg/kg	
		>C10-C16 Hydrocarbons	2013/03/07	NC		%	50
		>C16-C21 Hydrocarbons	2013/03/07	NC		%	50
		>C21-<C32 Hydrocarbons	2013/03/07	NC		%	50

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 spiked amount was not sufficiently significant to permit a reliable recovery calculation.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

(1) Elevated recovery due to sample matrix. < 10 % of compounds in multi-component analysis in violation.

Your P.O. #: CALLUP#49
 Site Location: R.053663.004 SOUTHSIDE CCG BASE
 Your C.O.C. #: ES683513

Attention: Carolyn Anstey-Moore

Stantec Consulting Ltd.
 607 Torbay Road
 St. John's, NL
 CANADA A1A 4Y6

Report Date: 2013/04/04

This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B331283

Received: 2013/03/04, 09:09

Sample Matrix: Soil
 # Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Soil (AA PIRI) (1)	2	2013/03/06	2013/03/11	ATL SOP 00116	Based on Atl. PIRI
TEH in Leachate (PIRI) (1)	3	2013/03/28	2013/03/28	ATL SOP-00113	Based on Atl. PIRI
TEH in Leachate (PIRI) (1)	1	2013/03/28	2013/04/01	ATL SOP-00113	Based on Atl. PIRI
TEH in Soil (PIRI) 2,3	2	2013/03/05	2013/03/12	ATL SOP-00197	Based on Atl. PIRI
TEH in Soil (PIRI) 2,3	6	2013/03/20	2013/03/21	ATL SOP-00197	Based on Atl. PIRI
Metals Leach TCLP/CGSB extraction (1)	4	2013/03/27	2013/03/27	ATL SOP-00059	Based on EPA6020A
Metals Solids Acid Extr. ICPMS (1)	6	2013/03/05	2013/03/06	ATL SOP 00059	Based on EPA6020A
Metals Solids Acid Extr. ICPMS (1)	2	2013/03/07	2013/03/08	ATL SOP 00059	Based on EPA6020A
Moisture (1)	10	N/A	2013/03/04	ATL SOP 00001	MOE Handbook 1983
PAH in Leachate by GC/MS (SIM) (1)	4	2013/04/01	2013/04/02	ATL SOP-00103	Based on EPA 8270C
PAH Compounds by GCMS (SIM) 1,3	7	2013/03/05	2013/03/07	ATL SOP 00102	Based on EPA8270C
PAH Compounds by GCMS (SIM) 1,3	1	2013/03/05	2013/03/11	ATL SOP 00102	Based on EPA8270C
PCBs in soil by GC/ECD 1,3	8	2013/03/08	2013/03/12	ATL SOP 00106	Based on EPA8082
VPH in Soil (PIRI2) (1)	2	2013/03/04	2013/03/05	ATL SOP 00120	Based on Atl. PIRI
VPH in Soil (PIRI) (1)	6	2013/03/04	2013/03/04	ATL SOP 00119	Based on Atl. PIRI
VPH in Soil (PIRI) (1)	2	2013/03/04	2013/03/05	ATL SOP 00119	Based on Atl. PIRI
TCLP Inorganic extraction - pH (1)	4	N/A	2013/03/27	ATL SOP-00035	Based on EPA1311
TCLP Inorganic extraction - Weight (1)	4	N/A	2013/03/27	ATL SOP-00035	Based on EPA1311
Total Oil and Grease - Soil (1)	2	2013/03/05	2013/03/08	ATL SOP 00100	Based on EPA9071B
ModTPH (T1) Calc. for Soil (1)	2	2013/03/04	2013/03/12		Based on Atl. PIRI
ModTPH (T1) Calc. for Soil (1)	6	2013/03/04	2013/03/21		Based on Atl. PIRI
ModTPH (T2) Calc. for Soil (1)	2	N/A	2013/03/12	n/a	Based on Atl. PIRI

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

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

- (1) This test was performed by Bedford
- (2) Reported on a dry weight basis.
- (3) Soils are reported on a dry weight basis unless otherwise specified.

Your P.O. #: CALLUP#49
Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your C.O.C. #: ES683513

Attention: Carolyn Anstey-Moore

Stantec Consulting Ltd.
607 Torbay Road
St. John's, NL
CANADA A1A 4Y6

Report Date: 2013/04/04

This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

-2-

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Mari Kenny, Project Manager
Email: MKenny@maxxam.ca
Phone# (902) 420-0203 Ext:291

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

Total cover pages: 2

Stantec Consulting Ltd.

Maxxam Job #: B331283
Report Date: 2013/04/04

Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALLUP#49

ATLANTIC FRACTIONATION (PIRIT2) IN SOIL

Maxxam ID		QS3675		QS3676	QS3676		
Sampling Date		2013/02/25		2013/02/26	2013/02/26		
COC Number		ES683513		ES683513	ES683513		
	Units	BH6-SS4	RDL	BH15-SS3	BH15-SS3 Lab-Dup	RDL	QC Batch

Inorganics							
Moisture	%	19	1	15		1	3139829
Petroleum Hydrocarbons							
Benzene	mg/kg	0.087	0.025	ND		0.025	3140116
Toluene	mg/kg	0.20	0.025	ND (1)		0.070	3140116
Ethylbenzene	mg/kg	0.60	0.025	0.10		0.025	3140116
Xylene (Total)	mg/kg	3.6	0.050	0.41		0.050	3140116
Aliphatic >C6-C8	mg/kg	390 (2)	2.0	160 (2)		2.0	3140116
Aliphatic >C8-C10	mg/kg	750	4.0	570		4.0	3140116
>C8-C10 Aromatics (-EX)	mg/kg	80	0.10	44		0.10	3140116
Aliphatic >C10-C12	mg/kg	880	8.0	1000	780	8.0	3142304
Aliphatic >C12-C16	mg/kg	2100	15	2100	1600	15	3142304
Aliphatic >C16-C21	mg/kg	1200	15	790	590	15	3142304
Aliphatic >C21-<C32	mg/kg	260	15	96	68	15	3142304
Aromatic >C10-C12	mg/kg	340	4.0	220	240	4.0	3142304
Aromatic >C12-C16	mg/kg	620	15	580	570	15	3142304
Aromatic >C16-C21	mg/kg	570	15	370	330	15	3142304
Aromatic >C21-<C32	mg/kg	180	15	98	81	15	3142304
Modified TPH (Tier 2)	mg/kg	7300	15	6000		15	3139917
Reached Baseline at C32	mg/kg	Yes	N/A	Yes		N/A	3142304
Hydrocarbon Resemblance	mg/kg	COMMENT (3)	N/A	COMMENT (4)		N/A	3142304
Surrogate Recovery (%)							
Isobutylbenzene - Extractable	%	89		91	101		3142304
n-Dotriacontane - Extractable	%	104		114	102		3142304
Isobutylbenzene - Volatile	%	75		52 (5)			3140116

ND = Not detected

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) Elevated VPH RDL(s) due to matrix interference.

(2) Elevated VPH RDL(s) due to detected levels in the blank.

(3) Weathered fuel oil fraction. Lube oil fraction.

(4) Weathered fuel oil fraction. Possible lube oil fraction.

(5) VPH surrogate not within acceptance limits. Analysis was repeated with similar results.

Stantec Consulting Ltd.

Maxxam Job #: B331283
Report Date: 2013/04/04

Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALLUP#49

ATLANTIC MUST IN SOIL (SOIL)

Maxxam ID		QS3347			QS3348	QS3349		
Sampling Date		2013/02/25			2013/02/25	2013/02/25		
COC Number		ES683513			ES683513	ES683513		
	Units	BH6-SS4	RDL	QC Batch	BH7-SS1	BH7-SS6	RDL	QC Batch

Inorganics								
Moisture	%	19	1	3139829	6	20	1	3139829
Petroleum Hydrocarbons								
Benzene	mg/kg	ND (1)	0.050	3140111	ND	ND	0.025	3140111
Toluene	mg/kg	0.14	0.025	3140111	ND	ND	0.025	3140111
Ethylbenzene	mg/kg	0.73	0.025	3140111	ND	ND	0.025	3140111
Xylene (Total)	mg/kg	4.0	0.050	3140111	ND	ND	0.050	3140111
C6 - C10 (less BTEX)	mg/kg	1200	25	3140111	ND	ND	2.5	3140111
>C10-C16 Hydrocarbons	mg/kg	4300	10	3147329	ND	ND	10	3156538
>C16-C21 Hydrocarbons	mg/kg	1700	10	3147329	ND	ND	10	3156538
>C21-<C32 Hydrocarbons	mg/kg	470	15	3147329	32	24	15	3156538
Modified TPH (Tier1)	mg/kg	7700	25	3139781	32	24	15	3139781
Reached Baseline at C32	mg/kg	Yes	N/A	3147329	No	No	N/A	3156538
Hydrocarbon Resemblance	mg/kg	SEECOMMENT (2)	N/A	3147329	SEECOMMENT (3)	SEECOMMENT (4)	N/A	3156538
Surrogate Recovery (%)								
Isobutylbenzene - Extractable	%	126		3147329	98	96		3156538
n-Dotriacontane - Extractable	%	154 (5)		3147329	113 (6)	113 (6)		3156538
Isobutylbenzene - Volatile	%	70		3140111	93	106		3140111

ND = Not detected

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) Elevated VPH RDL(s) due to matrix interference.

(2) Weathered fuel oil fraction.

(3) Possible lube oil fraction.

(4) No resemblance to petroleum products in lube oil range.

(5) Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to matrix/co-extractive interference. Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.

(6) Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.

Stantec Consulting Ltd.

Maxxam Job #: B331283
Report Date: 2013/04/04

Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALLUP#49

ATLANTIC MUST IN SOIL (SOIL)

Maxxam ID		QS3350	QS3351	QS3352	QS3353	QS3353		
Sampling Date		2013/02/24	2013/02/24	2013/02/24	2013/02/26	2013/02/26		
COC Number		ES683513	ES683513	ES683513	ES683513	ES683513		
	Units	BH9-SS2	BH14-SS3	BH14-AS3C	BH15-SS1	BH15-SS1 Lab-Dup	RDL	QC Batch

Inorganics								
Moisture	%	9	10	3	4		1	3139829
Petroleum Hydrocarbons								
Benzene	mg/kg	ND	0.033	ND	ND		0.025	3140111
Toluene	mg/kg	ND	0.10	ND	ND		0.025	3140111
Ethylbenzene	mg/kg	ND	0.044	ND	ND		0.025	3140111
Xylene (Total)	mg/kg	ND	0.34	ND	ND		0.050	3140111
C6 - C10 (less BTEX)	mg/kg	ND	ND	ND	ND		2.5	3140111
>C10-C16 Hydrocarbons	mg/kg	ND	670	19	ND	ND	10	3156538
>C16-C21 Hydrocarbons	mg/kg	ND	620	110	ND	ND	10	3156538
>C21-<C32 Hydrocarbons	mg/kg	ND	860	2400	16	19	15	3156538
Modified TPH (Tier1)	mg/kg	ND	2100	2500	16		15	3139781
Reached Baseline at C32	mg/kg	Yes	Yes	No	No	No	N/A	3156538
Hydrocarbon Resemblance	mg/kg		SEECOMMENT (1)	SEECOMMENT (2)	SEECOMMENT (3)		N/A	3156538
Surrogate Recovery (%)								
Isobutylbenzene - Extractable	%	100	91	76	97	96		3156538
n-Dotriacontane - Extractable	%	105 (4)	148 (5)	97 (4)	113 (4)	112 (4)		3156538
Isobutylbenzene - Volatile	%	96	96	85	94			3140111

ND = Not detected

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) No resemblance to petroleum products in fuel oil /lube oil range.

(2) Lube oil fraction.

(3) Possible lube oil fraction.

(4) Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.

(5) Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to matrix/co-extractive interference. Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.

Maxxam Job #: B331283
Report Date: 2013/04/04

Stantec Consulting Ltd.

Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALLUP#49

ATLANTIC MUST IN SOIL (SOIL)

Maxxam ID		QS3354		
Sampling Date		2013/02/26		
COC Number		ES683513		
	Units	BH15-SS3	RDL	QC Batch

Inorganics				
Moisture	%	15	1	3139829
Petroleum Hydrocarbons				
Benzene	mg/kg	ND	0.025	3140111
Toluene	mg/kg	ND	0.025	3140111
Ethylbenzene	mg/kg	0.085	0.025	3140111
Xylene (Total)	mg/kg	0.42	0.050	3140111
C6 - C10 (less BTEX)	mg/kg	720	25	3140111
>C10-C16 Hydrocarbons	mg/kg	5000	10	3147329
>C16-C21 Hydrocarbons	mg/kg	1500	10	3147329
>C21-<C32 Hydrocarbons	mg/kg	250	15	3147329
Modified TPH (Tier1)	mg/kg	7500	25	3139781
Reached Baseline at C32	mg/kg	Yes	N/A	3147329
Hydrocarbon Resemblance	mg/kg	SEECOMMENT (1)	N/A	3147329
Surrogate Recovery (%)				
Isobutylbenzene - Extractable	%	166 (2)		3147329
n-Dotriacontane - Extractable	%	145 (2)		3147329
Isobutylbenzene - Volatile	%	51 (3)		3140111

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Weathered fuel oil fraction.
(2) Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to matrix/co-extractive interference. Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.
(3) VPH surrogate not within acceptance limits. Analysis was repeated with similar results.

Stantec Consulting Ltd.

Maxxam Job #: B331283
Report Date: 2013/04/04

Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALLUP#49

ATLANTIC TCLP LEACHATE + LEAD (SOIL)

Maxxam ID		QS3347	QS3351	QS3352	QS3354		
Sampling Date		2013/02/25	2013/02/24	2013/02/24	2013/02/26		
COC Number		ES683513	ES683513	ES683513	ES683513		
	Units	BH6-SS4	BH14-SS3	BH14-AS3C	BH15-SS3	RDL	QC Batch

Inorganics							
Sample Weight (as received)	g	50	50	50	50	N/A	3163254
Initial pH	N/A	7.2	8.0	8.4	6.8		3163255
Final pH	N/A	5.0	5.0	5.0	4.9		3163255
Metals							
Leachable Lead (Pb)	ug/L	410	2200	10	540	5.0	3163484

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B331283
Report Date: 2013/04/04

Stantec Consulting Ltd.

Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALLUP#49

RESULTS OF ANALYSES OF SOIL

Maxxam ID		QS3347	QS3354		
Sampling Date		2013/02/25	2013/02/26		
COC Number		ES683513	ES683513		
	Units	BH6-SS4	BH15-SS3	RDL	QC Batch

Petroleum Hydrocarbons					
Total Oil & Grease	mg/kg	5200	3500	100	3141399
RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Stantec Consulting Ltd.

Maxxam Job #: B331283
Report Date: 2013/04/04

Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALLUP#49

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		QS3347	QS3347		QS3348	QS3349	QS3350		
Sampling Date		2013/02/25	2013/02/25		2013/02/25	2013/02/25	2013/02/24		
COC Number		ES683513	ES683513		ES683513	ES683513	ES683513		
	Units	BH6-SS4	BH6-SS4 Lab-Dup	QC Batch	BH7-SS1	BH7-SS6	BH9-SS2	RDL	QC Batch

Metals									
Acid Extractable Aluminum (Al)	mg/kg	13000	13000	3143771	7600	16000	11000	10	3141159
Acid Extractable Antimony (Sb)	mg/kg	3.6	ND	3143771	ND	ND	ND	2.0	3141159
Acid Extractable Arsenic (As)	mg/kg	7.9	8.0	3143771	3.5	3.6	4.7	2.0	3141159
Acid Extractable Barium (Ba)	mg/kg	59	52	3143771	36	38	34	5.0	3141159
Acid Extractable Beryllium (Be)	mg/kg	ND	ND	3143771	ND	ND	ND	2.0	3141159
Acid Extractable Boron (B)	mg/kg	ND	ND	3143771	ND	ND	ND	50	3141159
Acid Extractable Cadmium (Cd)	mg/kg	ND	ND	3143771	0.46	ND	ND	0.30	3141159
Acid Extractable Chromium (Cr)	mg/kg	21	17	3143771	12	21	9.4	2.0	3141159
Acid Extractable Cobalt (Co)	mg/kg	11	11	3143771	6.1	8.8	8.3	1.0	3141159
Acid Extractable Copper (Cu)	mg/kg	31	30	3143771	11	45	14	2.0	3141159
Acid Extractable Iron (Fe)	mg/kg	27000	26000	3143771	17000	29000	20000	50	3141159
Acid Extractable Lead (Pb)	mg/kg	210	200	3143771	12	15	12	0.50	3141159
Acid Extractable Manganese (Mn)	mg/kg	690	680	3143771	660	620	880	2.0	3141159
Acid Extractable Mercury (Hg)	mg/kg	0.11	ND	3143771	ND	ND	ND	0.10	3141159
Acid Extractable Molybdenum (Mo)	mg/kg	3.2	3.3	3143771	ND	ND	ND	2.0	3141159
Acid Extractable Nickel (Ni)	mg/kg	13	13	3143771	7.2	21	6.8	2.0	3141159
Acid Extractable Selenium (Se)	mg/kg	ND	ND	3143771	ND	ND	ND	1.0	3141159
Acid Extractable Silver (Ag)	mg/kg	0.75	ND	3143771	ND	5.3	ND	0.50	3141159
Acid Extractable Strontium (Sr)	mg/kg	21	20	3143771	6.3	21	19	5.0	3141159
Acid Extractable Thallium (Tl)	mg/kg	ND	ND	3143771	ND	ND	ND	0.10	3141159
Acid Extractable Tin (Sn)	mg/kg	4.1	2.5	3143771	ND	ND	ND	2.0	3141159
Acid Extractable Uranium (U)	mg/kg	1.4	1.4	3143771	0.38	3.7	0.63	0.10	3141159
Acid Extractable Vanadium (V)	mg/kg	19	20	3143771	8.9	25	13	2.0	3141159
Acid Extractable Zinc (Zn)	mg/kg	130	120	3143771	45	63	54	5.0	3141159

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Stantec Consulting Ltd.

Maxxam Job #: B331283
Report Date: 2013/04/04

Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALLUP#49

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		QS3351	QS3352	QS3353		QS3354		
Sampling Date		2013/02/24	2013/02/24	2013/02/26		2013/02/26		
COC Number		ES683513	ES683513	ES683513		ES683513		
	Units	BH14-SS3	BH14-AS3C	BH15-SS1	QC Batch	BH15-SS3	RDL	QC Batch

Metals								
Acid Extractable Aluminum (Al)	mg/kg	9700	6800	7800	3141159	17000	10	3143771
Acid Extractable Antimony (Sb)	mg/kg	ND	ND	ND	3141159	ND	2.0	3143771
Acid Extractable Arsenic (As)	mg/kg	15	2.9	4.2	3141159	12	2.0	3143771
Acid Extractable Barium (Ba)	mg/kg	140	26	21	3141159	110	5.0	3143771
Acid Extractable Beryllium (Be)	mg/kg	ND	ND	ND	3141159	ND	2.0	3143771
Acid Extractable Boron (B)	mg/kg	ND	ND	ND	3141159	ND	50	3143771
Acid Extractable Cadmium (Cd)	mg/kg	0.31	ND	ND	3141159	ND	0.30	3143771
Acid Extractable Chromium (Cr)	mg/kg	33	33	7.1	3141159	18	2.0	3143771
Acid Extractable Cobalt (Co)	mg/kg	8.7	5.1	6.5	3141159	10	1.0	3143771
Acid Extractable Copper (Cu)	mg/kg	51	15	12	3141159	43	2.0	3143771
Acid Extractable Iron (Fe)	mg/kg	34000	16000	18000	3141159	34000	50	3143771
Acid Extractable Lead (Pb)	mg/kg	340	11	14	3141159	850	0.50	3143771
Acid Extractable Manganese (Mn)	mg/kg	610	540	730	3141159	620	2.0	3143771
Acid Extractable Mercury (Hg)	mg/kg	0.65	ND	ND	3141159	0.44	0.10	3143771
Acid Extractable Molybdenum (Mo)	mg/kg	5.0	ND	ND	3141159	ND	2.0	3143771
Acid Extractable Nickel (Ni)	mg/kg	18	9.6	6.7	3141159	20	2.0	3143771
Acid Extractable Selenium (Se)	mg/kg	ND	ND	ND	3141159	ND	1.0	3143771
Acid Extractable Silver (Ag)	mg/kg	0.77	ND	ND	3141159	ND	0.50	3143771
Acid Extractable Strontium (Sr)	mg/kg	33	9.7	6.3	3141159	30	5.0	3143771
Acid Extractable Thallium (Tl)	mg/kg	0.11	ND	ND	3141159	0.11	0.10	3143771
Acid Extractable Tin (Sn)	mg/kg	15	ND	ND	3141159	27	2.0	3143771
Acid Extractable Uranium (U)	mg/kg	0.66	0.38	0.35	3141159	0.86	0.10	3143771
Acid Extractable Vanadium (V)	mg/kg	24	30	9.3	3141159	23	2.0	3143771
Acid Extractable Zinc (Zn)	mg/kg	140	53	47	3141159	140	5.0	3143771

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Stantec Consulting Ltd.

Maxxam Job #: B331283
Report Date: 2013/04/04

Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALLUP#49

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		QS3347	QS3348	QS3349	QS3350		QS3351		
Sampling Date		2013/02/25	2013/02/25	2013/02/25	2013/02/24		2013/02/24		
COC Number		ES683513	ES683513	ES683513	ES683513		ES683513		
	Units	BH6-SS4	BH7-SS1	BH7-SS6	BH9-SS2	RDL	BH14-SS3	RDL	QC Batch

Polyaromatic Hydrocarbons									
1-Methylnaphthalene	mg/kg	2.5	ND	ND	ND	0.010	8.1	0.10	3141091
2-Methylnaphthalene	mg/kg	1.6	ND	ND	ND	0.010	13	0.10	3141091
Acenaphthene	mg/kg	0.20	ND	0.039	ND	0.010	12	0.10	3141091
Acenaphthylene	mg/kg	0.27	ND	ND	ND	0.010	5.0	0.10	3141091
Anthracene	mg/kg	0.35	ND	ND	ND	0.010	20	0.10	3141091
Benzo(a)anthracene	mg/kg	0.52	ND	ND	ND	0.010	25	0.10	3141091
Benzo(a)pyrene	mg/kg	0.53	ND	ND	ND	0.010	16	0.10	3141091
Benzo(b)fluoranthene	mg/kg	0.40	ND	ND	ND	0.010	11	0.10	3141091
Benzo(g,h,i)perylene	mg/kg	0.36	ND	ND	ND	0.010	7.5	0.10	3141091
Benzo(j)fluoranthene	mg/kg	0.32	ND	ND	ND	0.010	7.0	0.10	3141091
Benzo(k)fluoranthene	mg/kg	0.25	ND	ND	ND	0.010	6.5	0.10	3141091
Chrysene	mg/kg	0.64	0.018	ND	ND	0.010	23	0.10	3141091
Dibenz(a,h)anthracene	mg/kg	0.081	ND	ND	ND	0.010	2.0	0.10	3141091
Fluoranthene	mg/kg	0.84	0.014	ND	0.017	0.010	64	0.10	3141091
Leachable Fluoranthene	ug/L	0.21				0.10	8.5	0.10	3166728
Fluorene	mg/kg	0.78	ND	0.033	ND	0.010	21	0.10	3141091
Indeno(1,2,3-cd)pyrene	mg/kg	0.31	ND	ND	ND	0.010	6.7	0.10	3141091
Naphthalene	mg/kg	1.1	ND	ND	ND	0.010	38	0.10	3141091
Leachable Naphthalene	ug/L	8.4				2.0	600	40	3166728
Perylene	mg/kg	0.22	ND	0.014	ND	0.010	3.6	0.10	3141091
Phenanthrene	mg/kg	1.6	0.026	ND	0.024	0.010	100	0.10	3141091
Leachable Phenanthrene	ug/L	1.5				0.10	93	2.0	3166728
Pyrene	mg/kg	0.83	0.014	ND	0.016	0.010	52	0.10	3141091
Surrogate Recovery (%)									
Leachable D10-Anthracene	%	83					94		3166728
Leachable D14-Terphenyl	%	98					79 (1)		3166728
Leachable D8-Acenaphthylene	%	99					98		3166728
D10-Anthracene	%	88	80	76	72		94		3141091
D14-Terphenyl (FS)	%	90	92	88	90		109 (1)		3141091
D8-Acenaphthylene	%	95	87	90	83		92		3141091

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Elevated PAH RDL(s) due to sample dilution.

Stantec Consulting Ltd.

Maxxam Job #: B331283
Report Date: 2013/04/04

Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALLUP#49

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		QS3352	QS3352		QS3353	QS3354		
Sampling Date		2013/02/24	2013/02/24		2013/02/26	2013/02/26		
COC Number		ES683513	ES683513		ES683513	ES683513		
	Units	BH14-AS3C	BH14-AS3C Lab-Dup	RDL	BH15-SS1	BH15-SS3	RDL	QC Batch

Polyaromatic Hydrocarbons								
1-Methylnaphthalene	mg/kg	0.011		0.010	ND	2.6	0.010	3141091
2-Methylnaphthalene	mg/kg	0.014		0.010	ND	0.13	0.010	3141091
Acenaphthene	mg/kg	ND		0.010	ND	0.36	0.010	3141091
Acenaphthylene	mg/kg	ND		0.010	ND	0.33	0.010	3141091
Anthracene	mg/kg	ND		0.010	ND	0.12	0.010	3141091
Benzo(a)anthracene	mg/kg	ND (1)		0.10	ND	0.28	0.010	3141091
Benzo(a)pyrene	mg/kg	0.044		0.010	ND	0.22	0.010	3141091
Benzo(b)fluoranthene	mg/kg	ND (1)		0.20	ND	0.20	0.010	3141091
Benzo(g,h,i)perylene	mg/kg	0.11		0.010	ND	0.12	0.010	3141091
Benzo(j)fluoranthene	mg/kg	ND (1)		0.030	ND	0.12	0.010	3141091
Benzo(k)fluoranthene	mg/kg	ND (1)		0.020	ND	0.12	0.010	3141091
Chrysene	mg/kg	0.56		0.010	0.014	0.32	0.010	3141091
Dibenz(a,h)anthracene	mg/kg	ND (1)		0.030	ND	0.031	0.010	3141091
Fluoranthene	mg/kg	0.040		0.010	ND	0.64	0.010	3141091
Leachable Fluoranthene	ug/L	ND	ND	0.10		0.30	0.10	3166728
Fluorene	mg/kg	0.010		0.010	ND	0.78	0.010	3141091
Indeno(1,2,3-cd)pyrene	mg/kg	ND (1)		0.020	ND	0.11	0.010	3141091
Naphthalene	mg/kg	0.010		0.010	ND	0.066	0.010	3141091
Leachable Naphthalene	ug/L	ND	ND	2.0		ND	2.0	3166728
Perylene	mg/kg	0.035		0.010	ND	0.047	0.010	3141091
Phenanthrene	mg/kg	0.040		0.010	ND	0.95	0.010	3141091
Leachable Phenanthrene	ug/L	0.20	0.24	0.10		1.7	0.10	3166728
Pyrene	mg/kg	0.12		0.010	ND	0.65	0.010	3141091
Surrogate Recovery (%)								
Leachable D10-Anthracene	%	96	96			88		3166728
Leachable D14-Terphenyl	%	111	114			101		3166728
Leachable D8-Acenaphthylene	%	98	101			100		3166728
D10-Anthracene	%	83			76	84		3141091
D14-Terphenyl (FS)	%	93			91	85		3141091

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

Stantec Consulting Ltd.

Maxxam Job #: B331283
Report Date: 2013/04/04

Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALLUP#49

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		QS3352	QS3352		QS3353	QS3354		
Sampling Date		2013/02/24	2013/02/24		2013/02/26	2013/02/26		
COC Number		ES683513	ES683513		ES683513	ES683513		
	Units	BH14-AS3C	BH14-AS3C Lab-Dup	RDL	BH15-SS1	BH15-SS3	RDL	QC Batch

D8-Acenaphthylene	%	82			83	100		3141091
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RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Stantec Consulting Ltd.

Maxxam Job #: B331283
Report Date: 2013/04/04

Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALLUP#49

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		QS3347	QS3351	QS3351	QS3352	QS3354		
Sampling Date		2013/02/25	2013/02/24	2013/02/24	2013/02/24	2013/02/26		
COC Number		ES683513	ES683513	ES683513	ES683513	ES683513		
	Units	BH6-SS4	BH14-SS3	BH14-SS3 Lab-Dup	BH14-AS3C	BH15-SS3	RDL	QC Batch

Petroleum Hydrocarbons								
Leachable >C10-C16 Hydrocarbons	mg/L	1.1	1.7	1.7	ND	0.92	0.20	3164837
Leachable >C16-C21 Hydrocarbons	mg/L	ND	0.46	0.47	ND	ND	0.20	3164837
Leachable >C21-<C32 Hydrocarbons	mg/L	ND	ND	ND	ND	ND	0.50	3164837
Leachable Reached Baseline at C32	mg/L	Yes	Yes		NA	Yes	N/A	3164837
Leachable Hydrocarbon Resemblance	mg/L	COMMENT (1)	COMMENT (1)		NA	COMMENT (1)	N/A	3164837
Surrogate Recovery (%)								
Leachable Isobutylbenzene - Extractable	%	74	81	76	81	70		3164837
Leachable n-Dotriacontane - Extractable	%	127	116	121	127	113		3164837

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Unidentified compound(s) in fuel oil range.

Stantec Consulting Ltd.

Maxxam Job #: B331283
Report Date: 2013/04/04

Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALLUP#49

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		QS3347	QS3348	QS3349	QS3350	QS3351	QS3352		
Sampling Date		2013/02/25	2013/02/25	2013/02/25	2013/02/24	2013/02/24	2013/02/24		
COC Number		ES683513	ES683513	ES683513	ES683513	ES683513	ES683513		
	Units	BH6-SS4	BH7-SS1	BH7-SS6	BH9-SS2	BH14-SS3	BH14-AS3C	RDL	QC Batch

PCBs									
Total PCB	ug/g	ND	ND	ND	ND	ND	ND	0.050	3144949
Surrogate Recovery (%)									
Decachlorobiphenyl	%	85	81	83	84	74 (1)	66 (2)		3144949

ND = Not detected

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) PCB:Unidentified (possibly halogenated) compounds detected.

(2) PCB surrogate not within acceptance limits. Sample past recommended hold time for repeat analysis.

Maxxam ID		QS3353	QS3353	QS3354		
Sampling Date		2013/02/26	2013/02/26	2013/02/26		
COC Number		ES683513	ES683513	ES683513		
	Units	BH15-SS1	BH15-SS1 Lab-Dup	BH15-SS3	RDL	QC Batch

PCBs						
Total PCB	ug/g	ND	ND	ND	0.050	3144949
Surrogate Recovery (%)						
Decachlorobiphenyl	%	107	119	74		3144949

ND = Not detected

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Maxxam Job #: B331283
Report Date: 2013/04/04

Stantec Consulting Ltd.

Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALLUP#49

Package 1	8.4°C
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Each temperature is the average of up to three cooler temperatures taken at receipt

GENERAL COMMENTS

Revised report: TCLP Leachate + TEH, Lead, fluoranthene, naphthalene, and phenanthrene added to samples BH6-SS4, BH15-SS3, BH14-SS3, and BH14-AS3C as per client request March 22, 2013 MHL.

Results relate only to the items tested.

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #:
P.O. #: CALLUP#49
Site Location: R.053663.004 SOUTHSIDE CCG BASE

Quality Assurance Report
Maxxam Job Number: ZB331283

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3140111 THL	Matrix Spike	Isobutylbenzene - Volatile	2013/03/04		92	%	60 - 140
		Benzene	2013/03/04		81	%	60 - 140
		Toluene	2013/03/04		116	%	60 - 140
		Ethylbenzene	2013/03/04		101	%	60 - 140
		Xylene (Total)	2013/03/04		114	%	60 - 140
	Spiked Blank	Isobutylbenzene - Volatile	2013/03/04		95	%	60 - 140
		Benzene	2013/03/04		83	%	60 - 140
		Toluene	2013/03/04		82	%	60 - 140
		Ethylbenzene	2013/03/04		83	%	60 - 140
		Xylene (Total)	2013/03/04		83	%	60 - 140
	Method Blank	Isobutylbenzene - Volatile	2013/03/04		100	%	60 - 140
		Benzene	2013/03/04	ND, RDL=0.025		mg/kg	
		Toluene	2013/03/04	ND, RDL=0.025		mg/kg	
		Ethylbenzene	2013/03/04	ND, RDL=0.025		mg/kg	
		Xylene (Total)	2013/03/04	ND, RDL=0.050		mg/kg	
	RPD	C6 - C10 (less BTEX)	2013/03/04	ND, RDL=2.5		mg/kg	
		Benzene	2013/03/04	NC		%	50
		Toluene	2013/03/04	NC		%	50
		Ethylbenzene	2013/03/04	NC		%	50
		Xylene (Total)	2013/03/04	NC		%	50
		C6 - C10 (less BTEX)	2013/03/04	NC		%	50
		Isobutylbenzene - Volatile	2013/03/04		95	%	60 - 140
		Benzene	2013/03/04		83	%	60 - 140
3140116 THL	Spiked Blank	Toluene	2013/03/04		82	%	60 - 140
		Ethylbenzene	2013/03/04		83	%	60 - 140
		Xylene (Total)	2013/03/04		83	%	60 - 140
		Isobutylbenzene - Volatile	2013/03/04		100	%	60 - 140
		Benzene	2013/03/04	ND, RDL=0.025		mg/kg	
	Method Blank	Toluene	2013/03/04	ND, RDL=0.025		mg/kg	
		Ethylbenzene	2013/03/04	ND, RDL=0.025		mg/kg	
		Xylene (Total)	2013/03/04	ND, RDL=0.050		mg/kg	
		Aliphatic >C6-C8	2013/03/04	ND, RDL=0.20 (1)		mg/kg	
		Aliphatic >C8-C10	2013/03/04	ND, RDL=0.40		mg/kg	
		>C8-C10 Aromatics (-EX)	2013/03/04	ND, RDL=0.10		mg/kg	
		D10-Anthracene	2013/03/06		81	%	30 - 130
		D14-Terphenyl (FS)	2013/03/06		89	%	30 - 130
		D8-Acenaphthylene	2013/03/06		81	%	30 - 130
		1-Methylnaphthalene	2013/03/06		67	%	30 - 130
		2-Methylnaphthalene	2013/03/06		68	%	30 - 130
		Acenaphthene	2013/03/06		70	%	30 - 130
		Acenaphthylene	2013/03/06		75	%	30 - 130
		Anthracene	2013/03/06		74	%	30 - 130
3141091 GTH	Matrix Spike	Benzo(a)anthracene	2013/03/06		91	%	30 - 130
		Benzo(a)pyrene	2013/03/06		98	%	30 - 130
		Benzo(b)fluoranthene	2013/03/06		91	%	30 - 130
		Benzo(g,h,i)perylene	2013/03/06		94	%	30 - 130
		Benzo(j)fluoranthene	2013/03/06		91	%	30 - 130
		Benzo(k)fluoranthene	2013/03/06		91	%	30 - 130
		Chrysene	2013/03/06		83	%	30 - 130
		Dibenz(a,h)anthracene	2013/03/06		89	%	30 - 130
		Fluoranthene	2013/03/06		88	%	30 - 130
		Fluorene	2013/03/06		74	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2013/03/06		93	%	30 - 130
		Naphthalene	2013/03/06		66	%	30 - 130
		Perylene	2013/03/06		89	%	30 - 130

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #:
P.O. #: CALLUP#49
Site Location: R.053663.004 SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB331283

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3141091 GTH	Matrix Spike	Phenanthrene	2013/03/06		80	%	30 - 130
		Pyrene	2013/03/06		87	%	30 - 130
	Spiked Blank	D10-Anthracene	2013/03/06		86	%	30 - 130
		D14-Terphenyl (FS)	2013/03/06		96	%	30 - 130
		D8-Acenaphthylene	2013/03/06		87	%	30 - 130
		1-Methylnaphthalene	2013/03/06		73	%	30 - 130
		2-Methylnaphthalene	2013/03/06		76	%	30 - 130
		Acenaphthene	2013/03/06		77	%	30 - 130
		Acenaphthylene	2013/03/06		81	%	30 - 130
		Anthracene	2013/03/06		81	%	30 - 130
		Benzo(a)anthracene	2013/03/06		89	%	30 - 130
		Benzo(a)pyrene	2013/03/06		99	%	30 - 130
		Benzo(b)fluoranthene	2013/03/06		94	%	30 - 130
		Benzo(g,h,i)perylene	2013/03/06		98	%	30 - 130
		Benzo(j)fluoranthene	2013/03/06		96	%	30 - 130
		Benzo(k)fluoranthene	2013/03/06		95	%	30 - 130
		Chrysene	2013/03/06		85	%	30 - 130
		Dibenz(a,h)anthracene	2013/03/06		95	%	30 - 130
		Fluoranthene	2013/03/06		83	%	30 - 130
		Fluorene	2013/03/06		80	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2013/03/06		96	%	30 - 130
		Naphthalene	2013/03/06		74	%	30 - 130
		Perylene	2013/03/06		95	%	30 - 130
	Method Blank	Phenanthrene	2013/03/06		83	%	30 - 130
		Pyrene	2013/03/06		83	%	30 - 130
		D10-Anthracene	2013/03/06		81	%	30 - 130
		D14-Terphenyl (FS)	2013/03/06		94	%	30 - 130
		D8-Acenaphthylene	2013/03/06		84	%	30 - 130
		1-Methylnaphthalene	2013/03/06	ND, RDL=0.010		mg/kg	
		2-Methylnaphthalene	2013/03/06	ND, RDL=0.010		mg/kg	
		Acenaphthene	2013/03/06	ND, RDL=0.010		mg/kg	
		Acenaphthylene	2013/03/06	ND, RDL=0.010		mg/kg	
		Anthracene	2013/03/06	ND, RDL=0.010		mg/kg	
		Benzo(a)anthracene	2013/03/06	ND, RDL=0.010		mg/kg	
		Benzo(a)pyrene	2013/03/06	ND, RDL=0.010		mg/kg	
		Benzo(b)fluoranthene	2013/03/06	ND, RDL=0.010		mg/kg	
		Benzo(g,h,i)perylene	2013/03/06	ND, RDL=0.010		mg/kg	
		Benzo(j)fluoranthene	2013/03/06	ND, RDL=0.010		mg/kg	
		Benzo(k)fluoranthene	2013/03/06	ND, RDL=0.010		mg/kg	
		Chrysene	2013/03/06	ND, RDL=0.010		mg/kg	
		Dibenz(a,h)anthracene	2013/03/06	ND, RDL=0.010		mg/kg	
	RPD	Fluoranthene	2013/03/06	ND, RDL=0.010		mg/kg	
		Fluorene	2013/03/06	ND, RDL=0.010		mg/kg	
		Indeno(1,2,3-cd)pyrene	2013/03/06	ND, RDL=0.010		mg/kg	
		Naphthalene	2013/03/06	ND, RDL=0.010		mg/kg	
		Perylene	2013/03/06	ND, RDL=0.010		mg/kg	
		Phenanthrene	2013/03/06	ND, RDL=0.010		mg/kg	
		Pyrene	2013/03/06	ND, RDL=0.010		mg/kg	
		1-Methylnaphthalene	2013/03/06	NC		%	50
		2-Methylnaphthalene	2013/03/06	NC		%	50
		Acenaphthene	2013/03/06	NC		%	50
		Acenaphthylene	2013/03/06	NC		%	50
		Anthracene	2013/03/06	NC		%	50
		Benzo(a)anthracene	2013/03/06	20.6		%	50
		Benzo(a)pyrene	2013/03/06	13.2		%	50

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #:
P.O. #: CALLUP#49
Site Location: R.053663.004 SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB331283

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3141091 GTH	RPD	Benzo(b)fluoranthene	2013/03/06	14.2		%	50
		Benzo(g,h,i)perylene	2013/03/06	NC		%	50
		Benzo(j)fluoranthene	2013/03/06	NC		%	50
		Benzo(k)fluoranthene	2013/03/06	NC		%	50
		Chrysene	2013/03/06	17.0		%	50
		Dibenz(a,h)anthracene	2013/03/06	NC		%	50
		Fluoranthene	2013/03/06	18.4		%	50
		Fluorene	2013/03/06	NC		%	50
		Indeno(1,2,3-cd)pyrene	2013/03/06	NC		%	50
		Naphthalene	2013/03/06	NC		%	50
		Perylene	2013/03/06	NC		%	50
		Phenanthrene	2013/03/06	13.3		%	50
		Pyrene	2013/03/06	17.7		%	50
3141159 DLB	Matrix Spike	Acid Extractable Antimony (Sb)	2013/03/06		100	%	75 - 125
		Acid Extractable Arsenic (As)	2013/03/06		102	%	75 - 125
		Acid Extractable Barium (Ba)	2013/03/06		NC	%	75 - 125
		Acid Extractable Beryllium (Be)	2013/03/06		104	%	75 - 125
		Acid Extractable Boron (B)	2013/03/06		NC	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/03/06		98	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/03/06		103	%	75 - 125
		Acid Extractable Cobalt (Co)	2013/03/06		103	%	75 - 125
		Acid Extractable Copper (Cu)	2013/03/06		NC	%	75 - 125
		Acid Extractable Lead (Pb)	2013/03/06		NC	%	75 - 125
		Acid Extractable Manganese (Mn)	2013/03/06		NC	%	75 - 125
		Acid Extractable Mercury (Hg)	2013/03/06		98	%	75 - 125
		Acid Extractable Molybdenum (Mo)	2013/03/06		NC	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/03/06		99	%	75 - 125
		Acid Extractable Selenium (Se)	2013/03/06		97	%	75 - 125
	Spiked Blank	Acid Extractable Silver (Ag)	2013/03/06		98	%	75 - 125
		Acid Extractable Strontium (Sr)	2013/03/06		NC	%	75 - 125
		Acid Extractable Thallium (Tl)	2013/03/06		101	%	75 - 125
		Acid Extractable Tin (Sn)	2013/03/06		NC	%	75 - 125
		Acid Extractable Uranium (U)	2013/03/06		103	%	75 - 125
		Acid Extractable Vanadium (V)	2013/03/06		NC	%	75 - 125
		Acid Extractable Zinc (Zn)	2013/03/06		NC	%	75 - 125
		Acid Extractable Antimony (Sb)	2013/03/06		108	%	75 - 125
		Acid Extractable Arsenic (As)	2013/03/06		104	%	75 - 125
		Acid Extractable Barium (Ba)	2013/03/06		103	%	75 - 125
		Acid Extractable Beryllium (Be)	2013/03/06		105	%	75 - 125
		Acid Extractable Boron (B)	2013/03/06		100	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/03/06		102	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/03/06		104	%	75 - 125
		Acid Extractable Cobalt (Co)	2013/03/06		105	%	75 - 125
		Acid Extractable Copper (Cu)	2013/03/06		103	%	75 - 125
		Acid Extractable Lead (Pb)	2013/03/06		103	%	75 - 125
		Acid Extractable Manganese (Mn)	2013/03/06		102	%	75 - 125
		Acid Extractable Mercury (Hg)	2013/03/06		102	%	75 - 125
		Acid Extractable Molybdenum (Mo)	2013/03/06		105	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/03/06		103	%	75 - 125
		Acid Extractable Selenium (Se)	2013/03/06		103	%	75 - 125
		Acid Extractable Silver (Ag)	2013/03/06		104	%	75 - 125
		Acid Extractable Strontium (Sr)	2013/03/06		102	%	75 - 125
		Acid Extractable Thallium (Tl)	2013/03/06		104	%	75 - 125
		Acid Extractable Tin (Sn)	2013/03/06		102	%	75 - 125
		Acid Extractable Uranium (U)	2013/03/06		105	%	75 - 125

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #:
P.O. #: CALLUP#49
Site Location: R.053663.004 SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB331283

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3141159 DLB	Spiked Blank	Acid Extractable Vanadium (V)	2013/03/06		103	%	75 - 125
		Acid Extractable Zinc (Zn)	2013/03/06		104	%	75 - 125
	Method Blank	Acid Extractable Aluminum (Al)	2013/03/06	ND, RDL=10		mg/kg	
		Acid Extractable Antimony (Sb)	2013/03/06	ND, RDL=2.0		mg/kg	
		Acid Extractable Arsenic (As)	2013/03/06	ND, RDL=2.0		mg/kg	
		Acid Extractable Barium (Ba)	2013/03/06	ND, RDL=5.0		mg/kg	
		Acid Extractable Beryllium (Be)	2013/03/06	ND, RDL=2.0		mg/kg	
		Acid Extractable Boron (B)	2013/03/06	ND, RDL=50		mg/kg	
		Acid Extractable Cadmium (Cd)	2013/03/06	ND, RDL=0.30		mg/kg	
		Acid Extractable Chromium (Cr)	2013/03/06	ND, RDL=2.0		mg/kg	
		Acid Extractable Cobalt (Co)	2013/03/06	ND, RDL=1.0		mg/kg	
		Acid Extractable Copper (Cu)	2013/03/06	ND, RDL=2.0		mg/kg	
		Acid Extractable Iron (Fe)	2013/03/06	ND, RDL=50		mg/kg	
		Acid Extractable Lead (Pb)	2013/03/06	ND, RDL=0.50		mg/kg	
		Acid Extractable Manganese (Mn)	2013/03/06	ND, RDL=2.0		mg/kg	
		Acid Extractable Mercury (Hg)	2013/03/06	ND, RDL=0.10		mg/kg	
		Acid Extractable Molybdenum (Mo)	2013/03/06	ND, RDL=2.0		mg/kg	
		Acid Extractable Nickel (Ni)	2013/03/06	ND, RDL=2.0		mg/kg	
		Acid Extractable Selenium (Se)	2013/03/06	ND, RDL=1.0		mg/kg	
		Acid Extractable Silver (Ag)	2013/03/06	ND, RDL=0.50		mg/kg	
		Acid Extractable Strontium (Sr)	2013/03/06	ND, RDL=5.0		mg/kg	
		Acid Extractable Thallium (Tl)	2013/03/06	ND, RDL=0.10		mg/kg	
		Acid Extractable Tin (Sn)	2013/03/06	ND, RDL=2.0		mg/kg	
		Acid Extractable Uranium (U)	2013/03/06	ND, RDL=0.10		mg/kg	
		Acid Extractable Vanadium (V)	2013/03/06	ND, RDL=2.0		mg/kg	
		Acid Extractable Zinc (Zn)	2013/03/06	ND, RDL=5.0		mg/kg	
	RPD	Acid Extractable Aluminum (Al)	2013/03/06	1.3		%	35
		Acid Extractable Antimony (Sb)	2013/03/06	NC		%	35
		Acid Extractable Arsenic (As)	2013/03/06	2.7		%	35
		Acid Extractable Barium (Ba)	2013/03/06	5.6		%	35
		Acid Extractable Beryllium (Be)	2013/03/06	NC		%	35
		Acid Extractable Boron (B)	2013/03/06	NC		%	35
		Acid Extractable Cadmium (Cd)	2013/03/06	NC		%	35
		Acid Extractable Chromium (Cr)	2013/03/06	16.1		%	35
		Acid Extractable Cobalt (Co)	2013/03/06	4.0		%	35
		Acid Extractable Copper (Cu)	2013/03/06	20.3		%	35
		Acid Extractable Iron (Fe)	2013/03/06	4.5		%	35
		Acid Extractable Lead (Pb)	2013/03/06	9.3		%	35
		Acid Extractable Manganese (Mn)	2013/03/06	2.4		%	35
		Acid Extractable Mercury (Hg)	2013/03/06	NC		%	35
		Acid Extractable Molybdenum (Mo)	2013/03/06	NC		%	35
		Acid Extractable Nickel (Ni)	2013/03/06	0.6		%	35
		Acid Extractable Selenium (Se)	2013/03/06	NC		%	35
		Acid Extractable Silver (Ag)	2013/03/06	NC		%	35
		Acid Extractable Strontium (Sr)	2013/03/06	20.1		%	35
		Acid Extractable Thallium (Tl)	2013/03/06	NC		%	35
		Acid Extractable Tin (Sn)	2013/03/06	NC		%	35
		Acid Extractable Uranium (U)	2013/03/06	2.3		%	35
		Acid Extractable Vanadium (V)	2013/03/06	5.7		%	35
		Acid Extractable Zinc (Zn)	2013/03/06	6.8		%	35
3141399 CDS	Matrix Spike	Total Oil & Grease	2013/03/07		NC	%	30 - 130
	Spiked Blank	Total Oil & Grease	2013/03/07		71	%	30 - 130
	Method Blank	Total Oil & Grease	2013/03/07	ND, RDL=100		mg/kg	
	RPD	Total Oil & Grease	2013/03/07	10.7		%	50
3142304 SHF	Spiked Blank	Aliphatic >C10-C12	2013/03/11		73	%	30 - 130

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Quality Assurance Report (Continued)

Maxxam Job Number: ZB331283

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3142304 SHF	Spiked Blank	Aliphatic >C12-C16	2013/03/11		77	%	30 - 130
		Aliphatic >C16-C21	2013/03/11		83	%	30 - 130
		Aliphatic >C21-<C32	2013/03/11		83	%	30 - 130
		Aromatic >C10-C12	2013/03/11		99	%	30 - 130
		Aromatic >C12-C16	2013/03/11		88	%	30 - 130
		Aromatic >C16-C21	2013/03/11		90	%	30 - 130
	Method Blank	Aromatic >C21-<C32	2013/03/11		92	%	30 - 130
		Isobutylbenzene - Extractable	2013/03/11		103	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/11		108	%	30 - 130
		Aliphatic >C10-C12	2013/03/11	ND, RDL=8.0		mg/kg	
		Aliphatic >C12-C16	2013/03/11	ND, RDL=15		mg/kg	
		Aliphatic >C16-C21	2013/03/11	ND, RDL=15		mg/kg	
	RPD [QS3676-01]	Aliphatic >C21-<C32	2013/03/11	ND, RDL=15		mg/kg	
		Aromatic >C10-C12	2013/03/11	ND, RDL=4.0		mg/kg	
		Aromatic >C12-C16	2013/03/11	ND, RDL=15		mg/kg	
		Aromatic >C16-C21	2013/03/11	ND, RDL=15		mg/kg	
		Aromatic >C21-<C32	2013/03/11	ND, RDL=15		mg/kg	
		Aliphatic >C10-C12	2013/03/11	26.3		%	50
		Aliphatic >C12-C16	2013/03/11	27.3		%	50
		Aliphatic >C16-C21	2013/03/11	29.3		%	50
		Aliphatic >C21-<C32	2013/03/11	NC		%	50
		Aromatic >C10-C12	2013/03/11	6.4		%	50
		Aromatic >C12-C16	2013/03/11	2.9		%	50
		Aromatic >C16-C21	2013/03/11	11.6		%	50
		Aromatic >C21-<C32	2013/03/11	18.6		%	50
3143771 DLB	Matrix Spike [QS3347-01]	Acid Extractable Antimony (Sb)	2013/03/08		NC	%	75 - 125
		Acid Extractable Arsenic (As)	2013/03/08		96	%	75 - 125
		Acid Extractable Barium (Ba)	2013/03/08		NC	%	75 - 125
		Acid Extractable Beryllium (Be)	2013/03/08		100	%	75 - 125
		Acid Extractable Boron (B)	2013/03/08		93	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/03/08		94	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/03/08		98	%	75 - 125
		Acid Extractable Cobalt (Co)	2013/03/08		96	%	75 - 125
		Acid Extractable Copper (Cu)	2013/03/08		NC	%	75 - 125
		Acid Extractable Lead (Pb)	2013/03/08		NC	%	75 - 125
		Acid Extractable Manganese (Mn)	2013/03/08		NC	%	75 - 125
		Acid Extractable Mercury (Hg)	2013/03/08		94	%	75 - 125
	Spiked Blank	Acid Extractable Molybdenum (Mo)	2013/03/08		NC	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/03/08		98	%	75 - 125
		Acid Extractable Selenium (Se)	2013/03/08		98	%	75 - 125
		Acid Extractable Silver (Ag)	2013/03/08		134 (2)	%	75 - 125
		Acid Extractable Strontium (Sr)	2013/03/08		95	%	75 - 125
		Acid Extractable Thallium (Tl)	2013/03/08		98	%	75 - 125
		Acid Extractable Tin (Sn)	2013/03/08		NC	%	75 - 125
		Acid Extractable Uranium (U)	2013/03/08		96	%	75 - 125
		Acid Extractable Vanadium (V)	2013/03/08		95	%	75 - 125
		Acid Extractable Zinc (Zn)	2013/03/08		NC	%	75 - 125
		Acid Extractable Antimony (Sb)	2013/03/08		102	%	75 - 125
		Acid Extractable Arsenic (As)	2013/03/08		100	%	75 - 125
		Acid Extractable Barium (Ba)	2013/03/08		97	%	75 - 125
		Acid Extractable Beryllium (Be)	2013/03/08		101	%	75 - 125
		Acid Extractable Boron (B)	2013/03/08		98	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/03/08		96	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/03/08		97	%	75 - 125

Stantec Consulting Ltd.
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Quality Assurance Report (Continued)

Maxxam Job Number: ZB331283

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3143771 DLB	Spiked Blank	Acid Extractable Cobalt (Co)	2013/03/08		98	%	75 - 125
		Acid Extractable Copper (Cu)	2013/03/08		98	%	75 - 125
		Acid Extractable Lead (Pb)	2013/03/08		96	%	75 - 125
		Acid Extractable Manganese (Mn)	2013/03/08		97	%	75 - 125
		Acid Extractable Mercury (Hg)	2013/03/08		99	%	75 - 125
		Acid Extractable Molybdenum (Mo)	2013/03/08		100	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/03/08		96	%	75 - 125
		Acid Extractable Selenium (Se)	2013/03/08		100	%	75 - 125
		Acid Extractable Silver (Ag)	2013/03/08		97	%	75 - 125
		Acid Extractable Strontium (Sr)	2013/03/08		95	%	75 - 125
		Acid Extractable Thallium (Tl)	2013/03/08		100	%	75 - 125
		Acid Extractable Tin (Sn)	2013/03/08		97	%	75 - 125
		Acid Extractable Uranium (U)	2013/03/08		98	%	75 - 125
		Acid Extractable Vanadium (V)	2013/03/08		97	%	75 - 125
		Acid Extractable Zinc (Zn)	2013/03/08		102	%	75 - 125
	Method Blank	Acid Extractable Aluminum (Al)	2013/03/08	28, RDL=10 (3)		mg/kg	
		Acid Extractable Antimony (Sb)	2013/03/08	ND, RDL=2.0		mg/kg	
		Acid Extractable Arsenic (As)	2013/03/08	ND, RDL=2.0		mg/kg	
		Acid Extractable Barium (Ba)	2013/03/08	ND, RDL=5.0		mg/kg	
		Acid Extractable Beryllium (Be)	2013/03/08	ND, RDL=2.0		mg/kg	
		Acid Extractable Boron (B)	2013/03/08	ND, RDL=50		mg/kg	
		Acid Extractable Cadmium (Cd)	2013/03/08	ND, RDL=0.30		mg/kg	
		Acid Extractable Chromium (Cr)	2013/03/08	ND, RDL=2.0		mg/kg	
		Acid Extractable Cobalt (Co)	2013/03/08	ND, RDL=1.0		mg/kg	
		Acid Extractable Copper (Cu)	2013/03/08	ND, RDL=2.0		mg/kg	
		Acid Extractable Iron (Fe)	2013/03/08	ND, RDL=50		mg/kg	
		Acid Extractable Lead (Pb)	2013/03/08	ND, RDL=0.50		mg/kg	
		Acid Extractable Manganese (Mn)	2013/03/08	ND, RDL=2.0		mg/kg	
		Acid Extractable Mercury (Hg)	2013/03/08	ND, RDL=0.10		mg/kg	
		Acid Extractable Molybdenum (Mo)	2013/03/08	ND, RDL=2.0		mg/kg	
		Acid Extractable Nickel (Ni)	2013/03/08	ND, RDL=2.0		mg/kg	
		Acid Extractable Selenium (Se)	2013/03/08	ND, RDL=1.0		mg/kg	
		Acid Extractable Silver (Ag)	2013/03/08	ND, RDL=0.50		mg/kg	
		Acid Extractable Strontium (Sr)	2013/03/08	ND, RDL=5.0		mg/kg	
		Acid Extractable Thallium (Tl)	2013/03/08	ND, RDL=0.10		mg/kg	
		Acid Extractable Tin (Sn)	2013/03/08	ND, RDL=2.0		mg/kg	
		Acid Extractable Uranium (U)	2013/03/08	ND, RDL=0.10		mg/kg	
		Acid Extractable Vanadium (V)	2013/03/08	ND, RDL=2.0		mg/kg	
		Acid Extractable Zinc (Zn)	2013/03/08	ND, RDL=5.0		mg/kg	
	RPD [QS3347-01]	Acid Extractable Aluminum (Al)	2013/03/08	0.6		%	35
		Acid Extractable Antimony (Sb)	2013/03/08	NC		%	35
		Acid Extractable Arsenic (As)	2013/03/08	NC		%	35
		Acid Extractable Barium (Ba)	2013/03/08	12.2		%	35
		Acid Extractable Beryllium (Be)	2013/03/08	NC		%	35
		Acid Extractable Boron (B)	2013/03/08	NC		%	35
		Acid Extractable Cadmium (Cd)	2013/03/08	NC		%	35
		Acid Extractable Chromium (Cr)	2013/03/08	19.6		%	35
		Acid Extractable Cobalt (Co)	2013/03/08	1.0		%	35
		Acid Extractable Copper (Cu)	2013/03/08	3.4		%	35
		Acid Extractable Iron (Fe)	2013/03/08	2.1		%	35
		Acid Extractable Lead (Pb)	2013/03/08	4.4		%	35
		Acid Extractable Manganese (Mn)	2013/03/08	1.9		%	35
		Acid Extractable Mercury (Hg)	2013/03/08	NC		%	35
		Acid Extractable Molybdenum (Mo)	2013/03/08	NC		%	35
		Acid Extractable Nickel (Ni)	2013/03/08	6.3		%	35

Stantec Consulting Ltd.
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Quality Assurance Report (Continued)

Maxxam Job Number: ZB331283

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3143771 DLB	RPD [QS3347-01]	Acid Extractable Selenium (Se)	2013/03/08	NC		%	35
		Acid Extractable Silver (Ag)	2013/03/08	NC		%	35
		Acid Extractable Strontium (Sr)	2013/03/08	NC		%	35
		Acid Extractable Thallium (Tl)	2013/03/08	NC		%	35
		Acid Extractable Tin (Sn)	2013/03/08	NC		%	35
		Acid Extractable Uranium (U)	2013/03/08	1.1		%	35
		Acid Extractable Vanadium (V)	2013/03/08	2.7		%	35
		Acid Extractable Zinc (Zn)	2013/03/08	7.8		%	35
3144949 BGR	Matrix Spike [QS3353-01]	Decachlorobiphenyl	2013/03/12		114	%	30 - 130
		Total PCB	2013/03/12		84	%	70 - 130
	Spiked Blank	Decachlorobiphenyl	2013/03/12		83	%	30 - 130
		Total PCB	2013/03/12		108	%	70 - 130
	Method Blank	Decachlorobiphenyl	2013/03/12		86	%	30 - 130
		Total PCB	2013/03/12	ND, RDL=0.050		ug/g	
	RPD [QS3353-01]	Total PCB	2013/03/12	NC		%	50
	Matrix Spike	Isobutylbenzene - Extractable	2013/03/12		98	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/12		112	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/12		85	%	30 - 130
		>C16-C21 Hydrocarbons	2013/03/12		92	%	30 - 130
		>C21-<C32 Hydrocarbons	2013/03/12		89	%	30 - 130
	Spiked Blank	Isobutylbenzene - Extractable	2013/03/12		94	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/12		111	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/12		80	%	30 - 130
		>C16-C21 Hydrocarbons	2013/03/12		86	%	30 - 130
3147329 SPI	Method Blank	>C21-<C32 Hydrocarbons	2013/03/12		91	%	30 - 130
		Isobutylbenzene - Extractable	2013/03/12		100	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/12		107	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/12	ND, RDL=10		mg/kg	
	RPD	>C16-C21 Hydrocarbons	2013/03/12	ND, RDL=10		mg/kg	
		>C21-<C32 Hydrocarbons	2013/03/12	ND, RDL=15		mg/kg	
		>C10-C16 Hydrocarbons	2013/03/12	NC		%	50
		>C16-C21 Hydrocarbons	2013/03/12	NC		%	50
		>C21-<C32 Hydrocarbons	2013/03/12	NC		%	50
	Matrix Spike [QS3353-01]	Isobutylbenzene - Extractable	2013/03/21		97	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/21		114	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/21		99	%	30 - 130
		>C16-C21 Hydrocarbons	2013/03/21		104	%	30 - 130
		>C21-<C32 Hydrocarbons	2013/03/21		117	%	30 - 130
	Spiked Blank	Isobutylbenzene - Extractable	2013/03/21		96	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/21		105	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/21		92	%	30 - 130
		>C16-C21 Hydrocarbons	2013/03/21		95	%	30 - 130
3156538 SPI	Method Blank	>C21-<C32 Hydrocarbons	2013/03/21		102	%	30 - 130
		Isobutylbenzene - Extractable	2013/03/21		96	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/21		97	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/21	ND, RDL=10		mg/kg	
	RPD [QS3353-01]	>C16-C21 Hydrocarbons	2013/03/21	ND, RDL=10		mg/kg	
		>C21-<C32 Hydrocarbons	2013/03/21	ND, RDL=15		mg/kg	
		>C10-C16 Hydrocarbons	2013/03/21	NC		%	50
		>C16-C21 Hydrocarbons	2013/03/21	NC		%	50
		>C21-<C32 Hydrocarbons	2013/03/21	NC		%	50
	Method Blank	Sample Weight (as received)	2013/03/27	NA		g	
		Sample Weight (as received)	2013/03/27	0		%	N/A

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Quality Assurance Report (Continued)

Maxxam Job Number: ZB331283

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3163484 DLB	Spiked Blank	Leachable Lead (Pb)	2013/03/27		108	%	80 - 120
	Method Blank	Leachable Lead (Pb)	2013/03/27	ND, RDL=5.0		ug/L	
3164837 JRU	Leachate Blank	Leachable Isobutylbenzene - Extractable	2013/03/28		92	%	30 - 130
		Leachable n-Dotriacontane - Extractable	2013/03/28		119	%	30 - 130
		Leachable >C10-C16 Hydrocarbons	2013/03/28	ND, RDL=0.20		mg/L	
		Leachable >C16-C21 Hydrocarbons	2013/03/28	ND, RDL=0.20		mg/L	
		Leachable >C21-<C32 Hydrocarbons	2013/03/28	ND, RDL=0.50		mg/L	
	Spiked Blank	Leachable Isobutylbenzene - Extractable	2013/03/28		81	%	30 - 130
		Leachable n-Dotriacontane - Extractable	2013/03/28		123	%	30 - 130
		Leachable >C10-C16 Hydrocarbons	2013/03/28		83	%	30 - 130
		Leachable >C16-C21 Hydrocarbons	2013/03/28		93	%	30 - 130
		Leachable >C21-<C32 Hydrocarbons	2013/03/28		83	%	30 - 130
	Method Blank	Leachable Isobutylbenzene - Extractable	2013/03/28		80	%	30 - 130
		Leachable n-Dotriacontane - Extractable	2013/03/28		127	%	30 - 130
		Leachable >C10-C16 Hydrocarbons	2013/03/28	ND, RDL=0.20		mg/L	
		Leachable >C16-C21 Hydrocarbons	2013/03/28	ND, RDL=0.20		mg/L	
		Leachable >C21-<C32 Hydrocarbons	2013/03/28	ND, RDL=0.50		mg/L	
	RPD [QS3351-01]	Leachable >C10-C16 Hydrocarbons	2013/03/28	2.0		%	40
		Leachable >C16-C21 Hydrocarbons	2013/03/28	NC		%	40
		Leachable >C21-<C32 Hydrocarbons	2013/03/28	NC		%	40
3166728 RST	Matrix Spike [QS3354-01]	Leachable D10-Anthracene	2013/04/02		88	%	30 - 130
		Leachable D14-Terphenyl	2013/04/02		101 (4)	%	30 - 130
		Leachable D8-Acenaphthylene	2013/04/02		111	%	30 - 130
		Leachable Fluoranthene	2013/04/02		97	%	30 - 130
		Leachable Naphthalene	2013/04/02		86	%	30 - 130
		Leachable Phenanthrene	2013/04/02		NC	%	30 - 130
	Leachate Blank	Leachable D10-Anthracene	2013/04/03		99	%	30 - 130
		Leachable D14-Terphenyl	2013/04/03		104	%	30 - 130
		Leachable D8-Acenaphthylene	2013/04/03		96	%	30 - 130
		Leachable Fluoranthene	2013/04/03	ND, RDL=0.10		ug/L	
		Leachable Naphthalene	2013/04/03	ND, RDL=2.0		ug/L	
		Leachable Phenanthrene	2013/04/03	ND, RDL=0.10		ug/L	
	Spiked Blank	Leachable D10-Anthracene	2013/04/02		93	%	30 - 130
		Leachable D14-Terphenyl	2013/04/02		102	%	30 - 130
		Leachable D8-Acenaphthylene	2013/04/02		96	%	30 - 130
		Leachable Fluoranthene	2013/04/02		92	%	30 - 130
		Leachable Naphthalene	2013/04/02		98	%	30 - 130
		Leachable Phenanthrene	2013/04/02		98	%	30 - 130
	Method Blank	Leachable D10-Anthracene	2013/04/01		92	%	30 - 130
		Leachable D14-Terphenyl	2013/04/01		95	%	30 - 130
		Leachable D8-Acenaphthylene	2013/04/01		93	%	30 - 130
		Leachable Fluoranthene	2013/04/01	ND, RDL=0.10		ug/L	
		Leachable Naphthalene	2013/04/01	ND, RDL=2.0		ug/L	
		Leachable Phenanthrene	2013/04/01	ND, RDL=0.10		ug/L	
	RPD [QS3352-01]	Leachable Fluoranthene	2013/04/02	NC		%	40
		Leachable Naphthalene	2013/04/02	NC		%	40
		Leachable Phenanthrene	2013/04/02	NC		%	40

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.

Leachate Blank: A blank matrix containing all reagents used in the leaching procedure. Used to determine any process contamination.

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.

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
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Quality Assurance Report (Continued)

Maxxam Job Number: ZB331283

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 spiked amount was not sufficiently significant to permit a reliable recovery calculation.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

- (1) Elevated VPH RDL(s) due to detected levels in the blank.
- (2) Elevated recovery due to sample matrix. < 10 % of compounds in multi-component analysis in violation.
- (3) Low level lab contamination. Minimal impact on data quality.
- (4) Matrix Spike: < 10 % of compounds in multi-component analysis in violation

Your P.O. #: CALL UP#49
Site Location: R.053663.004 SOUTHSIDE ECA BASE
Your C.O.C. #: ES684613

Attention: Carolyn Anstey-Moore

Stantec Consulting Ltd.
607 Torbay Road
St. John's, NL
CANADA A1A 4Y6

Report Date: 2013/03/18

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B332892

Received: 2013/03/06, 10:18

Sample Matrix: Soil
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Soil (PIRI) (1,3)	3	2013/03/15	2013/03/18	ATL SOP-00197	Based on Atl. PIRI
Metals Solids Acid Extr. ICPMS (2)	2	2013/03/08	2013/08/03	ATL SOP 00059	Based on EPA6020A
Metals Solids Acid Extr. ICPMS (2)	1	2013/03/11	2013/03/11	ATL SOP 00059	Based on EPA6020A
Moisture (2)	2	N/A	2013/03/07	ATL SOP 00001	MOE Handbook 1983
Moisture (2)	1	N/A	2013/03/08	ATL SOP 00001	MOE Handbook 1983
PAH Compounds by GCMS (SIM) (2,3)	2	2013/03/12	2013/03/12	ATL SOP 00102	Based on EPA8270C
PAH Compounds by GCMS (SIM) (2,3)	1	2013/03/12	2013/03/13	ATL SOP 00102	Based on EPA8270C
PCBs in soil by GC/ECD (2,3)	2	2013/03/11	2013/03/14	ATL SOP 00106	Based on EPA8082
VPH in Soil (PIRI) (2)	3	2013/03/07	2013/03/12	ATL SOP 00119	Based on Atl. PIRI
Total Oil and Grease - Soil (2)	1	2013/03/11	2013/03/14	ATL SOP 00100	Based on EPA9071B
ModTPH (T1) Calc. for Soil (2)	3	2013/03/07	2013/03/18		Based on Atl. PIRI

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

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

- (1) Reported on a dry weight basis.
- (2) This test was performed by Bedford
- (3) Soils are reported on a dry weight basis unless otherwise specified.

Your P.O. #: CALL UP#49
Site Location: R.053663.004 SOUTHSIDE ECA BASE
Your C.O.C. #: ES684613

Attention: Carolyn Anstey-Moore

Stantec Consulting Ltd.
607 Torbay Road
St. John's, NL
CANADA A1A 4Y6

Report Date: 2013/03/18

CERTIFICATE OF ANALYSIS

-2-

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Mari Kenny, Project Manager
Email: MKenny@maxxam.ca
Phone# (902) 420-0203 Ext:291

=====

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

Total cover pages: 2

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Stantec Consulting Ltd.

Maxxam Job #: B332892
Report Date: 2013/03/18

Site Location: R.053663.004 SOUTHSIDE ECA BASE
Your P.O. #: CALL UP#49

ATLANTIC MUST IN SOIL (SOIL)

Maxxam ID		QT3134		QT3135	QT3136		
Sampling Date		2013/02/27		2013/02/27	2013/02/28		
COC Number		ES684613		ES684613	ES684613		
	Units	BH2 SS5	QC Batch	BH2 SS7	BH4 SS5	RDL	QC Batch

Inorganics							
Moisture	%	30	3145145	14	53	1	3143574
Petroleum Hydrocarbons							
Benzene	mg/kg	ND	3146956	0.83	0.18	0.025	3146956
Toluene	mg/kg	ND	3146956	0.29	0.18	0.025	3146956
Ethylbenzene	mg/kg	ND	3146956	0.66	ND	0.025	3146956
Xylene (Total)	mg/kg	ND	3146956	1.2	0.31	0.050	3146956
C6 - C10 (less BTEX)	mg/kg	ND	3146956	190	10	2.5	3146956
>C10-C16 Hydrocarbons	mg/kg	1800	3152563	ND	1300	10	3152563
>C16-C21 Hydrocarbons	mg/kg	560	3152563	25	640	10	3152563
>C21-<C32 Hydrocarbons	mg/kg	170	3152563	18	430	15	3152563
Modified TPH (Tier1)	mg/kg	2500	3143530	230	2400	15	3143530
Reached Baseline at C32	mg/kg	Yes	3152563	No	Yes	N/A	3152563
Hydrocarbon Resemblance	mg/kg	SEECOMMENT (1)	3152563	SEECOMMENT (2)	SEECOMMENT (1)	N/A	3152563
Surrogate Recovery (%)							
Isobutylbenzene - Extractable	%	109	3152563	82	102		3152563
n-Dotriacontane - Extractable	%	130 (3)	3152563	115 (3)	123 (3)		3152563
Isobutylbenzene - Volatile	%	123	3146956	98	159 (4)		3146956

ND = Not detected

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) Weathered fuel oil fraction.

(2) No resemblance to petroleum products in fuel oil /lube oil range.

(3) Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.

(4) VPH surrogate not within acceptance limits due to matrix interference.

Maxxam Job #: B332892
Report Date: 2013/03/18

Stantec Consulting Ltd.

Site Location: R.053663.004 SOUTHSIDE ECA BASE
Your P.O. #: CALL UP#49

RESULTS OF ANALYSES OF SOIL

Maxxam ID		QT3134		
Sampling Date		2013/02/27		
COC Number		ES684613		
	Units	BH2 SS5	RDL	QC Batch

Petroleum Hydrocarbons				
Total Oil & Grease	mg/kg	1800	100	3147326
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

Stantec Consulting Ltd.

Maxxam Job #: B332892

Report Date: 2013/03/18

Site Location: R.053663.004 SOUTHSIDE ECA BASE

Your P.O. #: CALL UP#49

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		QT3134	QT3134	QT3134		QT3135		
Sampling Date		2013/02/27	2013/02/27	2013/02/27		2013/02/27		
COC Number		ES684613	ES684613	ES684613		ES684613		
	Units	BH2 SS5	BH2 SS5 Lab-Dup	BH2 SS5 Lab-Dup 2	QC Batch	BH2 SS7	RDL	QC Batch

Metals								
Acid Extractable Aluminum (Al)	mg/kg	15000	14000		3146789	6100	10	3145016
Acid Extractable Antimony (Sb)	mg/kg	ND	ND		3146789	ND	2.0	3145016
Acid Extractable Arsenic (As)	mg/kg	19	20		3146789	16	2.0	3145016
Acid Extractable Barium (Ba)	mg/kg	54	52		3146789	52	5.0	3145016
Acid Extractable Beryllium (Be)	mg/kg	ND	ND		3146789	ND	2.0	3145016
Acid Extractable Boron (B)	mg/kg	ND	ND		3146789	ND	50	3145016
Acid Extractable Cadmium (Cd)	mg/kg	ND	ND		3146789	ND	0.30	3145016
Acid Extractable Chromium (Cr)	mg/kg	28	38		3146789	15	2.0	3145016
Acid Extractable Cobalt (Co)	mg/kg	12	13		3146789	5.4	1.0	3145016
Acid Extractable Copper (Cu)	mg/kg	57	120 (1)	59	3146789	23	2.0	3145016
Acid Extractable Iron (Fe)	mg/kg	60000	64000		3146789	27000	50	3145016
Acid Extractable Lead (Pb)	mg/kg	230	230		3146789	280	0.50	3145016
Acid Extractable Manganese (Mn)	mg/kg	760	790		3146789	370	2.0	3145016
Acid Extractable Mercury (Hg)	mg/kg	0.22	0.29		3146789	0.17	0.10	3145016
Acid Extractable Molybdenum (Mo)	mg/kg	7.6	10		3146789	7.8	2.0	3145016
Acid Extractable Nickel (Ni)	mg/kg	26	29		3146789	20	2.0	3145016
Acid Extractable Selenium (Se)	mg/kg	ND	ND		3146789	1.2	1.0	3145016
Acid Extractable Silver (Ag)	mg/kg	0.90	0.77		3146789	0.76	0.50	3145016
Acid Extractable Strontium (Sr)	mg/kg	31	37		3146789	23	5.0	3145016
Acid Extractable Thallium (Tl)	mg/kg	0.15	0.14		3146789	0.24	0.10	3145016
Acid Extractable Tin (Sn)	mg/kg	5.7	6.3		3146789	3.4	2.0	3145016
Acid Extractable Uranium (U)	mg/kg	3.1	3.4		3146789	1.9	0.10	3145016
Acid Extractable Vanadium (V)	mg/kg	28	28		3146789	15	2.0	3145016
Acid Extractable Zinc (Zn)	mg/kg	120	130		3146789	62	5.0	3145016

ND = Not detected

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) Poor RPD due to sample inhomogeneity.

Maxxam Job #: B332892
Report Date: 2013/03/18

Stantec Consulting Ltd.

Site Location: R.053663.004 SOUTHSIDE ECA BASE
Your P.O. #: CALL UP#49

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		QT3136		
Sampling Date		2013/02/28		
COC Number		ES684613		
	Units	BH4 SS5	RDL	QC Batch

Metals				
Acid Extractable Aluminum (Al)	mg/kg	11000	10	3145016
Acid Extractable Antimony (Sb)	mg/kg	4.5	2.0	3145016
Acid Extractable Arsenic (As)	mg/kg	46	2.0	3145016
Acid Extractable Barium (Ba)	mg/kg	120	5.0	3145016
Acid Extractable Beryllium (Be)	mg/kg	ND	2.0	3145016
Acid Extractable Boron (B)	mg/kg	ND	50	3145016
Acid Extractable Cadmium (Cd)	mg/kg	0.88	0.30	3145016
Acid Extractable Chromium (Cr)	mg/kg	51	2.0	3145016
Acid Extractable Cobalt (Co)	mg/kg	15	1.0	3145016
Acid Extractable Copper (Cu)	mg/kg	130	2.0	3145016
Acid Extractable Iron (Fe)	mg/kg	57000	50	3145016
Acid Extractable Lead (Pb)	mg/kg	2700	0.50	3145016
Acid Extractable Manganese (Mn)	mg/kg	360	2.0	3145016
Acid Extractable Mercury (Hg)	mg/kg	0.72	0.10	3145016
Acid Extractable Molybdenum (Mo)	mg/kg	11	2.0	3145016
Acid Extractable Nickel (Ni)	mg/kg	73	2.0	3145016
Acid Extractable Selenium (Se)	mg/kg	2.0	1.0	3145016
Acid Extractable Silver (Ag)	mg/kg	ND	0.50	3145016
Acid Extractable Strontium (Sr)	mg/kg	63	5.0	3145016
Acid Extractable Thallium (Tl)	mg/kg	0.37	0.10	3145016
Acid Extractable Tin (Sn)	mg/kg	320	20	3145016
Acid Extractable Uranium (U)	mg/kg	3.5	0.10	3145016
Acid Extractable Vanadium (V)	mg/kg	45	2.0	3145016
Acid Extractable Zinc (Zn)	mg/kg	880	5.0	3145016
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

Stantec Consulting Ltd.

Maxxam Job #: B332892
Report Date: 2013/03/18

Site Location: R.053663.004 SOUTHSIDE ECA BASE
Your P.O. #: CALL UP#49

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		QT3134		QT3135		QT3136		
Sampling Date		2013/02/27		2013/02/27		2013/02/28		
COC Number		ES684613		ES684613		ES684613		
	Units	BH2 SS5	RDL	BH2 SS7	RDL	BH4 SS5	RDL	QC Batch

Polyaromatic Hydrocarbons								
1-Methylnaphthalene	mg/kg	0.69	0.010	0.058	0.010	0.96	0.010	3147996
2-Methylnaphthalene	mg/kg	ND (1)	0.30	0.031	0.010	0.96	0.010	3147996
Acenaphthene	mg/kg	ND (1)	0.80	0.16	0.010	1.2	0.010	3147996
Acenaphthylene	mg/kg	ND (1)	0.070	0.088	0.010	1.7	0.010	3147996
Anthracene	mg/kg	1.5	0.010	0.40	0.010	2.2	0.010	3147996
Benzo(a)anthracene	mg/kg	1.2	0.010	0.95	0.010	6.8 (2)	0.050	3147996
Benzo(a)pyrene	mg/kg	0.89	0.010	0.65	0.010	6.6 (2)	0.050	3147996
Benzo(b)fluoranthene	mg/kg	0.62	0.010	0.40	0.010	4.8	0.010	3147996
Benzo(g,h,i)perylene	mg/kg	0.53	0.010	0.33	0.010	4.5	0.010	3147996
Benzo(j)fluoranthene	mg/kg	0.39	0.010	0.24	0.010	3.1	0.010	3147996
Benzo(k)fluoranthene	mg/kg	0.35	0.010	0.23	0.010	2.8	0.010	3147996
Chrysene	mg/kg	1.2	0.010	0.78	0.010	7.3 (2)	0.050	3147996
Dibenz(a,h)anthracene	mg/kg	0.12	0.010	0.079	0.010	0.90	0.010	3147996
Fluoranthene	mg/kg	3.4	0.010	1.6	0.010	17	0.010	3147996
Fluorene	mg/kg	0.55	0.010	0.14	0.010	ND (1)	2.0	3147996
Indeno(1,2,3-cd)pyrene	mg/kg	0.37	0.010	0.24	0.010	3.4	0.010	3147996
Naphthalene	mg/kg	0.48	0.010	0.055	0.010	1.5	0.010	3147996
Perylene	mg/kg	0.17	0.010	0.12	0.010	1.3	0.010	3147996
Phenanthrene	mg/kg	1.1	0.010	0.64	0.010	13	0.010	3147996
Pyrene	mg/kg	2.8	0.010	1.7	0.010	19	0.010	3147996
Surrogate Recovery (%)								
D10-Anthracene	%	81		81		82		3147996
D14-Terphenyl (FS)	%	82		82		97		3147996
D8-Acenaphthylene	%	87		81		80		3147996

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

(2) Elevated PAH RDL(s) due to sample dilution.

Maxxam Job #: B332892
Report Date: 2013/03/18

Stantec Consulting Ltd.

Site Location: R.053663.004 SOUTHSIDE ECA BASE
Your P.O. #: CALL UP#49

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		QT3134	QT3136	QT3136		
Sampling Date		2013/02/27	2013/02/28	2013/02/28		
COC Number		ES684613	ES684613	ES684613		
	Units	BH2 SS5	BH4 SS5	BH4 SS5 Lab-Dup	RDL	QC Batch

PCBs						
Total PCB	ug/g	ND	ND	ND	0.050	3147426
Surrogate Recovery (%)						
Decachlorobiphenyl	%	90	85	107		3147426

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B332892
Report Date: 2013/03/18

Stantec Consulting Ltd.

Site Location: R.053663.004 SOUTHSIDE ECA BASE
Your P.O. #: CALL UP#49

Package 1	8.5°C
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Each temperature is the average of up to three cooler temperatures taken at receipt

GENERAL COMMENTS

Results relate only to the items tested.

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #:
P.O. #: CALL UP#49
Site Location: R.053663.004 SOUTHSIDE ECA BASE

Quality Assurance Report
Maxxam Job Number: ZB332892

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3145016 DLB	Matrix Spike	Acid Extractable Antimony (Sb)	2013/08/03		104	%	75 - 125
		Acid Extractable Arsenic (As)	2013/08/03		105	%	75 - 125
		Acid Extractable Barium (Ba)	2013/08/03		103	%	75 - 125
		Acid Extractable Beryllium (Be)	2013/08/03		109	%	75 - 125
		Acid Extractable Boron (B)	2013/08/03		105	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/08/03		102	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/08/03		104	%	75 - 125
		Acid Extractable Cobalt (Co)	2013/08/03		104	%	75 - 125
		Acid Extractable Copper (Cu)	2013/08/03		103	%	75 - 125
		Acid Extractable Lead (Pb)	2013/08/03		102	%	75 - 125
		Acid Extractable Manganese (Mn)	2013/08/03		101	%	75 - 125
		Acid Extractable Mercury (Hg)	2013/08/03		101	%	75 - 125
		Acid Extractable Molybdenum (Mo)	2013/08/03		102	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/08/03		101	%	75 - 125
		Acid Extractable Selenium (Se)	2013/08/03		107	%	75 - 125
		Acid Extractable Silver (Ag)	2013/08/03		99	%	75 - 125
		Acid Extractable Strontium (Sr)	2013/08/03		102	%	75 - 125
		Acid Extractable Thallium (Tl)	2013/08/03		103	%	75 - 125
		Acid Extractable Tin (Sn)	2013/08/03		98	%	75 - 125
		Acid Extractable Uranium (U)	2013/08/03		107	%	75 - 125
		Acid Extractable Vanadium (V)	2013/08/03		105	%	75 - 125
		Acid Extractable Zinc (Zn)	2013/08/03		104	%	75 - 125
	Spiked Blank	Acid Extractable Antimony (Sb)	2013/08/03		97	%	75 - 125
		Acid Extractable Arsenic (As)	2013/08/03		102	%	75 - 125
		Acid Extractable Barium (Ba)	2013/08/03		101	%	75 - 125
		Acid Extractable Beryllium (Be)	2013/08/03		106	%	75 - 125
		Acid Extractable Boron (B)	2013/08/03		108	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/08/03		101	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/08/03		101	%	75 - 125
		Acid Extractable Cobalt (Co)	2013/08/03		102	%	75 - 125
		Acid Extractable Copper (Cu)	2013/08/03		102	%	75 - 125
		Acid Extractable Lead (Pb)	2013/08/03		100	%	75 - 125
		Acid Extractable Manganese (Mn)	2013/08/03		100	%	75 - 125
		Acid Extractable Mercury (Hg)	2013/08/03		102	%	75 - 125
		Acid Extractable Molybdenum (Mo)	2013/08/03		101	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/08/03		100	%	75 - 125
		Acid Extractable Selenium (Se)	2013/08/03		105	%	75 - 125
		Acid Extractable Silver (Ag)	2013/08/03		100	%	75 - 125
		Acid Extractable Strontium (Sr)	2013/08/03		97	%	75 - 125
		Acid Extractable Thallium (Tl)	2013/08/03		101	%	75 - 125
		Acid Extractable Tin (Sn)	2013/08/03		98	%	75 - 125
		Acid Extractable Uranium (U)	2013/08/03		105	%	75 - 125
		Acid Extractable Vanadium (V)	2013/08/03		102	%	75 - 125
		Acid Extractable Zinc (Zn)	2013/08/03		102	%	75 - 125
	Method Blank	Acid Extractable Aluminum (Al)	2013/08/03	ND, RDL=10		mg/kg	
		Acid Extractable Antimony (Sb)	2013/08/03	ND, RDL=2.0		mg/kg	
		Acid Extractable Arsenic (As)	2013/08/03	ND, RDL=2.0		mg/kg	
		Acid Extractable Barium (Ba)	2013/08/03	ND, RDL=5.0		mg/kg	
		Acid Extractable Beryllium (Be)	2013/08/03	ND, RDL=2.0		mg/kg	
		Acid Extractable Boron (B)	2013/08/03	ND, RDL=50		mg/kg	
		Acid Extractable Cadmium (Cd)	2013/08/03	ND, RDL=0.30		mg/kg	
		Acid Extractable Chromium (Cr)	2013/08/03	ND, RDL=2.0		mg/kg	
		Acid Extractable Cobalt (Co)	2013/08/03	ND, RDL=1.0		mg/kg	
		Acid Extractable Copper (Cu)	2013/08/03	ND, RDL=2.0		mg/kg	
		Acid Extractable Iron (Fe)	2013/08/03	ND, RDL=50		mg/kg	

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #:
P.O. #: CALL UP#49
Site Location: R.053663.004 SOUTHSIDE ECA BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB332892

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3145016 DLB	Method Blank	Acid Extractable Lead (Pb)	2013/08/03	ND, RDL=0.50		mg/kg	
		Acid Extractable Manganese (Mn)	2013/08/03	ND, RDL=2.0		mg/kg	
		Acid Extractable Mercury (Hg)	2013/08/03	ND, RDL=0.10		mg/kg	
		Acid Extractable Molybdenum (Mo)	2013/08/03	ND, RDL=2.0		mg/kg	
		Acid Extractable Nickel (Ni)	2013/08/03	ND, RDL=2.0		mg/kg	
		Acid Extractable Selenium (Se)	2013/08/03	ND, RDL=1.0		mg/kg	
		Acid Extractable Silver (Ag)	2013/08/03	ND, RDL=0.50		mg/kg	
		Acid Extractable Strontium (Sr)	2013/08/03	ND, RDL=5.0		mg/kg	
		Acid Extractable Thallium (Tl)	2013/08/03	ND, RDL=0.10		mg/kg	
		Acid Extractable Tin (Sn)	2013/08/03	ND, RDL=2.0		mg/kg	
	RPD	Acid Extractable Uranium (U)	2013/08/03	ND, RDL=0.10		mg/kg	
		Acid Extractable Vanadium (V)	2013/08/03	ND, RDL=2.0		mg/kg	
		Acid Extractable Zinc (Zn)	2013/08/03	ND, RDL=5.0		mg/kg	
		Acid Extractable Aluminum (Al)	2013/08/03	NC		%	35
		Acid Extractable Antimony (Sb)	2013/08/03	NC		%	35
		Acid Extractable Arsenic (As)	2013/08/03	NC		%	35
		Acid Extractable Barium (Ba)	2013/08/03	NC		%	35
		Acid Extractable Beryllium (Be)	2013/08/03	NC		%	35
		Acid Extractable Boron (B)	2013/08/03	NC		%	35
		Acid Extractable Cadmium (Cd)	2013/08/03	NC		%	35
		Acid Extractable Chromium (Cr)	2013/08/03	NC		%	35
		Acid Extractable Cobalt (Co)	2013/08/03	NC		%	35
		Acid Extractable Copper (Cu)	2013/08/03	NC		%	35
		Acid Extractable Iron (Fe)	2013/08/03	NC		%	35
		Acid Extractable Lead (Pb)	2013/08/03	NC		%	35
		Acid Extractable Manganese (Mn)	2013/08/03	NC		%	35
		Acid Extractable Mercury (Hg)	2013/08/03	NC		%	35
		Acid Extractable Molybdenum (Mo)	2013/08/03	NC		%	35
		Acid Extractable Nickel (Ni)	2013/08/03	NC		%	35
		Acid Extractable Selenium (Se)	2013/08/03	NC		%	35
		Acid Extractable Silver (Ag)	2013/08/03	NC		%	35
		Acid Extractable Strontium (Sr)	2013/08/03	NC		%	35
		Acid Extractable Thallium (Tl)	2013/08/03	NC		%	35
		Acid Extractable Tin (Sn)	2013/08/03	NC		%	35
		Acid Extractable Uranium (U)	2013/08/03	NC		%	35
		Acid Extractable Vanadium (V)	2013/08/03	NC		%	35
		Acid Extractable Zinc (Zn)	2013/08/03	NC		%	35
3146789 DLB	Matrix Spike [QT3134-01]	Acid Extractable Antimony (Sb)	2013/03/11		98	%	75 - 125
		Acid Extractable Arsenic (As)	2013/03/11		111	%	75 - 125
		Acid Extractable Barium (Ba)	2013/03/11		NC	%	75 - 125
		Acid Extractable Beryllium (Be)	2013/03/11		106	%	75 - 125
		Acid Extractable Boron (B)	2013/03/11		98	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/03/11		103	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/03/11		NC	%	75 - 125
		Acid Extractable Cobalt (Co)	2013/03/11		110	%	75 - 125
		Acid Extractable Copper (Cu)	2013/03/11		NC	%	75 - 125
		Acid Extractable Lead (Pb)	2013/03/11		NC	%	75 - 125
		Acid Extractable Manganese (Mn)	2013/03/11		NC	%	75 - 125
		Acid Extractable Mercury (Hg)	2013/03/11		102	%	75 - 125
		Acid Extractable Molybdenum (Mo)	2013/03/11		NC	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/03/11		NC	%	75 - 125
		Acid Extractable Selenium (Se)	2013/03/11		104	%	75 - 125
		Acid Extractable Silver (Ag)	2013/03/11		104	%	75 - 125
		Acid Extractable Strontium (Sr)	2013/03/11		NC	%	75 - 125

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #:
P.O. #: CALL UP#49
Site Location: R.053663.004 SOUTHSIDE ECA BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB332892

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3146789 DLB	Matrix Spike [QT3134-01]	Acid Extractable Thallium (Tl)	2013/03/11		104	%	75 - 125
		Acid Extractable Tin (Sn)	2013/03/11		NC	%	75 - 125
		Acid Extractable Uranium (U)	2013/03/11		113	%	75 - 125
		Acid Extractable Vanadium (V)	2013/03/11		NC	%	75 - 125
	Spiked Blank	Acid Extractable Zinc (Zn)	2013/03/11		NC	%	75 - 125
		Acid Extractable Antimony (Sb)	2013/03/11		103	%	75 - 125
		Acid Extractable Arsenic (As)	2013/03/11		108	%	75 - 125
		Acid Extractable Barium (Ba)	2013/03/11		104	%	75 - 125
		Acid Extractable Beryllium (Be)	2013/03/11		107	%	75 - 125
		Acid Extractable Boron (B)	2013/03/11		112	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/03/11		104	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/03/11		107	%	75 - 125
		Acid Extractable Cobalt (Co)	2013/03/11		107	%	75 - 125
		Acid Extractable Copper (Cu)	2013/03/11		107	%	75 - 125
		Acid Extractable Lead (Pb)	2013/03/11		106	%	75 - 125
		Acid Extractable Manganese (Mn)	2013/03/11		106	%	75 - 125
		Acid Extractable Mercury (Hg)	2013/03/11		106	%	75 - 125
		Acid Extractable Molybdenum (Mo)	2013/03/11		101	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/03/11		106	%	75 - 125
		Acid Extractable Selenium (Se)	2013/03/11		109	%	75 - 125
		Acid Extractable Silver (Ag)	2013/03/11		103	%	75 - 125
		Acid Extractable Strontium (Sr)	2013/03/11		103	%	75 - 125
		Acid Extractable Thallium (Tl)	2013/03/11		106	%	75 - 125
		Acid Extractable Tin (Sn)	2013/03/11		102	%	75 - 125
		Acid Extractable Uranium (U)	2013/03/11		109	%	75 - 125
		Acid Extractable Vanadium (V)	2013/03/11		109	%	75 - 125
		Acid Extractable Zinc (Zn)	2013/03/11		109	%	75 - 125
	Method Blank	Acid Extractable Aluminum (Al)	2013/03/11	ND, RDL=10		mg/kg	
		Acid Extractable Antimony (Sb)	2013/03/11	ND, RDL=2.0		mg/kg	
		Acid Extractable Arsenic (As)	2013/03/11	ND, RDL=2.0		mg/kg	
		Acid Extractable Barium (Ba)	2013/03/11	ND, RDL=5.0		mg/kg	
		Acid Extractable Beryllium (Be)	2013/03/11	ND, RDL=2.0		mg/kg	
		Acid Extractable Boron (B)	2013/03/11	ND, RDL=50		mg/kg	
		Acid Extractable Cadmium (Cd)	2013/03/11	ND, RDL=0.30		mg/kg	
		Acid Extractable Chromium (Cr)	2013/03/11	ND, RDL=2.0		mg/kg	
		Acid Extractable Cobalt (Co)	2013/03/11	ND, RDL=1.0		mg/kg	
		Acid Extractable Copper (Cu)	2013/03/11	ND, RDL=2.0		mg/kg	
		Acid Extractable Iron (Fe)	2013/03/11	ND, RDL=50		mg/kg	
		Acid Extractable Lead (Pb)	2013/03/11	ND, RDL=0.50		mg/kg	
		Acid Extractable Manganese (Mn)	2013/03/11	ND, RDL=2.0		mg/kg	
		Acid Extractable Mercury (Hg)	2013/03/11	ND, RDL=0.10		mg/kg	
		Acid Extractable Molybdenum (Mo)	2013/03/11	ND, RDL=2.0		mg/kg	
		Acid Extractable Nickel (Ni)	2013/03/11	ND, RDL=2.0		mg/kg	
		Acid Extractable Selenium (Se)	2013/03/11	ND, RDL=1.0		mg/kg	
		Acid Extractable Silver (Ag)	2013/03/11	ND, RDL=0.50		mg/kg	
		Acid Extractable Strontium (Sr)	2013/03/11	ND, RDL=5.0		mg/kg	
		Acid Extractable Thallium (Tl)	2013/03/11	ND, RDL=0.10		mg/kg	
		Acid Extractable Tin (Sn)	2013/03/11	ND, RDL=2.0		mg/kg	
		Acid Extractable Uranium (U)	2013/03/11	ND, RDL=0.10		mg/kg	
		Acid Extractable Vanadium (V)	2013/03/11	ND, RDL=2.0		mg/kg	
		Acid Extractable Zinc (Zn)	2013/03/11	ND, RDL=5.0		mg/kg	
	RPD [QT3134-01]	Acid Extractable Aluminum (Al)	2013/03/11	2.7		%	35
		Acid Extractable Antimony (Sb)	2013/03/11	NC		%	35
		Acid Extractable Arsenic (As)	2013/03/11	5.6		%	35

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
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Site Location: R.053663.004 SOUTHSIDE ECA BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB332892

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3146789 DLB	RPD [QT3134-01]	Acid Extractable Barium (Ba)	2013/03/11	4.3		%	35
		Acid Extractable Beryllium (Be)	2013/03/11	NC		%	35
		Acid Extractable Boron (B)	2013/03/11	NC		%	35
		Acid Extractable Cadmium (Cd)	2013/03/11	NC		%	35
		Acid Extractable Chromium (Cr)	2013/03/11	30.6		%	35
		Acid Extractable Cobalt (Co)	2013/03/11	5.1		%	35
		Acid Extractable Copper (Cu)	2013/03/11	72.9 (1)		%	35
		Acid Extractable Iron (Fe)	2013/03/11	6.6		%	35
		Acid Extractable Lead (Pb)	2013/03/11	2.3		%	35
		Acid Extractable Manganese (Mn)	2013/03/11	4.2		%	35
		Acid Extractable Mercury (Hg)	2013/03/11	NC		%	35
		Acid Extractable Molybdenum (Mo)	2013/03/11	NC		%	35
		Acid Extractable Nickel (Ni)	2013/03/11	11.9		%	35
		Acid Extractable Selenium (Se)	2013/03/11	NC		%	35
		Acid Extractable Silver (Ag)	2013/03/11	NC		%	35
		Acid Extractable Strontium (Sr)	2013/03/11	17.3		%	35
		Acid Extractable Thallium (Tl)	2013/03/11	NC		%	35
		Acid Extractable Tin (Sn)	2013/03/11	NC		%	35
		Acid Extractable Uranium (U)	2013/03/11	9.5		%	35
		Acid Extractable Vanadium (V)	2013/03/11	3.3		%	35
3146956 THL	Matrix Spike	Acid Extractable Zinc (Zn)	2013/03/11	8.0		%	35
		Isobutylbenzene - Volatile	2013/03/12		94	%	60 - 140
		Benzene	2013/03/12		92	%	60 - 140
		Toluene	2013/03/12		110	%	60 - 140
		Ethylbenzene	2013/03/12		107	%	60 - 140
		Xylene (Total)	2013/03/12		116	%	60 - 140
	Spiked Blank	Isobutylbenzene - Volatile	2013/03/12		105	%	60 - 140
		Benzene	2013/03/12		87	%	60 - 140
		Toluene	2013/03/12		89	%	60 - 140
		Ethylbenzene	2013/03/12		88	%	60 - 140
	Method Blank	Xylene (Total)	2013/03/12		87	%	60 - 140
		Isobutylbenzene - Volatile	2013/03/12		107	%	60 - 140
		Benzene	2013/03/12	ND, RDL=0.025		mg/kg	
		Toluene	2013/03/12	ND, RDL=0.025		mg/kg	
	RPD	Ethylbenzene	2013/03/12	ND, RDL=0.025		mg/kg	
		Xylene (Total)	2013/03/12	ND, RDL=0.050		mg/kg	
		C6 - C10 (less BTEX)	2013/03/12	ND, RDL=2.5		mg/kg	
		Benzene	2013/03/12	NC		%	50
		Toluene	2013/03/12	NC		%	50
		Ethylbenzene	2013/03/12	NC		%	50
		Xylene (Total)	2013/03/12	NC		%	50
		C6 - C10 (less BTEX)	2013/03/12	NC		%	50
3147326 CDS	Matrix Spike	Total Oil & Grease	2013/03/14		NC	%	30 - 130
	Spiked Blank	Total Oil & Grease	2013/03/14		90	%	30 - 130
	Method Blank	Total Oil & Grease	2013/03/14	ND, RDL=100		mg/kg	
	RPD	Total Oil & Grease	2013/03/14	10.2		%	50
3147426 BGR	Matrix Spike [QT3136-01]	Decachlorobiphenyl	2013/03/14		85	%	30 - 130
		Total PCB	2013/03/14		108	%	70 - 130
	Spiked Blank	Decachlorobiphenyl	2013/03/14		94	%	30 - 130
		Total PCB	2013/03/14		112	%	70 - 130
	Method Blank	Decachlorobiphenyl	2013/03/14		86	%	30 - 130
		Total PCB	2013/03/14	ND, RDL=0.050		ug/g	
	RPD [QT3136-01]	Total PCB	2013/03/14	NC		%	50
	Matrix Spike	D10-Anthracene	2013/03/12		78	%	30 - 130

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #:
P.O. #: CALL UP#49
Site Location: R.053663.004 SOUTHSIDE ECA BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB332892

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3147996 LGE	Matrix Spike	D14-Terphenyl (FS)	2013/03/12		84	%	30 - 130
		D8-Acenaphthylene	2013/03/12		83	%	30 - 130
		1-Methylnaphthalene	2013/03/12		76	%	30 - 130
		2-Methylnaphthalene	2013/03/12		79	%	30 - 130
		Acenaphthene	2013/03/12		81	%	30 - 130
		Acenaphthylene	2013/03/12		77	%	30 - 130
		Anthracene	2013/03/12		78	%	30 - 130
		Benzo(a)anthracene	2013/03/12		86	%	30 - 130
		Benzo(a)pyrene	2013/03/12		81	%	30 - 130
		Benzo(b)fluoranthene	2013/03/12		79	%	30 - 130
		Benzo(g,h,i)perylene	2013/03/12		77	%	30 - 130
		Benzo(j)fluoranthene	2013/03/12		81	%	30 - 130
		Benzo(k)fluoranthene	2013/03/12		81	%	30 - 130
		Chrysene	2013/03/12		85	%	30 - 130
		Dibenz(a,h)anthracene	2013/03/12		80	%	30 - 130
		Fluoranthene	2013/03/12		83	%	30 - 130
		Fluorene	2013/03/12		82	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2013/03/12		80	%	30 - 130
		Naphthalene	2013/03/12		79	%	30 - 130
		Perylene	2013/03/12		77	%	30 - 130
		Phenanthrene	2013/03/12		84	%	30 - 130
		Pyrene	2013/03/12		84	%	30 - 130
	Spiked Blank	D10-Anthracene	2013/03/12		76	%	30 - 130
		D14-Terphenyl (FS)	2013/03/12		84	%	30 - 130
		D8-Acenaphthylene	2013/03/12		83	%	30 - 130
		1-Methylnaphthalene	2013/03/12		76	%	30 - 130
		2-Methylnaphthalene	2013/03/12		80	%	30 - 130
		Acenaphthene	2013/03/12		82	%	30 - 130
		Acenaphthylene	2013/03/12		77	%	30 - 130
		Anthracene	2013/03/12		77	%	30 - 130
		Benzo(a)anthracene	2013/03/12		80	%	30 - 130
		Benzo(a)pyrene	2013/03/12		88	%	30 - 130
		Benzo(b)fluoranthene	2013/03/12		87	%	30 - 130
		Benzo(g,h,i)perylene	2013/03/12		88	%	30 - 130
		Benzo(j)fluoranthene	2013/03/12		89	%	30 - 130
		Benzo(k)fluoranthene	2013/03/12		88	%	30 - 130
		Chrysene	2013/03/12		87	%	30 - 130
		Dibenz(a,h)anthracene	2013/03/12		85	%	30 - 130
		Fluoranthene	2013/03/12		81	%	30 - 130
		Fluorene	2013/03/12		82	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2013/03/12		85	%	30 - 130
		Naphthalene	2013/03/12		80	%	30 - 130
		Perylene	2013/03/12		87	%	30 - 130
		Phenanthrene	2013/03/12		79	%	30 - 130
		Pyrene	2013/03/12		85	%	30 - 130
	Method Blank	D10-Anthracene	2013/03/12		93	%	30 - 130
		D14-Terphenyl (FS)	2013/03/12		98	%	30 - 130
		D8-Acenaphthylene	2013/03/12		86	%	30 - 130
		1-Methylnaphthalene	2013/03/12	ND, RDL=0.010		mg/kg	
		2-Methylnaphthalene	2013/03/12	ND, RDL=0.010		mg/kg	
		Acenaphthene	2013/03/12	ND, RDL=0.010		mg/kg	
		Acenaphthylene	2013/03/12	ND, RDL=0.010		mg/kg	
		Anthracene	2013/03/12	ND, RDL=0.010		mg/kg	
		Benzo(a)anthracene	2013/03/12	ND, RDL=0.010		mg/kg	
		Benzo(a)pyrene	2013/03/12	ND, RDL=0.010		mg/kg	

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #:
P.O. #: CALL UP#49
Site Location: R.053663.004 SOUTHSIDE ECA BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB332892

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3147996 LGE	Method Blank	Benzo(b)fluoranthene	2013/03/12	ND, RDL=0.010		mg/kg	
		Benzo(g,h,i)perylene	2013/03/12	ND, RDL=0.010		mg/kg	
		Benzo(j)fluoranthene	2013/03/12	ND, RDL=0.010		mg/kg	
		Benzo(k)fluoranthene	2013/03/12	ND, RDL=0.010		mg/kg	
		Chrysene	2013/03/12	ND, RDL=0.010		mg/kg	
		Dibenz(a,h)anthracene	2013/03/12	ND, RDL=0.010		mg/kg	
		Fluoranthene	2013/03/12	ND, RDL=0.010		mg/kg	
		Fluorene	2013/03/12	ND, RDL=0.010		mg/kg	
		Indeno(1,2,3-cd)pyrene	2013/03/12	ND, RDL=0.010		mg/kg	
		Naphthalene	2013/03/12	ND, RDL=0.010		mg/kg	
	RPD	Perylene	2013/03/12	ND, RDL=0.010		mg/kg	
		Phenanthrene	2013/03/12	ND, RDL=0.010		mg/kg	
		Pyrene	2013/03/12	ND, RDL=0.010		mg/kg	
		1-Methylnaphthalene	2013/03/12	NC		%	50
		2-Methylnaphthalene	2013/03/12	NC		%	50
		Acenaphthene	2013/03/12	NC		%	50
		Acenaphthylene	2013/03/12	NC		%	50
		Anthracene	2013/03/12	NC		%	50
		Benzo(a)anthracene	2013/03/12	NC		%	50
		Benzo(a)pyrene	2013/03/12	NC		%	50
		Benzo(b)fluoranthene	2013/03/12	NC		%	50
		Benzo(g,h,i)perylene	2013/03/12	NC		%	50
		Benzo(j)fluoranthene	2013/03/12	NC		%	50
		Benzo(k)fluoranthene	2013/03/12	NC		%	50
		Chrysene	2013/03/12	NC		%	50
		Dibenz(a,h)anthracene	2013/03/12	NC		%	50
		Fluoranthene	2013/03/12	23.8		%	50
		Fluorene	2013/03/12	NC		%	50
		Indeno(1,2,3-cd)pyrene	2013/03/12	NC		%	50
		Naphthalene	2013/03/12	NC		%	50
		Perylene	2013/03/12	NC		%	50
		Phenanthrene	2013/03/12	37.1		%	50
		Pyrene	2013/03/12	18.6		%	50
3152563 SPI	Matrix Spike	Isobutylbenzene - Extractable	2013/03/18		95	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/18		108	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/18		87	%	30 - 130
		>C16-C21 Hydrocarbons	2013/03/18		93	%	30 - 130
		>C21-<C32 Hydrocarbons	2013/03/18		99	%	30 - 130
	Spiked Blank	Isobutylbenzene - Extractable	2013/03/18		96	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/18		108	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/18		88	%	30 - 130
		>C16-C21 Hydrocarbons	2013/03/18		94	%	30 - 130
		>C21-<C32 Hydrocarbons	2013/03/18		104	%	30 - 130
	Method Blank	Isobutylbenzene - Extractable	2013/03/18		93	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/18		98	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/18	ND, RDL=10		mg/kg	
		>C16-C21 Hydrocarbons	2013/03/18	ND, RDL=10		mg/kg	
		>C21-<C32 Hydrocarbons	2013/03/18	ND, RDL=15		mg/kg	
	RPD	>C10-C16 Hydrocarbons	2013/03/18	NC		%	50
		>C16-C21 Hydrocarbons	2013/03/18	NC		%	50
		>C21-<C32 Hydrocarbons	2013/03/18	NC		%	50

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.

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #:
P.O. #: CALL UP#49
Site Location: R.053663.004 SOUTHSIDE ECA BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB332892

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 spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) Poor RPD due to sample inhomogeneity.

Your P.O. #: CALL UP #49
Your Project #: 1214
Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your C.O.C. #: ES685713

Attention: Carolyn Anstey-Moore

Stantec Consulting Ltd.
607 Torbay Road
St. John's, NL
CANADA A1A 4Y6

Report Date: 2013/03/18

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B334900

Received: 2013/03/08, 16:14

Sample Matrix: Soil
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Soil (PIRI) (1,3)	4	2013/03/11	2013/03/12	ATL SOP-00197	Based on Atl. PIRI
Metals Solids Acid Extr. ICPMS (2)	4	2013/03/14	2013/03/14	ATL SOP 00059	Based on EPA6020A
Moisture	4	N/A	2013/03/08	ATL SOP-00196	MOE Handbook 1983
PAH Compounds by GCMS (SIM) (2,3)	3	2013/03/13	2013/03/13	ATL SOP 00102	Based on EPA8270C
PAH Compounds by GCMS (SIM) (2,3)	1	2013/03/13	2013/03/14	ATL SOP 00102	Based on EPA8270C
PCBs in soil by GC/ECD (2,3)	4	2013/03/15	2013/03/18	ATL SOP 00106	Based on EPA8082
VPH in Soil (PIRI) (1)	4	2013/03/11	2013/03/08	ATL SOP 00199	Based on Atl. PIRI
ModTPH (T1) Calc. for Soil	4	2013/03/08	2013/03/13		Based on Atl. PIRI

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

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

- (1) Reported on a dry weight basis.
- (2) This test was performed by Bedford
- (3) Soils are reported on a dry weight basis unless otherwise specified.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Mari Kenny, Project Manager
Email: MKenny@maxxam.ca
Phone# (902) 420-0203 Ext:291

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Your P.O. #: CALL UP #49
Your Project #: 1214
Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your C.O.C. #: ES685713

Attention: Carolyn Anstey-Moore

Stantec Consulting Ltd.
607 Torbay Road
St. John's, NL
CANADA A1A 4Y6

Report Date: 2013/03/18

CERTIFICATE OF ANALYSIS

-2-

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 Job #: B334900
Report Date: 2013/03/18

Stantec Consulting Ltd.
Client Project #: 1214
Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALL UP #49
Sampler Initials: DM

ATLANTIC MUST IN SOIL (SOIL)

Maxxam ID		QU2443	QU2495	QU2496	QU2497		
Sampling Date		2013/03/04	2013/03/04	2013/03/05	2013/03/03		
COC Number		ES685713	ES685713	ES685713	ES685713		
	Units	BH1 - SS3	BH1 - SS9	BH10 - SS1	BH12 - SS2	RDL	QC Batch

Inorganics							
Moisture	%	16	50	8	11	1	3146748
Petroleum Hydrocarbons							
Benzene	mg/kg	0.16	ND	0.030	ND	0.025	3147328
Toluene	mg/kg	0.28	ND	0.056	ND	0.025	3147328
Ethylbenzene	mg/kg	0.052	ND	ND	ND	0.025	3147328
Xylene (Total)	mg/kg	0.40	ND	0.079	ND	0.050	3147328
C6 - C10 (less BTEX)	mg/kg	17	ND	7.1	ND	2.5	3147328
>C10-C16 Hydrocarbons	mg/kg	220	ND	66	ND	10	3147329
>C16-C21 Hydrocarbons	mg/kg	140	27	61	27	10	3147329
>C21-<C32 Hydrocarbons	mg/kg	310	130	74	110	15	3147329
Modified TPH (Tier1)	mg/kg	700	150	210	140	15	3145085
Reached Baseline at C32	mg/kg	No	No	Yes	Yes	N/A	3147329
Hydrocarbon Resemblance	mg/kg	SEECOMMENT (1)	SEECOMMENT (2)	SEECOMMENT (3)	SEECOMMENT (2)	N/A	3147329
Surrogate Recovery (%)							
Isobutylbenzene - Extractable	%	106	99	99	97		3147329
n-Dotriacontane - Extractable	%	112	145 (4)	107	107		3147329
Isobutylbenzene - Volatile	%	104	97	100	103		3147328

ND = Not detected

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) Weathered fuel oil fraction. Lube oil fraction.

(2) No resemblance to petroleum products in fuel oil /lube oil range.

(3) Weathered fuel oil fraction. No resemblance to petroleum products in lube oil range.

(4) Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to matrix/co-extractive interference.

Maxxam Job #: B334900
Report Date: 2013/03/18

Stantec Consulting Ltd.
Client Project #: 1214
Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALL UP #49
Sampler Initials: DM

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		QU2443	QU2495	QU2496	QU2497		
Sampling Date		2013/03/04	2013/03/04	2013/03/05	2013/03/03		
COC Number		ES685713	ES685713	ES685713	ES685713		
	Units	BH1 - SS3	BH1 - SS9	BH10 - SS1	BH12 - SS2	RDL	QC Batch

Metals							
Acid Extractable Aluminum (Al)	mg/kg	11000	12000	11000	9200	10	3150645
Acid Extractable Antimony (Sb)	mg/kg	4.0	ND	ND	ND	2.0	3150645
Acid Extractable Arsenic (As)	mg/kg	11	5.0	4.6	4.8	2.0	3150645
Acid Extractable Barium (Ba)	mg/kg	58	30	41	45	5.0	3150645
Acid Extractable Beryllium (Be)	mg/kg	ND	ND	ND	ND	2.0	3150645
Acid Extractable Boron (B)	mg/kg	ND	61	ND	ND	50	3150645
Acid Extractable Cadmium (Cd)	mg/kg	0.35	1.0	ND	ND	0.30	3150645
Acid Extractable Chromium (Cr)	mg/kg	17	17	14	13	2.0	3150645
Acid Extractable Cobalt (Co)	mg/kg	9.4	6.0	7.9	7.8	1.0	3150645
Acid Extractable Copper (Cu)	mg/kg	38	26	21	23	2.0	3150645
Acid Extractable Iron (Fe)	mg/kg	31000	21000	23000	25000	50	3150645
Acid Extractable Lead (Pb)	mg/kg	220	18	32	26	0.50	3150645
Acid Extractable Manganese (Mn)	mg/kg	690	350	840	790	2.0	3150645
Acid Extractable Mercury (Hg)	mg/kg	0.30	ND	ND	ND	0.10	3150645
Acid Extractable Molybdenum (Mo)	mg/kg	3.1	15	ND	ND	2.0	3150645
Acid Extractable Nickel (Ni)	mg/kg	15	15	12	12	2.0	3150645
Acid Extractable Selenium (Se)	mg/kg	ND	1.4	ND	ND	1.0	3150645
Acid Extractable Silver (Ag)	mg/kg	ND	2.1	ND	ND	0.50	3150645
Acid Extractable Strontium (Sr)	mg/kg	25	780	18	15	5.0	3150645
Acid Extractable Thallium (Tl)	mg/kg	ND	0.28	ND	ND	0.10	3150645
Acid Extractable Tin (Sn)	mg/kg	12	ND	ND	3.8	2.0	3150645
Acid Extractable Uranium (U)	mg/kg	0.84	10	0.42	0.49	0.10	3150645
Acid Extractable Vanadium (V)	mg/kg	20	30	19	16	2.0	3150645
Acid Extractable Zinc (Zn)	mg/kg	120	100	81	82	5.0	3150645

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B334900
Report Date: 2013/03/18

Stantec Consulting Ltd.
Client Project #: 1214
Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALL UP #49
Sampler Initials: DM

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		QU2443		QU2443		QU2495		QU2496		
Sampling Date		2013/03/04		2013/03/04		2013/03/04		2013/03/05		
COC Number		ES685713		ES685713		ES685713		ES685713		
	Units	BH1 - SS3	RDL	BH1 - SS3 Lab-Dup	RDL	BH1 - SS9	RDL	BH10 - SS1	RDL	QC Batch

Polyaromatic Hydrocarbons										
1-Methylnaphthalene	mg/kg	0.37	0.010	0.26	0.010	ND	0.010	0.11	0.010	3149198
2-Methylnaphthalene	mg/kg	0.44	0.010	0.32	0.010	ND	0.010	0.17	0.010	3149198
Acenaphthene	mg/kg	0.067	0.010	0.053	0.010	ND	0.010	0.36	0.010	3149198
Acenaphthylene	mg/kg	ND (1)	0.020	ND (1)	0.050	ND	0.010	0.034	0.010	3149198
Anthracene	mg/kg	0.20	0.010	0.20	0.010	ND	0.010	0.51	0.010	3149198
Benzo(a)anthracene	mg/kg	0.84	0.010	0.99	0.010	ND	0.010	0.59	0.010	3149198
Benzo(a)pyrene	mg/kg	0.64	0.010	0.67	0.010	ND	0.010	0.38	0.010	3149198
Benzo(b)fluoranthene	mg/kg	0.64	0.010	0.62	0.010	ND	0.010	0.32	0.010	3149198
Benzo(g,h,i)perylene	mg/kg	0.54	0.010	0.52	0.010	ND	0.010	0.18	0.010	3149198
Benzo(j)fluoranthene	mg/kg	0.34	0.010	0.33	0.010	ND	0.010	0.19	0.010	3149198
Benzo(k)fluoranthene	mg/kg	0.33	0.010	0.33	0.010	ND	0.010	0.18	0.010	3149198
Chrysene	mg/kg	0.94	0.010	1.1	0.010	ND	0.010	0.64	0.010	3149198
Dibenz(a,h)anthracene	mg/kg	0.12	0.010	0.11	0.010	ND	0.010	0.049	0.010	3149198
Fluoranthene	mg/kg	1.4	0.010	1.8	0.010	0.050	0.010	2.1	0.010	3149198
Fluorene	mg/kg	0.13	0.010	0.097	0.010	ND	0.010	0.50	0.010	3149198
Indeno(1,2,3-cd)pyrene	mg/kg	0.43	0.010	0.43	0.010	ND	0.010	0.17	0.010	3149198
Naphthalene	mg/kg	0.33	0.010	0.22	0.010	ND	0.010	0.34	0.010	3149198
Perylene	mg/kg	0.18	0.010	0.19	0.010	0.44	0.010	0.089	0.010	3149198
Phenanthrene	mg/kg	0.73	0.010	0.73	0.010	ND (1)	0.030	2.1	0.010	3149198
Pyrene	mg/kg	1.2	0.010	1.5	0.010	0.056	0.010	1.6	0.010	3149198
Surrogate Recovery (%)										
D10-Anthracene	%	84		85		79		83		3149198
D14-Terphenyl (FS)	%	84		89		95		92		3149198
D8-Acenaphthylene	%	82		82		83		84		3149198

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

Maxxam Job #: B334900
Report Date: 2013/03/18

Stantec Consulting Ltd.
Client Project #: 1214
Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALL UP #49
Sampler Initials: DM

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		QU2497		
Sampling Date		2013/03/03		
COC Number		ES685713		
	Units	BH12 - SS2	RDL	QC Batch

Polyaromatic Hydrocarbons				
1-Methylnaphthalene	mg/kg	0.34	0.010	3149198
2-Methylnaphthalene	mg/kg	0.42	0.010	3149198
Acenaphthene	mg/kg	1.3	0.010	3149198
Acenaphthylene	mg/kg	0.078	0.010	3149198
Anthracene	mg/kg	2.2	0.010	3149198
Benzo(a)anthracene	mg/kg	4.0	0.010	3149198
Benzo(a)pyrene	mg/kg	2.4	0.010	3149198
Benzo(b)fluoranthene	mg/kg	1.7	0.010	3149198
Benzo(g,h,i)perylene	mg/kg	1.0	0.010	3149198
Benzo(j)fluoranthene	mg/kg	1.1	0.010	3149198
Benzo(k)fluoranthene	mg/kg	1.1	0.010	3149198
Chrysene	mg/kg	4.0	0.010	3149198
Dibenz(a,h)anthracene	mg/kg	0.32	0.010	3149198
Fluoranthene	mg/kg	9.3	0.010	3149198
Fluorene	mg/kg	1.4	0.010	3149198
Indeno(1,2,3-cd)pyrene	mg/kg	0.95	0.010	3149198
Naphthalene	mg/kg	0.58	0.010	3149198
Perylene	mg/kg	0.49	0.010	3149198
Phenanthrene	mg/kg	11	0.010	3149198
Pyrene	mg/kg	7.1	0.010	3149198
Surrogate Recovery (%)				
D10-Anthracene	%	87		3149198
D14-Terphenyl (FS)	%	90		3149198
D8-Acenaphthylene	%	80		3149198
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

Maxxam Job #: B334900
Report Date: 2013/03/18

Stantec Consulting Ltd.
Client Project #: 1214
Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALL UP #49
Sampler Initials: DM

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		QU2443	QU2443	QU2495	QU2496	QU2497		
Sampling Date		2013/03/04	2013/03/04	2013/03/04	2013/03/05	2013/03/03		
COC Number		ES685713	ES685713	ES685713	ES685713	ES685713		
	Units	BH1 - SS3	BH1 - SS3 Lab-Dup	BH1 - SS9	BH10 - SS1	BH12 - SS2	RDL	QC Batch

PCBs								
Total PCB	ug/g	ND	ND	ND	ND	ND	0.050	3151998
Surrogate Recovery (%)								
Decachlorobiphenyl	%	81	80	80	78	77 (1)		3151998

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) PCB:Unidentified (possibly halogenated) compounds detected.

Maxxam Job #: B334900
Report Date: 2013/03/18

Stantec Consulting Ltd.
Client Project #: 1214
Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALL UP #49
Sampler Initials: DM

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

PAH Compounds by GCMS (SIM): Elevated PAH RDL(s) due to matrix / co-extractive interference.

Results relate only to the items tested.

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 1214
P.O. #: CALL UP #49
Site Location: R.053663.004 SOUTHSIDE CCG BASE

Quality Assurance Report
Maxxam Job Number: ZB334900

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3146748 JHW	RPD	Moisture	2013/03/08	2.2		%	25
3147328 JHW	Spiked Blank	Isobutylbenzene - Volatile	2013/03/08		99	%	60 - 140
		Benzene	2013/03/08		105	%	60 - 140
		Toluene	2013/03/08		98	%	60 - 140
		Ethylbenzene	2013/03/08		92	%	60 - 140
		Xylene (Total)	2013/03/08		103	%	60 - 140
	Method Blank	Isobutylbenzene - Volatile	2013/03/08		90	%	60 - 140
		Benzene	2013/03/08	ND, RDL=0.025		mg/kg	
		Toluene	2013/03/08	ND, RDL=0.025		mg/kg	
		Ethylbenzene	2013/03/08	ND, RDL=0.025		mg/kg	
		Xylene (Total)	2013/03/08	ND, RDL=0.050		mg/kg	
		C6 - C10 (less BTEX)	2013/03/08	ND, RDL=2.5		mg/kg	
	RPD	Benzene	2013/03/08	NC		%	50
		Toluene	2013/03/08	NC		%	50
		Ethylbenzene	2013/03/08	NC		%	50
		Xylene (Total)	2013/03/08	NC		%	50
		C6 - C10 (less BTEX)	2013/03/08	NC		%	50
3147329 SPI	Matrix Spike	Isobutylbenzene - Extractable	2013/03/12		98	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/12		112	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/12		85	%	30 - 130
		>C16-C21 Hydrocarbons	2013/03/12		92	%	30 - 130
		>C21-<C32 Hydrocarbons	2013/03/12		89	%	30 - 130
	Spiked Blank	Isobutylbenzene - Extractable	2013/03/12		94	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/12		111	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/12		80	%	30 - 130
		>C16-C21 Hydrocarbons	2013/03/12		86	%	30 - 130
		>C21-<C32 Hydrocarbons	2013/03/12		91	%	30 - 130
	Method Blank	Isobutylbenzene - Extractable	2013/03/12		100	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/12		107	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/12	ND, RDL=10		mg/kg	
		>C16-C21 Hydrocarbons	2013/03/12	ND, RDL=10		mg/kg	
		>C21-<C32 Hydrocarbons	2013/03/12	ND, RDL=15		mg/kg	
	RPD	>C10-C16 Hydrocarbons	2013/03/12	NC		%	50
		>C16-C21 Hydrocarbons	2013/03/12	NC		%	50
		>C21-<C32 Hydrocarbons	2013/03/12	NC		%	50
3149198 GTH	Matrix Spike [QU2443-02]	D10-Anthracene	2013/03/13		85	%	30 - 130
		D14-Terphenyl (FS)	2013/03/13		90	%	30 - 130
		D8-Acenaphthylene	2013/03/13		81	%	30 - 130
		1-Methylnaphthalene	2013/03/13		64	%	30 - 130
		2-Methylnaphthalene	2013/03/13		68	%	30 - 130
		Acenaphthene	2013/03/13		75	%	30 - 130
		Acenaphthylene	2013/03/13		76	%	30 - 130
		Anthracene	2013/03/13		75	%	30 - 130
		Benzo(a)anthracene	2013/03/13		90	%	30 - 130
		Benzo(a)pyrene	2013/03/13		66	%	30 - 130
		Benzo(b)fluoranthene	2013/03/13		60	%	30 - 130
		Benzo(g,h,i)perylene	2013/03/13		57	%	30 - 130
		Benzo(j)fluoranthene	2013/03/13		65	%	30 - 130
		Benzo(k)fluoranthene	2013/03/13		64	%	30 - 130
		Chrysene	2013/03/13		79	%	30 - 130
		Dibenz(a,h)anthracene	2013/03/13		65	%	30 - 130
		Fluoranthene	2013/03/13		NC	%	30 - 130
		Fluorene	2013/03/13		77	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2013/03/13		61	%	30 - 130

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 1214
P.O. #: CALL UP #49
Site Location: R.053663.004 SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB334900

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3149198 GTH	Matrix Spike [QU2443-02]	Naphthalene	2013/03/13		70	%	30 - 130
		Perylene	2013/03/13		67	%	30 - 130
		Phenanthrene	2013/03/13		75	%	30 - 130
		Pyrene	2013/03/13		71	%	30 - 130
	Spiked Blank	D10-Anthracene	2013/03/13		91	%	30 - 130
		D14-Terphenyl (FS)	2013/03/13		97	%	30 - 130
		D8-Acenaphthylene	2013/03/13		88	%	30 - 130
		1-Methylnaphthalene	2013/03/13		79	%	30 - 130
		2-Methylnaphthalene	2013/03/13		83	%	30 - 130
		Acenaphthene	2013/03/13		85	%	30 - 130
		Acenaphthylene	2013/03/13		81	%	30 - 130
		Anthracene	2013/03/13		82	%	30 - 130
		Benzo(a)anthracene	2013/03/13		89	%	30 - 130
		Benzo(a)pyrene	2013/03/13		88	%	30 - 130
		Benzo(b)fluoranthene	2013/03/13		83	%	30 - 130
		Benzo(g,h,i)perylene	2013/03/13		86	%	30 - 130
		Benzo(j)fluoranthene	2013/03/13		84	%	30 - 130
		Benzo(k)fluoranthene	2013/03/13		83	%	30 - 130
		Chrysene	2013/03/13		91	%	30 - 130
		Dibenz(a,h)anthracene	2013/03/13		84	%	30 - 130
		Fluoranthene	2013/03/13		87	%	30 - 130
		Fluorene	2013/03/13		87	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2013/03/13		84	%	30 - 130
	Method Blank	Naphthalene	2013/03/13		85	%	30 - 130
		Perylene	2013/03/13		85	%	30 - 130
		Phenanthrene	2013/03/13		86	%	30 - 130
		Pyrene	2013/03/13		89	%	30 - 130
		D10-Anthracene	2013/03/13		87	%	30 - 130
		D14-Terphenyl (FS)	2013/03/13		97	%	30 - 130
		D8-Acenaphthylene	2013/03/13		89	%	30 - 130
		1-Methylnaphthalene	2013/03/13	ND, RDL=0.010		mg/kg	
		2-Methylnaphthalene	2013/03/13	ND, RDL=0.010		mg/kg	
		Acenaphthene	2013/03/13	ND, RDL=0.010		mg/kg	
		Acenaphthylene	2013/03/13	ND, RDL=0.010		mg/kg	
		Anthracene	2013/03/13	ND, RDL=0.010		mg/kg	
		Benzo(a)anthracene	2013/03/13	ND, RDL=0.010		mg/kg	
		Benzo(a)pyrene	2013/03/13	ND, RDL=0.010		mg/kg	
		Benzo(b)fluoranthene	2013/03/13	ND, RDL=0.010		mg/kg	
		Benzo(g,h,i)perylene	2013/03/13	ND, RDL=0.010		mg/kg	
		Benzo(j)fluoranthene	2013/03/13	ND, RDL=0.010		mg/kg	
		Benzo(k)fluoranthene	2013/03/13	ND, RDL=0.010		mg/kg	
		Chrysene	2013/03/13	ND, RDL=0.010		mg/kg	
		Dibenz(a,h)anthracene	2013/03/13	ND, RDL=0.010		mg/kg	
		Fluoranthene	2013/03/13	ND, RDL=0.010		mg/kg	
		Fluorene	2013/03/13	ND, RDL=0.010		mg/kg	
		Indeno(1,2,3-cd)pyrene	2013/03/13	ND, RDL=0.010		mg/kg	
	RPD [QU2443-02]	Naphthalene	2013/03/13	ND, RDL=0.010		mg/kg	
		Perylene	2013/03/13	ND, RDL=0.010		mg/kg	
		Phenanthrene	2013/03/13	ND, RDL=0.010		mg/kg	
		Pyrene	2013/03/13	ND, RDL=0.010		mg/kg	
		1-Methylnaphthalene	2013/03/13	36.9		%	50
		2-Methylnaphthalene	2013/03/13	31.3		%	50
		Acenaphthene	2013/03/13	22.5		%	50
		Acenaphthylene	2013/03/13	NC (1)		%	50

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 1214
P.O. #: CALL UP #49
Site Location: R.053663.004 SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB334900

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3149198 GTH	RPD [QU2443-02]	Anthracene	2013/03/13	3.0		%	50
		Benzo(a)anthracene	2013/03/13	16.0		%	50
		Benzo(a)pyrene	2013/03/13	4.9		%	50
		Benzo(b)fluoranthene	2013/03/13	2.7		%	50
		Benzo(g,h,i)perylene	2013/03/13	4.8		%	50
		Benzo(j)fluoranthene	2013/03/13	3.6		%	50
		Benzo(k)fluoranthene	2013/03/13	2.3		%	50
		Chrysene	2013/03/13	11.7		%	50
		Dibenz(a,h)anthracene	2013/03/13	8.5		%	50
		Fluoranthene	2013/03/13	22.0		%	50
		Fluorene	2013/03/13	32.8		%	50
		Indeno(1,2,3-cd)pyrene	2013/03/13	0.6		%	50
		Naphthalene	2013/03/13	39.4		%	50
		Perylene	2013/03/13	7.6		%	50
		Phenanthrene	2013/03/13	0.02		%	50
		Pyrene	2013/03/13	17.0		%	50
3150645 DLB	Matrix Spike	Acid Extractable Antimony (Sb)	2013/03/14		NC	%	75 - 125
		Acid Extractable Arsenic (As)	2013/03/14		101	%	75 - 125
		Acid Extractable Barium (Ba)	2013/03/14		NC	%	75 - 125
		Acid Extractable Beryllium (Be)	2013/03/14		101	%	75 - 125
		Acid Extractable Boron (B)	2013/03/14		96	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/03/14		101	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/03/14		NC	%	75 - 125
		Acid Extractable Cobalt (Co)	2013/03/14		103	%	75 - 125
		Acid Extractable Copper (Cu)	2013/03/14		NC	%	75 - 125
		Acid Extractable Lead (Pb)	2013/03/14		NC	%	75 - 125
		Acid Extractable Manganese (Mn)	2013/03/14		NC	%	75 - 125
		Acid Extractable Mercury (Hg)	2013/03/14		97	%	75 - 125
		Acid Extractable Molybdenum (Mo)	2013/03/14		NC	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/03/14		NC	%	75 - 125
		Acid Extractable Selenium (Se)	2013/03/14		99	%	75 - 125
		Acid Extractable Silver (Ag)	2013/03/14		100	%	75 - 125
		Acid Extractable Strontium (Sr)	2013/03/14		NC	%	75 - 125
		Acid Extractable Thallium (Tl)	2013/03/14		103	%	75 - 125
		Acid Extractable Tin (Sn)	2013/03/14		NC	%	75 - 125
		Acid Extractable Uranium (U)	2013/03/14		103	%	75 - 125
	Spiked Blank	Acid Extractable Vanadium (V)	2013/03/14		NC	%	75 - 125
		Acid Extractable Zinc (Zn)	2013/03/14		NC	%	75 - 125
		Acid Extractable Antimony (Sb)	2013/03/14		103	%	75 - 125
		Acid Extractable Arsenic (As)	2013/03/14		102	%	75 - 125
		Acid Extractable Barium (Ba)	2013/03/14		101	%	75 - 125
		Acid Extractable Beryllium (Be)	2013/03/14		100	%	75 - 125
		Acid Extractable Boron (B)	2013/03/14		107	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/03/14		101	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/03/14		101	%	75 - 125
		Acid Extractable Cobalt (Co)	2013/03/14		102	%	75 - 125
		Acid Extractable Copper (Cu)	2013/03/14		102	%	75 - 125
		Acid Extractable Lead (Pb)	2013/03/14		100	%	75 - 125
		Acid Extractable Manganese (Mn)	2013/03/14		99	%	75 - 125
		Acid Extractable Mercury (Hg)	2013/03/14		106	%	75 - 125
		Acid Extractable Molybdenum (Mo)	2013/03/14		100	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/03/14		100	%	75 - 125
		Acid Extractable Selenium (Se)	2013/03/14		102	%	75 - 125
		Acid Extractable Silver (Ag)	2013/03/14		99	%	75 - 125
		Acid Extractable Strontium (Sr)	2013/03/14		98	%	75 - 125

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 1214
P.O. #: CALL UP #49
Site Location: R.053663.004 SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB334900

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3150645 DLB	Spiked Blank	Acid Extractable Thallium (Tl)	2013/03/14		104	%	75 - 125
		Acid Extractable Tin (Sn)	2013/03/14		99	%	75 - 125
		Acid Extractable Uranium (U)	2013/03/14		102	%	75 - 125
		Acid Extractable Vanadium (V)	2013/03/14		100	%	75 - 125
		Acid Extractable Zinc (Zn)	2013/03/14		101	%	75 - 125
	Method Blank	Acid Extractable Aluminum (Al)	2013/03/14	ND, RDL=10		mg/kg	
		Acid Extractable Antimony (Sb)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Arsenic (As)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Barium (Ba)	2013/03/14	ND, RDL=5.0		mg/kg	
		Acid Extractable Beryllium (Be)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Boron (B)	2013/03/14	ND, RDL=50		mg/kg	
		Acid Extractable Cadmium (Cd)	2013/03/14	ND, RDL=0.30		mg/kg	
		Acid Extractable Chromium (Cr)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Cobalt (Co)	2013/03/14	ND, RDL=1.0		mg/kg	
		Acid Extractable Copper (Cu)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Iron (Fe)	2013/03/14	ND, RDL=50		mg/kg	
		Acid Extractable Lead (Pb)	2013/03/14	ND, RDL=0.50		mg/kg	
		Acid Extractable Manganese (Mn)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Mercury (Hg)	2013/03/14	ND, RDL=0.10		mg/kg	
		Acid Extractable Molybdenum (Mo)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Nickel (Ni)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Selenium (Se)	2013/03/14	ND, RDL=1.0		mg/kg	
		Acid Extractable Silver (Ag)	2013/03/14	ND, RDL=0.50		mg/kg	
		Acid Extractable Strontium (Sr)	2013/03/14	ND, RDL=5.0		mg/kg	
		Acid Extractable Thallium (Tl)	2013/03/14	ND, RDL=0.10		mg/kg	
		Acid Extractable Tin (Sn)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Uranium (U)	2013/03/14	ND, RDL=0.10		mg/kg	
		Acid Extractable Vanadium (V)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Zinc (Zn)	2013/03/14	ND, RDL=5.0		mg/kg	
	RPD	Acid Extractable Aluminum (Al)	2013/03/15	3.7		%	35
		Acid Extractable Antimony (Sb)	2013/03/15	NC		%	35
		Acid Extractable Arsenic (As)	2013/03/15	1.4		%	35
		Acid Extractable Barium (Ba)	2013/03/15	0.3		%	35
		Acid Extractable Beryllium (Be)	2013/03/15	NC		%	35
		Acid Extractable Boron (B)	2013/03/15	NC		%	35
		Acid Extractable Cadmium (Cd)	2013/03/15	NC		%	35
		Acid Extractable Chromium (Cr)	2013/03/15	2.2		%	35
		Acid Extractable Cobalt (Co)	2013/03/15	2.0		%	35
		Acid Extractable Copper (Cu)	2013/03/15	3.8		%	35
		Acid Extractable Iron (Fe)	2013/03/15	0.4		%	35
		Acid Extractable Lead (Pb)	2013/03/15	7.9		%	35
		Acid Extractable Manganese (Mn)	2013/03/15	0.9		%	35
		Acid Extractable Mercury (Hg)	2013/03/15	NC		%	35
		Acid Extractable Molybdenum (Mo)	2013/03/15	1.2		%	35
		Acid Extractable Nickel (Ni)	2013/03/15	0.4		%	35
		Acid Extractable Selenium (Se)	2013/03/15	NC		%	35
		Acid Extractable Silver (Ag)	2013/03/15	NC		%	35
		Acid Extractable Strontium (Sr)	2013/03/15	0.8		%	35
		Acid Extractable Thallium (Tl)	2013/03/15	NC		%	35
		Acid Extractable Tin (Sn)	2013/03/15	NC		%	35
		Acid Extractable Uranium (U)	2013/03/15	2.8		%	35
		Acid Extractable Vanadium (V)	2013/03/15	1.1		%	35
		Acid Extractable Zinc (Zn)	2013/03/15	3.0		%	35
3151998 RST	Matrix Spike [QU2443-02]	Decachlorobiphenyl	2013/03/18		79	%	30 - 130

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 1214
P.O. #: CALL UP #49
Site Location: R.053663.004 SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB334900

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3151998 RST	Matrix Spike	Total PCB	2013/03/18		108	%	70 - 130
	[QU2443-02]	Decachlorobiphenyl	2013/03/18		87	%	30 - 130
	Spiked Blank	Total PCB	2013/03/18		120	%	70 - 130
	Method Blank	Decachlorobiphenyl	2013/03/18		84	%	30 - 130
		Total PCB	2013/03/18	ND, RDL=0.050		ug/g	
	RPD [QU2443-02]	Total PCB	2013/03/18	NC		%	50

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 spiked amount was not sufficiently significant to permit a reliable recovery calculation.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

Your P.O. #: CALL UP #49
Your Project #: 1214
Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your C.O.C. #: ES686413

Attention: Carolyn Anstey-Moore

Stantec Consulting Ltd.
607 Torbay Road
St. John's, NL
CANADA A1A 4Y6

Report Date: 2013/03/18

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B335399

Received: 2013/03/08, 16:14

Sample Matrix: Soil
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Soil (PIRI) (1,3)	2	2013/03/11	2013/03/12	ATL SOP-00197	Based on Atl. PIRI
Metals Solids Acid Extr. ICPMS (2)	1	2013/03/14	2013/03/14	ATL SOP 00059	Based on EPA6020A
Metals Solids Acid Extr. ICPMS (2)	1	2013/03/14	2013/03/15	ATL SOP 00059	Based on EPA6020A
Moisture	2	N/A	2013/03/08	ATL SOP-00196	MOE Handbook 1983
PAH Compounds by GCMS (SIM) (2,3)	1	2013/03/13	2013/03/14	ATL SOP 00102	Based on EPA8270C
PAH Compounds by GCMS (SIM) (2,3)	1	2013/03/13	2013/03/15	ATL SOP 00102	Based on EPA8270C
PCBs in soil by GC/ECD (2,3)	2	2013/03/15	2013/03/18	ATL SOP 00106	Based on EPA8082
VPH in Soil (PIRI) (1)	2	2013/03/11	2013/03/08	ATL SOP 00199	Based on Atl. PIRI
ModTPH (T1) Calc. for Soil	2	2013/03/11	2013/03/13		Based on Atl. PIRI

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

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

- (1) Reported on a dry weight basis.
- (2) This test was performed by Bedford
- (3) Soils are reported on a dry weight basis unless otherwise specified.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Mari Kenny, Project Manager
Email: MKenny@maxxam.ca
Phone# (902) 420-0203 Ext:291

Your P.O. #: CALL UP #49
Your Project #: 1214
Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your C.O.C. #: ES686413

Attention: Carolyn Anstey-Moore

Stantec Consulting Ltd.
607 Torbay Road
St. John's, NL
CANADA A1A 4Y6

Report Date: 2013/03/18

CERTIFICATE OF ANALYSIS

-2-

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

Total cover pages: 2

Page 2 of 13

Maxxam Job #: B335399
Report Date: 2013/03/18

Stantec Consulting Ltd.
Client Project #: 1214
Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALL UP #49
Sampler Initials: DM

ATLANTIC MUST IN SOIL (SOIL)

Maxxam ID		QU4873	QU4874		
Sampling Date		2013/03/06	2013/03/07		
COC Number		ES686413	ES686413		
	Units	BH3 - SS4	BH11 - SS1	RDL	QC Batch

Petroleum Hydrocarbons					
Benzene	mg/kg	0.36	ND	0.025	3147328
Toluene	mg/kg	0.15	ND	0.025	3147328
Ethylbenzene	mg/kg	1.8	ND	0.025	3147328
Xylene (Total)	mg/kg	3.4	ND	0.050	3147328
C6 - C10 (less BTEX)	mg/kg	1400	ND	2.5	3147328
>C10-C16 Hydrocarbons	mg/kg	24000	ND	10	3147329
>C16-C21 Hydrocarbons	mg/kg	11000	ND	10	3147329
>C21-<C32 Hydrocarbons	mg/kg	3300	31	15	3147329
Modified TPH (Tier1)	mg/kg	40000	31	15	3146695
Reached Baseline at C32	mg/kg	Yes	No	N/A	3147329
Hydrocarbon Resemblance	mg/kg	SEECOMMENT (1)	SEECOMMENT (2)	N/A	3147329
Surrogate Recovery (%)					
Isobutylbenzene - Extractable	%	282 (3)	98		3147329
n-Dotriacontane - Extractable	%	133 (4)	106		3147329
Isobutylbenzene - Volatile	%	72	105		3147328

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Weathered fuel oil fraction.
(2) Lube oil fraction.
(3) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.
(4) Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to matrix/co-extractive interference.

Maxxam Job #: B335399
Report Date: 2013/03/18

Stantec Consulting Ltd.
Client Project #: 1214
Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALL UP #49
Sampler Initials: DM

RESULTS OF ANALYSES OF SOIL

Maxxam ID		QU4873	QU4874		
Sampling Date		2013/03/06	2013/03/07		
COC Number		ES686413	ES686413		
	Units	BH3 - SS4	BH11 - SS1	RDL	QC Batch

Inorganics					
Moisture	%	53	8	1	3146748

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B335399
Report Date: 2013/03/18

Stantec Consulting Ltd.
Client Project #: 1214
Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALL UP #49
Sampler Initials: DM

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		QU4873		QU4874		
Sampling Date		2013/03/06		2013/03/07		
COC Number		ES686413		ES686413		
	Units	BH3 - SS4	RDL	BH11 - SS1	RDL	QC Batch

Metals						
Acid Extractable Aluminum (Al)	mg/kg	11000	10	10000	10	3150645
Acid Extractable Antimony (Sb)	mg/kg	ND	2.0	ND	2.0	3150645
Acid Extractable Arsenic (As)	mg/kg	9.6	2.0	4.8	2.0	3150645
Acid Extractable Barium (Ba)	mg/kg	63	5.0	36	5.0	3150645
Acid Extractable Beryllium (Be)	mg/kg	ND	2.0	ND	2.0	3150645
Acid Extractable Boron (B)	mg/kg	ND	50	ND	50	3150645
Acid Extractable Cadmium (Cd)	mg/kg	1.0	0.30	0.32	0.30	3150645
Acid Extractable Chromium (Cr)	mg/kg	32	2.0	21	2.0	3150645
Acid Extractable Cobalt (Co)	mg/kg	11	1.0	7.8	1.0	3150645
Acid Extractable Copper (Cu)	mg/kg	280	2.0	25	2.0	3150645
Acid Extractable Iron (Fe)	mg/kg	170000	500	26000	50	3150645
Acid Extractable Lead (Pb)	mg/kg	390	0.50	12	0.50	3150645
Acid Extractable Manganese (Mn)	mg/kg	1100	2.0	820	2.0	3150645
Acid Extractable Mercury (Hg)	mg/kg	0.36	0.10	ND	0.10	3150645
Acid Extractable Molybdenum (Mo)	mg/kg	18	2.0	ND	2.0	3150645
Acid Extractable Nickel (Ni)	mg/kg	25	2.0	18	2.0	3150645
Acid Extractable Selenium (Se)	mg/kg	ND	1.0	ND	1.0	3150645
Acid Extractable Silver (Ag)	mg/kg	1.6	0.50	ND	0.50	3150645
Acid Extractable Strontium (Sr)	mg/kg	84	5.0	30	5.0	3150645
Acid Extractable Thallium (Tl)	mg/kg	ND	0.10	ND	0.10	3150645
Acid Extractable Tin (Sn)	mg/kg	18	2.0	ND	2.0	3150645
Acid Extractable Uranium (U)	mg/kg	3.6	0.10	0.64	0.10	3150645
Acid Extractable Vanadium (V)	mg/kg	36	2.0	26	2.0	3150645
Acid Extractable Zinc (Zn)	mg/kg	200	5.0	59	5.0	3150645

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B335399
Report Date: 2013/03/18

Stantec Consulting Ltd.
Client Project #: 1214
Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALL UP #49
Sampler Initials: DM

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		QU4873		QU4874		
Sampling Date		2013/03/06		2013/03/07		
COC Number		ES686413		ES686413		
	Units	BH3 - SS4	RDL	BH11 - SS1	RDL	QC Batch

Polyaromatic Hydrocarbons						
1-Methylnaphthalene	mg/kg	12	0.050	ND	0.010	3149198
2-Methylnaphthalene	mg/kg	2.9	0.050	ND	0.010	3149198
Acenaphthene	mg/kg	4.3	0.050	ND	0.010	3149198
Acenaphthylene	mg/kg	ND	4.0	ND	0.010	3149198
Anthracene	mg/kg	ND (1)	2.0	ND	0.010	3149198
Benzo(a)anthracene	mg/kg	2.0	0.050	0.033	0.010	3149198
Benzo(a)pyrene	mg/kg	1.5	0.050	0.027	0.010	3149198
Benzo(b)fluoranthene	mg/kg	1.2	0.050	0.026	0.010	3149198
Benzo(g,h,i)perylene	mg/kg	1.0	0.050	0.025	0.010	3149198
Benzo(j)fluoranthene	mg/kg	0.71	0.050	0.015	0.010	3149198
Benzo(k)fluoranthene	mg/kg	0.67	0.050	0.013	0.010	3149198
Chrysene	mg/kg	2.3	0.050	0.047	0.010	3149198
Dibenz(a,h)anthracene	mg/kg	0.20	0.050	ND	0.010	3149198
Fluoranthene	mg/kg	5.5	0.050	0.062	0.010	3149198
Fluorene	mg/kg	3.6	0.050	ND	0.010	3149198
Indeno(1,2,3-cd)pyrene	mg/kg	0.72	0.050	0.017	0.010	3149198
Naphthalene	mg/kg	2.9	0.050	ND	0.010	3149198
Perylene	mg/kg	0.32	0.050	ND	0.010	3149198
Phenanthrene	mg/kg	11	0.050	0.031	0.010	3149198
Pyrene	mg/kg	5.2	0.050	0.056	0.010	3149198
Surrogate Recovery (%)						
D10-Anthracene	%	94		79		3149198
D14-Terphenyl (FS)	%	93 (2)		88		3149198
D8-Acenaphthylene	%	96		84		3149198

ND = Not detected

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

(2) Elevated PAH RDL(s) due to sample dilution.

Maxxam Job #: B335399
Report Date: 2013/03/18

Stantec Consulting Ltd.
Client Project #: 1214
Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALL UP #49
Sampler Initials: DM

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		QU4873	QU4874		
Sampling Date		2013/03/06	2013/03/07		
COC Number		ES686413	ES686413		
	Units	BH3 - SS4	BH11 - SS1	RDL	QC Batch

PCBs					
Total PCB	ug/g	ND	ND	0.050	3151998
Surrogate Recovery (%)					
Decachlorobiphenyl	%	76	76		3151998
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: B335399
Report Date: 2013/03/18

Stantec Consulting Ltd.
Client Project #: 1214
Site Location: R.053663.004 SOUTHSIDE CCG BASE
Your P.O. #: CALL UP #49
Sampler Initials: DM

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

PAH Compounds by GCMS (SIM): Elevated PAH RDL(s) due to matrix / co-extractive interference.

Results relate only to the items tested.

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 1214
P.O. #: CALL UP #49
Site Location: R.053663.004 SOUTHSIDE CCG BASE

Quality Assurance Report
Maxxam Job Number: ZB335399

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3146748 JHW	RPD	Moisture	2013/03/08	2.2		%	25
3147328 JHW	Spiked Blank	Isobutylbenzene - Volatile	2013/03/08		99	%	60 - 140
		Benzene	2013/03/08		105	%	60 - 140
		Toluene	2013/03/08		98	%	60 - 140
		Ethylbenzene	2013/03/08		92	%	60 - 140
		Xylene (Total)	2013/03/08		103	%	60 - 140
	Method Blank	Isobutylbenzene - Volatile	2013/03/08		90	%	60 - 140
		Benzene	2013/03/08	ND, RDL=0.025		mg/kg	
		Toluene	2013/03/08	ND, RDL=0.025		mg/kg	
		Ethylbenzene	2013/03/08	ND, RDL=0.025		mg/kg	
		Xylene (Total)	2013/03/08	ND, RDL=0.050		mg/kg	
		C6 - C10 (less BTEX)	2013/03/08	ND, RDL=2.5		mg/kg	
	RPD	Benzene	2013/03/08	NC		%	50
		Toluene	2013/03/08	NC		%	50
		Ethylbenzene	2013/03/08	NC		%	50
		Xylene (Total)	2013/03/08	NC		%	50
		C6 - C10 (less BTEX)	2013/03/08	NC		%	50
3147329 SPI	Matrix Spike	Isobutylbenzene - Extractable	2013/03/12		98	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/12		112	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/12		85	%	30 - 130
		>C16-C21 Hydrocarbons	2013/03/12		92	%	30 - 130
		>C21-<C32 Hydrocarbons	2013/03/12		89	%	30 - 130
	Spiked Blank	Isobutylbenzene - Extractable	2013/03/12		94	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/12		111	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/12		80	%	30 - 130
		>C16-C21 Hydrocarbons	2013/03/12		86	%	30 - 130
		>C21-<C32 Hydrocarbons	2013/03/12		91	%	30 - 130
	Method Blank	Isobutylbenzene - Extractable	2013/03/12		100	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/12		107	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/12	ND, RDL=10		mg/kg	
		>C16-C21 Hydrocarbons	2013/03/12	ND, RDL=10		mg/kg	
		>C21-<C32 Hydrocarbons	2013/03/12	ND, RDL=15		mg/kg	
	RPD	>C10-C16 Hydrocarbons	2013/03/12	NC		%	50
		>C16-C21 Hydrocarbons	2013/03/12	NC		%	50
		>C21-<C32 Hydrocarbons	2013/03/12	NC		%	50
3149198 GTH	Matrix Spike	D10-Anthracene	2013/03/13		85	%	30 - 130
		D14-Terphenyl (FS)	2013/03/13		90	%	30 - 130
		D8-Acenaphthylene	2013/03/13		81	%	30 - 130
		1-Methylnaphthalene	2013/03/13		64	%	30 - 130
		2-Methylnaphthalene	2013/03/13		68	%	30 - 130
		Acenaphthene	2013/03/13		75	%	30 - 130
		Acenaphthylene	2013/03/13		76	%	30 - 130
		Anthracene	2013/03/13		75	%	30 - 130
		Benzo(a)anthracene	2013/03/13		90	%	30 - 130
		Benzo(a)pyrene	2013/03/13		66	%	30 - 130
		Benzo(b)fluoranthene	2013/03/13		60	%	30 - 130
		Benzo(g,h,i)perylene	2013/03/13		57	%	30 - 130
		Benzo(j)fluoranthene	2013/03/13		65	%	30 - 130
		Benzo(k)fluoranthene	2013/03/13		64	%	30 - 130
		Chrysene	2013/03/13		79	%	30 - 130
		Dibenz(a,h)anthracene	2013/03/13		65	%	30 - 130
		Fluoranthene	2013/03/13		NC	%	30 - 130
		Fluorene	2013/03/13		77	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2013/03/13		61	%	30 - 130
		Naphthalene	2013/03/13		70	%	30 - 130

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 1214
P.O. #: CALL UP #49
Site Location: R.053663.004 SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB335399

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3149198 GTH	Matrix Spike	Perylene	2013/03/13		67	%	30 - 130
		Phenanthrene	2013/03/13		75	%	30 - 130
		Pyrene	2013/03/13		71	%	30 - 130
	Spiked Blank	D10-Anthracene	2013/03/13		91	%	30 - 130
		D14-Terphenyl (FS)	2013/03/13		97	%	30 - 130
		D8-Acenaphthylene	2013/03/13		88	%	30 - 130
		1-Methylnaphthalene	2013/03/13		79	%	30 - 130
		2-Methylnaphthalene	2013/03/13		83	%	30 - 130
		Acenaphthene	2013/03/13		85	%	30 - 130
		Acenaphthylene	2013/03/13		81	%	30 - 130
		Anthracene	2013/03/13		82	%	30 - 130
		Benzo(a)anthracene	2013/03/13		89	%	30 - 130
		Benzo(a)pyrene	2013/03/13		88	%	30 - 130
		Benzo(b)fluoranthene	2013/03/13		83	%	30 - 130
		Benzo(g,h,i)perylene	2013/03/13		86	%	30 - 130
		Benzo(j)fluoranthene	2013/03/13		84	%	30 - 130
		Benzo(k)fluoranthene	2013/03/13		83	%	30 - 130
		Chrysene	2013/03/13		91	%	30 - 130
		Dibenz(a,h)anthracene	2013/03/13		84	%	30 - 130
		Fluoranthene	2013/03/13		87	%	30 - 130
		Fluorene	2013/03/13		87	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2013/03/13		84	%	30 - 130
		Naphthalene	2013/03/13		85	%	30 - 130
		Perylene	2013/03/13		85	%	30 - 130
		Phenanthrene	2013/03/13		86	%	30 - 130
		Pyrene	2013/03/13		89	%	30 - 130
	Method Blank	D10-Anthracene	2013/03/13		87	%	30 - 130
		D14-Terphenyl (FS)	2013/03/13		97	%	30 - 130
		D8-Acenaphthylene	2013/03/13		89	%	30 - 130
		1-Methylnaphthalene	2013/03/13	ND, RDL=0.010		mg/kg	
		2-Methylnaphthalene	2013/03/13	ND, RDL=0.010		mg/kg	
		Acenaphthene	2013/03/13	ND, RDL=0.010		mg/kg	
		Acenaphthylene	2013/03/13	ND, RDL=0.010		mg/kg	
		Anthracene	2013/03/13	ND, RDL=0.010		mg/kg	
		Benzo(a)anthracene	2013/03/13	ND, RDL=0.010		mg/kg	
		Benzo(a)pyrene	2013/03/13	ND, RDL=0.010		mg/kg	
		Benzo(b)fluoranthene	2013/03/13	ND, RDL=0.010		mg/kg	
		Benzo(g,h,i)perylene	2013/03/13	ND, RDL=0.010		mg/kg	
		Benzo(j)fluoranthene	2013/03/13	ND, RDL=0.010		mg/kg	
		Benzo(k)fluoranthene	2013/03/13	ND, RDL=0.010		mg/kg	
		Chrysene	2013/03/13	ND, RDL=0.010		mg/kg	
		Dibenz(a,h)anthracene	2013/03/13	ND, RDL=0.010		mg/kg	
		Fluoranthene	2013/03/13	ND, RDL=0.010		mg/kg	
		Fluorene	2013/03/13	ND, RDL=0.010		mg/kg	
		Indeno(1,2,3-cd)pyrene	2013/03/13	ND, RDL=0.010		mg/kg	
		Naphthalene	2013/03/13	ND, RDL=0.010		mg/kg	
		Perylene	2013/03/13	ND, RDL=0.010		mg/kg	
	RPD	Phenanthrene	2013/03/13	ND, RDL=0.010		mg/kg	
		Pyrene	2013/03/13	ND, RDL=0.010		mg/kg	
		1-Methylnaphthalene	2013/03/13	36.9		%	50
		2-Methylnaphthalene	2013/03/13	31.3		%	50
		Acenaphthene	2013/03/13	22.5		%	50
		Acenaphthylene	2013/03/13	NC (1)		%	50
		Anthracene	2013/03/13	3.0		%	50
		Benzo(a)anthracene	2013/03/13	16.0		%	50

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 1214
P.O. #: CALL UP #49
Site Location: R.053663.004 SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB335399

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3149198 GTH	RPD	Benzo(a)pyrene	2013/03/13	4.9		%	50
		Benzo(b)fluoranthene	2013/03/13	2.7		%	50
		Benzo(g,h,i)perylene	2013/03/13	4.8		%	50
		Benzo(j)fluoranthene	2013/03/13	3.6		%	50
		Benzo(k)fluoranthene	2013/03/13	2.3		%	50
		Chrysene	2013/03/13	11.7		%	50
		Dibenz(a,h)anthracene	2013/03/13	8.5		%	50
		Fluoranthene	2013/03/13	22.0		%	50
		Fluorene	2013/03/13	32.8		%	50
		Indeno(1,2,3-cd)pyrene	2013/03/13	0.6		%	50
		Naphthalene	2013/03/13	39.4		%	50
		Perylene	2013/03/13	7.6		%	50
		Phenanthrene	2013/03/13	0.02		%	50
		Pyrene	2013/03/13	17.0		%	50
3150645 DLB	Matrix Spike	Acid Extractable Antimony (Sb)	2013/03/14		NC	%	75 - 125
		Acid Extractable Arsenic (As)	2013/03/14		101	%	75 - 125
		Acid Extractable Barium (Ba)	2013/03/14		NC	%	75 - 125
		Acid Extractable Beryllium (Be)	2013/03/14		101	%	75 - 125
		Acid Extractable Boron (B)	2013/03/14		96	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/03/14		101	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/03/14		NC	%	75 - 125
		Acid Extractable Cobalt (Co)	2013/03/14		103	%	75 - 125
		Acid Extractable Copper (Cu)	2013/03/14		NC	%	75 - 125
		Acid Extractable Lead (Pb)	2013/03/14		NC	%	75 - 125
		Acid Extractable Manganese (Mn)	2013/03/14		NC	%	75 - 125
		Acid Extractable Mercury (Hg)	2013/03/14		97	%	75 - 125
		Acid Extractable Molybdenum (Mo)	2013/03/14		NC	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/03/14		NC	%	75 - 125
		Acid Extractable Selenium (Se)	2013/03/14		99	%	75 - 125
	Spiked Blank	Acid Extractable Silver (Ag)	2013/03/14		100	%	75 - 125
		Acid Extractable Strontium (Sr)	2013/03/14		NC	%	75 - 125
		Acid Extractable Thallium (Tl)	2013/03/14		103	%	75 - 125
		Acid Extractable Tin (Sn)	2013/03/14		NC	%	75 - 125
		Acid Extractable Uranium (U)	2013/03/14		103	%	75 - 125
		Acid Extractable Vanadium (V)	2013/03/14		NC	%	75 - 125
		Acid Extractable Zinc (Zn)	2013/03/14		NC	%	75 - 125
		Acid Extractable Antimony (Sb)	2013/03/14		103	%	75 - 125
		Acid Extractable Arsenic (As)	2013/03/14		102	%	75 - 125
		Acid Extractable Barium (Ba)	2013/03/14		101	%	75 - 125
		Acid Extractable Beryllium (Be)	2013/03/14		100	%	75 - 125
		Acid Extractable Boron (B)	2013/03/14		107	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/03/14		101	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/03/14		101	%	75 - 125
		Acid Extractable Cobalt (Co)	2013/03/14		102	%	75 - 125
		Acid Extractable Copper (Cu)	2013/03/14		102	%	75 - 125
		Acid Extractable Lead (Pb)	2013/03/14		100	%	75 - 125
		Acid Extractable Manganese (Mn)	2013/03/14		99	%	75 - 125
		Acid Extractable Mercury (Hg)	2013/03/14		106	%	75 - 125
		Acid Extractable Molybdenum (Mo)	2013/03/14		100	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/03/14		100	%	75 - 125
		Acid Extractable Selenium (Se)	2013/03/14		102	%	75 - 125
		Acid Extractable Silver (Ag)	2013/03/14		99	%	75 - 125
		Acid Extractable Strontium (Sr)	2013/03/14		98	%	75 - 125
		Acid Extractable Thallium (Tl)	2013/03/14		104	%	75 - 125
		Acid Extractable Tin (Sn)	2013/03/14		99	%	75 - 125

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 1214
P.O. #: CALL UP #49
Site Location: R.053663.004 SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB335399

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3150645 DLB	Spiked Blank	Acid Extractable Uranium (U)	2013/03/14		102	%	75 - 125
		Acid Extractable Vanadium (V)	2013/03/14		100	%	75 - 125
		Acid Extractable Zinc (Zn)	2013/03/14		101	%	75 - 125
	Method Blank	Acid Extractable Aluminum (Al)	2013/03/14	ND, RDL=10		mg/kg	
		Acid Extractable Antimony (Sb)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Arsenic (As)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Barium (Ba)	2013/03/14	ND, RDL=5.0		mg/kg	
		Acid Extractable Beryllium (Be)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Boron (B)	2013/03/14	ND, RDL=50		mg/kg	
		Acid Extractable Cadmium (Cd)	2013/03/14	ND, RDL=0.30		mg/kg	
		Acid Extractable Chromium (Cr)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Cobalt (Co)	2013/03/14	ND, RDL=1.0		mg/kg	
		Acid Extractable Copper (Cu)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Iron (Fe)	2013/03/14	ND, RDL=50		mg/kg	
		Acid Extractable Lead (Pb)	2013/03/14	ND, RDL=0.50		mg/kg	
		Acid Extractable Manganese (Mn)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Mercury (Hg)	2013/03/14	ND, RDL=0.10		mg/kg	
		Acid Extractable Molybdenum (Mo)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Nickel (Ni)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Selenium (Se)	2013/03/14	ND, RDL=1.0		mg/kg	
		Acid Extractable Silver (Ag)	2013/03/14	ND, RDL=0.50		mg/kg	
		Acid Extractable Strontium (Sr)	2013/03/14	ND, RDL=5.0		mg/kg	
		Acid Extractable Thallium (Tl)	2013/03/14	ND, RDL=0.10		mg/kg	
		Acid Extractable Tin (Sn)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Uranium (U)	2013/03/14	ND, RDL=0.10		mg/kg	
		Acid Extractable Vanadium (V)	2013/03/14	ND, RDL=2.0		mg/kg	
		Acid Extractable Zinc (Zn)	2013/03/14	ND, RDL=5.0		mg/kg	
	RPD	Acid Extractable Aluminum (Al)	2013/03/15	3.7		%	35
		Acid Extractable Antimony (Sb)	2013/03/15	NC		%	35
		Acid Extractable Arsenic (As)	2013/03/15	1.4		%	35
		Acid Extractable Barium (Ba)	2013/03/15	0.3		%	35
		Acid Extractable Beryllium (Be)	2013/03/15	NC		%	35
		Acid Extractable Boron (B)	2013/03/15	NC		%	35
		Acid Extractable Cadmium (Cd)	2013/03/15	NC		%	35
		Acid Extractable Chromium (Cr)	2013/03/15	2.2		%	35
		Acid Extractable Cobalt (Co)	2013/03/15	2.0		%	35
		Acid Extractable Copper (Cu)	2013/03/15	3.8		%	35
		Acid Extractable Iron (Fe)	2013/03/15	0.4		%	35
		Acid Extractable Lead (Pb)	2013/03/15	7.9		%	35
		Acid Extractable Manganese (Mn)	2013/03/15	0.9		%	35
		Acid Extractable Mercury (Hg)	2013/03/15	NC		%	35
		Acid Extractable Molybdenum (Mo)	2013/03/15	1.2		%	35
		Acid Extractable Nickel (Ni)	2013/03/15	0.4		%	35
		Acid Extractable Selenium (Se)	2013/03/15	NC		%	35
		Acid Extractable Silver (Ag)	2013/03/15	NC		%	35
		Acid Extractable Strontium (Sr)	2013/03/15	0.8		%	35
		Acid Extractable Thallium (Tl)	2013/03/15	NC		%	35
		Acid Extractable Tin (Sn)	2013/03/15	NC		%	35
		Acid Extractable Uranium (U)	2013/03/15	2.8		%	35
		Acid Extractable Vanadium (V)	2013/03/15	1.1		%	35
		Acid Extractable Zinc (Zn)	2013/03/15	3.0		%	35
3151998 RST	Matrix Spike	Decachlorobiphenyl	2013/03/18		79	%	30 - 130
		Total PCB	2013/03/18		108	%	70 - 130
	Spiked Blank	Decachlorobiphenyl	2013/03/18		87	%	30 - 130
		Total PCB	2013/03/18		120	%	70 - 130

Stantec Consulting Ltd.
 Attention: Carolyn Anstey-Moore
 Client Project #: 1214
 P.O. #: CALL UP #49
 Site Location: R.053663.004 SOUTHSIDE CCG BASE

Quality Assurance Report (Continued)

Maxxam Job Number: ZB335399

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3151998 RST	Method Blank	Decachlorobiphenyl	2013/03/18		84	%	30 - 130
		Total PCB	2013/03/18	ND, RDL=0.050		ug/g	
	RPD	Total PCB	2013/03/18	NC		%	50

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 spiked amount was not sufficiently significant to permit a reliable recovery calculation.
 NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
 (1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

Your P.O. #: CALL UP #49
 Your Project #: 1214-12551
 Your C.O.C. #: ES630312

Attention: Carolyn Anstey-Moore

Stantec Consulting Ltd.
 607 Torbay Road
 St. John's, NL
 CANADA A1A 4Y6

Report Date: 2013/03/20

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B336834

Received: 2013/03/12, 16:07

Sample Matrix: Water
 # Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Water (PIRI)	8	2013/03/13	2013/03/15	ATL SOP 00198	Based on Atl. PIRI
VPH in Water (PIRI)	8	2013/03/13	2013/03/14	ATL SOP 00200	Based on Atl. PIRI
ModTPH (T1) Calc. for Water	8	N/A	2013/03/15		Based on Atl. PIRI

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

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

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Rob Whelan, Project Manager
 Email: RWhelan@maxxam.ca
 Phone# (709) 754-0203

=====

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

Total cover pages: 1

Maxxam Job #: B336834
Report Date: 2013/03/20

Stantec Consulting Ltd.
Client Project #: 1214-12551

Your P.O. #: CALL UP #49
Sampler Initials: BM

ATLANTIC MUST IN WATER - PIRI TIER I (WATER)

Maxxam ID		QV2018	QV2019	QV2020	QV2021		
Sampling Date		2013/03/12	2013/03/12	2013/03/12	2013/03/12		
COC Number		ES630312	ES630312	ES630312	ES630312		
	Units	BH1	BH2	BH4	BH5	RDL	QC Batch

Petroleum Hydrocarbons							
Benzene	mg/L	ND	ND	0.0020	ND	0.0010	3149453
Toluene	mg/L	ND	ND	ND	ND	0.0010	3149453
Ethylbenzene	mg/L	ND	ND	ND	ND	0.0010	3149453
Xylene (Total)	mg/L	ND	ND	ND	ND	0.0020	3149453
C6 - C10 (less BTEX)	mg/L	ND	0.017	0.064	ND	0.010	3149453
>C10-C16 Hydrocarbons	mg/L	0.085	0.068	0.13	0.055	0.050	3149499
>C16-C21 Hydrocarbons	mg/L	ND	ND	ND	0.065	0.050	3149499
>C21-<C32 Hydrocarbons	mg/L	ND	ND	ND	0.10	0.10	3149499
Modified TPH (Tier1)	mg/L	ND	ND	0.19	0.22	0.10	3149210
Reached Baseline at C32	mg/L	Yes	Yes	Yes	No	N/A	3149499
Hydrocarbon Resemblance	mg/L	SEECOMMENT (1)	SEECOMMENT (2)	SEECOMMENT (2)	SEECOMMENT (3)	N/A	3149499
Surrogate Recovery (%)							
Isobutylbenzene - Extractable	%	107	107	105	107		3149499
n-Dotriacontane - Extractable	%	111 (4)	106 (5)	103	110 (5)		3149499
Isobutylbenzene - Volatile	%	105	101	105	101		3149453

ND = Not detected

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) No resemblance to petroleum products in fuel oil range.

(2) One product in the gas/fuel oil range.

(3) No resemblance to petroleum products in fuel oil /lube oil range.

(4) TEH sample decanted due to sediment.

(5) TEH sample contained sediment.

Maxxam Job #: B336834
Report Date: 2013/03/20

Stantec Consulting Ltd.
Client Project #: 1214-12551

Your P.O. #: CALL UP #49
Sampler Initials: BM

ATLANTIC MUST IN WATER - PIRI TIER I (WATER)

Maxxam ID		QV2023	QV2024	QV2025	QV2026		
Sampling Date		2013/03/12	2013/03/12	2013/03/12	2013/03/12		
COC Number		ES630312	ES630312	ES630312	ES630312		
	Units	BH7	BH8	BH11	BH13	RDL	QC Batch

Petroleum Hydrocarbons							
Benzene	mg/L	ND	ND	0.0030	ND	0.0010	3149453
Toluene	mg/L	ND	ND	0.0020	ND	0.0010	3149453
Ethylbenzene	mg/L	ND	ND	0.0040	ND	0.0010	3149453
Xylene (Total)	mg/L	ND	ND	0.011	ND	0.0020	3149453
C6 - C10 (less BTEX)	mg/L	ND	0.079	0.20	ND	0.010	3149453
>C10-C16 Hydrocarbons	mg/L	0.15	1.2	0.28	0.088	0.050	3149499
>C16-C21 Hydrocarbons	mg/L	0.085	0.33	0.061	ND	0.050	3149499
>C21-<C32 Hydrocarbons	mg/L	ND	0.30	ND	ND	0.10	3149499
Modified TPH (Tier1)	mg/L	0.23	1.9	0.54	ND	0.10	3149210
Reached Baseline at C32	mg/L	Yes	No	Yes	Yes	N/A	3149499
Hydrocarbon Resemblance	mg/L	SEECOMMENT (1)	SEECOMMENT (1)	SEECOMMENT (2)	SEECOMMENT (1)	N/A	3149499
Surrogate Recovery (%)							
Isobutylbenzene - Extractable	%	108	96	108	107		3149499
n-Dotriacontane - Extractable	%	111 (3)	98 (3)	108 (3)	109 (3)		3149499
Isobutylbenzene - Volatile	%	102	100	105	100		3149453

ND = Not detected

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) One product in fuel oil range.

(2) Gasoline fraction.

(3) TEH sample contained sediment.

Maxxam Job #: B336834
Report Date: 2013/03/20

Stantec Consulting Ltd.
Client Project #: 1214-12551

Your P.O. #: CALL UP #49
Sampler Initials: BM

GENERAL COMMENTS

Results relate only to the items tested.

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 1214-12551
P.O. #: CALL UP #49
Site Location:

Quality Assurance Report

Maxxam Job Number: ZB336834

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3149453 DDE	Matrix Spike	Isobutylbenzene - Volatile	2013/03/15		104	%	70 - 130
		Benzene	2013/03/15		100	%	70 - 130
		Toluene	2013/03/15		100	%	70 - 130
		Ethylbenzene	2013/03/15		90	%	70 - 130
		Xylene (Total)	2013/03/15		90	%	70 - 130
	Spiked Blank	Isobutylbenzene - Volatile	2013/03/15		99	%	70 - 130
		Benzene	2013/03/15		90	%	70 - 130
		Toluene	2013/03/15		95	%	70 - 130
		Ethylbenzene	2013/03/15		85	%	70 - 130
		Xylene (Total)	2013/03/15		92	%	70 - 130
	Method Blank	Isobutylbenzene - Volatile	2013/03/15		100	%	70 - 130
		Benzene	2013/03/15	ND, RDL=0.0010		mg/L	
		Toluene	2013/03/15	ND, RDL=0.0010		mg/L	
		Ethylbenzene	2013/03/15	ND, RDL=0.0010		mg/L	
		Xylene (Total)	2013/03/15	ND, RDL=0.0020		mg/L	
	RPD	C6 - C10 (less BTEX)	2013/03/15	ND, RDL=0.010		mg/L	
		Benzene	2013/03/14	NC		%	40
		Toluene	2013/03/14	NC		%	40
		Ethylbenzene	2013/03/14	NC		%	40
		Xylene (Total)	2013/03/14	NC		%	40
3149499 SPI	Matrix Spike	C6 - C10 (less BTEX)	2013/03/14	NC		%	40
		Isobutylbenzene - Extractable	2013/03/15		107	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/15		113 (1)	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/15		23 (2)	%	30 - 130
		>C16-C21 Hydrocarbons	2013/03/15		27 (2)	%	30 - 130
	Spiked Blank	>C21-<C32 Hydrocarbons	2013/03/15		30	%	30 - 130
		Isobutylbenzene - Extractable	2013/03/15		102	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/15		106	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/15		89	%	30 - 130
		>C16-C21 Hydrocarbons	2013/03/15		93	%	30 - 130
	Method Blank	>C21-<C32 Hydrocarbons	2013/03/15		89	%	30 - 130
		Isobutylbenzene - Extractable	2013/03/15		106	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/15		106	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/15	ND, RDL=0.050		mg/L	
		>C16-C21 Hydrocarbons	2013/03/15	ND, RDL=0.050		mg/L	
	RPD	>C21-<C32 Hydrocarbons	2013/03/15	ND, RDL=0.10		mg/L	
		>C10-C16 Hydrocarbons	2013/03/15	NC		%	40
		>C16-C21 Hydrocarbons	2013/03/15	NC		%	40
		>C21-<C32 Hydrocarbons	2013/03/15	NC		%	40

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

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

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

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

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

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

(1) Fuel/lube oil range recovery(ies) not within acceptance limits. Insufficient sample to repeat.

(2) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Your P.O. #: CALL UP #49
 Your Project #: 1214
 Your C.O.C. #: ES630412

Attention: Carolyn Anstey-Moore

Stantec Consulting Ltd.
 607 Torbay Road
 St. John's, NL
 CANADA A1A 4Y6

Report Date: 2013/03/20

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B337216

Received: 2013/03/13, 14:30

Sample Matrix: Water
 # Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Water (PIRI)	1	2013/03/14	2013/03/19	ATL SOP 00198	Based on Atl. PIRI
VPH in Water (PIRI)	1	2013/03/14	2013/03/15	ATL SOP 00200	Based on Atl. PIRI
ModTPH (T1) Calc. for Water	1	N/A	2013/03/19		Based on Atl. PIRI

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

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

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Rob Whelan, Project Manager
 Email: RWhelan@maxxam.ca
 Phone# (709) 754-0203

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

Total cover pages: 1

Page 1 of 4

Maxxam Job #: B337216
Report Date: 2013/03/20

Stantec Consulting Ltd.
Client Project #: 1214

Your P.O. #: CALL UP #49
Sampler Initials: BM

ATLANTIC MUST IN WATER - PIRI TIER I (WATER)

Maxxam ID		QV3778		
Sampling Date		2013/03/13 13:45		
COC Number		ES630412		
	Units	BH15	RDL	QC Batch

Petroleum Hydrocarbons				
Benzene	mg/L	ND	0.0010	3151246
Toluene	mg/L	ND	0.0010	3151246
Ethylbenzene	mg/L	ND	0.0010	3151246
Xylene (Total)	mg/L	ND	0.0020	3151246
C6 - C10 (less BTEX)	mg/L	0.20	0.010	3151246
>C10-C16 Hydrocarbons	mg/L	1.1	0.050	3150888
>C16-C21 Hydrocarbons	mg/L	0.25	0.050	3150888
>C21-<C32 Hydrocarbons	mg/L	ND	0.10	3150888
Modified TPH (Tier1)	mg/L	1.5	0.10	3149210
Reached Baseline at C32	mg/L	Yes	N/A	3150888
Hydrocarbon Resemblance	mg/L	SEECOMMENT (1)	N/A	3150888
Surrogate Recovery (%)				
Isobutylbenzene - Extractable	%	113		3150888
n-Dotriacontane - Extractable	%	103 (2)		3150888
Isobutylbenzene - Volatile	%	93		3151246

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) One product in the gas/fuel oil range.
(2) TEH sample decanted due to sediment.

Maxxam Job #: B337216
Report Date: 2013/03/20

Stantec Consulting Ltd.
Client Project #: 1214

Your P.O. #: CALL UP #49
Sampler Initials: BM

GENERAL COMMENTS

Results relate only to the items tested.

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 1214
P.O. #: CALL UP #49
Site Location:

Quality Assurance Report
Maxxam Job Number: ZB337216

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3150888 SPI	Matrix Spike	Isobutylbenzene - Extractable	2013/03/19		114	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/19		124 (1)	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/19		NC	%	30 - 130
		>C16-C21 Hydrocarbons	2013/03/19		14 (2)	%	30 - 130
		>C21-<C32 Hydrocarbons	2013/03/19		21 (2)	%	30 - 130
	Spiked Blank	Isobutylbenzene - Extractable	2013/03/19		104	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/19		106	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/19		89	%	30 - 130
		>C16-C21 Hydrocarbons	2013/03/19		94	%	30 - 130
		>C21-<C32 Hydrocarbons	2013/03/19		100	%	30 - 130
	Method Blank	Isobutylbenzene - Extractable	2013/03/19		122	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/19		125	%	30 - 130
		>C10-C16 Hydrocarbons	2013/03/19	ND, RDL=0.050		mg/L	
		>C16-C21 Hydrocarbons	2013/03/19	ND, RDL=0.050		mg/L	
		>C21-<C32 Hydrocarbons	2013/03/19	ND, RDL=0.10		mg/L	
	RPD	>C10-C16 Hydrocarbons	2013/03/19	NC		%	40
		>C16-C21 Hydrocarbons	2013/03/19	NC		%	40
		>C21-<C32 Hydrocarbons	2013/03/19	42.1 (2)		%	40
3151246 DDE	Matrix Spike	Isobutylbenzene - Volatile	2013/03/18		82	%	70 - 130
		Benzene	2013/03/18		0 (2)	%	70 - 130
		Toluene	2013/03/18		0 (2)	%	70 - 130
		Ethylbenzene	2013/03/18		0 (2)	%	70 - 130
		Xylene (Total)	2013/03/18		0 (2)	%	70 - 130
	Spiked Blank	Isobutylbenzene - Volatile	2013/03/18		91	%	70 - 130
		Benzene	2013/03/18		95	%	70 - 130
		Toluene	2013/03/18		95	%	70 - 130
		Ethylbenzene	2013/03/18		90	%	70 - 130
		Xylene (Total)	2013/03/18		93	%	70 - 130
	Method Blank	Isobutylbenzene - Volatile	2013/03/18		100	%	70 - 130
		Benzene	2013/03/18	ND, RDL=0.0010		mg/L	
		Toluene	2013/03/18	ND, RDL=0.0010		mg/L	
		Ethylbenzene	2013/03/18	ND, RDL=0.0010		mg/L	
		Xylene (Total)	2013/03/18	ND, RDL=0.0020		mg/L	
	RPD	C6 - C10 (less BTEX)	2013/03/18	ND, RDL=0.010		mg/L	
		Benzene	2013/03/15	NC		%	40
		Toluene	2013/03/15	NC		%	40
		Ethylbenzene	2013/03/15	NC		%	40
		Xylene (Total)	2013/03/15	NC		%	40
		C6 - C10 (less BTEX)	2013/03/15	NC		%	40

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

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

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

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

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

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

(1) Fuel/lube oil range recovery(ies) not within acceptance limits. Insufficient sample to repeat.

(2) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Your P.O. #: CALLUP#49
Your Project #: 121412551
Your C.O.C. #: ES630312

Attention: Carolyn Anstey-Moore

Stantec Consulting Ltd.
607 Torbay Road
St. John's, NL
CANADA A1A 4Y6

Report Date: 2013/03/28

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B338084

Received: 2013/03/14, 09:39

Sample Matrix: Water

Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Carbonate, Bicarbonate and Hydroxide (1)	4	N/A	2013/03/18	CAM SOP-00102	APHA 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide (1)	5	N/A	2013/03/19	CAM SOP-00102	APHA 4500-CO2 D
Alkalinity (1)	9	N/A	2013/03/21	ATL SOP 00013	Based on EPA310.2
Chloride (1)	9	N/A	2013/03/18	ATL SOP 00014	Based on SM4500-Cl-
Colour (1)	9	N/A	2013/03/19	ATL SOP 00020	Based on SM2120C
Conductance - water (1)	9	N/A	2013/03/18	ATL SOP-00004	Based on SM2510B
TEH in Water (AA PIRI) (1)	1	2013/03/18	2013/03/26	ATL SOP 00116	Based on Atl. PIRI
Hardness (calculated as CaCO3) (1)	1	N/A	2013/03/18	ATL SOP 00048	Based on SM2340B
Hardness (calculated as CaCO3) (1)	3	N/A	2013/03/19	ATL SOP 00048	Based on SM2340B
Hardness (calculated as CaCO3) (1)	5	N/A	2013/03/20	ATL SOP 00048	Based on SM2340B
Mercury - Total (CVAA,LL) (1)	4	2013/03/18	2013/03/18	ATL SOP 00026	Based on EPA245.1
Mercury - Total (CVAA,LL) (1)	5	2013/03/19	2013/03/12	ATL SOP 00026	Based on EPA245.1
Metals Water Diss. MS (1,2)	1	N/A	2013/03/15	ATL SOP 00059	Based on EPA6020A
Metals Water Diss. MS (1,2)	3	N/A	2013/03/18	ATL SOP 00059	Based on EPA6020A
Metals Water Diss. MS (1,2)	5	N/A	2013/03/19	ATL SOP 00059	Based on EPA6020A
Ion Balance (% Difference) (1)	9	N/A	2013/03/22		
Anion and Cation Sum (1)	4	N/A	2013/03/19		
Anion and Cation Sum (1)	5	N/A	2013/03/20		
Nitrogen Ammonia - water (1)	8	N/A	2013/03/18	ATL SOP 00015	Based on USEPA 350.1
Nitrogen Ammonia - water (1)	1	N/A	2013/03/19	ATL SOP 00015	Based on USEPA 350.1
Nitrogen - Nitrate + Nitrite (1)	9	N/A	2013/03/20	ATL SOP 00016	Based on USGS - Enz.
Nitrogen - Nitrite (1)	9	N/A	2013/03/18	ATL SOP 00017	Based on SM4500-NO2B
Nitrogen - Nitrate (as N) (1)	9	N/A	2013/03/20	ATL SOP 00018	Based on ASTM D3867
PAH in Water by GC/MS (SIM) (1)	8	2013/03/15	2013/03/15	ATL SOP 00103	Based on EPA 8270C
PAH in Water by GC/MS (SIM) (1)	1	2013/03/15	2013/03/19	ATL SOP 00103	Based on EPA 8270C
PCBs in water by GC/ECD (1)	9	2013/03/18	2013/03/20	ATL SOP 00107	Based on EPA8082
pH (1)	9	N/A	2013/03/18	ATL SOP 00003	Based on SM4500H+B
Phosphorus - ortho (1)	9	N/A	2013/03/21	ATL SOP 00021	Based on USEPA 365.2
VPH in Water (PIRI2) (1)	1	2013/03/21	2013/03/21	ATL SOP 00120	Based on Atl. PIRI
Sat. pH and Langelier Index (@ 20C) (1)	9	N/A	2013/03/22	ATL SOP-00049	.
Sat. pH and Langelier Index (@ 4C) (1)	9	N/A	2013/03/22	ATL SOP-00049	.
Reactive Silica (1)	9	N/A	2013/03/19	ATL SOP 00022	Based on EPA 366.0
Sulphate (1)	9	N/A	2013/03/19	ATL SOP 00023	Based on EPA 375.4
Total Dissolved Solids (TDS calc) (1)	9	N/A	2013/03/22		
Organic carbon - Total (TOC) (1)	9	N/A	2013/03/19	ATL SOP 00037	Based on SM5310C
ModTPH (T2) Calc. for Water (1)	1	N/A	2013/03/27		Based on Atl. PIRI
Turbidity (1)	9	N/A	2013/03/18	ATL SOP 00011	based on EPA 180.1

Your P.O. #: CALLUP#49
Your Project #: 121412551
Your C.O.C. #: ES630312

Attention: Carolyn Anstey-Moore

Stantec Consulting Ltd.
607 Torbay Road
St. John's, NL
CANADA A1A 4Y6

Report Date: 2013/03/28

CERTIFICATE OF ANALYSIS

-2-

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

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

- (1) This test was performed by Bedford
- (2) Sample filtered in laboratory prior to analysis for dissolved metals.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Mari Kenny, Project Manager
Email: MKenny@maxxam.ca
Phone# (902) 420-0203 Ext:291

=====

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

Total cover pages: 2

Maxxam Job #: B338084
Report Date: 2013/03/28

Stantec Consulting Ltd.
Client Project #: 121412551

Your P.O. #: CALLUP#49
Sampler Initials: BM

ATLANTIC FRACTIONATION (PIRIT2) IN WATER

Maxxam ID		QV7554		QV7554		
Sampling Date		2013/03/12		2013/03/12		
COC Number		ES630312		ES630312		
	Units	BH6	RDL	BH6 Lab-Dup	RDL	QC Batch

Petroleum Hydrocarbons						
Benzene	mg/L	0.016	0.0010		0.0010	3158098
Toluene	mg/L	0.0038	0.0010		0.0010	3158098
Ethylbenzene	mg/L	0.067	0.0010		0.0010	3158098
Xylene (Total)	mg/L	0.12	0.0020		0.0020	3158098
Aliphatic >C6-C8	mg/L	0.47	0.010		0.010	3158098
Aliphatic >C8-C10	mg/L	0.12	0.010		0.010	3158098
>C8-C10 Aromatics (-EX)	mg/L	0.62	0.010		0.010	3158098
Aliphatic >C10-C12	mg/L	0.12 (1)	0.012	0.096 (2)	0.014	3153836
Aliphatic >C12-C16	mg/L	0.26 (1)	0.060	0.23 (2)	0.072	3153836
Aliphatic >C16-C21	mg/L	0.14 (1)	0.060	0.13 (2)	0.072	3153836
Aliphatic >C21-<C32	mg/L	ND (1)	0.12	ND (2)	0.14	3153836
Aromatic >C10-C12	mg/L	0.54 (1)	0.012	0.46 (2)	0.014	3153836
Aromatic >C12-C16	mg/L	0.33 (1)	0.060	0.29 (2)	0.072	3153836
Aromatic >C16-C21	mg/L	0.17 (1)	0.060	0.15 (2)	0.072	3153836
Aromatic >C21-<C32	mg/L	ND (1)	0.12	ND (2)	0.14	3153836
Modified TPH (Tier 2)	mg/L	2.8	0.12			3151469
Reached Baseline at C32	mg/L	Yes	N/A			3153836
Hydrocarbon Resemblance	mg/L	COMMENT (3)	N/A			3153836
Surrogate Recovery (%)						
Isobutylbenzene - Extractable	%	105		90		3153836
n-Dotriacontane - Extractable	%	85 (4)		93 (4)		3153836
Isobutylbenzene - Volatile	%	103				3158098

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Elevated TEH RDL(s) due to matrix interference.
(2) Elevated TEH RDL(s) due to matrix interference. Elevated TEH RDL(s) due to limited sample.
(3) Gasoline fraction. Weathered fuel oil fraction.
(4) TEH sample contained sediment.

Maxxam Job #: B338084
Report Date: 2013/03/28

Stantec Consulting Ltd.
Client Project #: 121412551

Your P.O. #: CALLUP#49
Sampler Initials: BM

ATL. RCAP-MS DISSOLVED (LABFILT) IN W

Maxxam ID		QV7550	QV7550			QV7551		QV7552		
Sampling Date		2013/03/12	2013/03/12			2013/03/12		2013/03/12		
COC Number		ES630312	ES630312			ES630312		ES630312		
	Units	BH1	BH1 Lab-Dup	RDL	QC Batch	BH2	RDL	BH4	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L	18.2		N/A	3150933	66.4	N/A	70.1	N/A	3150933
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	22		1.0	3150930	29	1.0	23	1.0	3150930
Calculated TDS	mg/L	1180		1.0	3150937	3970	1.0	4570	1.0	3150937
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND		1.0	3150930	ND	1.0	ND	1.0	3150930
Cation Sum	me/L	24.5		N/A	3150933	73.0	N/A	95.1	N/A	3150933
Hardness (CaCO3)	mg/L	310		1.0	3150931	900	1.0	1300	1.0	3150931
Ion Balance (% Difference)	%	14.8		N/A	3150932	4.71	N/A	15.2	N/A	3150932
Langelier Index (@ 20C)	N/A	-1.66			3150935	-1.40		-1.40		3150935
Langelier Index (@ 4C)	N/A	-1.90			3150936	-1.64		-1.64		3150936
Nitrate (N)	mg/L	0.18		0.050	3150934	ND	0.050	0.073	0.050	3150934
Saturation pH (@ 20C)	N/A	8.68			3150935	8.34		8.25		3150935
Saturation pH (@ 4C)	N/A	8.92			3150936	8.58		8.49		3150936
Inorganics										
Total Alkalinity (Total as CaCO3)	mg/L	22	22	5.0	3153879	29	5.0	23	5.0	3153868
Dissolved Chloride (Cl)	mg/L	580	580	10	3153883	2100	50	2300	50	3153871
Colour	TCU	ND	ND	5.0	3153887	150	25	240	25	3153874
Nitrate + Nitrite	mg/L	0.18	0.17	0.050	3153888	ND	0.050	0.073	0.050	3153876
Nitrite (N)	mg/L	ND	ND	0.010	3153889	ND	0.010	ND	0.010	3153877
Nitrogen (Ammonia Nitrogen)	mg/L	0.16		0.050	3153981	0.66	0.050	0.90	0.050	3153981
Total Organic Carbon (C)	mg/L	7.1 (1)		5.0	3155347	5.9 (1)	5.0	2.7	0.50	3155347
Orthophosphate (P)	mg/L	ND	ND	0.010	3153886	ND	0.010	ND	0.010	3153875
pH	pH	7.02	7.08	N/A	3153980	6.94	N/A	6.85	N/A	3153986
Reactive Silica (SiO2)	mg/L	5.6	6.0	0.50	3153885	5.2	0.50	5.3	0.50	3153873
Dissolved Sulphate (SO4)	mg/L	71	72	10	3153884	270	20	280	20	3153872
Turbidity	NTU	560		3.0	3153970	340	1.0	210	1.0	3153970
Conductivity	uS/cm	2100	2100	1.0	3153984	6900	1.0	7500	1.0	3153987
Metals										
Dissolved Aluminum (Al)	ug/L	ND		5.0	3152660	ND	5.0	ND	5.0	3152660
Dissolved Antimony (Sb)	ug/L	ND		1.0	3152660	ND	1.0	ND	1.0	3152660

ND = Not detected

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) Reporting limit was increased due to turbidity.

Maxxam Job #: B338084
Report Date: 2013/03/28

Stantec Consulting Ltd.
Client Project #: 121412551

Your P.O. #: CALLUP#49
Sampler Initials: BM

ATL. RCAP-MS DISSOLVED (LABFILT) IN W

Maxxam ID		QV7550	QV7550			QV7551		QV7552		
Sampling Date		2013/03/12	2013/03/12			2013/03/12		2013/03/12		
COC Number		ES630312	ES630312			ES630312		ES630312		
	Units	BH1	BH1 Lab-Dup	RDL	QC Batch	BH2	RDL	BH4	RDL	QC Batch

Dissolved Arsenic (As)	ug/L	ND		1.0	3152660	1.0	1.0	ND	1.0	3152660
Dissolved Barium (Ba)	ug/L	36.2		1.0	3152660	264	1.0	427	1.0	3152660
Dissolved Beryllium (Be)	ug/L	ND		1.0	3152660	ND	1.0	ND	1.0	3152660
Dissolved Bismuth (Bi)	ug/L	ND		2.0	3152660	ND	2.0	ND	2.0	3152660
Dissolved Boron (B)	ug/L	150		50	3152660	371	50	425	50	3152660
Dissolved Cadmium (Cd)	ug/L	0.028		0.017	3152660	ND	0.017	ND	0.017	3152660
Dissolved Calcium (Ca)	ug/L	35900		100	3152660	88300	100	149000	100	3152660
Dissolved Chromium (Cr)	ug/L	ND		1.0	3152660	ND	1.0	ND	1.0	3152660
Dissolved Cobalt (Co)	ug/L	1.32		0.40	3152660	3.15	0.40	1.57	0.40	3152660
Dissolved Copper (Cu)	ug/L	ND		2.0	3152660	ND	2.0	ND	2.0	3152660
Dissolved Iron (Fe)	ug/L	ND		50	3152660	8120	50	15100	50	3152660
Dissolved Lead (Pb)	ug/L	ND		0.50	3152660	ND	0.50	ND	0.50	3152660
Dissolved Magnesium (Mg)	ug/L	52500		100	3152660	164000	1000	215000	1000	3152660
Dissolved Manganese (Mn)	ug/L	395		2.0	3152660	11900	2.0	14500	2.0	3152660
Dissolved Molybdenum (Mo)	ug/L	2.2		2.0	3152660	3.1	2.0	2.2	2.0	3152660
Dissolved Nickel (Ni)	ug/L	3.6		2.0	3152660	ND	2.0	ND	2.0	3152660
Dissolved Phosphorus (P)	ug/L	ND		100	3152660	ND	100	ND	100	3152660
Dissolved Potassium (K)	ug/L	12600		100	3152660	36900	100	45100	100	3152660
Dissolved Selenium (Se)	ug/L	ND		1.0	3152660	ND	1.0	ND	1.0	3152660
Dissolved Silver (Ag)	ug/L	ND		0.10	3152660	ND	0.10	ND	0.10	3152660
Dissolved Sodium (Na)	ug/L	414000		100	3152660	1240000	1000	1570000	1000	3152660
Dissolved Strontium (Sr)	ug/L	429		2.0	3152660	1270	2.0	1750	2.0	3152660
Dissolved Thallium (Tl)	ug/L	ND		0.10	3152660	ND	0.10	ND	0.10	3152660
Dissolved Tin (Sn)	ug/L	ND		2.0	3152660	ND	2.0	ND	2.0	3152660
Dissolved Titanium (Ti)	ug/L	ND		2.0	3152660	ND	2.0	ND	2.0	3152660
Dissolved Uranium (U)	ug/L	ND		0.10	3152660	0.12	0.10	1.76	0.10	3152660
Dissolved Vanadium (V)	ug/L	ND		2.0	3152660	ND	2.0	ND	2.0	3152660
Dissolved Zinc (Zn)	ug/L	6.5		5.0	3152660	ND	5.0	ND	5.0	3152660

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B338084
Report Date: 2013/03/28

Stantec Consulting Ltd.
Client Project #: 121412551

Your P.O. #: CALLUP#49
Sampler Initials: BM

ATL. RCAP-MS DISSOLVED (LABFILT) IN W

Maxxam ID		QV7553			QV7554		QV7555		
Sampling Date		2013/03/12			2013/03/12		2013/03/12		
COC Number		ES630312			ES630312		ES630312		
	Units	BH5	RDL	QC Batch	BH6	RDL	BH7	RDL	QC Batch
Calculated Parameters									
Anion Sum	me/L	4.57	N/A	3150933	5.89	N/A	14.6	N/A	3150933
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	14	1.0	3150930	18	1.0	20	1.0	3150930
Calculated TDS	mg/L	266	1.0	3150937	345	1.0	859	1.0	3150937
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	ND	1.0	3150930	ND	1.0	ND	1.0	3150930
Cation Sum	me/L	4.35	N/A	3150933	5.84	N/A	14.8	N/A	3150933
Hardness (CaCO ₃)	mg/L	51	1.0	3150931	79	1.0	130	1.0	3150931
Ion Balance (% Difference)	%	2.47	N/A	3150932	0.430	N/A	0.510	N/A	3150932
Langelier Index (@ 20C)	N/A	-2.25		3150935	-1.91		-1.53		3150935
Langelier Index (@ 4C)	N/A	-2.50		3150936	-2.16		-1.78		3150936
Nitrate (N)	mg/L	0.10	0.050	3150934	ND	0.050	0.15	0.050	3150934
Saturation pH (@ 20C)	N/A	9.22		3150935	8.82		8.62		3150935
Saturation pH (@ 4C)	N/A	9.47		3150936	9.07		8.87		3150936
Inorganics									
Total Alkalinity (Total as CaCO ₃)	mg/L	14	5.0	3153868	18	5.0	20	5.0	3153868
Dissolved Chloride (Cl)	mg/L	140	5.0	3153871	190	5.0	490	10	3153871
Colour	TCU	ND	5.0	3153874	160	25	ND	5.0	3153874
Nitrate + Nitrite	mg/L	0.10	0.050	3153876	ND	0.050	0.15	0.050	3153876
Nitrite (N)	mg/L	ND	0.010	3153877	ND	0.010	ND	0.010	3153877
Nitrogen (Ammonia Nitrogen)	mg/L	0.075	0.050	3153981	0.37	0.050	ND	0.050	3153981
Total Organic Carbon (C)	mg/L	ND (1)	50	3155347	5.5 (1)	5.0	ND (1)	50	3155348
Orthophosphate (P)	mg/L	ND	0.010	3153875	ND	0.010	0.014	0.010	3153875
pH	pH	6.97	N/A	3153986	6.91	N/A	7.09	N/A	3154464
Reactive Silica (SiO ₂)	mg/L	5.2	0.50	3153873	6.0	0.50	4.9	0.50	3153873
Dissolved Sulphate (SO ₄)	mg/L	20	2.0	3153872	13	2.0	25	2.0	3153872
Turbidity	NTU	>1000	10	3153970	370	1.0	>1000	5.0	3153970
Conductivity	uS/cm	520	1.0	3153987	690	1.0	1700	1.0	3154465
Metals									
Dissolved Aluminum (Al)	ug/L	11.2	5.0	3152660	7.6	5.0	14.2	5.0	3152713
Dissolved Antimony (Sb)	ug/L	ND	1.0	3152660	ND	1.0	ND	1.0	3152713
Dissolved Arsenic (As)	ug/L	ND	1.0	3152660	ND	1.0	ND	1.0	3152713
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch (1) Reporting limit was increased due to turbidity.									

Maxxam Job #: B338084
Report Date: 2013/03/28

Stantec Consulting Ltd.
Client Project #: 121412551

Your P.O. #: CALLUP#49
Sampler Initials: BM

ATL. RCAP-MS DISSOLVED (LABFILT) IN W

Maxxam ID		QV7553			QV7554		QV7555		
Sampling Date		2013/03/12			2013/03/12		2013/03/12		
COC Number		ES630312			ES630312		ES630312		
	Units	BH5	RDL	QC Batch	BH6	RDL	BH7	RDL	QC Batch
Dissolved Barium (Ba)	ug/L	72.9	1.0	3152660	86.1	1.0	94.4	1.0	3152713
Dissolved Beryllium (Be)	ug/L	ND	1.0	3152660	ND	1.0	ND	1.0	3152713
Dissolved Bismuth (Bi)	ug/L	ND	2.0	3152660	ND	2.0	ND	2.0	3152713
Dissolved Boron (B)	ug/L	ND	50	3152660	ND	50	ND	50	3152713
Dissolved Cadmium (Cd)	ug/L	0.033	0.017	3152660	0.017	0.017	0.078	0.017	3152713
Dissolved Calcium (Ca)	ug/L	11400	100	3152660	22400	100	41400	100	3152713
Dissolved Chromium (Cr)	ug/L	ND	1.0	3152660	ND	1.0	ND	1.0	3152713
Dissolved Cobalt (Co)	ug/L	1.32	0.40	3152660	5.67	0.40	3.11	0.40	3152713
Dissolved Copper (Cu)	ug/L	ND	2.0	3152660	ND	2.0	3.6	2.0	3152713
Dissolved Iron (Fe)	ug/L	ND	50	3152660	1220	50	ND	50	3152713
Dissolved Lead (Pb)	ug/L	ND	0.50	3152660	0.53	0.50	ND	0.50	3152713
Dissolved Magnesium (Mg)	ug/L	5490	100	3152660	5690	100	6810	100	3152713
Dissolved Manganese (Mn)	ug/L	126	2.0	3152660	1880	2.0	164	2.0	3152713
Dissolved Molybdenum (Mo)	ug/L	ND	2.0	3152660	ND	2.0	ND	2.0	3152713
Dissolved Nickel (Ni)	ug/L	4.1	2.0	3152660	4.8	2.0	10.2	2.0	3152713
Dissolved Phosphorus (P)	ug/L	ND	100	3152660	ND	100	ND	100	3152713
Dissolved Potassium (K)	ug/L	2170	100	3152660	2940	100	4710	100	3152713
Dissolved Selenium (Se)	ug/L	ND	1.0	3152660	ND	1.0	ND	1.0	3152713
Dissolved Silver (Ag)	ug/L	ND	0.10	3152660	ND	0.10	ND	0.10	3152713
Dissolved Sodium (Na)	ug/L	75200	100	3152660	94400	100	277000	100	3152713
Dissolved Strontium (Sr)	ug/L	62.0	2.0	3152660	91.3	2.0	163	2.0	3152713
Dissolved Thallium (Tl)	ug/L	ND	0.10	3152660	ND	0.10	ND	0.10	3152713
Dissolved Tin (Sn)	ug/L	ND	2.0	3152660	ND	2.0	ND	2.0	3152713
Dissolved Titanium (Ti)	ug/L	ND	2.0	3152660	ND	2.0	ND	2.0	3152713
Dissolved Uranium (U)	ug/L	ND	0.10	3152660	ND	0.10	ND	0.10	3152713
Dissolved Vanadium (V)	ug/L	ND	2.0	3152660	ND	2.0	ND	2.0	3152713
Dissolved Zinc (Zn)	ug/L	10.8	5.0	3152660	9.5	5.0	43.6	5.0	3152713
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch									

Maxxam Job #: B338084
Report Date: 2013/03/28

Stantec Consulting Ltd.
Client Project #: 121412551

Your P.O. #: CALLUP#49
Sampler Initials: BM

ATL. RCAP-MS DISSOLVED (LABFILT) IN W

Maxxam ID		QV7556			QV7557		QV7558		
Sampling Date		2013/03/12			2013/03/12		2013/03/12		
COC Number		ES630312			ES630312		ES630312		
	Units	BH8	RDL	QC Batch	BH11	RDL	BH13	RDL	QC Batch

Calculated Parameters									
Anion Sum	me/L	3.52	N/A	3150933	17.1	N/A	78.5	N/A	3150933
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	12	1.0	3150930	54	1.0	72	1.0	3150930
Calculated TDS	mg/L	201	1.0	3150937	1060	1.0	4550	1.0	3150937
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	ND	1.0	3150930	4.9	1.0	ND	1.0	3150930
Cation Sum	me/L	3.12	N/A	3150933	20.0	N/A	77.9	N/A	3150933
Hardness (CaCO ₃)	mg/L	38	1.0	3150931	170	1.0	780	1.0	3150931
Ion Balance (% Difference)	%	6.02	N/A	3150932	7.97	N/A	0.400	N/A	3150932
Langelier Index (@ 20C)	N/A	-2.34		3150935	0.950		-0.783		3150935
Langelier Index (@ 4C)	N/A	-2.59		3150936	0.704		-1.02		3150936
Nitrate (N)	mg/L	0.11	0.050	3150934	0.083	0.050	0.10	0.050	3150934
Saturation pH (@ 20C)	N/A	9.24		3150935	8.04		8.02		3150935
Saturation pH (@ 4C)	N/A	9.49		3150936	8.29		8.26		3150936
Inorganics									
Total Alkalinity (Total as CaCO ₃)	mg/L	12	5.0	3153868	59	5.0	72	5.0	3153879
Dissolved Chloride (Cl)	mg/L	110	5.0	3153871	550	10	2500	50	3153883
Colour	TCU	ND	5.0	3153874	5.8	5.0	ND	5.0	3153887
Nitrate + Nitrite	mg/L	0.11	0.050	3153876	0.083	0.050	0.10	0.050	3153888
Nitrite (N)	mg/L	ND	0.010	3153877	ND	0.010	ND	0.010	3153889
Nitrogen (Ammonia Nitrogen)	mg/L	0.084	0.050	3153981	0.25	0.050	0.71	0.050	3153985
Total Organic Carbon (C)	mg/L	ND (1)	50	3155348	ND (1)	5.0	8.0 (1)	5.0	3155348
Orthophosphate (P)	mg/L	ND	0.010	3153875	0.066	0.010	ND	0.010	3153886
pH	pH	6.90	N/A	3154464	8.99	N/A	7.24	N/A	3154464
Reactive Silica (SiO ₂)	mg/L	5.1	0.50	3153873	7.0	0.50	3.5	0.50	3153885
Dissolved Sulphate (SO ₄)	mg/L	13	2.0	3153872	13	2.0	380	20	3153884
Turbidity	NTU	>1000	10	3153970	660	3.0	380	1.0	3153970
Conductivity	uS/cm	410	1.0	3154465	2000	1.0	8200	1.0	3154465
Metals									
Dissolved Aluminum (Al)	ug/L	5.9	5.0	3152713	51.9	5.0	ND	5.0	3152713
Dissolved Antimony (Sb)	ug/L	ND	1.0	3152713	1.0	1.0	ND	1.0	3152713
Dissolved Arsenic (As)	ug/L	ND	1.0	3152713	5.9	1.0	ND	1.0	3152713

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Reporting limit was increased due to turbidity.

Maxxam Job #: B338084
Report Date: 2013/03/28

Stantec Consulting Ltd.
Client Project #: 121412551

Your P.O. #: CALLUP#49
Sampler Initials: BM

ATL. RCAP-MS DISSOLVED (LABFILT) IN W

Maxxam ID		QV7556			QV7557		QV7558		
Sampling Date		2013/03/12			2013/03/12		2013/03/12		
COC Number		ES630312			ES630312		ES630312		
	Units	BH8	RDL	QC Batch	BH11	RDL	BH13	RDL	QC Batch
Dissolved Barium (Ba)	ug/L	19.7	1.0	3152713	750	1.0	61.9	1.0	3152713
Dissolved Beryllium (Be)	ug/L	ND	1.0	3152713	ND	1.0	ND	1.0	3152713
Dissolved Bismuth (Bi)	ug/L	ND	2.0	3152713	ND	2.0	ND	2.0	3152713
Dissolved Boron (B)	ug/L	ND	50	3152713	ND	50	697	50	3152713
Dissolved Cadmium (Cd)	ug/L	ND	0.017	3152713	ND	0.017	0.037	0.017	3152713
Dissolved Calcium (Ca)	ug/L	11300	100	3152713	61400	100	78900	100	3152713
Dissolved Chromium (Cr)	ug/L	ND	1.0	3152713	ND	1.0	ND	1.0	3152713
Dissolved Cobalt (Co)	ug/L	1.55	0.40	3152713	ND	0.40	2.63	0.40	3152713
Dissolved Copper (Cu)	ug/L	ND	2.0	3152713	2.3	2.0	ND	2.0	3152713
Dissolved Iron (Fe)	ug/L	621	50	3152713	ND	50	ND	50	3152713
Dissolved Lead (Pb)	ug/L	ND	0.50	3152713	ND	0.50	ND	0.50	3152713
Dissolved Magnesium (Mg)	ug/L	2320	100	3152713	5160	100	141000	1000	3152713
Dissolved Manganese (Mn)	ug/L	389	2.0	3152713	7.3	2.0	1340	2.0	3152713
Dissolved Molybdenum (Mo)	ug/L	2.5	2.0	3152713	7.0	2.0	ND	2.0	3152713
Dissolved Nickel (Ni)	ug/L	9.9	2.0	3152713	ND	2.0	7.4	2.0	3152713
Dissolved Phosphorus (P)	ug/L	ND	100	3152713	103	100	ND	100	3152713
Dissolved Potassium (K)	ug/L	2020	100	3152713	4180	100	46200	100	3152713
Dissolved Selenium (Se)	ug/L	ND	1.0	3152713	ND	1.0	ND	1.0	3152713
Dissolved Silver (Ag)	ug/L	ND	0.10	3152713	ND	0.10	ND	0.10	3152713
Dissolved Sodium (Na)	ug/L	52500	100	3152713	378000	100	1410000	1000	3152713
Dissolved Strontium (Sr)	ug/L	46.0	2.0	3152713	277	2.0	860	2.0	3152713
Dissolved Thallium (Tl)	ug/L	ND	0.10	3152713	ND	0.10	ND	0.10	3152713
Dissolved Tin (Sn)	ug/L	ND	2.0	3152713	ND	2.0	ND	2.0	3152713
Dissolved Titanium (Ti)	ug/L	ND	2.0	3152713	ND	2.0	ND	2.0	3152713
Dissolved Uranium (U)	ug/L	ND	0.10	3152713	1.80	0.10	0.22	0.10	3152713
Dissolved Vanadium (V)	ug/L	ND	2.0	3152713	4.6	2.0	ND	2.0	3152713
Dissolved Zinc (Zn)	ug/L	7.2	5.0	3152713	ND	5.0	23.4	5.0	3152713
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch									

Maxxam Job #: B338084
Report Date: 2013/03/28

Stantec Consulting Ltd.
Client Project #: 121412551

Your P.O. #: CALLUP#49
Sampler Initials: BM

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		QV7550	QV7551	QV7552	QV7553		QV7554	QV7555		
Sampling Date		2013/03/12	2013/03/12	2013/03/12	2013/03/12		2013/03/12	2013/03/12		
COC Number		ES630312	ES630312	ES630312	ES630312		ES630312	ES630312		
	Units	BH1	BH2	BH4	BH5	QC Batch	BH6	BH7	RDL	QC Batch

Metals										
Total Mercury (Hg)	ug/L	0.053	0.050	ND	0.10	3154014	ND	0.022	0.013	3155071

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		QV7556	QV7557	QV7558		
Sampling Date		2013/03/12	2013/03/12	2013/03/12		
COC Number		ES630312	ES630312	ES630312		
	Units	BH8	BH11	BH13	RDL	QC Batch

Metals						
Total Mercury (Hg)	ug/L	0.35	0.041	0.18	0.013	3155071

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B338084
Report Date: 2013/03/28

Stantec Consulting Ltd.
Client Project #: 121412551

Your P.O. #: CALLUP#49
Sampler Initials: BM

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		QV7550	QV7551		QV7552		QV7553		
Sampling Date		2013/03/12	2013/03/12		2013/03/12		2013/03/12		
COC Number		ES630312	ES630312		ES630312		ES630312		
	Units	BH1	BH2	RDL	BH4	RDL	BH5	RDL	QC Batch

Polyaromatic Hydrocarbons									
1-Methylnaphthalene	ug/L	2.7	0.32	0.050	ND	0.050	0.13	0.050	3152099
2-Methylnaphthalene	ug/L	4.0	0.20	0.050	ND (1)	0.070	0.15	0.050	3152099
Acenaphthene	ug/L	4.5	0.27	0.010	0.30	0.010	ND (1)	0.40	3152099
Acenaphthylene	ug/L	0.74	0.085	0.010	ND (1)	0.070	0.038	0.010	3152099
Anthracene	ug/L	9.1	0.46	0.010	ND (1)	0.020	1.8	0.010	3152099
Benzo(a)anthracene	ug/L	12	0.63	0.010	0.011	0.010	3.4	0.010	3152099
Benzo(a)pyrene	ug/L	7.9	0.53	0.010	ND	0.010	2.3	0.010	3152099
Benzo(b)fluoranthene	ug/L	5.4	0.41	0.010	ND	0.010	1.6	0.010	3152099
Benzo(g,h,i)perylene	ug/L	3.8	0.34	0.010	ND	0.010	1.0	0.010	3152099
Benzo(j)fluoranthene	ug/L	3.4	0.25	0.010	ND	0.010	1.0	0.010	3152099
Benzo(k)fluoranthene	ug/L	3.2	0.23	0.010	ND	0.010	1.0	0.010	3152099
Chrysene	ug/L	11	0.67	0.010	0.011	0.010	3.3	0.010	3152099
Dibenz(a,h)anthracene	ug/L	0.89	0.085	0.010	ND	0.010	0.26	0.010	3152099
Fluoranthene	ug/L	30	1.9	0.010	0.037	0.010	7.7	0.010	3152099
Fluorene	ug/L	6.6	0.41	0.010	0.67	0.010	1.1	0.010	3152099
Indeno(1,2,3-cd)pyrene	ug/L	2.9	0.25	0.010	ND	0.010	0.73	0.010	3152099
Naphthalene	ug/L	6.8	0.33	0.20	ND	0.20	0.26	0.20	3152099
Perylene	ug/L	1.7	0.13	0.010	ND	0.010	0.45	0.010	3152099
Phenanthrene	ug/L	35	0.99	0.010	ND (1)	0.030	4.6	0.010	3152099
Pyrene	ug/L	25	1.6	0.010	0.031	0.010	7.4	0.010	3152099
Surrogate Recovery (%)									
D10-Anthracene	%	84	84		109		78		3152099
D14-Terphenyl	%	56 (2)	81 (2)		122 (2)		83 (2)		3152099
D8-Acenaphthylene	%	80	86		107		73		3152099

ND = Not detected

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

(2) PAH sample contained sediment.

Maxxam Job #: B338084
Report Date: 2013/03/28

Stantec Consulting Ltd.
Client Project #: 121412551

Your P.O. #: CALLUP#49
Sampler Initials: BM

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		QV7554		QV7555		QV7556		QV7557		
Sampling Date		2013/03/12		2013/03/12		2013/03/12		2013/03/12		
COC Number		ES630312		ES630312		ES630312		ES630312		
	Units	BH6	RDL	BH7	RDL	BH8	RDL	BH11	RDL	QC Batch

Polyaromatic Hydrocarbons										
1-Methylnaphthalene	ug/L	13	0.050	ND	0.050	0.14	0.050	2.0	0.050	3152099
2-Methylnaphthalene	ug/L	4.4	0.050	ND	0.050	ND (1)	0.20	1.4	0.050	3152099
Acenaphthene	ug/L	0.36	0.010	0.012	0.010	ND (1)	0.20	0.28	0.010	3152099
Acenaphthylene	ug/L	ND (1)	0.20	0.021	0.010	ND (1)	0.090	ND (1)	0.060	3152099
Anthracene	ug/L	ND (1)	0.050	0.029	0.010	ND (1)	0.30	ND (1)	0.050	3152099
Benzo(a)anthracene	ug/L	0.013	0.010	0.12	0.010	0.58	0.010	0.021	0.010	3152099
Benzo(a)pyrene	ug/L	ND	0.010	0.098	0.010	0.53	0.010	0.012	0.010	3152099
Benzo(b)fluoranthene	ug/L	ND	0.010	0.079	0.010	0.40	0.010	0.011	0.010	3152099
Benzo(g,h,i)perylene	ug/L	ND	0.010	0.060	0.010	0.33	0.010	0.010	0.010	3152099
Benzo(j)fluoranthene	ug/L	ND	0.010	0.046	0.010	0.25	0.010	ND	0.010	3152099
Benzo(k)fluoranthene	ug/L	ND	0.010	0.043	0.010	0.22	0.010	ND	0.010	3152099
Chrysene	ug/L	0.018	0.010	0.13	0.010	0.71	0.010	0.030	0.010	3152099
Dibenz(a,h)anthracene	ug/L	ND	0.010	0.015	0.010	0.077	0.010	ND	0.010	3152099
Fluoranthene	ug/L	0.054	0.010	0.17	0.010	1.3	0.010	0.14	0.010	3152099
Fluorene	ug/L	0.97	0.010	0.018	0.010	0.35	0.010	0.46	0.010	3152099
Indeno(1,2,3-cd)pyrene	ug/L	ND	0.010	0.044	0.010	0.25	0.010	ND	0.010	3152099
Naphthalene	ug/L	13	0.20	ND	0.20	ND	0.20	3.6	0.20	3152099
Perylene	ug/L	ND	0.010	0.023	0.010	0.13	0.010	ND	0.010	3152099
Phenanthrene	ug/L	0.37	0.010	0.065	0.010	0.73	0.010	0.50	0.010	3152099
Pyrene	ug/L	0.052	0.010	0.18	0.010	1.7	0.010	0.12	0.010	3152099
Surrogate Recovery (%)										
D10-Anthracene	%	92		93		98		113		3152099
D14-Terphenyl	%	105 (2)		111 (2)		83 (2)		116 (2)		3152099
D8-Acenaphthylene	%	93		94		94		105		3152099

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.
(2) PAH sample contained sediment.

Maxxam Job #: B338084
Report Date: 2013/03/28

Stantec Consulting Ltd.
Client Project #: 121412551

Your P.O. #: CALLUP#49
Sampler Initials: BM

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		QV7558		
Sampling Date		2013/03/12		
COC Number		ES630312		
	Units	BH13	RDL	QC Batch

Polyaromatic Hydrocarbons				
1-Methylnaphthalene	ug/L	0.20	0.050	3152099
2-Methylnaphthalene	ug/L	0.081	0.050	3152099
Acenaphthene	ug/L	0.50	0.010	3152099
Acenaphthylene	ug/L	ND (1)	0.080	3152099
Anthracene	ug/L	0.30	0.010	3152099
Benzo(a)anthracene	ug/L	0.25	0.010	3152099
Benzo(a)pyrene	ug/L	0.20	0.010	3152099
Benzo(b)fluoranthene	ug/L	0.16	0.010	3152099
Benzo(g,h,i)perylene	ug/L	0.12	0.010	3152099
Benzo(j)fluoranthene	ug/L	0.094	0.010	3152099
Benzo(k)fluoranthene	ug/L	0.086	0.010	3152099
Chrysene	ug/L	0.26	0.010	3152099
Dibenz(a,h)anthracene	ug/L	0.029	0.010	3152099
Fluoranthene	ug/L	1.0	0.010	3152099
Fluorene	ug/L	0.40	0.010	3152099
Indeno(1,2,3-cd)pyrene	ug/L	0.093	0.010	3152099
Naphthalene	ug/L	ND	0.20	3152099
Perylene	ug/L	0.070	0.010	3152099
Phenanthrene	ug/L	1.3	0.010	3152099
Pyrene	ug/L	0.83	0.010	3152099
Surrogate Recovery (%)				
D10-Anthracene	%	107		3152099
D14-Terphenyl	%	108 (2)		3152099
D8-Acenaphthylene	%	103		3152099

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.
(2) PAH sample contained sediment.

Maxxam Job #: B338084
Report Date: 2013/03/28

Stantec Consulting Ltd.
Client Project #: 121412551

Your P.O. #: CALLUP#49
Sampler Initials: BM

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		QV7550	QV7551	QV7552	QV7553	QV7554	QV7555		
Sampling Date		2013/03/12	2013/03/12	2013/03/12	2013/03/12	2013/03/12	2013/03/12		
COC Number		ES630312	ES630312	ES630312	ES630312	ES630312	ES630312		
	Units	BH1	BH2	BH4	BH5	BH6	BH7	RDL	QC Batch

PCBs									
Total PCB	ug/L	ND	ND	ND	ND	ND	ND	0.050	3154075
Surrogate Recovery (%)									
Decachlorobiphenyl	%	31 (1)	57 (1)	75 (1)	35 (1)	63 (1)	69 (1)		3154075

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) PCB sample contained sediment.

Maxxam ID		QV7556	QV7557	QV7558		
Sampling Date		2013/03/12	2013/03/12	2013/03/12		
COC Number		ES630312	ES630312	ES630312		
	Units	BH8	BH11	BH13	RDL	QC Batch

PCBs						
Total PCB	ug/L	ND	ND	ND	0.050	3154075
Surrogate Recovery (%)						
Decachlorobiphenyl	%	34 (1)	43 (1)	50 (1)		3154075

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) PCB sample contained sediment.

Maxxam Job #: B338084
Report Date: 2013/03/28

Stantec Consulting Ltd.
Client Project #: 121412551

Your P.O. #: CALLUP#49
Sampler Initials: BM

Package 1	9.2°C
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Each temperature is the average of up to three cooler temperatures taken at receipt

GENERAL COMMENTS

Sample QV7550-01: Poor RCap Ion Balance due to sample matrix. Possibly due to fine particulate matter.

Sample QV7552-01: Poor RCap Ion Balance due to sample matrix. Possibly due to fine particulate matter.

Sample QV7556-01: Poor RCap Ion Balance due to sample matrix. Possibly due to fine particulate matter.

Sample QV7557-01: Poor RCap Ion Balance due to sample matrix. Possibly due to fine particulate matter.

Results relate only to the items tested.

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 121412551
P.O. #: CALLUP#49
Site Location:

Quality Assurance Report
Maxxam Job Number: ZB338084

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3152099 GTH	Matrix Spike [QV7551-01]	D10-Anthracene	2013/03/15		82	%	30 - 130
		D14-Terphenyl	2013/03/15		90 (1)	%	30 - 130
		D8-Acenaphthylene	2013/03/15		85	%	30 - 130
		1-Methylnaphthalene	2013/03/15		66	%	30 - 130
		2-Methylnaphthalene	2013/03/15		68	%	30 - 130
		Acenaphthene	2013/03/15		73	%	30 - 130
		Acenaphthylene	2013/03/15		78	%	30 - 130
		Anthracene	2013/03/15		73	%	30 - 130
		Benzo(a)anthracene	2013/03/15		NC	%	30 - 130
		Benzo(a)pyrene	2013/03/15		NC	%	30 - 130
		Benzo(b)fluoranthene	2013/03/15		58	%	30 - 130
		Benzo(g,h,i)perylene	2013/03/15		43 (2)	%	30 - 130
		Benzo(j)fluoranthene	2013/03/15		50	%	30 - 130
		Benzo(k)fluoranthene	2013/03/15		48 (2)	%	30 - 130
		Chrysene	2013/03/15		NC	%	30 - 130
		Dibenz(a,h)anthracene	2013/03/15		34 (2)	%	30 - 130
		Fluoranthene	2013/03/15		NC	%	30 - 130
		Fluorene	2013/03/15		70	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2013/03/15		37 (2)	%	30 - 130
		Naphthalene	2013/03/15		67	%	30 - 130
		Perylene	2013/03/15		48 (2)	%	30 - 130
		Phenanthrene	2013/03/15		NC	%	30 - 130
		Pyrene	2013/03/15		NC	%	30 - 130
	Spiked Blank	D10-Anthracene	2013/03/15		92	%	30 - 130
		D14-Terphenyl	2013/03/15		96	%	30 - 130
		D8-Acenaphthylene	2013/03/15		93	%	30 - 130
		1-Methylnaphthalene	2013/03/15		83	%	30 - 130
		2-Methylnaphthalene	2013/03/15		87	%	30 - 130
		Acenaphthene	2013/03/15		93	%	30 - 130
		Acenaphthylene	2013/03/15		83	%	30 - 130
		Anthracene	2013/03/15		83	%	30 - 130
		Benzo(a)anthracene	2013/03/15		79	%	30 - 130
		Benzo(a)pyrene	2013/03/15		83	%	30 - 130
		Benzo(b)fluoranthene	2013/03/15		85	%	30 - 130
		Benzo(g,h,i)perylene	2013/03/15		94	%	30 - 130
		Benzo(j)fluoranthene	2013/03/15		80	%	30 - 130
		Benzo(k)fluoranthene	2013/03/15		78	%	30 - 130
		Chrysene	2013/03/15		82	%	30 - 130
		Dibenz(a,h)anthracene	2013/03/15		75	%	30 - 130
		Fluoranthene	2013/03/15		84	%	30 - 130
		Fluorene	2013/03/15		93	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2013/03/15		81	%	30 - 130
		Naphthalene	2013/03/15		87	%	30 - 130
Perylene		2013/03/15		84	%	30 - 130	
Phenanthrene		2013/03/15		95	%	30 - 130	
Pyrene		2013/03/15		87	%	30 - 130	
Method Blank	D10-Anthracene	2013/03/15		92	%	30 - 130	
	D14-Terphenyl	2013/03/15		92	%	30 - 130	
	D8-Acenaphthylene	2013/03/15		92	%	30 - 130	
	1-Methylnaphthalene	2013/03/15	ND, RDL=0.050		ug/L		
	2-Methylnaphthalene	2013/03/15	ND, RDL=0.050		ug/L		
	Acenaphthene	2013/03/15	ND, RDL=0.010		ug/L		
	Acenaphthylene	2013/03/15	ND, RDL=0.010		ug/L		
	Anthracene	2013/03/15	ND, RDL=0.010		ug/L		

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 121412551
P.O. #: CALLUP#49
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: ZB338084

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3152099 GTH	Method Blank	Benzo(a)anthracene	2013/03/15	ND, RDL=0.010		ug/L	
		Benzo(a)pyrene	2013/03/15	ND, RDL=0.010		ug/L	
		Benzo(b)fluoranthene	2013/03/15	ND, RDL=0.010		ug/L	
		Benzo(g,h,i)perylene	2013/03/15	ND, RDL=0.010		ug/L	
		Benzo(j)fluoranthene	2013/03/15	ND, RDL=0.010		ug/L	
		Benzo(k)fluoranthene	2013/03/15	ND, RDL=0.010		ug/L	
		Chrysene	2013/03/15	ND, RDL=0.010		ug/L	
		Dibenz(a,h)anthracene	2013/03/15	ND, RDL=0.010		ug/L	
		Fluoranthene	2013/03/15	ND, RDL=0.010		ug/L	
		Fluorene	2013/03/15	ND, RDL=0.010		ug/L	
		Indeno(1,2,3-cd)pyrene	2013/03/15	ND, RDL=0.010		ug/L	
		Naphthalene	2013/03/15	ND, RDL=0.20		ug/L	
		Perylene	2013/03/15	ND, RDL=0.010		ug/L	
		Phenanthrene	2013/03/15	ND, RDL=0.010		ug/L	
		Pyrene	2013/03/15	ND, RDL=0.010		ug/L	
	RPD	Acenaphthylene	2013/03/15	NC		%	40
		Anthracene	2013/03/15	NC		%	40
		Fluorene	2013/03/15	NC		%	40
		Naphthalene	2013/03/15	NC		%	40
		Phenanthrene	2013/03/15	NC (3)		%	40
3152660 DLB	Matrix Spike	Pyrene	2013/03/15	NC		%	40
		Dissolved Aluminum (Al)	2013/03/15		108	%	80 - 120
		Dissolved Antimony (Sb)	2013/03/15		112	%	80 - 120
		Dissolved Arsenic (As)	2013/03/15		96	%	80 - 120
		Dissolved Barium (Ba)	2013/03/15		NC	%	80 - 120
		Dissolved Beryllium (Be)	2013/03/15		108	%	80 - 120
		Dissolved Bismuth (Bi)	2013/03/15		95	%	80 - 120
		Dissolved Boron (B)	2013/03/15		105	%	80 - 120
		Dissolved Cadmium (Cd)	2013/03/15		97	%	80 - 120
		Dissolved Calcium (Ca)	2013/03/15		NC	%	80 - 120
		Dissolved Chromium (Cr)	2013/03/15		97	%	80 - 120
		Dissolved Cobalt (Co)	2013/03/15		96	%	80 - 120
		Dissolved Copper (Cu)	2013/03/15		93	%	80 - 120
		Dissolved Iron (Fe)	2013/03/15		NC	%	80 - 120
		Dissolved Lead (Pb)	2013/03/15		95	%	80 - 120
		Dissolved Magnesium (Mg)	2013/03/15		NC	%	80 - 120
		Dissolved Manganese (Mn)	2013/03/15		NC	%	80 - 120
		Dissolved Molybdenum (Mo)	2013/03/15		113	%	80 - 120
		Dissolved Nickel (Ni)	2013/03/15		93	%	80 - 120
		Dissolved Phosphorus (P)	2013/03/15		105	%	80 - 120
		Dissolved Potassium (K)	2013/03/15		NC	%	80 - 120
		Dissolved Selenium (Se)	2013/03/15		91	%	80 - 120
		Dissolved Silver (Ag)	2013/03/15		103	%	80 - 120
		Dissolved Sodium (Na)	2013/03/15		NC	%	80 - 120
		Dissolved Strontium (Sr)	2013/03/15		NC	%	80 - 120
		Dissolved Thallium (Tl)	2013/03/15		99	%	80 - 120
		Dissolved Tin (Sn)	2013/03/15		108	%	80 - 120
		Dissolved Titanium (Ti)	2013/03/15		103	%	80 - 120
		Dissolved Uranium (U)	2013/03/15		103	%	80 - 120
		Dissolved Vanadium (V)	2013/03/15		102	%	80 - 120
		Dissolved Zinc (Zn)	2013/03/15		97	%	80 - 120
	Spiked Blank	Dissolved Aluminum (Al)	2013/03/15		104	%	80 - 120
		Dissolved Antimony (Sb)	2013/03/15		100	%	80 - 120
		Dissolved Arsenic (As)	2013/03/15		95	%	80 - 120
		Dissolved Barium (Ba)	2013/03/15		94	%	80 - 120

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 121412551
P.O. #: CALLUP#49
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: ZB338084

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3152660 DLB	Spiked Blank	Dissolved Beryllium (Be)	2013/03/15		97	%	80 - 120
		Dissolved Bismuth (Bi)	2013/03/15		96	%	80 - 120
		Dissolved Boron (B)	2013/03/15		96	%	80 - 120
		Dissolved Cadmium (Cd)	2013/03/15		98	%	80 - 120
		Dissolved Calcium (Ca)	2013/03/15		84	%	80 - 120
		Dissolved Chromium (Cr)	2013/03/15		99	%	80 - 120
		Dissolved Cobalt (Co)	2013/03/15		101	%	80 - 120
		Dissolved Copper (Cu)	2013/03/15		100	%	80 - 120
		Dissolved Iron (Fe)	2013/03/15		103	%	80 - 120
		Dissolved Lead (Pb)	2013/03/15		95	%	80 - 120
		Dissolved Magnesium (Mg)	2013/03/15		106	%	80 - 120
		Dissolved Manganese (Mn)	2013/03/15		98	%	80 - 120
		Dissolved Molybdenum (Mo)	2013/03/15		101	%	80 - 120
		Dissolved Nickel (Ni)	2013/03/15		100	%	80 - 120
		Dissolved Phosphorus (P)	2013/03/15		102	%	80 - 120
		Dissolved Potassium (K)	2013/03/15		98	%	80 - 120
		Dissolved Selenium (Se)	2013/03/15		94	%	80 - 120
		Dissolved Silver (Ag)	2013/03/15		101	%	80 - 120
		Dissolved Sodium (Na)	2013/03/15		101	%	80 - 120
		Dissolved Strontium (Sr)	2013/03/15		93	%	80 - 120
		Dissolved Thallium (Tl)	2013/03/15		97	%	80 - 120
		Dissolved Tin (Sn)	2013/03/15		96	%	80 - 120
		Dissolved Titanium (Ti)	2013/03/15		100	%	80 - 120
		Dissolved Uranium (U)	2013/03/15		99	%	80 - 120
		Dissolved Vanadium (V)	2013/03/15		100	%	80 - 120
		Dissolved Zinc (Zn)	2013/03/15		104	%	80 - 120
	Method Blank	Dissolved Aluminum (Al)	2013/03/15	ND, RDL=5.0		ug/L	
		Dissolved Antimony (Sb)	2013/03/15	ND, RDL=1.0		ug/L	
		Dissolved Arsenic (As)	2013/03/15	ND, RDL=1.0		ug/L	
		Dissolved Barium (Ba)	2013/03/15	ND, RDL=1.0		ug/L	
		Dissolved Beryllium (Be)	2013/03/15	ND, RDL=1.0		ug/L	
		Dissolved Bismuth (Bi)	2013/03/15	ND, RDL=2.0		ug/L	
		Dissolved Boron (B)	2013/03/15	ND, RDL=50		ug/L	
		Dissolved Cadmium (Cd)	2013/03/15	ND, RDL=0.017		ug/L	
		Dissolved Calcium (Ca)	2013/03/15	ND, RDL=100		ug/L	
		Dissolved Chromium (Cr)	2013/03/15	ND, RDL=1.0		ug/L	
		Dissolved Cobalt (Co)	2013/03/15	ND, RDL=0.40		ug/L	
		Dissolved Copper (Cu)	2013/03/15	ND, RDL=2.0		ug/L	
		Dissolved Iron (Fe)	2013/03/15	ND, RDL=50		ug/L	
		Dissolved Lead (Pb)	2013/03/15	ND, RDL=0.50		ug/L	
		Dissolved Magnesium (Mg)	2013/03/15	ND, RDL=100		ug/L	
		Dissolved Manganese (Mn)	2013/03/15	ND, RDL=2.0		ug/L	
		Dissolved Molybdenum (Mo)	2013/03/15	ND, RDL=2.0		ug/L	
		Dissolved Nickel (Ni)	2013/03/15	ND, RDL=2.0		ug/L	
		Dissolved Phosphorus (P)	2013/03/15	ND, RDL=100		ug/L	
		Dissolved Potassium (K)	2013/03/15	ND, RDL=100		ug/L	
		Dissolved Selenium (Se)	2013/03/15	ND, RDL=1.0		ug/L	
		Dissolved Silver (Ag)	2013/03/15	ND, RDL=0.10		ug/L	
		Dissolved Sodium (Na)	2013/03/15	ND, RDL=100		ug/L	
		Dissolved Strontium (Sr)	2013/03/15	ND, RDL=2.0		ug/L	
		Dissolved Thallium (Tl)	2013/03/15	ND, RDL=0.10		ug/L	
		Dissolved Tin (Sn)	2013/03/15	ND, RDL=2.0		ug/L	
		Dissolved Titanium (Ti)	2013/03/15	ND, RDL=2.0		ug/L	
		Dissolved Uranium (U)	2013/03/15	ND, RDL=0.10		ug/L	
		Dissolved Vanadium (V)	2013/03/15	ND, RDL=2.0		ug/L	

Stantec Consulting Ltd.
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QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3152660 DLB	Method Blank RPD	Dissolved Zinc (Zn)	2013/03/15	ND, RDL=5.0		ug/L	
		Dissolved Aluminum (Al)	2013/03/18	0.2		%	20
		Dissolved Antimony (Sb)	2013/03/18	NC		%	20
		Dissolved Arsenic (As)	2013/03/18	NC		%	20
		Dissolved Barium (Ba)	2013/03/18	0.5		%	20
		Dissolved Beryllium (Be)	2013/03/18	NC		%	20
		Dissolved Bismuth (Bi)	2013/03/18	NC		%	20
		Dissolved Boron (B)	2013/03/18	NC		%	20
		Dissolved Cadmium (Cd)	2013/03/18	NC		%	20
		Dissolved Calcium (Ca)	2013/03/18	1.1		%	20
		Dissolved Chromium (Cr)	2013/03/18	NC		%	20
		Dissolved Cobalt (Co)	2013/03/18	2.2		%	20
		Dissolved Copper (Cu)	2013/03/18	NC		%	20
		Dissolved Iron (Fe)	2013/03/18	0.3		%	20
		Dissolved Lead (Pb)	2013/03/18	NC		%	20
		Dissolved Magnesium (Mg)	2013/03/18	0.5		%	20
		Dissolved Manganese (Mn)	2013/03/18	2.5		%	20
		Dissolved Molybdenum (Mo)	2013/03/18	NC		%	20
		Dissolved Nickel (Ni)	2013/03/18	0.5		%	20
		Dissolved Phosphorus (P)	2013/03/18	NC		%	20
		Dissolved Potassium (K)	2013/03/18	3.1		%	20
		Dissolved Selenium (Se)	2013/03/18	NC		%	20
		Dissolved Silver (Ag)	2013/03/18	NC		%	20
		Dissolved Sodium (Na)	2013/03/18	0.3		%	20
		Dissolved Strontium (Sr)	2013/03/18	0.8		%	20
		Dissolved Thallium (Tl)	2013/03/18	NC		%	20
		Dissolved Tin (Sn)	2013/03/18	NC		%	20
		Dissolved Titanium (Ti)	2013/03/18	NC		%	20
		Dissolved Uranium (U)	2013/03/18	NC		%	20
		Dissolved Vanadium (V)	2013/03/18	NC		%	20
		Dissolved Zinc (Zn)	2013/03/18	NC		%	20
3152713 DLB	Matrix Spike	Dissolved Aluminum (Al)	2013/03/19		100	%	80 - 120
		Dissolved Antimony (Sb)	2013/03/19		109	%	80 - 120
		Dissolved Arsenic (As)	2013/03/19		97	%	80 - 120
		Dissolved Barium (Ba)	2013/03/19		103	%	80 - 120
		Dissolved Beryllium (Be)	2013/03/19		103	%	80 - 120
		Dissolved Bismuth (Bi)	2013/03/19		98	%	80 - 120
		Dissolved Boron (B)	2013/03/19		103	%	80 - 120
		Dissolved Cadmium (Cd)	2013/03/19		96	%	80 - 120
		Dissolved Calcium (Ca)	2013/03/19		NC	%	80 - 120
		Dissolved Chromium (Cr)	2013/03/19		99	%	80 - 120
		Dissolved Cobalt (Co)	2013/03/19		96	%	80 - 120
		Dissolved Copper (Cu)	2013/03/19		94	%	80 - 120
		Dissolved Iron (Fe)	2013/03/19		102	%	80 - 120
		Dissolved Lead (Pb)	2013/03/19		97	%	80 - 120
		Dissolved Magnesium (Mg)	2013/03/19		NC	%	80 - 120
		Dissolved Manganese (Mn)	2013/03/19		NC	%	80 - 120
		Dissolved Molybdenum (Mo)	2013/03/19		109	%	80 - 120
		Dissolved Nickel (Ni)	2013/03/19		94	%	80 - 120
		Dissolved Phosphorus (P)	2013/03/19		104	%	80 - 120
		Dissolved Potassium (K)	2013/03/19		NC	%	80 - 120
		Dissolved Selenium (Se)	2013/03/19		97	%	80 - 120
		Dissolved Silver (Ag)	2013/03/19		105	%	80 - 120
		Dissolved Sodium (Na)	2013/03/19		NC	%	80 - 120
		Dissolved Strontium (Sr)	2013/03/19		94	%	80 - 120

Stantec Consulting Ltd.
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QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3152713 DLB	Matrix Spike	Dissolved Thallium (Tl)	2013/03/19		100	%	80 - 120
		Dissolved Tin (Sn)	2013/03/19		107	%	80 - 120
		Dissolved Titanium (Ti)	2013/03/19		101	%	80 - 120
		Dissolved Uranium (U)	2013/03/19		103	%	80 - 120
		Dissolved Vanadium (V)	2013/03/19		101	%	80 - 120
	Spiked Blank	Dissolved Zinc (Zn)	2013/03/19		98	%	80 - 120
		Dissolved Aluminum (Al)	2013/03/19		101	%	80 - 120
		Dissolved Antimony (Sb)	2013/03/19		104	%	80 - 120
		Dissolved Arsenic (As)	2013/03/19		95	%	80 - 120
		Dissolved Barium (Ba)	2013/03/19		96	%	80 - 120
		Dissolved Beryllium (Be)	2013/03/19		100	%	80 - 120
		Dissolved Bismuth (Bi)	2013/03/19		100	%	80 - 120
		Dissolved Boron (B)	2013/03/19		100	%	80 - 120
		Dissolved Cadmium (Cd)	2013/03/19		97	%	80 - 120
		Dissolved Calcium (Ca)	2013/03/19		85	%	80 - 120
		Dissolved Chromium (Cr)	2013/03/19		99	%	80 - 120
		Dissolved Cobalt (Co)	2013/03/19		96	%	80 - 120
		Dissolved Copper (Cu)	2013/03/19		95	%	80 - 120
		Dissolved Iron (Fe)	2013/03/19		105	%	80 - 120
		Dissolved Lead (Pb)	2013/03/19		97	%	80 - 120
		Dissolved Magnesium (Mg)	2013/03/19		104	%	80 - 120
		Dissolved Manganese (Mn)	2013/03/19		98	%	80 - 120
		Dissolved Molybdenum (Mo)	2013/03/19		107	%	80 - 120
		Dissolved Nickel (Ni)	2013/03/19		97	%	80 - 120
		Dissolved Phosphorus (P)	2013/03/19		103	%	80 - 120
		Dissolved Potassium (K)	2013/03/19		100	%	80 - 120
		Dissolved Selenium (Se)	2013/03/19		95	%	80 - 120
		Dissolved Silver (Ag)	2013/03/19		104	%	80 - 120
		Dissolved Sodium (Na)	2013/03/19		102	%	80 - 120
		Dissolved Strontium (Sr)	2013/03/19		94	%	80 - 120
		Dissolved Thallium (Tl)	2013/03/19		100	%	80 - 120
		Dissolved Tin (Sn)	2013/03/19		103	%	80 - 120
		Dissolved Titanium (Ti)	2013/03/19		102	%	80 - 120
		Dissolved Uranium (U)	2013/03/19		101	%	80 - 120
		Dissolved Vanadium (V)	2013/03/19		99	%	80 - 120
		Dissolved Zinc (Zn)	2013/03/19		102	%	80 - 120
	Method Blank	Dissolved Aluminum (Al)	2013/03/19	ND, RDL=5.0		ug/L	
		Dissolved Antimony (Sb)	2013/03/19	ND, RDL=1.0		ug/L	
		Dissolved Arsenic (As)	2013/03/19	ND, RDL=1.0		ug/L	
		Dissolved Barium (Ba)	2013/03/19	ND, RDL=1.0		ug/L	
		Dissolved Beryllium (Be)	2013/03/19	ND, RDL=1.0		ug/L	
		Dissolved Bismuth (Bi)	2013/03/19	ND, RDL=2.0		ug/L	
		Dissolved Boron (B)	2013/03/19	ND, RDL=50		ug/L	
		Dissolved Cadmium (Cd)	2013/03/19	ND, RDL=0.017		ug/L	
		Dissolved Calcium (Ca)	2013/03/19	ND, RDL=100		ug/L	
		Dissolved Chromium (Cr)	2013/03/19	ND, RDL=1.0		ug/L	
		Dissolved Cobalt (Co)	2013/03/19	ND, RDL=0.40		ug/L	
		Dissolved Copper (Cu)	2013/03/19	ND, RDL=2.0		ug/L	
		Dissolved Iron (Fe)	2013/03/19	ND, RDL=50		ug/L	
		Dissolved Lead (Pb)	2013/03/19	ND, RDL=0.50		ug/L	
		Dissolved Magnesium (Mg)	2013/03/19	ND, RDL=100		ug/L	
		Dissolved Manganese (Mn)	2013/03/19	ND, RDL=2.0		ug/L	
		Dissolved Molybdenum (Mo)	2013/03/19	ND, RDL=2.0		ug/L	
		Dissolved Nickel (Ni)	2013/03/19	ND, RDL=2.0		ug/L	
		Dissolved Phosphorus (P)	2013/03/19	ND, RDL=100		ug/L	

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QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3152713 DLB	Method Blank	Dissolved Potassium (K)	2013/03/19	ND, RDL=100		ug/L	
		Dissolved Selenium (Se)	2013/03/19	ND, RDL=1.0		ug/L	
		Dissolved Silver (Ag)	2013/03/19	ND, RDL=0.10		ug/L	
		Dissolved Sodium (Na)	2013/03/19	ND, RDL=100		ug/L	
		Dissolved Strontium (Sr)	2013/03/19	ND, RDL=2.0		ug/L	
		Dissolved Thallium (Tl)	2013/03/19	ND, RDL=0.10		ug/L	
		Dissolved Tin (Sn)	2013/03/19	ND, RDL=2.0		ug/L	
		Dissolved Titanium (Ti)	2013/03/19	ND, RDL=2.0		ug/L	
		Dissolved Uranium (U)	2013/03/19	ND, RDL=0.10		ug/L	
		Dissolved Vanadium (V)	2013/03/19	ND, RDL=2.0		ug/L	
	RPD	Dissolved Zinc (Zn)	2013/03/19	ND, RDL=5.0		ug/L	
		Dissolved Aluminum (Al)	2013/03/19	NC		%	20
		Dissolved Antimony (Sb)	2013/03/19	NC		%	20
		Dissolved Arsenic (As)	2013/03/19	NC		%	20
		Dissolved Barium (Ba)	2013/03/19	1.1		%	20
		Dissolved Beryllium (Be)	2013/03/19	NC		%	20
		Dissolved Bismuth (Bi)	2013/03/19	NC		%	20
		Dissolved Boron (B)	2013/03/19	NC		%	20
		Dissolved Cadmium (Cd)	2013/03/19	NC		%	20
		Dissolved Calcium (Ca)	2013/03/19	1.4		%	20
		Dissolved Chromium (Cr)	2013/03/19	NC		%	20
		Dissolved Cobalt (Co)	2013/03/19	1.1		%	20
		Dissolved Copper (Cu)	2013/03/19	NC		%	20
		Dissolved Iron (Fe)	2013/03/19	NC		%	20
		Dissolved Lead (Pb)	2013/03/19	NC		%	20
		Dissolved Magnesium (Mg)	2013/03/19	0.2		%	20
		Dissolved Manganese (Mn)	2013/03/19	0.7		%	20
		Dissolved Molybdenum (Mo)	2013/03/19	NC		%	20
		Dissolved Nickel (Ni)	2013/03/19	NC		%	20
		Dissolved Phosphorus (P)	2013/03/19	NC		%	20
		Dissolved Potassium (K)	2013/03/19	0.02		%	20
		Dissolved Selenium (Se)	2013/03/19	NC		%	20
		Dissolved Silver (Ag)	2013/03/19	NC		%	20
		Dissolved Sodium (Na)	2013/03/19	0.4		%	20
		Dissolved Strontium (Sr)	2013/03/19	0.5		%	20
		Dissolved Thallium (Tl)	2013/03/19	NC		%	20
		Dissolved Tin (Sn)	2013/03/19	NC		%	20
		Dissolved Titanium (Ti)	2013/03/19	NC		%	20
		Dissolved Uranium (U)	2013/03/19	NC		%	20
		Dissolved Vanadium (V)	2013/03/19	NC		%	20
		Dissolved Zinc (Zn)	2013/03/19	NC		%	20
3153836 SHF	Spiked Blank	Aliphatic >C10-C12	2013/03/26		84	%	30 - 130
		Aliphatic >C12-C16	2013/03/26		82	%	30 - 130
		Aliphatic >C16-C21	2013/03/26		90	%	30 - 130
		Aliphatic >C21-<C32	2013/03/26		96	%	30 - 130
		Aromatic >C10-C12	2013/03/26		102	%	30 - 130
		Aromatic >C12-C16	2013/03/26		99	%	30 - 130
		Aromatic >C16-C21	2013/03/26		101	%	30 - 130
		Aromatic >C21-<C32	2013/03/26		101	%	30 - 130
	Method Blank	Isobutylbenzene - Extractable	2013/03/26		75	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/26		80	%	30 - 130
		Aliphatic >C10-C12	2013/03/26	ND, RDL=0.010		mg/L	
		Aliphatic >C12-C16	2013/03/26	ND, RDL=0.050		mg/L	
		Aliphatic >C16-C21	2013/03/26	ND, RDL=0.050		mg/L	
		Aliphatic >C21-<C32	2013/03/26	ND, RDL=0.10		mg/L	

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QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3153836 SHF	Method Blank	Aromatic >C10-C12	2013/03/26	ND, RDL=0.010		mg/L	
		Aromatic >C12-C16	2013/03/26	ND, RDL=0.050		mg/L	
		Aromatic >C16-C21	2013/03/26	ND, RDL=0.050		mg/L	
		Aromatic >C21-<C32	2013/03/26	ND, RDL=0.10		mg/L	
	RPD [QV7554-06]	Aliphatic >C10-C12	2013/03/26	19.4 (4)		%	40
		Aliphatic >C12-C16	2013/03/26	NC (4)		%	40
		Aliphatic >C16-C21	2013/03/26	NC (4)		%	40
		Aliphatic >C21-<C32	2013/03/26	NC (4)		%	40
		Aromatic >C10-C12	2013/03/26	14.7 (4)		%	40
		Aromatic >C12-C16	2013/03/26	NC (4)		%	40
		Aromatic >C16-C21	2013/03/26	NC (4)		%	40
		Aromatic >C21-<C32	2013/03/26	NC (4)		%	40
3153868 ALG	Matrix Spike	Total Alkalinity (Total as CaCO3)	2013/03/21		NC	%	80 - 120
	QC Standard	Total Alkalinity (Total as CaCO3)	2013/03/21		96	%	80 - 120
	Spiked Blank	Total Alkalinity (Total as CaCO3)	2013/03/21		99	%	80 - 120
	Method Blank	Total Alkalinity (Total as CaCO3)	2013/03/21	ND, RDL=5.0		mg/L	
3153871 ARS	RPD	Total Alkalinity (Total as CaCO3)	2013/03/21	NC		%	25
	Matrix Spike	Dissolved Chloride (Cl)	2013/03/18		NC	%	80 - 120
	QC Standard	Dissolved Chloride (Cl)	2013/03/18		99	%	80 - 120
	Spiked Blank	Dissolved Chloride (Cl)	2013/03/18		100	%	80 - 120
3153872 ARS	Method Blank	Dissolved Chloride (Cl)	2013/03/18	ND, RDL=1.0		mg/L	
	RPD	Dissolved Chloride (Cl)	2013/03/18	0.8		%	25
	Matrix Spike	Dissolved Sulphate (SO4)	2013/03/19		NC	%	80 - 120
	QC Standard	Dissolved Sulphate (SO4)	2013/03/19		99	%	80 - 120
3153873 ARS	Spiked Blank	Dissolved Sulphate (SO4)	2013/03/19		101	%	80 - 120
	Method Blank	Dissolved Sulphate (SO4)	2013/03/19	ND, RDL=2.0		mg/L	
	RPD	Dissolved Sulphate (SO4)	2013/03/19	2.0		%	25
	Matrix Spike	Reactive Silica (SiO2)	2013/03/19		NC	%	80 - 120
3153874 MCY	Spiked Blank	Reactive Silica (SiO2)	2013/03/19		99	%	80 - 120
	Method Blank	Reactive Silica (SiO2)	2013/03/19	ND, RDL=0.50		mg/L	
	RPD	Reactive Silica (SiO2)	2013/03/19	1.4		%	25
	QC Standard	Colour	2013/03/19		106	%	80 - 120
3153875 MCY	Method Blank	Colour	2013/03/19	ND, RDL=5.0		TCU	
	RPD	Colour	2013/03/19	NC		%	25
	Matrix Spike	Orthophosphate (P)	2013/03/21		97	%	80 - 120
	Spiked Blank	Orthophosphate (P)	2013/03/21		94	%	80 - 120
3153876 ARS	Method Blank	Orthophosphate (P)	2013/03/21	ND, RDL=0.010		mg/L	
	RPD	Orthophosphate (P)	2013/03/21	NC		%	25
	Matrix Spike	Nitrate + Nitrite	2013/03/20		NC	%	80 - 120
	Spiked Blank	Nitrate + Nitrite	2013/03/20		93	%	80 - 120
3153877 ARS	Method Blank	Nitrate + Nitrite	2013/03/20	ND, RDL=0.050		mg/L	
	RPD	Nitrate + Nitrite	2013/03/20	3.8		%	25
	Matrix Spike	Nitrite (N)	2013/03/18		95	%	80 - 120
	Spiked Blank	Nitrite (N)	2013/03/18		100	%	80 - 120
3153879 ALG	Method Blank	Nitrite (N)	2013/03/18	ND, RDL=0.010		mg/L	
	RPD	Nitrite (N)	2013/03/18	NC		%	25
	Matrix Spike	Total Alkalinity (Total as CaCO3)	2013/03/21		NC	%	80 - 120
	[QV7550-03]	Total Alkalinity (Total as CaCO3)	2013/03/21		98	%	80 - 120
3153883 ARS	QC Standard	Total Alkalinity (Total as CaCO3)	2013/03/21		104	%	80 - 120
	Spiked Blank	Total Alkalinity (Total as CaCO3)	2013/03/21		104	%	80 - 120
	Method Blank	Total Alkalinity (Total as CaCO3)	2013/03/21	ND, RDL=5.0		mg/L	
	RPD [QV7550-03]	Total Alkalinity (Total as CaCO3)	2013/03/21	NC		%	25
3153883 ARS	Matrix Spike	Dissolved Chloride (Cl)	2013/03/18		NC	%	80 - 120
	QC Standard	Dissolved Chloride (Cl)	2013/03/18		99	%	80 - 120

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3153883 ARS	Spiked Blank	Dissolved Chloride (Cl)	2013/03/18		101	%	80 - 120
	Method Blank	Dissolved Chloride (Cl)	2013/03/18	ND, RDL=1.0		mg/L	
	RPD [QV7550-03]	Dissolved Chloride (Cl)	2013/03/18	0.5		%	25
3153884 ARS	Matrix Spike						
	[QV7550-03]	Dissolved Sulphate (SO4)	2013/03/19		NC	%	80 - 120
	QC Standard	Dissolved Sulphate (SO4)	2013/03/19		100	%	80 - 120
	Spiked Blank	Dissolved Sulphate (SO4)	2013/03/19		100	%	80 - 120
	Method Blank	Dissolved Sulphate (SO4)	2013/03/19	ND, RDL=2.0		mg/L	
	RPD [QV7550-03]	Dissolved Sulphate (SO4)	2013/03/19	1.1		%	25
3153885 ARS	Matrix Spike						
	[QV7550-03]	Reactive Silica (SiO2)	2013/03/19		NC	%	80 - 120
	Spiked Blank	Reactive Silica (SiO2)	2013/03/19		99	%	80 - 120
	Method Blank	Reactive Silica (SiO2)	2013/03/19	ND, RDL=0.50		mg/L	
	RPD [QV7550-03]	Reactive Silica (SiO2)	2013/03/19	7.6		%	25
3153886 MCY	Matrix Spike						
	[QV7550-03]	Orthophosphate (P)	2013/03/21		94	%	80 - 120
	Spiked Blank	Orthophosphate (P)	2013/03/21		95	%	80 - 120
	Method Blank	Orthophosphate (P)	2013/03/21	ND, RDL=0.010		mg/L	
	RPD [QV7550-03]	Orthophosphate (P)	2013/03/21	NC		%	25
3153887 MCY	QC Standard	Colour	2013/03/19		105	%	80 - 120
	Method Blank	Colour	2013/03/19	ND, RDL=5.0		TCU	
	RPD [QV7550-03]	Colour	2013/03/19	NC		%	25
3153888 ARS	Matrix Spike						
	[QV7550-03]	Nitrate + Nitrite	2013/03/20		99	%	80 - 120
	Spiked Blank	Nitrate + Nitrite	2013/03/20		97	%	80 - 120
	Method Blank	Nitrate + Nitrite	2013/03/20	0.053, RDL=0.050		mg/L	
	RPD [QV7550-03]	Nitrate + Nitrite	2013/03/20	NC		%	25
3153889 ARS	Matrix Spike						
	[QV7550-03]	Nitrite (N)	2013/03/18		101	%	80 - 120
	Spiked Blank	Nitrite (N)	2013/03/18		98	%	80 - 120
	Method Blank	Nitrite (N)	2013/03/18	ND, RDL=0.010		mg/L	
	RPD [QV7550-03]	Nitrite (N)	2013/03/18	NC		%	25
3153970 SCR	QC Standard	Turbidity	2013/03/18		101	%	80 - 120
	RPD	Turbidity	2013/03/18	0.8		%	25
3153980 SCR	QC Standard	pH	2013/03/18		100	%	80 - 120
	RPD [QV7550-03]	pH	2013/03/18	0.9		%	25
3153981 ARS	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2013/03/18		107	%	80 - 120
	QC Standard	Nitrogen (Ammonia Nitrogen)	2013/03/18		100	%	80 - 120
	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2013/03/18		102	%	80 - 120
	Method Blank	Nitrogen (Ammonia Nitrogen)	2013/03/18	ND, RDL=0.050		mg/L	
	RPD	Nitrogen (Ammonia Nitrogen)	2013/03/18	NC		%	25
3153984 SCR	Spiked Blank	Conductivity	2013/03/18		100	%	80 - 120
	Method Blank	Conductivity	2013/03/18	1.1, RDL=1.0		uS/cm	
	RPD [QV7550-03]	Conductivity	2013/03/18	0.5		%	25
3153985 ARS	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2013/03/18		103	%	80 - 120
	QC Standard	Nitrogen (Ammonia Nitrogen)	2013/03/18		103	%	80 - 120
	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2013/03/18		102	%	80 - 120
	Method Blank	Nitrogen (Ammonia Nitrogen)	2013/03/18	ND, RDL=0.050		mg/L	
	RPD	Nitrogen (Ammonia Nitrogen)	2013/03/18	NC		%	25
3153986 SCR	QC Standard	pH	2013/03/18		100	%	80 - 120
	RPD	pH	2013/03/18	0		%	25
3153987 SCR	Spiked Blank	Conductivity	2013/03/18		100	%	80 - 120
	Method Blank	Conductivity	2013/03/18	1.2, RDL=1.0		uS/cm	
	RPD	Conductivity	2013/03/18	0		%	25
3154014 MKH	Matrix Spike	Total Mercury (Hg)	2013/03/18		101	%	80 - 120

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 121412551
P.O. #: CALLUP#49
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: ZB338084

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3154014 MKH	QC Standard	Total Mercury (Hg)	2013/03/18		101	%	80 - 120
	Spiked Blank	Total Mercury (Hg)	2013/03/18		101	%	80 - 120
	Method Blank	Total Mercury (Hg)	2013/03/18	ND, RDL=0.013		ug/L	
	RPD	Total Mercury (Hg)	2013/03/18	NC		%	25
3154075 BGR	Matrix Spike	Decachlorobiphenyl	2013/03/20		68	%	30 - 130
		Total PCB	2013/03/20		104	%	70 - 130
	Spiked Blank	Decachlorobiphenyl	2013/03/20		74	%	30 - 130
		Total PCB	2013/03/20		107	%	70 - 130
	Method Blank	Decachlorobiphenyl	2013/03/20		67	%	30 - 130
		Total PCB	2013/03/20	ND, RDL=0.050		ug/L	
	RPD	Total PCB	2013/03/20	NC		%	40
3154464 SCR	QC Standard	pH	2013/03/18		100	%	80 - 120
	RPD	pH	2013/03/18	0.5		%	25
3154465 SCR	Spiked Blank	Conductivity	2013/03/18		100	%	80 - 120
	Method Blank	Conductivity	2013/03/18	1.2, RDL=1.0		uS/cm	
	RPD	Conductivity	2013/03/18	0.3		%	25
3155071 MKH	Matrix Spike	Total Mercury (Hg)	2013/03/12		101	%	80 - 120
	QC Standard	Total Mercury (Hg)	2013/03/12		99	%	80 - 120
	Spiked Blank	Total Mercury (Hg)	2013/03/12		101	%	80 - 120
	Method Blank	Total Mercury (Hg)	2013/03/12	ND, RDL=0.013		ug/L	
	RPD	Total Mercury (Hg)	2013/03/12	NC		%	25
3155347 CRA	Matrix Spike	Total Organic Carbon (C)	2013/03/19		NC	%	80 - 120
	Spiked Blank	Total Organic Carbon (C)	2013/03/19		86	%	80 - 120
	Method Blank	Total Organic Carbon (C)	2013/03/19	ND, RDL=0.50		mg/L	
	RPD	Total Organic Carbon (C)	2013/03/19	4.5		%	25
3155348 CRA	Matrix Spike	Total Organic Carbon (C)	2013/03/19		NC	%	80 - 120
	Spiked Blank	Total Organic Carbon (C)	2013/03/19		89	%	80 - 120
	Method Blank	Total Organic Carbon (C)	2013/03/19	ND, RDL=0.50		mg/L	
	RPD	Total Organic Carbon (C)	2013/03/19	NC (5)		%	25
3158098 MSK	Spiked Blank	Isobutylbenzene - Volatile	2013/03/21		105	%	70 - 130
		Benzene	2013/03/21		104	%	70 - 130
		Toluene	2013/03/21		113	%	70 - 130
		Ethylbenzene	2013/03/21		113	%	70 - 130
		Xylene (Total)	2013/03/21		112	%	70 - 130
					103	%	70 - 130
	Method Blank	Isobutylbenzene - Volatile	2013/03/21				
		Benzene	2013/03/21	ND, RDL=0.0010		mg/L	
		Toluene	2013/03/21	ND, RDL=0.0010		mg/L	
		Ethylbenzene	2013/03/21	ND, RDL=0.0010		mg/L	
		Xylene (Total)	2013/03/21	ND, RDL=0.0020		mg/L	
		Aliphatic >C6-C8	2013/03/21	ND, RDL=0.010		mg/L	
		Aliphatic >C8-C10	2013/03/21	ND, RDL=0.010		mg/L	
		>C8-C10 Aromatics (-EX)	2013/03/21	ND, RDL=0.010		mg/L	

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.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

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 spiked amount was not sufficiently significant to permit a reliable recovery calculation.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

Stantec Consulting Ltd.
 Attention: Carolyn Anstey-Moore
 Client Project #: 121412551
 P.O. #: CALLUP#49
 Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: ZB338084

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
(1)		PAH sample contained sediment.					
(2)		Matrix Spike: results are outside acceptance limit. Insufficient sample for repeat analysis.					
(3)		Elevated PAH RDL(s) due to matrix / co-extractive interference.					
(4)		Elevated TEH RDL(s) due to matrix interference. Elevated TEH RDL(s) due to limited sample.					
(5)		Elevated reporting limit due to sample matrix.					

Your P.O. #: CALLUP#49
Your Project #: 1214
Your C.O.C. #: ES630412

Attention: Carolyn Anstey-Moore

Stantec Consulting Ltd.
607 Torbay Road
St. John's, NL
CANADA A1A 4Y6

Report Date: 2013/04/03

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B338124

Received: 2013/03/14, 09:39

Sample Matrix: Water

Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Carbonate, Bicarbonate and Hydroxide (1)	1	N/A	2013/03/19	CAM SOP-00102	APHA 4500-CO2 D
Alkalinity (1)	1	N/A	2013/03/21	ATL SOP 00013	Based on EPA310.2
Chloride (1)	1	N/A	2013/03/18	ATL SOP 00014	Based on SM4500-Cl-
Colour (1)	1	N/A	2013/03/19	ATL SOP 00020	Based on SM2120C
Conductance - water (1)	1	N/A	2013/03/18	ATL SOP-00004	Based on SM2510B
TEH in Water (AA PIRI) (1)	1	2013/03/18	2013/04/02	ATL SOP 00116	Based on Atl. PIRI
Hardness (calculated as CaCO3) (1)	1	N/A	2013/03/20	ATL SOP 00048	Based on SM2340B
Mercury - Total (CVAA,LL) (1)	1	2013/03/19	2013/03/12	ATL SOP 00026	Based on EPA245.1
Metals Water Diss. MS (1,2)	1	N/A	2013/03/19	ATL SOP 00059	Based on EPA6020A
Ion Balance (% Difference) (1)	1	N/A	2013/03/22		
Anion and Cation Sum (1)	1	N/A	2013/03/20		
Nitrogen Ammonia - water (1)	1	N/A	2013/03/19	ATL SOP 00015	Based on USEPA 350.1
Nitrogen - Nitrate + Nitrite (1)	1	N/A	2013/03/20	ATL SOP 00016	Based on USGS - Enz.
Nitrogen - Nitrite (1)	1	N/A	2013/03/18	ATL SOP 00017	Based on SM4500-NO2B
Nitrogen - Nitrate (as N) (1)	1	N/A	2013/03/20	ATL SOP 00018	Based on ASTM D3867
PAH in Water by GC/MS (SIM) (1)	1	2013/03/15	2013/03/16	ATL SOP 00103	Based on EPA 8270C
PCBs in water by GC/ECD (1)	1	2013/03/18	2013/03/20	ATL SOP 00107	Based on EPA8082
pH (1)	1	N/A	2013/03/18	ATL SOP 00003	Based on SM4500H+B
Phosphorus - ortho (1)	1	N/A	2013/03/21	ATL SOP 00021	Based on USEPA 365.2
VPH in Water (PIRI2) (1)	1	2013/03/21	2013/03/21	ATL SOP 00120	Based on Atl. PIRI
Sat. pH and Langelier Index (@ 20C) (1)	1	N/A	2013/03/22	ATL SOP-00049	.
Sat. pH and Langelier Index (@ 4C) (1)	1	N/A	2013/03/22	ATL SOP-00049	.
Reactive Silica (1)	1	N/A	2013/03/19	ATL SOP 00022	Based on EPA 366.0
Sulphate (1)	1	N/A	2013/03/19	ATL SOP 00023	Based on EPA 375.4
Total Dissolved Solids (TDS calc) (1)	1	N/A	2013/03/22		
Organic carbon - Total (TOC) (1)	1	N/A	2013/03/19	ATL SOP 00037	Based on SM5310C
ModTPH (T2) Calc. for Water (1)	1	N/A	2013/04/03		Based on Atl. PIRI
Turbidity (1)	1	N/A	2013/03/18	ATL SOP 00011	based on EPA 180.1

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

Your P.O. #: CALLUP#49
Your Project #: 1214
Your C.O.C. #: ES630412

Attention: Carolyn Anstey-Moore

Stantec Consulting Ltd.
607 Torbay Road
St. John's, NL
CANADA A1A 4Y6

Report Date: 2013/04/03

CERTIFICATE OF ANALYSIS

-2-

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

- (1) This test was performed by Bedford
- (2) Sample filtered in laboratory prior to analysis for dissolved metals.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Mari Kenny, Project Manager
Email: MKenny@maxxam.ca
Phone# (902) 420-0203 Ext:291

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

Total cover pages: 2

Maxxam Job #: B338124
Report Date: 2013/04/03

Stantec Consulting Ltd.
Client Project #: 1214

Your P.O. #: CALLUP#49
Sampler Initials: BM

ATLANTIC FRACTIONATION (PIRIT2) IN WATER

Maxxam ID		QV7679		
Sampling Date		2013/03/13 13:45		
COC Number		ES630412		
	Units	BH 15	RDL	QC Batch

Petroleum Hydrocarbons				
Benzene	mg/L	ND	0.0010	3158098
Toluene	mg/L	ND	0.0010	3158098
Ethylbenzene	mg/L	ND	0.0010	3158098
Xylene (Total)	mg/L	0.0030	0.0020	3158098
Aliphatic >C6-C8	mg/L	0.13	0.010	3158098
Aliphatic >C8-C10	mg/L	0.091	0.010	3158098
>C8-C10 Aromatics (-EX)	mg/L	0.045	0.010	3158098
Aliphatic >C10-C12	mg/L	0.35	0.011	3153836
Aliphatic >C12-C16	mg/L	0.78	0.057	3153836
Aliphatic >C16-C21	mg/L	0.32	0.057	3153836
Aliphatic >C21-<C32	mg/L	ND	0.11	3153836
Aromatic >C10-C12	mg/L	0.19	0.010	3153836
Aromatic >C12-C16	mg/L	0.31	0.050	3153836
Aromatic >C16-C21	mg/L	0.19	0.050	3153836
Aromatic >C21-<C32	mg/L	ND	0.10	3153836
Modified TPH (Tier 2)	mg/L	2.4	0.11	3151469
Reached Baseline at C32	mg/L	Yes	N/A	3153836
Hydrocarbon Resemblance	mg/L	COMMENT (1)	N/A	3153836
Surrogate Recovery (%)				
Isobutylbenzene - Extractable	%	85		3153836
n-Dotriacontane - Extractable	%	89 (2)		3153836
Isobutylbenzene - Volatile	%	96		3158098

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Weathered fuel oil fraction.
(2) TEH sample decanted due to sediment.

Maxxam Job #: B338124
Report Date: 2013/04/03

Stantec Consulting Ltd.
Client Project #: 1214

Your P.O. #: CALLUP#49
Sampler Initials: BM

ATL. RCAP-MS DISSOLVED (LABFILT) IN W

Maxxam ID		QV7679	QV7679		
Sampling Date		2013/03/13 13:45	2013/03/13 13:45		
COC Number		ES630412	ES630412		
	Units	BH 15	BH 15 Lab-Dup	RDL	QC Batch

Calculated Parameters					
Anion Sum	me/L	3.81		N/A	3150933
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	32		1.0	3150930
Calculated TDS	mg/L	220		1.0	3150937
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	ND		1.0	3150930
Cation Sum	me/L	3.49		N/A	3150933
Hardness (CaCO ₃)	mg/L	43		1.0	3150931
Ion Balance (% Difference)	%	4.38		N/A	3150932
Langelier Index (@ 20C)	N/A	-1.77			3150935
Langelier Index (@ 4C)	N/A	-2.02			3150936
Nitrate (N)	mg/L	0.083		0.050	3150934
Saturation pH (@ 20C)	N/A	8.87			3150935
Saturation pH (@ 4C)	N/A	9.12			3150936
Inorganics					
Total Alkalinity (Total as CaCO ₃)	mg/L	32		5.0	3153879
Dissolved Chloride (Cl)	mg/L	100		1.0	3153883
Colour	TCU	ND		5.0	3153887
Nitrate + Nitrite	mg/L	0.083		0.050	3153888
Nitrite (N)	mg/L	ND		0.010	3153889
Nitrogen (Ammonia Nitrogen)	mg/L	ND	ND	0.050	3153985
Total Organic Carbon (C)	mg/L	19 (1)		0.50	3155348
Orthophosphate (P)	mg/L	ND		0.010	3153886
pH	pH	7.10		N/A	3154464
Reactive Silica (SiO ₂)	mg/L	7.1		0.50	3153885
Dissolved Sulphate (SO ₄)	mg/L	17		2.0	3153884
Turbidity	NTU	>1000		10	3153973
Conductivity	uS/cm	430		1.0	3154465
Metals					
Dissolved Aluminum (Al)	ug/L	11.2		5.0	3152713

ND = Not detected
RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
QC Batch = Quality Control Batch
(1) The sample was decanted due to sediment content.

Maxxam Job #: B338124
Report Date: 2013/04/03

Stantec Consulting Ltd.
Client Project #: 1214

Your P.O. #: CALLUP#49
Sampler Initials: BM

ATL. RCAP-MS DISSOLVED (LABFILT) IN W

Maxxam ID		QV7679	QV7679		
Sampling Date		2013/03/13 13:45	2013/03/13 13:45		
COC Number		ES630412	ES630412		
	Units	BH 15	BH 15 Lab-Dup	RDL	QC Batch

Dissolved Antimony (Sb)	ug/L	ND		1.0	3152713
Dissolved Arsenic (As)	ug/L	3.0		1.0	3152713
Dissolved Barium (Ba)	ug/L	10.4		1.0	3152713
Dissolved Beryllium (Be)	ug/L	ND		1.0	3152713
Dissolved Bismuth (Bi)	ug/L	ND		2.0	3152713
Dissolved Boron (B)	ug/L	ND		50	3152713
Dissolved Cadmium (Cd)	ug/L	ND		0.017	3152713
Dissolved Calcium (Ca)	ug/L	10600		100	3152713
Dissolved Chromium (Cr)	ug/L	ND		1.0	3152713
Dissolved Cobalt (Co)	ug/L	ND		0.40	3152713
Dissolved Copper (Cu)	ug/L	ND		2.0	3152713
Dissolved Iron (Fe)	ug/L	ND		50	3152713
Dissolved Lead (Pb)	ug/L	1.00		0.50	3152713
Dissolved Magnesium (Mg)	ug/L	3900		100	3152713
Dissolved Manganese (Mn)	ug/L	234		2.0	3152713
Dissolved Molybdenum (Mo)	ug/L	ND		2.0	3152713
Dissolved Nickel (Ni)	ug/L	ND		2.0	3152713
Dissolved Phosphorus (P)	ug/L	ND		100	3152713
Dissolved Potassium (K)	ug/L	3130		100	3152713
Dissolved Selenium (Se)	ug/L	ND		1.0	3152713
Dissolved Silver (Ag)	ug/L	ND		0.10	3152713
Dissolved Sodium (Na)	ug/L	58800		100	3152713
Dissolved Strontium (Sr)	ug/L	48.6		2.0	3152713
Dissolved Thallium (Tl)	ug/L	ND		0.10	3152713
Dissolved Tin (Sn)	ug/L	ND		2.0	3152713
Dissolved Titanium (Ti)	ug/L	ND		2.0	3152713
Dissolved Uranium (U)	ug/L	ND		0.10	3152713
Dissolved Vanadium (V)	ug/L	ND		2.0	3152713
Dissolved Zinc (Zn)	ug/L	5.6		5.0	3152713

ND = Not detected
RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
QC Batch = Quality Control Batch

Maxxam Job #: B338124
Report Date: 2013/04/03

Stantec Consulting Ltd.
Client Project #: 1214

Your P.O. #: CALLUP#49
Sampler Initials: BM

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		QV7679		
Sampling Date		2013/03/13 13:45		
COC Number		ES630412		
	Units	BH 15	RDL	QC Batch

Metals				
Total Mercury (Hg)	ug/L	1.3	0.013	3155071
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

Maxxam Job #: B338124
Report Date: 2013/04/03

Stantec Consulting Ltd.
Client Project #: 1214

Your P.O. #: CALLUP#49
Sampler Initials: BM

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		QV7679		
Sampling Date		2013/03/13 13:45		
COC Number		ES630412		
	Units	BH 15	RDL	QC Batch

Polyaromatic Hydrocarbons				
1-Methylnaphthalene	ug/L	1.7	0.050	3152099
2-Methylnaphthalene	ug/L	ND (1)	0.20	3152099
Acenaphthene	ug/L	0.29	0.010	3152099
Acenaphthylene	ug/L	ND (1)	0.20	3152099
Anthracene	ug/L	ND (1)	0.080	3152099
Benzo(a)anthracene	ug/L	0.026	0.010	3152099
Benzo(a)pyrene	ug/L	0.021	0.010	3152099
Benzo(b)fluoranthene	ug/L	0.019	0.010	3152099
Benzo(g,h,i)perylene	ug/L	0.015	0.010	3152099
Benzo(j)fluoranthene	ug/L	0.011	0.010	3152099
Benzo(k)fluoranthene	ug/L	ND	0.010	3152099
Chrysene	ug/L	0.031	0.010	3152099
Dibenz(a,h)anthracene	ug/L	ND	0.010	3152099
Fluoranthene	ug/L	0.13	0.010	3152099
Fluorene	ug/L	0.56	0.010	3152099
Indeno(1,2,3-cd)pyrene	ug/L	0.011	0.010	3152099
Naphthalene	ug/L	ND (1)	0.40	3152099
Perylene	ug/L	ND	0.010	3152099
Phenanthrene	ug/L	0.14	0.010	3152099
Pyrene	ug/L	0.12	0.010	3152099
Surrogate Recovery (%)				
D10-Anthracene	%	98		3152099
D14-Terphenyl	%	119 (2)		3152099
D8-Acenaphthylene	%	102		3152099

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.
(2) PAH sample decanted due to sediment.

Maxxam Job #: B338124
Report Date: 2013/04/03

Stantec Consulting Ltd.
Client Project #: 1214

Your P.O. #: CALLUP#49
Sampler Initials: BM

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		QV7679		
Sampling Date		2013/03/13 13:45		
COC Number		ES630412		
	Units	BH 15	RDL	QC Batch

PCBs				
Total PCB	ug/L	ND	0.060	3154075
Surrogate Recovery (%)				
Decachlorobiphenyl	%	93 (1)		3154075

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) PCB sample contained sediment. Elevated PCB RDL due to insufficient sample.

Maxxam Job #: B338124
Report Date: 2013/04/03

Stantec Consulting Ltd.
Client Project #: 1214

Your P.O. #: CALLUP#49
Sampler Initials: BM

Package 1	7.6°C
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Each temperature is the average of up to three cooler temperatures taken at receipt

GENERAL COMMENTS

Results relate only to the items tested.

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 1214
P.O. #: CALLUP#49
Site Location:

Quality Assurance Report
Maxxam Job Number: ZB338124

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3152099 GTH	Matrix Spike	D10-Anthracene	2013/03/15		82	%	30 - 130
		D14-Terphenyl	2013/03/15		90 (1)	%	30 - 130
		D8-Acenaphthylene	2013/03/15		85	%	30 - 130
		1-Methylnaphthalene	2013/03/15		66	%	30 - 130
		2-Methylnaphthalene	2013/03/15		68	%	30 - 130
		Acenaphthene	2013/03/15		73	%	30 - 130
		Acenaphthylene	2013/03/15		78	%	30 - 130
		Anthracene	2013/03/15		73	%	30 - 130
		Benzo(a)anthracene	2013/03/15		NC	%	30 - 130
		Benzo(a)pyrene	2013/03/15		NC	%	30 - 130
		Benzo(b)fluoranthene	2013/03/15		58	%	30 - 130
		Benzo(g,h,i)perylene	2013/03/15		43 (2)	%	30 - 130
		Benzo(j)fluoranthene	2013/03/15		50	%	30 - 130
		Benzo(k)fluoranthene	2013/03/15		48 (2)	%	30 - 130
		Chrysene	2013/03/15		NC	%	30 - 130
		Dibenz(a,h)anthracene	2013/03/15		34 (2)	%	30 - 130
		Fluoranthene	2013/03/15		NC	%	30 - 130
		Fluorene	2013/03/15		70	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2013/03/15		37 (2)	%	30 - 130
		Naphthalene	2013/03/15		67	%	30 - 130
		Perylene	2013/03/15		48 (2)	%	30 - 130
		Phenanthrene	2013/03/15		NC	%	30 - 130
		Pyrene	2013/03/15		NC	%	30 - 130
	Spiked Blank	D10-Anthracene	2013/03/15		92	%	30 - 130
		D14-Terphenyl	2013/03/15		96	%	30 - 130
		D8-Acenaphthylene	2013/03/15		93	%	30 - 130
		1-Methylnaphthalene	2013/03/15		83	%	30 - 130
		2-Methylnaphthalene	2013/03/15		87	%	30 - 130
		Acenaphthene	2013/03/15		93	%	30 - 130
		Acenaphthylene	2013/03/15		83	%	30 - 130
		Anthracene	2013/03/15		83	%	30 - 130
		Benzo(a)anthracene	2013/03/15		79	%	30 - 130
		Benzo(a)pyrene	2013/03/15		83	%	30 - 130
		Benzo(b)fluoranthene	2013/03/15		85	%	30 - 130
		Benzo(g,h,i)perylene	2013/03/15		94	%	30 - 130
		Benzo(j)fluoranthene	2013/03/15		80	%	30 - 130
		Benzo(k)fluoranthene	2013/03/15		78	%	30 - 130
		Chrysene	2013/03/15		82	%	30 - 130
		Dibenz(a,h)anthracene	2013/03/15		75	%	30 - 130
		Fluoranthene	2013/03/15		84	%	30 - 130
		Fluorene	2013/03/15		93	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2013/03/15		81	%	30 - 130
		Naphthalene	2013/03/15		87	%	30 - 130
		Perylene	2013/03/15		84	%	30 - 130
		Phenanthrene	2013/03/15		95	%	30 - 130
		Pyrene	2013/03/15		87	%	30 - 130
	Method Blank	D10-Anthracene	2013/03/15		92	%	30 - 130
		D14-Terphenyl	2013/03/15		92	%	30 - 130
		D8-Acenaphthylene	2013/03/15		92	%	30 - 130
		1-Methylnaphthalene	2013/03/15	ND, RDL=0.050		ug/L	
		2-Methylnaphthalene	2013/03/15	ND, RDL=0.050		ug/L	
		Acenaphthene	2013/03/15	ND, RDL=0.010		ug/L	
		Acenaphthylene	2013/03/15	ND, RDL=0.010		ug/L	
		Anthracene	2013/03/15	ND, RDL=0.010		ug/L	
		Benzo(a)anthracene	2013/03/15	ND, RDL=0.010		ug/L	

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 1214
P.O. #: CALLUP#49
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: ZB338124

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3152099 GTH	Method Blank	Benzo(a)pyrene	2013/03/15	ND, RDL=0.010		ug/L	
		Benzo(b)fluoranthene	2013/03/15	ND, RDL=0.010		ug/L	
		Benzo(g,h,i)perylene	2013/03/15	ND, RDL=0.010		ug/L	
		Benzo(j)fluoranthene	2013/03/15	ND, RDL=0.010		ug/L	
		Benzo(k)fluoranthene	2013/03/15	ND, RDL=0.010		ug/L	
		Chrysene	2013/03/15	ND, RDL=0.010		ug/L	
		Dibenz(a,h)anthracene	2013/03/15	ND, RDL=0.010		ug/L	
		Fluoranthene	2013/03/15	ND, RDL=0.010		ug/L	
		Fluorene	2013/03/15	ND, RDL=0.010		ug/L	
		Indeno(1,2,3-cd)pyrene	2013/03/15	ND, RDL=0.010		ug/L	
		Naphthalene	2013/03/15	ND, RDL=0.20		ug/L	
		Perylene	2013/03/15	ND, RDL=0.010		ug/L	
		Phenanthrene	2013/03/15	ND, RDL=0.010		ug/L	
		Pyrene	2013/03/15	ND, RDL=0.010		ug/L	
	RPD	Acenaphthylene	2013/03/15	NC		%	40
		Anthracene	2013/03/15	NC		%	40
		Fluorene	2013/03/15	NC		%	40
		Naphthalene	2013/03/15	NC		%	40
		Phenanthrene	2013/03/15	NC (3)		%	40
3152713 DLB	Matrix Spike	Pyrene	2013/03/15	NC		%	40
		Dissolved Aluminum (Al)	2013/03/19		100	%	80 - 120
		Dissolved Antimony (Sb)	2013/03/19		109	%	80 - 120
		Dissolved Arsenic (As)	2013/03/19		97	%	80 - 120
		Dissolved Barium (Ba)	2013/03/19		103	%	80 - 120
		Dissolved Beryllium (Be)	2013/03/19		103	%	80 - 120
		Dissolved Bismuth (Bi)	2013/03/19		98	%	80 - 120
		Dissolved Boron (B)	2013/03/19		103	%	80 - 120
		Dissolved Cadmium (Cd)	2013/03/19		96	%	80 - 120
		Dissolved Calcium (Ca)	2013/03/19		NC	%	80 - 120
		Dissolved Chromium (Cr)	2013/03/19		99	%	80 - 120
		Dissolved Cobalt (Co)	2013/03/19		96	%	80 - 120
		Dissolved Copper (Cu)	2013/03/19		94	%	80 - 120
		Dissolved Iron (Fe)	2013/03/19		102	%	80 - 120
		Dissolved Lead (Pb)	2013/03/19		97	%	80 - 120
		Dissolved Magnesium (Mg)	2013/03/19		NC	%	80 - 120
		Dissolved Manganese (Mn)	2013/03/19		NC	%	80 - 120
		Dissolved Molybdenum (Mo)	2013/03/19		109	%	80 - 120
		Dissolved Nickel (Ni)	2013/03/19		94	%	80 - 120
		Dissolved Phosphorus (P)	2013/03/19		104	%	80 - 120
	Spiked Blank	Dissolved Potassium (K)	2013/03/19		NC	%	80 - 120
		Dissolved Selenium (Se)	2013/03/19		97	%	80 - 120
		Dissolved Silver (Ag)	2013/03/19		105	%	80 - 120
		Dissolved Sodium (Na)	2013/03/19		NC	%	80 - 120
		Dissolved Strontium (Sr)	2013/03/19		94	%	80 - 120
		Dissolved Thallium (Tl)	2013/03/19		100	%	80 - 120
		Dissolved Tin (Sn)	2013/03/19		107	%	80 - 120
		Dissolved Titanium (Ti)	2013/03/19		101	%	80 - 120
		Dissolved Uranium (U)	2013/03/19		103	%	80 - 120
		Dissolved Vanadium (V)	2013/03/19		101	%	80 - 120
		Dissolved Zinc (Zn)	2013/03/19		98	%	80 - 120
		Dissolved Aluminum (Al)	2013/03/19		101	%	80 - 120
		Dissolved Antimony (Sb)	2013/03/19		104	%	80 - 120
		Dissolved Arsenic (As)	2013/03/19		95	%	80 - 120
		Dissolved Barium (Ba)	2013/03/19		96	%	80 - 120
		Dissolved Beryllium (Be)	2013/03/19		100	%	80 - 120

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 1214
P.O. #: CALLUP#49
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: ZB338124

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3152713 DLB	Spiked Blank	Dissolved Bismuth (Bi)	2013/03/19		100	%	80 - 120
		Dissolved Boron (B)	2013/03/19		100	%	80 - 120
		Dissolved Cadmium (Cd)	2013/03/19		97	%	80 - 120
		Dissolved Calcium (Ca)	2013/03/19		85	%	80 - 120
		Dissolved Chromium (Cr)	2013/03/19		99	%	80 - 120
		Dissolved Cobalt (Co)	2013/03/19		96	%	80 - 120
		Dissolved Copper (Cu)	2013/03/19		95	%	80 - 120
		Dissolved Iron (Fe)	2013/03/19		105	%	80 - 120
		Dissolved Lead (Pb)	2013/03/19		97	%	80 - 120
		Dissolved Magnesium (Mg)	2013/03/19		104	%	80 - 120
		Dissolved Manganese (Mn)	2013/03/19		98	%	80 - 120
		Dissolved Molybdenum (Mo)	2013/03/19		107	%	80 - 120
		Dissolved Nickel (Ni)	2013/03/19		97	%	80 - 120
		Dissolved Phosphorus (P)	2013/03/19		103	%	80 - 120
		Dissolved Potassium (K)	2013/03/19		100	%	80 - 120
		Dissolved Selenium (Se)	2013/03/19		95	%	80 - 120
		Dissolved Silver (Ag)	2013/03/19		104	%	80 - 120
		Dissolved Sodium (Na)	2013/03/19		102	%	80 - 120
		Dissolved Strontium (Sr)	2013/03/19		94	%	80 - 120
		Dissolved Thallium (Tl)	2013/03/19		100	%	80 - 120
		Dissolved Tin (Sn)	2013/03/19		103	%	80 - 120
		Dissolved Titanium (Ti)	2013/03/19		102	%	80 - 120
		Dissolved Uranium (U)	2013/03/19		101	%	80 - 120
		Dissolved Vanadium (V)	2013/03/19		99	%	80 - 120
		Dissolved Zinc (Zn)	2013/03/19		102	%	80 - 120
	Method Blank	Dissolved Aluminum (Al)	2013/03/19	ND, RDL=5.0		ug/L	
		Dissolved Antimony (Sb)	2013/03/19	ND, RDL=1.0		ug/L	
		Dissolved Arsenic (As)	2013/03/19	ND, RDL=1.0		ug/L	
		Dissolved Barium (Ba)	2013/03/19	ND, RDL=1.0		ug/L	
		Dissolved Beryllium (Be)	2013/03/19	ND, RDL=1.0		ug/L	
		Dissolved Bismuth (Bi)	2013/03/19	ND, RDL=2.0		ug/L	
		Dissolved Boron (B)	2013/03/19	ND, RDL=50		ug/L	
		Dissolved Cadmium (Cd)	2013/03/19	ND, RDL=0.017		ug/L	
		Dissolved Calcium (Ca)	2013/03/19	ND, RDL=100		ug/L	
		Dissolved Chromium (Cr)	2013/03/19	ND, RDL=1.0		ug/L	
		Dissolved Cobalt (Co)	2013/03/19	ND, RDL=0.40		ug/L	
		Dissolved Copper (Cu)	2013/03/19	ND, RDL=2.0		ug/L	
		Dissolved Iron (Fe)	2013/03/19	ND, RDL=50		ug/L	
		Dissolved Lead (Pb)	2013/03/19	ND, RDL=0.50		ug/L	
		Dissolved Magnesium (Mg)	2013/03/19	ND, RDL=100		ug/L	
		Dissolved Manganese (Mn)	2013/03/19	ND, RDL=2.0		ug/L	
		Dissolved Molybdenum (Mo)	2013/03/19	ND, RDL=2.0		ug/L	
		Dissolved Nickel (Ni)	2013/03/19	ND, RDL=2.0		ug/L	
		Dissolved Phosphorus (P)	2013/03/19	ND, RDL=100		ug/L	
		Dissolved Potassium (K)	2013/03/19	ND, RDL=100		ug/L	
		Dissolved Selenium (Se)	2013/03/19	ND, RDL=1.0		ug/L	
		Dissolved Silver (Ag)	2013/03/19	ND, RDL=0.10		ug/L	
		Dissolved Sodium (Na)	2013/03/19	ND, RDL=100		ug/L	
		Dissolved Strontium (Sr)	2013/03/19	ND, RDL=2.0		ug/L	
		Dissolved Thallium (Tl)	2013/03/19	ND, RDL=0.10		ug/L	
		Dissolved Tin (Sn)	2013/03/19	ND, RDL=2.0		ug/L	
		Dissolved Titanium (Ti)	2013/03/19	ND, RDL=2.0		ug/L	
		Dissolved Uranium (U)	2013/03/19	ND, RDL=0.10		ug/L	
		Dissolved Vanadium (V)	2013/03/19	ND, RDL=2.0		ug/L	
		Dissolved Zinc (Zn)	2013/03/19	ND, RDL=5.0		ug/L	

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 1214
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Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: ZB338124

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3152713 DLB	RPD	Dissolved Aluminum (Al)	2013/03/19	NC		%	20
		Dissolved Antimony (Sb)	2013/03/19	NC		%	20
		Dissolved Arsenic (As)	2013/03/19	NC		%	20
		Dissolved Barium (Ba)	2013/03/19	1.1		%	20
		Dissolved Beryllium (Be)	2013/03/19	NC		%	20
		Dissolved Bismuth (Bi)	2013/03/19	NC		%	20
		Dissolved Boron (B)	2013/03/19	NC		%	20
		Dissolved Cadmium (Cd)	2013/03/19	NC		%	20
		Dissolved Calcium (Ca)	2013/03/19	1.4		%	20
		Dissolved Chromium (Cr)	2013/03/19	NC		%	20
		Dissolved Cobalt (Co)	2013/03/19	1.1		%	20
		Dissolved Copper (Cu)	2013/03/19	NC		%	20
		Dissolved Iron (Fe)	2013/03/19	NC		%	20
		Dissolved Lead (Pb)	2013/03/19	NC		%	20
		Dissolved Magnesium (Mg)	2013/03/19	0.2		%	20
		Dissolved Manganese (Mn)	2013/03/19	0.7		%	20
		Dissolved Molybdenum (Mo)	2013/03/19	NC		%	20
		Dissolved Nickel (Ni)	2013/03/19	NC		%	20
		Dissolved Phosphorus (P)	2013/03/19	NC		%	20
		Dissolved Potassium (K)	2013/03/19	0.02		%	20
		Dissolved Selenium (Se)	2013/03/19	NC		%	20
		Dissolved Silver (Ag)	2013/03/19	NC		%	20
		Dissolved Sodium (Na)	2013/03/19	0.4		%	20
		Dissolved Strontium (Sr)	2013/03/19	0.5		%	20
		Dissolved Thallium (Tl)	2013/03/19	NC		%	20
		Dissolved Tin (Sn)	2013/03/19	NC		%	20
		Dissolved Titanium (Ti)	2013/03/19	NC		%	20
		Dissolved Uranium (U)	2013/03/19	NC		%	20
		Dissolved Vanadium (V)	2013/03/19	NC		%	20
		Dissolved Zinc (Zn)	2013/03/19	NC		%	20
3153836 SHF	Spiked Blank	Aliphatic >C10-C12	2013/03/26		84	%	30 - 130
		Aliphatic >C12-C16	2013/03/26		82	%	30 - 130
		Aliphatic >C16-C21	2013/03/26		90	%	30 - 130
		Aliphatic >C21-<C32	2013/03/26		96	%	30 - 130
		Aromatic >C10-C12	2013/03/26		102	%	30 - 130
		Aromatic >C12-C16	2013/03/26		99	%	30 - 130
		Aromatic >C16-C21	2013/03/26		101	%	30 - 130
		Aromatic >C21-<C32	2013/03/26		101	%	30 - 130
	Method Blank	Isobutylbenzene - Extractable	2013/03/26		75	%	30 - 130
		n-Dotriacontane - Extractable	2013/03/26		80	%	30 - 130
	RPD	Aliphatic >C10-C12	2013/03/26	ND, RDL=0.010		mg/L	
		Aliphatic >C12-C16	2013/03/26	ND, RDL=0.050		mg/L	
		Aliphatic >C16-C21	2013/03/26	ND, RDL=0.050		mg/L	
		Aliphatic >C21-<C32	2013/03/26	ND, RDL=0.10		mg/L	
		Aromatic >C10-C12	2013/03/26	ND, RDL=0.010		mg/L	
		Aromatic >C12-C16	2013/03/26	ND, RDL=0.050		mg/L	
		Aromatic >C16-C21	2013/03/26	ND, RDL=0.050		mg/L	
		Aromatic >C21-<C32	2013/03/26	ND, RDL=0.10		mg/L	
		Aliphatic >C10-C12	2013/03/26	19.4 (4)		%	40
		Aliphatic >C12-C16	2013/03/26	NC (4)		%	40
		Aliphatic >C16-C21	2013/03/26	NC (4)		%	40
		Aliphatic >C21-<C32	2013/03/26	NC (4)		%	40
		Aromatic >C10-C12	2013/03/26	14.7 (4)		%	40
		Aromatic >C12-C16	2013/03/26	NC (4)		%	40
		Aromatic >C16-C21	2013/03/26	NC (4)		%	40

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Quality Assurance Report (Continued)

Maxxam Job Number: ZB338124

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3153836 SHF	RPD	Aromatic >C21-<C32	2013/03/26	NC (4)		%	40
3153879 ALG	Matrix Spike	Total Alkalinity (Total as CaCO3)	2013/03/21		NC	%	80 - 120
	QC Standard	Total Alkalinity (Total as CaCO3)	2013/03/21		98	%	80 - 120
	Spiked Blank	Total Alkalinity (Total as CaCO3)	2013/03/21		104	%	80 - 120
	Method Blank	Total Alkalinity (Total as CaCO3)	2013/03/21	ND, RDL=5.0		mg/L	
	RPD	Total Alkalinity (Total as CaCO3)	2013/03/21	NC		%	25
3153883 ARS	Matrix Spike	Dissolved Chloride (Cl)	2013/03/18		NC	%	80 - 120
	QC Standard	Dissolved Chloride (Cl)	2013/03/18		99	%	80 - 120
	Spiked Blank	Dissolved Chloride (Cl)	2013/03/18		101	%	80 - 120
	Method Blank	Dissolved Chloride (Cl)	2013/03/18	ND, RDL=1.0		mg/L	
	RPD	Dissolved Chloride (Cl)	2013/03/18	0.5		%	25
3153884 ARS	Matrix Spike	Dissolved Sulphate (SO4)	2013/03/19		NC	%	80 - 120
	QC Standard	Dissolved Sulphate (SO4)	2013/03/19		100	%	80 - 120
	Spiked Blank	Dissolved Sulphate (SO4)	2013/03/19		100	%	80 - 120
	Method Blank	Dissolved Sulphate (SO4)	2013/03/19	ND, RDL=2.0		mg/L	
	RPD	Dissolved Sulphate (SO4)	2013/03/19	1.1		%	25
3153885 ARS	Matrix Spike	Reactive Silica (SiO2)	2013/03/19		NC	%	80 - 120
	Spiked Blank	Reactive Silica (SiO2)	2013/03/19		99	%	80 - 120
	Method Blank	Reactive Silica (SiO2)	2013/03/19	ND, RDL=0.50		mg/L	
	RPD	Reactive Silica (SiO2)	2013/03/19	7.6		%	25
3153886 MCY	Matrix Spike	Orthophosphate (P)	2013/03/21		94	%	80 - 120
	Spiked Blank	Orthophosphate (P)	2013/03/21		95	%	80 - 120
	Method Blank	Orthophosphate (P)	2013/03/21	ND, RDL=0.010		mg/L	
	RPD	Orthophosphate (P)	2013/03/21	NC		%	25
3153887 MCY	QC Standard	Colour	2013/03/19		105	%	80 - 120
	Method Blank	Colour	2013/03/19	ND, RDL=5.0		TCU	
	RPD	Colour	2013/03/19	NC		%	25
3153888 ARS	Matrix Spike	Nitrate + Nitrite	2013/03/20		99	%	80 - 120
	Spiked Blank	Nitrate + Nitrite	2013/03/20		97	%	80 - 120
	Method Blank	Nitrate + Nitrite	2013/03/20	0.053, RDL=0.050		mg/L	
	RPD	Nitrate + Nitrite	2013/03/20	NC		%	25
3153889 ARS	Matrix Spike	Nitrite (N)	2013/03/18		101	%	80 - 120
	Spiked Blank	Nitrite (N)	2013/03/18		98	%	80 - 120
	Method Blank	Nitrite (N)	2013/03/18	ND, RDL=0.010		mg/L	
	RPD	Nitrite (N)	2013/03/18	NC		%	25
3153973 SCR	QC Standard	Turbidity	2013/03/18		100	%	80 - 120
	RPD	Turbidity	2013/03/18	4.4		%	25
3153985 ARS	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2013/03/18		103	%	80 - 120
	QC Standard	Nitrogen (Ammonia Nitrogen)	2013/03/18		103	%	80 - 120
	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2013/03/18		102	%	80 - 120
	Method Blank	Nitrogen (Ammonia Nitrogen)	2013/03/18	ND, RDL=0.050		mg/L	
	RPD [QV7679-05]	Nitrogen (Ammonia Nitrogen)	2013/03/18	NC		%	25
3154075 BGR	Matrix Spike	Decachlorobiphenyl	2013/03/20		68	%	30 - 130
		Total PCB	2013/03/20		104	%	70 - 130
	Spiked Blank	Decachlorobiphenyl	2013/03/20		74	%	30 - 130
		Total PCB	2013/03/20		107	%	70 - 130
	Method Blank	Decachlorobiphenyl	2013/03/20		67	%	30 - 130
		Total PCB	2013/03/20	ND, RDL=0.050		ug/L	
	RPD	Total PCB	2013/03/20	NC		%	40
3154464 SCR	QC Standard	pH	2013/03/18		100	%	80 - 120
	RPD	pH	2013/03/18	0.5		%	25
3154465 SCR	Spiked Blank	Conductivity	2013/03/18		100	%	80 - 120
	Method Blank	Conductivity	2013/03/18	1.2, RDL=1.0		uS/cm	
	RPD	Conductivity	2013/03/18	0.3		%	25

Stantec Consulting Ltd.
Attention: Carolyn Anstey-Moore
Client Project #: 1214
P.O. #: CALLUP#49
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: ZB338124

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3155071 MKH	Matrix Spike	Total Mercury (Hg)	2013/03/12		101	%	80 - 120
	QC Standard	Total Mercury (Hg)	2013/03/12		99	%	80 - 120
	Spiked Blank	Total Mercury (Hg)	2013/03/12		101	%	80 - 120
	Method Blank	Total Mercury (Hg)	2013/03/12	ND, RDL=0.013		ug/L	
	RPD	Total Mercury (Hg)	2013/03/12	NC		%	25
3155348 CRA	Matrix Spike	Total Organic Carbon (C)	2013/03/19		NC	%	80 - 120
	Spiked Blank	Total Organic Carbon (C)	2013/03/19		89	%	80 - 120
	Method Blank	Total Organic Carbon (C)	2013/03/19	ND, RDL=0.50		mg/L	
	RPD	Total Organic Carbon (C)	2013/03/19	NC (5)		%	25
3158098 MSK	Spiked Blank	Isobutylbenzene - Volatile	2013/03/21		105	%	70 - 130
		Benzene	2013/03/21		104	%	70 - 130
		Toluene	2013/03/21		113	%	70 - 130
		Ethylbenzene	2013/03/21		113	%	70 - 130
		Xylene (Total)	2013/03/21		112	%	70 - 130
	Method Blank	Isobutylbenzene - Volatile	2013/03/21		103	%	70 - 130
		Benzene	2013/03/21	ND, RDL=0.0010		mg/L	
		Toluene	2013/03/21	ND, RDL=0.0010		mg/L	
		Ethylbenzene	2013/03/21	ND, RDL=0.0010		mg/L	
		Xylene (Total)	2013/03/21	ND, RDL=0.0020		mg/L	
		Aliphatic >C6-C8	2013/03/21	ND, RDL=0.010		mg/L	
		Aliphatic >C8-C10	2013/03/21	ND, RDL=0.010		mg/L	
		>C8-C10 Aromatics (-EX)	2013/03/21	ND, RDL=0.010		mg/L	

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.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

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 spiked amount was not sufficiently significant to permit a reliable recovery calculation.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

(1) PAH sample contained sediment.

(2) Matrix Spike: results are outside acceptance limit. Insufficient sample for repeat analysis.

(3) Elevated PAH RDL(s) due to matrix / co-extractive interference.

(4) Elevated TEH RDL(s) due to matrix interference. Elevated TEH RDL(s) due to limited sample.

(5) Elevated reporting limit due to sample matrix.