Implementation of the Remedial Action Plan – Year 6, Former U.S. Military Site, Hopedale, NL

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Executive Summary

Aivek Stantec Limited Partnership (Stantec) was retained by the Newfoundland and Labrador Department of Municipal Affairs and Environment (NLDMAE) to monitor environmental site remediation and conduct confirmatory sampling during Year 6 of the Implementation of the Remedial Action Plan (RAP) at the Former United States (U.S.) Military Site in Hopedale, Newfoundland and Labrador (NL) (the "Site") (see Drawing No. 121413099-800-EE-01 in Appendix A). The remediation program was carried out in response to a Remedial Action Plan/Risk Management Plan (RAP/RMP) prepared for the Site in 2010 (refer to Stantec Report No. 121410103, dated May 17, 2010).

The scope of work for Year 6 of the Implementation of the Remedial Action Plan was as follows:

1. Biopile Maintenance and Monitoring

    - Collect eight (8) representative soil samples from the impacted material within the biopile and submit for laboratory analysis of TPH/BTEX to document baseline petroleum hydrocarbon concentrations;
    - Supervise the addition of fertilizer/nutrients to the biopile and biopile cover installation; and,
    - Perform biopile maintenance and monitoring, as required.

2. Remediation of PCB-Impacted Soil

    - Supervise the remediation of PCB-impacted soil at Main Base-Area 1, Main Base-Area 4, Main Base-Area 5, POL West-Area 1, Old Base-Area 1 and Old Base-Area 2, in accordance with budget allowances;
    - Collect confirmatory soil samples from the final limits of the excavations and submit for analysis of Total PCBs (rush turnaround time); and,
    - Once confirming results have been received, monitor the backfilling of the excavations with clean fill material (to be sourced from the Community of Hopedale) or site grading, as necessary.

Note that PCB-impacted soil at Main Base-Area 5 was not completed in Year 6 due to the tonnage allowance restriction. As well, backfilling was only completed in areas that were fully remediated in Year 6 in order to reduce the potential for contamination of clean material. Topsoil was not placed in Year 6 due to wet conditions at the time remediation was completed and the increased potential for soil erosion. It is expected that these items will be completed once remediation is completed during subsequent years of the Implementation of the RAP.

Stantec personnel were onsite during site remediation between July 7 to 22, 2016. The loading of the PCB-impacted soil to the ship took place in two events being between July 30 and August 1, 2016 and on September 20, 2016, of which Stantec was pnly present for the first shipment. The metal debris was packaged in a container and was transported to Lewisporte, NL via the Astron

during the week of September 18, 2016 by the on-site contractor. Remedial activities were undertaken by Sanexen Environmental Services Inc. (Sanexen) of Brossard, Quebec (QC), who engaged Budgell's Equipment and Rentals (Budgell's) of Triton, NL and local hires. Stantec personnel maintained a record of activities while on-site and collected confirmatory soil samples.

The following is a summary of remedial and on-site activities carried out at the Site in Year 6.

1. The existing biopile was sampled following NLDMAE's standard COA for soil treatment facilities. Concentrations of TPH in the composite soil samples exceeded 1,000 mg/kg; therefore, the soil required additional treatment before it could be disposed. Biopile maintenance activities, consisting of the addition of specified nutrients and mechanical aeration were carried out following the placement of TPH-impacted soil in the biopile containment cell.
2. A total of 1,227 tonnes of PCB-impacted soil was removed from the northeast, centre and northwest areas of Main Base-Area 1, Main Base-Area 4, POLW-Area 1 and Old Base 1-Areas 1 and 2 and was transported to Saint-Ambroise, QC by sea for PCB destruction. Confirmatory soil sampling was carried out along the limits of the remedial excavation to determine if the soil remaining on-site contained concentrations of PCBs below the residential site specific target level (SSTL) of 9 mg/kg. To meet the SSTL, additional soil removal is required to the centre of the Main Base-Area 1 excavation in the vicinity of samples 15-MB-110, 16-MB-107, 16-MB-108, 16-MB-BS113, 16-MB-117 to 16-MB-119 and to the northeast of the Main Base-Area 1 excavation in the vicinity of samples 16-BS105, 16-MB-BS114, 16-MB-BS116, 16-MB-BS121. PCB-soil removal is also required in the vicinity of samples 6546 (referred to as "Main Base-Area 5") and Pit No. 1 used as a laydown area for the PCB-impacted soil. These areas have not yet been remediated. Sludge removal is required at the septic tank along the northern of the Main Base (referred to as "Main Base-Area 6").
3. Metal debris removed from the PCB remedial excavation at Main Base was stockpiled on tarps at the Laydown Area at Pit No. 1 during the remediation activities along with debris stockpiled from Years 4 and 5. The metal debris had a weight of 27.32 tonnes and was shipped from Hopedale, NL to a licensed metal recycling facility in St. John's, NL. Boulders were placed at the entrance to Pit No.1 to block public access over the winter months.

Recommendations

Based on the results of the Year 6 of the Implementation of the RAP program, Stantec makes the following recommendations:

1. Complete the removal of TPH-impacted soil exceeding the ecological SSTL of 1,700 mg/kg in areas specified for remediation at BMEWS (estimated 243 tonnes), Main Base (estimated 722 tonnes) and Pit No. 3 (estimated 7,700 tonnes) as per Table 5.1. Once clean boundaries are obtained, return the site to its original condition. This will include backfilling, levelling and/or the placement of topsoil, as necessary.

2. Complete the removal of PCB-impacted soil exceeding the residential SSTL of 9 mg/kg at Main Base (estimated 484 tonnes) and Pit No. 1 (estimated 547 tonnes) as per Table 5.1. Once clean boundaries are obtained, return the Site to its original condition. This will include backfilling, levelling and/or the placement of topsoil, as necessary.
3. Complete the removal of metals-impacted soil exceeding the ecological SSTLs of 1.3 mg/kg for cadmium, 20 mg/kg for chromium and 75 mg/kg for lead at the Mid-Canada Line (estimated 17 tonnes) as per Table 5.1. Once clean boundaries are obtained, return the Site to its original condition. This will include backfilling, levelling and/or the placement of topsoil, as necessary.
4. Monitor concentrations of TPH in the biopile and perform maintenance activities, as necessary. Collect composite soil samples for the laboratory analysis of metals leachability to confirm disposal options.
5. Once site remediation is complete, re-evaluate area- and site-wide EPCs for comparison to the SSTLs.
6. Continue remediation efforts at the Former U.S. Military Site in accordance with the RAP/RMP and the recommendations provided by the Stakeholder Scientific Advisory Working Group.

The statements made in the Executive Summary are subject to the same limitations included in the Closure Section 7.0 and are to be read in conjunction with the remainder of this report.

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1.0 INTRODUCTION

Aivek Stantec Limited Partnership (Stantec) was retained by the Newfoundland and Labrador Department of Municipal Affairs and Environment (NLDMAE) to monitor environmental site remediation and conduct confirmatory sampling during Year 6 of the Implementation of the Remedial Action Plan (RAP) at the Former United States (U.S.) Military Site in Hopedale, Newfoundland and Labrador (NL) (the "Site") (see Drawing No. 121413099-800-EE-01 in Appendix A). The remediation program was carried out in response to a Remedial Action Plan/Risk Management Plan (RAP/RMP) prepared for the Site in 2010 (refer to Stantec Report No. 121410103, dated May 17, 2010).

The following report describes the work completed during Year 6 of the Implementation of the RAP field program and was prepared specifically and solely for the above project. It presents the factual findings and laboratory results of the field work completed at the Site between July and August 2016.

1.1 Site Description and History

The Inuit Community of Hopedale is located on the Labrador coast, 148 air miles to the north of Goose Bay, Labrador and has no outside road access. Coastal boat service is available to the community from mid-summer to late fall.

Construction of a military base and radar site in Hopedale, NL commenced in 1952 and was completed in 1957. The military base and radar site in Hopedale was a station on the United States Air Force (USAF) Pinetree Line and was also the most easterly site on the Mid-Canada Line of antennae stations which had extended across the country. The military base and radar site was one of a series of sites that functioned as a Ballistic Missile Early Warning System (BMEWS) where enemy aircraft penetrating the northeastern approaches to the continent were identified and information was communicated to the United States. It has been reported that, during peak operations, the Site housed up to 300 personnel.

In Hopedale, the Former U.S. Military Site consists of three (3) main hilltop installations located north of the community, with various support sites located along the gravel road that extends from the wharf up to the hilltop sites. The three (3) hilltop installations of the Former U.S. Military Site are elevated between 100 m and 150 m above sea level, and include (from west to east): the BMEWS area, the Main Base and the Mid-Canada Line antennae area.

The military base and radar site in Hopedale were operated from 1957 until 1969 by the United States government. The base was closed down in 1969 and the radome and radar antennae were removed. Portions of the remaining site were operated by Canadian Marconi as a telecommunications site until 1972 and by ITT as a telecommunications site until 1975. The

complex was finally closed in 1975. Most of the remaining aboveground structures were demolished and buried in several undocumented locations throughout the Site in the mid-1980s. At that time, limited clean-up efforts were carried out and included the removal and disposal of polychlorinated biphenyl (PCB)-containing transformers. Currently remaining at the Former U.S. Military Site are the foundations and floor slabs of buildings and the foundations and bases of antennae. Two (2) antennae, with associated operations buildings and satellite dishes, are currently being operated by Bell Aliant in the BMEWS area. Four (4) antennae, with associated operations buildings and a helicopter pad, are currently being operated by Nav Canada in the Mid-Canada Line area.

The natural environment in Hopedale is typical of Labrador Coastal Barrens. Bedrock is granite and gneiss, and is largely exposed. Where present, soil cover on the hills is relatively thin (generally < 0.5 m), with accumulations of rock, gravel, sand and organic matter in low lying areas. Deeply incised U-shaped valleys occur in conjunction with steep-sided, rounded mountains and fjords that extend well inland. Large bogs can be found in the low-lying areas.

Drainage from the BMEWS area is in all directions (i.e., to the north, east, south and west), including to the south towards the community's main drinking water supply source, Reservoir Lake (approximately 300 m to the south). Drainage from the Main Base and Mid-Canada Line is in all directions, including to the south and southwest towards the Small Pond Bog, which empties into the stream that flows through the Residential Subdivision and empties into Hopedale Harbour.

During Year 6 of the Implementation of the RAP, remedial activities were carried out in two (2) areas of the Former U.S. Military Site: the Main Base and the Old Base 1. The former Helicopter Pad/Pit No. 1 was used as a staging area for the temporary storage of impacted materials. Test pits were placed at the biopile to determine if petroleum hydrocarbon concentrations were low enough to dispose of the soil to the landfill. Sample location plans showing the locations of current samples as well as general site features and sample locations from previous site investigations are provided in Drawing Nos. 121413099-800-EE-03 to 121413099-800-EE-11 in Appendix A.

The Main Base (also referred to as "the old base", "the upper site" and the "TACAN site" in previous environmental reports) has an area of approximately 45 hectares and is located on the top of a hill approximately 600 m northeast of a Residential Subdivision in the Community of Hopedale. The Main Base served as the Tactical Air Navigation Site (TACAN) when the Site was operational and included the radar complex, maintenance building, generator building, accommodations buildings and several additional buildings required to service the complex. Currently remaining former site infrastructure include concrete foundations. Terrain near the Main Base is moderately sloped and surface drainage (apparent groundwater flow direction) appears to be in all directions. There are distinct drainage courses in the Main Base area that drain to the northwest through the former sewage outfall area, to the southeast towards Pit No. 2

and to the southwest. The area consists of gravel, bedrock outcrops and low vegetation and alders.

Old Base 1 is located on a rock outcrop, southwest of the Main Base area. Old Base 1 formerly consisted of a troposcanner communications dish and possibly an emergency shelter for the United States Air Force (USAF). The concrete communications dish foundations are currently remaining. During previous environmental investigations, a tar-like spill was discovered flowing down a rock outcrop northeast of the communications dish foundations. The spill material was reported as having very high PCB levels (1,020,000 mg/kg) (ESG, 2006). In 2009, the PCB-impacted tar was removed from the Site. PCB-impacted tar and rock were manually removed from the surface of bedrock using hand scrapers and powered chippers.

A Laydown Area was established at the Pit No. 1/Helipad site during Year 1 of the Implementation of the RAP to temporarily store PCB-impacted soil pending shipment out of Hopedale. The Pit No. 1/Helipad area is located off of the main access road. The area is a heavily worked area consisting of gravel and boulders with low vegetation along the perimeter. Terrain in the area is relatively flat, with pooled water along the northwest boundary of the area and a steep drop to the southeast. Surface drainage (apparent groundwater flow direction) is expected to be to the southeast towards Pit No. 3. This area has been identified as a possible former waste site/drum storage area (ESG, 2007).

In 2011, a temporary biopile was constructed adjacent to the community's landfill to receive 5,322 tonnes of total petroleum hydrocarbon (TPH)-impacted soil from the Old School Site in Hopedale, NL (project completed on behalf of the Newfoundland and Labrador Department of Education). *Ex-situ* soil treatment was carried out in the biopile using enhanced natural attenuation. The biopile consists of one (1) containment cell that measures approximately 61 m long by 22 m wide by 2.5 m deep. In 2014, the biopile was sampled following NLDMAE's (formerly Department of Environment and Conservation) standard Certificate of Approval (COA) for soil treatment facilities and concentrations of TPH in the composite soil samples were below the landfill acceptance criteria of 1,000 mg/kg. Approvals were obtained from the Happy Valley-Goose Bay Government Service Centre (now Service NL) and the Inuit Community Government of Hopedale to dispose of treated soil in the Hopedale landfill. Soil was transported to the landfill on October 7, 2014 and was stockpiled in a designated area for use as landfill cover material. A 450 mm thick layer of soil was left in place at the bottom of the biopile containment cell to minimize the risk of damage to the bottom liner. In 2014 during Year 4 of the implementation of the remedial action plan, approximately 1,700 tonnes of TPH-impacted soil was removed from impacted areas of the Site (BMEWS, the Main Base and the POL Compound) and placed in the biopile containment cell for treatment. Biopile maintenance activities, consisting of the addition of specified nutrients and mechanical aeration, were carried out following the placement of TPH-impacted soil. A cover was placed over the biopile and was secured in place using clean sand. The cell is constructed with impermeable high density polyethylene (HDPE) liners that extend over perimeter berms with an approximate 1:1 slope. An entrance ramp with a 4:1 slope is present along the southeast portion of the cell. The ground

surface surrounding the biopile slopes slightly towards the northeast and is covered with grass, shrubs and some trees. The biopile is bordered by the local landfill to the west, a cemetery to the east and undeveloped land to the northeast and south/southwest. A northeast flowing drainage ditch runs around the biopile, through the local landfill and empties into the waters of Black Head Tickle.

1.2 Previous Environmental Investigations

Several environmental assessment reports have been produced (mainly since 1996) relating to potential and actual contamination at and in the vicinity of the Former U.S. Military Site and Residential Subdivision in Hopedale, Labrador. In 2009 and 2010, Stantec conducted a Phase II/III Environmental Site Assessment (ESA), Human Health and Ecological Risk Assessment (HHERA) and Remedial Action Plan/Risk Management Plan (RAP/RMP) at the Former U.S. Military Site and Residential Subdivision on behalf of the NLDMAE (refer to Stantec, 2010). Stantec also supervised limited-remediation of PCB-impacted tar in three (3) areas of the site at that time and the removal of total of three (3) tandem dump truck loads of debris from the stream in the Residential Subdivision (surficial debris) and from test pits excavated in the Residential Subdivision (excavated debris).

For the purposes of the 2010 human health risk assessment, the Site was divided into the following two (2) areas to adequately reflect the expected human exposure time and activities: the "Residential Area" where residents of Hopedale would be expected to spend the majority of their time and the "Former Radar Site" where residents of Hopedale would be expected to occasionally visit for recreational purposes (e.g., berry picking, hunting, walking). Ecological receptors with relatively small home ranges could spend their entire life in one particular portion of the Site; therefore, the Site was divided into three (3) areas for the purposes of risk modelling for ecological receptors with relatively small home ranges. Representative Exposure Point Concentrations (EPCs) were used to evaluate potential risks associated with COCs in the various media. An EPC is an estimate of a reasonable upper limit value for the average chemical concentration in the medium, determined for each exposure unit (USEPA, 1989). The appropriate upper confidence limit (UCL) provides reasonable confidence that the true site average will not be underestimated (USEPA, 1992). The results of the HHERA indicated the potential for adverse risks to human and/or ecological receptors from exposure to TPH, PCBs and/or metals impacts at the Site; therefore, precautionary actions, remedial activities and risk management strategies were recommended for the control of hazards identified at the Site.

Stantec recommended that soil be remediated in certain areas of the Site in order to eliminate unacceptable risks to individual human receptors and to populations of ecological receptors. It was recommended that soil containing concentrations of chemicals of concern (COCs) in exceedance of site-specific target levels (SSTLs) derived for the protection of human health be remediated (PCB and antimony-impacted soil in the Residential Area and PCB-impacted soil at the Former Radar Site). In 2014, NLDMAE requested that Stantec apply the residential SSTL of 9 mg/kg to PCB-impacted soil over the entire site. This decision was made following consultation

with the Inuit Community Government of Hopedale (ICGH) based on their potential future plans for residential expansion in certain areas of the Former Radar Site, as well as their concerns with maintaining traditional use of the land around the Former Radar Site.

It was also recommended that selected areas containing concentrations of COCs in exceedance of SSTLs derived for the protection of ecological health (TPH, lead, antimony, chromium and cadmium) be remediated in order to produce area- and site-wide EPCs less than the calculated SSTLs.

The remedial targets applied in the RAP and areas requiring remediation are summarized in Table 1.1. Additional information on how the SSTLs were calculated and how the remedial areas were selected is provided in the 2010 HHERA (Stantec, 2010).

Table 1.1 Summary of Remedial Targets

Chemical of Concern	Remedial Target (mg/kg)	Source	Areas Requiring Remediation
PCBs	9	HHRA	Old Dump Pond* Wharf Area/Pipeline** Residential Subdivision (stream)** BMEWS** Main Base* Old Base1** Pit No. 1
TPH	1,700	ERA	BMEWS* Main Base* Pit No. 3
Metals (Residential Area)	Antimony: 30	HHRA	Old Dump Pond*
Metals (Former Radar Site)	Antimony: 5 Chromium: 20 Cadmium: 1.3 Lead: 75	ERA	BMEWS** Main Base** Mid-Canada Line POL Compound*

Notes:
* Area partially remediated during Years 1 to 6 of the Implementation of the RAP.
** Area fully remediated during Years 1 to 6 of the Implementation of the RAP.

In the summer of 2010, Stantec conducted additional soil and sediment delineation, soil vapour monitoring, and a preliminary marine sampling program at the Site to address data gaps and/or actions recommended in the 2010 Phase II/III ESA and HHERA report, and recommendations provided through consultation with the Nunatsiavut Government (NG) (refer to Stantec, 2011). Volume estimates were refined for areas requiring soil remediation. Elevated concentrations of PCBs were detected in sediment and fish samples collected from Hopedale Harbour and from

select sediment samples collected from freshwater ponds and streams near the Former U.S. Military Base; therefore, a comprehensive marine study was recommended.

A Stakeholder Scientific Advisory Working Group (referred to as the "Stakeholder Committee") consisting of representatives from the Inuit Community Government of Hopedale (ICGH), NG, Labrador Grenfell Health, the Labrador and Aboriginal Affairs Office, NLDMAE and technical advisors was established in 2011 to advise on go-forward work plans at the Site. Based on the remedial options evaluation, the preferred options for soil remediation were as follows:

- PCB-Impacted Soil: Stockpile soil and transport to a licensed soil treatment facility.
- TPH-Impacted Soil: Pre-treat soil in temporary on-site biopile and place soil in the local landfill once treated.
- Metals-Impacted Soil: Stockpile soil and transport to a licensed soil treatment facility.

Priorities were assigned to different areas requiring remediation, with the highest priority assigned to PCB-impacted soil in the Residential Area and PCB-impacted soil located up-gradient of the community water supply source (the BMEWS site), followed by PCB-impacted areas in the remaining areas, then TPH-impacted areas and then metals-impacted areas. Consideration was given to the anticipated soil treatment times for TPH when preparing a go forward work plan.

In 2011, the Government of Newfoundland and Labrador committed funds to support remediation efforts in Hopedale for three (3) years. During each year, site remediation and investigative work was conducted in accordance with NLDMAE budget allowances. Between 2011 and 2013, remediation was carried out in the Residential Subdivision, Old Dump Pond, Pipeline/Wharf and BMEWS areas. A total of 2,265.15 tonnes of PCB-impacted soil was transported off-site for treatment and disposal at an approved soil treatment facility in Saint-Ambroise, Québec (QC). With the exception of a strip of un-remediated soil located adjacent to the Old Dump Pond, no further PCB remediation was deemed necessary in these areas in accordance with SSTLs calculated for the Site as part of the HHERA (Stantec, 2010). The calculated SSTLs for PCBs in soil were 9 mg/kg for the Residential Subdivision, the Old Dump Pond area and the Wharf Area/Pipeline area, and 22 mg/kg for the BMEWS area. Remedial activities were described in written reports prepared following each year of Implementation of the RAP (refer to Stantec, 2012, Stantec, 2014a and Stantec, 2014b). During the 2011 to 2013 period, a comprehensive Marine Study was also carried out in Hopedale Harbour and in freshwater lakes surrounding Hopedale. The results of the Marine Study were summarized in a Summary Report on Loadings, Sediment Inventory and Present and Future Outlook for PCB Impacts in Hopedale Harbour report (refer to Stantec, 2014c) and were included in a Human Health Risk Assessment for the Consumption of Country Foods in the Town of Hopedale (Stantec, 2014d). Additional soil delineation was carried out in several areas of the Site in 2014 to refine volume estimates in support of future remediation programs (Stantec, 2014e).

In 2014, the Government of Newfoundland and Labrador committed funds for an additional three (3) years to support ongoing remediation efforts in Hopedale. The following scope of work was recommended for Years 4 to 6 of the Implementation of the RAP:

Year 4 (2014-2015)

- Removal of treated soil from the temporary biopile.
- Remediation of PCB-impacted soil at the Main Base (estimated 1,500 tonnes).
- Remediation of TPH-impacted soil at the Main Base, BMEWS and POL Compound, with associated soil placement in the temporary biopile (estimated 1,700 tonnes).

Year 5 (2015-2016)

- Remediation of impacted soil in areas that were not finished in Year 4, if necessary.
- Remediation of PCB-impacted soil at Old Base 1 and Pit No. 1 (estimated 670 tonnes).
- Remediation of metals-impacted soil at Old Dump Pond, BMEWS, Main Base, Mid-Canada Line and POL Compound (estimated 200 tonnes).
- Biopile maintenance, including soil tilling and nutrient placement.

Year 6 (2016-2017)

- Remediation of impacted soil in areas that were not finished in Year 4 or 5, if necessary.
- Removal of treated soil from the temporary biopile.
- Remediation of TPH-impacted soil at Pit No. 3 (estimated 7,110 tonnes).

Site remediation and investigative work was to be conducted in accordance with annual NLDMAE budget allowances. The work scope was meant to be revised each year and was meant to be flexible based on the actual volumes of soil removed from each site and the time required for treatment of TPH-impacted soil in the biopile. The proposed work scope was designed based on the assumption that it would take only 2 years for concentrations of TPH in soil to be reduced below the landfill acceptance criteria of 1,000 mg/kg. The Stakeholder Committee agreed with the above recommendations for the Years 4 to 6 of the Implementation of the RAP.

In 2014, remediation was carried out in the Main Base, BMEWS and POL Compound areas. Remedial activities were described in the written report prepared in 2015 (refer to Stantec, 2015a). A total of 1,513.62 tonnes of PCB-impacted soil was removed from the Main Base area and transported off-site for treatment and disposal at an approved soil treatment facility in Saint-Ambroise, QC. Following remediation, additional soil removal was required along the northern limits of the remedial excavation, in the area of Main Base-Area 4, Main Base-Area 5 and POL West-Area 1 in accordance with the SSTL for PCBs calculated for the Site as part of the HHERA (Stantec, 2010). Sludge removal was also required at the septic tank at Main Base-Area 6. Metal debris removed from the PCB remedial excavation at Main Base (approximately 1.66

tonnes) was stockpiled on tarps at the Laydown Area at Pit No. 1 was transported to a licensed recycling facility in St. John's, NL as part of the Year 6 activities.

In 2014, the biopile was sampled following NLDMAE's standard Certificate of Approval (COA) for soil treatment facilities and concentrations of TPH in the composite soil samples were below the landfill acceptance criteria of 1,000 mg/kg. Approvals were obtained from the Happy Valley-Goose Bay Government Service Centre (now Service NL) and the Inuit Community Government of Hopedale to dispose of treated soil in the Hopedale landfill. Soil was transported to the landfill on October 7, 2014 and was stockpiled in a designated area for use as landfill cover material. A 450 mm thick layer of soil was left in place at the bottom of the biopile containment cell to minimize the risk of damage to the bottom liner. Approximately 1,700 tonnes of TPH-impacted soil was then removed from impacted areas of the Site (BMEWS, the Main Base and the POL Compound) and placed in the biopile containment cell for treatment. Biopile maintenance activities, consisting of the addition of specified nutrients and mechanical aeration, were carried out following the placement of TPH-impacted soil. A cover was placed over the biopile and was secured in place using clean sand. Metal debris removed from the TPH remedial excavations at BMEWS was stockpiled on tarps at the Laydown Area at Pit No. 1 and kept separate from the metal debris unearthed at the Main Base site. The metal debris was transported to a licensed recycling facility in St. John's, NL as part of the Year 6 activities. Following site remediation, additional TPH-impacted soil removal was required based on the SSTL along the southeast sidewall of BMEWS-Area 1, in the area of BMEWS-Area 3, to the east, south and west of Main Base-Area 7 and in the area of Main Base-Area 9. Remediation of TPH-impacted soil at Main Base-Area 7 and at the POL Compound is deemed complete in accordance with the SSTL calculated for the Site as part of the HHERA (Stantec, 2010).

In 2015, the existing biopile was sampled following NLDMAE's standard COA for soil treatment facilities. Concentrations of TPH in the composite soil samples exceeded 1,000 mg/kg; therefore, the soil required additional treatment before it could be disposed. Biopile maintenance activities, consisting of the addition of specified nutrients and mechanical aeration were carried out following the placement of TPH-impacted soil in the biopile containment cell. The treatability of the biopile was evaluated and the biopile treatment is anticipated to be effective given the observed baseline soil conditions, however, several follow-up activities will be required to ensure successful completion, including: monitoring, addition of specified nutrients, irrigation and aeration.

In 2015, a total of 749 tonnes of PCB-impacted soil was removed from the north and west areas of Main Base-Area 1 and was transported to Saint-Ambroise, QC by sea for PCB destruction. Confirmatory soil sampling was carried out along the limits of the remedial excavation to determine if the soil remaining on-site contained concentrations of PCBs below the residential site specific target level (SSTL) of 9 mg/kg. To meet the SSTL, additional soil removal was required to the north, centre and west of the Main Base-Area 1 excavations. PCB-soil removal was also required at Main Base-Area 4, Main Base-Area 5 and POL West-Area 1 that had not yet been remediated. A total of 201.6 tonnes of metals-impacted soil was removed from BMEWs-Area 4,

BMEWs-Area 5, Main Base Area 2, POL-Area 3 and POL-Area 4 and was transported to Chicoutimi, QC for treatment. Confirmatory soil sampling was carried out along the limits of the remedial excavations to determine if soil remaining on-site contained concentrations of metals below the applicable SSTLs. No additional soil removal was deemed necessary in these areas; however, metals impacted soil removal was required at Mid-Canada Line Areas 1 and 2 that had not yet been remediated.

Also in 2015, forecasted EPCs were generated using available confirmatory soil sampling results and predicted confirmatory soil sampling results (based on concentrations of COCs observed in nearby samples) to predict EPCs once areas designated in the 2010 HHERA and RAP have been remediated. A comparison of the historical versus forecasted EPCs indicates a substantial decrease in EPCs as a result of the multi-year remediation program (1 to 2 orders of magnitude); however, some EPCs are forecasted to remain above the SSTLs for the protection of ecological health. This may indicate the need for re-evaluation of the Ecological Risk Assessment with potential additional remediation.

1.3 Scope of Work

The scope of work for Year 6 of the Implementation of the Remedial Action Plan was as follows:

1. Biopile Maintenance and Monitoring

    - Collect eight (8) representative soil samples from the impacted material within the biopile and submit for laboratory analysis of TPH/BTEX to document baseline petroleum hydrocarbon concentrations;
    - Supervise the addition of fertilizer/nutrients to the biopile and biopile cover installation; and,
    - Perform biopile maintenance and monitoring, as required.

2. Remediation of PCB-Impacted Soil

    - Supervise the remediation of PCB-impacted soil at Main Base-Area 1, Main Base-Area 4, Main Base-Area 5, POL West-Area 1, Old Base-Area 1 and Old Base-Area 2, in accordance with budget allowances;
    - Collect confirmatory soil samples from the final limits of the excavations and submit for analysis of Total PCBs (rush turnaround time); and,
    - Once confirming results have been received, monitor the backfilling of the excavations with clean fill material (to be sourced from the Community of Hopedale) or site grading, as necessary.

Note that PCB-impacted soil at Main Base-Area 5 was not completed in Year 6 due to the tonnage allowance restriction. As well, backfilling was only completed in areas that were fully remediated in Year 6 in order to reduce the potential for contamination of clean material. Topsoil was not placed in Year 6 due to wet conditions at the time remediation was completed

and the increased potential for soil erosion. It is expected that these items will be completed once remediation is completed during subsequent years of the Implementation of the RAP.

Following the tendering process in 2014, Sanexen Environmental Services Inc. (Sanexen) was retained by NLDMAE for remedial work at the Former U.S. Military Site and Residential Subdivision during Years 4 to 6 of the Implementation of the RAP. Sanexen was responsible for site preparation, the excavation of impacted soil and debris from specified areas, and the proper disposal of impacted materials (including shipment).

1.4 Regulatory Framework

NLDMAE (formerly the Department of Environment and Conservation) Policy Directive PPD05-01 allows a site owner to use either of two approaches when remediating chemical impacts on a site. These approaches are outlined in the *Guidance Document for the Management of Impacted Sites, Version 2.0* (January 2014). The purpose of this guidance document is to provide a clear process for the management of impacted sites in Newfoundland and Labrador that result in the satisfactory resolution of environmental contamination, which may present an unacceptable risk to human health and ecological receptors. The guidance document incorporates recent scientific and regulatory advances in this area that have resulted from work at the international, national and regional levels.

Remediation of chemical impacts in various site media (e.g., soil, sediment, groundwater, surface water) can be completed using a criteria-based approach or a risk-based approach. Under the criteria-based remedial approach, the defined site impacts are remediated to levels below existing regulatory guidelines for the appropriate media. Under the risk-based remedial approach, the defined site impacts are remediated to levels below site-specific target levels (SSTLs) that are developed for the site during a site-specific human health risk assessment (HHRA) and ecological risk assessment (ERA) (if necessary).

For simple sites and sites with limited impacts, a criteria-based approach to remediation is often applied to guide the extent of removal of impacted media from the site. For more complex sites and sites with extensive impacts from multiple COCs, a human health and/or ecological risk assessment is often completed, based on the actual site conditions and the actual human and ecological usage of the site, to derive SSTLs to determine remedial options or a risk management strategy for the site. Experience at other former Pinetree military sites in Newfoundland and Labrador indicates that a risk-based remedial approach is the most appropriate for a complex site such as the one in Hopedale.

As part of the HHERA (Stantec, 2010), SSTLs were calculated for certain metals, petroleum hydrocarbons and PCBs. Where necessary, SSTLs were derived in accordance with the methods presented in *A Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines* (Canadian Council of Ministers of the Environment (CCME), 2006). The specific methods employed to develop the SSTLs are consistent with CCME and Health Canada

protocols as referenced above, and with standard human health risk assessment methodologies. The derivation of SSTLs for petroleum hydrocarbons (TPH, BTEX) was made with the aid of Groundwater Services, Inc. (GSI) RBCA Toolkit for Atlantic Canada, Version 2.1. The spreadsheet model is based on the exposure and mass transport equations presented in the appendix of the ASTM PS-104 Standard Provisional Guide for Risk-Based Corrective Action (ASTM, 2000). Table 1.1 in Section 1.2 summarizes the SSTLs applied as remedial targets at the Site.

For the work completed at the biopile, the provincial Guidelines for Construction and Operation of Facilities using Ex-Situ Bioremediation for the Treatment of Petroleum Contaminated Soil (GD-PPD013 rev. 4, dated August 2008) were referenced. "Clean soils" are defined as those having concentrations of benzene, toluene, ethylbenzene and xylene (BTEX) parameters below the Canadian Council of Ministers of the Environment (CCME) Canadian Soil Guidelines (CSQGs) for a commercial site and below 1,000 mg/kg for TPH. Inorganic parameters were also compared to the CCME CSQGs for a commercial site. Landfill facilities in Newfoundland and Labrador typically accept "clean soils" for use as cover material; however, soil acceptance is ultimately at the discretion of the landfill operator. The latest update of the CCME CSQGs was obtained online at http://ceqg-rcqe.ccme.ca/.

2.0 DESCRIPTION OF SITE WORK

Year 6 site remediation activities at the Former U.S. Military Site consisted of site preparation, biopile maintenance activities, the excavation and removal of PCB-impacted soil (Main Base-Areas 1 and 4, POLW - Area 1 and Old Base – Areas 1 and 2), confirmatory soil sampling, shipment of PCB-impacted soil to an approved soil treatment facility, shipment of metal debris to an approved recycling facility and site reinstatement. Stantec personnel were onsite during site remediation between July 7 to 22, 2016. The loading of the PCB-impacted soil to the ship took place in two events being between July 30 and August 1, 2016 and on September 20, 2016, of which Stantec was only present for the first shipment. The metal debris was packaged in a container and was transported to Lewisporte, NL via the Astron during the week of September 18, 2016 by the on-site contractor.

Remedial activities were undertaken by Sanexen Environmental Services Inc. (Sanexen) of Brossard, Quebec (QC) under separate contract to NLDMAE. Sanexen engaged Budgell's Equipment and Rentals (Budgell's) of Triton, NL, who provided heavy equipment, including excavators, loaders and dump trucks, equipment operators and labourers. Sanexen supplied a scale system to weigh remediated soil, metal debris and backfill. The scale was installed on a front end loader and was calibrated on-site. Stantec personnel maintained a record of activities while on-site and collected confirmatory soil samples.

2.1 Biopile Confirmatory Soil Sampling

On July 10, 2016, confirmatory soil sampling was carried out at the biopile to confirm that concentrations of TPH in soil were below the landfill acceptance criteria of 1,000 mg/kg. The HDPE cover was removed and test pits were excavated with the aid of a track-mounted excavator supplied and operated by Budgell's. Stantec personnel recorded details of subsurface conditions encountered during excavation and collected confirmatory soil samples.

Soil sampling was carried out following composite soil sampling protocols outlined in NLDMAE's standard Certificate of Approval (COA) for soil treatment facilities. Soil samples were collected from 13 test pits by bulk sample methods over continuous 0.5 m intervals, to a maximum depth of 2.0 m. The test pits were not extended to the bottom of the biopile (approximately 2.5 m deep) in order to prevent damage to the bottom liner. To obtain average petroleum hydrocarbon concentrations within each horizon of the biopile, soil samples from the same depths were combined to form composite samples following the confirmatory sampling protocol provided in NLDMAE's standard COA for soil treatment facilities. Two (2) composite samples from the 0.0 m to 0.5 m horizon (16-BP-COMP-A1 and 16-BP-COMP-A2), two (2) composite samples from the 0.5 m to 1.0 m horizon (16-BP-COMP-B1 and 16-BP-COMP-B2), two (2) composite samples from the 1.0 m to 1.5 m horizon (16-BP-COMP-C1 and 16-BP-COMP-C2) and two (2) composite samples from the 1.5 m to 2.0 m horizon (16-BP-COMP-D1 and 16-BP-COMP-D2) were submitted to Maxxam Analytics in St. John's, NL for analysis of petroleum hydrocarbons. The test pit locations are shown on Drawing No. 121413099-800-EE-11 in Appendix A. Photos taken of the biopile are provided in Appendix B.

The results of biopile sampling indicated that concentrations of TPH in soil were greater than the typical landfill acceptance limit of 1,000 mg/kg; therefore, further *in-situ* treatment of the soil is recommended.

2.2 Site Preparation

Six (6) areas were assigned for remediation in Year 6, but only four (4) areas were remediated completely as the maximum allowable tonnages for PCB was reached (i.e., Main Base Area 1 and Main Base-Area 5 are not complete). Table 2.1 presents the names that were used to identify the remedial areas during Year 6 of the Implementation of the RAP.

Table 2.1 Assigned Names for Remedial Areas

Assigned Name	Remedial Objective	Impacted Sample Locations
Main Base-Area 1	PCBs	Area 1 Northwest ((6515, 21486, 22408, 22400, 6517, 15-MB-BS104, MB-BS113 15-MB-BS114) Area 1 Centre (15-MB-BS103) Area 1 Northeast ((15-MB-BS103, 15-MB-BS104, 15-MB-BS111 to 15-MB-BS116, 15-MB-TP102)
Main Base-Area 4	PCBs	22705
Main Base-Area 5	PCBs	6546
POLW-Area 1	PCBs	13- POLW-BS10
Old Base 1-Area 1	PCBs	22577, 22578, 22582, 22583, 22585, 22594, 22609, BS121, BS126, OB1 BS2, OB1-BS6, OB1-BS7, 22576, 22630, BS121, BS122, BS123, BS126, OB1-BS7, 15-OB1-BS101
Old Base 1-Area 2	PCBs	22567

The following site preparations were undertaken prior to the commencement of the Year 6 remedial activities:

- The areas requiring remediation were marked out in the field using survey stakes and spray paint based on the results of previous investigations.
- Ongoing with the remedial excavation of impacted soil, confirmatory soil sampling was conducted along the limits of the marked out remedial areas in areas that were accessible and shallow. Samples were collected at Main Base-Area 1 (16-MB-BS101 to 16-MB-BS106), Main Base-Area 4 (16-MB-BS401 and 16-MB-BS402), POLW-Area 1 (16-POLW-BS101 and 16-POLW-BS102), Old Base 1-Area 1 (16-OB1-BS101 to 16-OB1-BS106) and Old Base 1-Area 2 (16-OB1-BS201). The samples were collected manually by bulk sample methods. The samples were visually examined in the field for evidence of impacts and were placed in clean glass jars with Teflon liners. Samples were placed on ice in sample coolers which were shipped to Maxxam Analytics in Bedford, NS for analysis of PCBs. Unsubmitted duplicate samples were shipped to Stantec's office in St. John's, NL to be archived. Sample locations are shown on Drawing Nos. 121413099-800-EE-04 and 121413099-800-EE-06 in Appendix A.

The following site preparations were undertaken at Pit No. 1 prior to the commencement of the Year 4, 5 and 6 remedial activities:

- Boulders at the entrance to the pit were moved to allow access.
- Crushed stone was used to level the Staging Area that would be used to fill soil bags and the Laydown Areas designated for temporary storage of filled soil bags, pending transportation out of Hopedale. Berms were formed along the southeast (downgradient) limits of the worked areas. The staging and laydown areas were covered with 40 mil HDPE liners.

2.3 Excavation of PCB-Impacted Soil, Confirmatory Sampling and Delineation

The remediation of PCB-impacted soil was carried out at Main Base and Old Base 1 between July 7 and 21, 2016 and additional samples for delineation at Main Base were collected on August 4, 2016 and at Pit No. 1 on July 22, 2016. Remediation progressed until clean boundaries (i.e., less than the remedial target) were encountered or until the annual tonnage allowance was reached. Soil was removed with a Deere 270D track-mounted excavator, a Deere 50C track-mounted mini-excavator and manually using shovels. Soil was loaded into rock trucks and was transported to the Staging Area at Pit No. 1 where it was loaded into UN-approved Quatrex-27 bulk bags with internal membrane using a Deere 50C track-mounted mini-excavator. Once filled, the soil bags were tied shut and temporarily stacked on liners at the Laydown Area. In areas that were difficult to access with heavy machinery and in areas of shallow overburden over bedrock, soil was manually excavated into enviro-bags using shovels and transported to the Staging Area. Photos taken during Year 6 of the Implementation of the RAP are provided in Appendix B.

Confirmatory soil sampling was conducted as remediation progressed to confirm that concentrations of PCBs in soil remaining at the Site were below the applicable SSTL. Confirmatory soil samples were collected from the sidewalls of the excavations. Soils were sampled by bulk sample methods. Additional samples were collected at Main Base Area 1 to help delineate the PCB impacts in soil exceeding the SSTL. Sidewall samples were collected just above groundwater, where encountered. In locations were groundwater was not encountered due to the presence of shallow bedrock, sidewall samples were collected just above bedrock. Confirmatory soil sample locations were recorded while in the field in relation to site structures/features. Sample locations are shown on Drawing Nos. 121413099-800-EE-03, 121413099-800-EE-06 and 121413099-800-EE-08 in Appendix A. Where possible, duplicate soil samples were collected at each sample location. The soil samples were visually examined in the field for impacts. The samples were placed into clean glass jars and were placed on ice in sample coolers for transportation. Samples were shipped directly to Maxxam Analytics in St. John's, NL for rush analysis of PCB parameters. Duplicate samples were shipped to Stantec's office in St. John's, NL for archive.

2.3.1 Main Base

The excavation of PCB-impacted soil at Main Base began on July 7, 2016 in the northwest portion of Main Base-Area 1 and extended up-hill to the northwest and northeast until July 9, 2016. The excavation extended to bedrock. The overburden thickness at Main Base-Area 1 Northwest ranged from 0 m (exposed bedrock) to approximately 0.6 m. Groundwater was not encountered in the remedial excavation. Approximately 193 tonnes of PCB-impacted soil was removed from the excavation. The results of the initial round of confirmatory soil sampling at Main Base-Area 1 Northwest indicated that soil along the PCB remedial excavation boundary at sample locations 16-MB-BS101 to 16-MB-BS104 contained PCBs below the residential SSTL of 9

mg/kg (refer to Section 3.2 for further details) and the remediation was considered complete in this area. Sample locations and the limits of the remedial excavation are shown on Drawing No. 121413099-800-EE-04 in Appendix A.

At the centre portion of Main Base-Area 1, the excavation of PCB-impacted soil took place on July 13, 2016. The excavation extended to bedrock. The overburden thickness at Main Base-Area 1 Centre ranged from 0 m (exposed bedrock) to approximately 2.0 m. Groundwater was not encountered in the remedial excavation. Approximately 39 tonnes of PCB-impacted soil was removed from the excavation. The results of the initial round of confirmatory soil sampling at Main Base-Area 1 indicated that soil along the PCB remedial excavation boundary at sample locations 16-MB-BS107 and 15-MB-BS108 contained PCBs exceeding the SSTL. Four additional samples (i.e., 16-MB-BS113 and 16-MB-BS117 to 16-MB-BS119) were collected between July 12, 2016 and July 21, 2016 to help delineate the extent of the PCB impacts in soil. Sample location 16-MB-BS117 contained PCBs below the residential SSTL of 9 mg/kg; however, samples 16-MB-BS118 and 16-MB-BS119 contained PCBs exceeding the SSTL. Further remediation is needed in the areas of samples 16-MB-BS107, 15-MB-BS108, 16-MB-BS118 and 16-MB-BS119. Sample locations and the limits of the remedial excavation are shown on Drawing No. 121413099-800-EE-04 in Appendix A.

At Main Base-Area 4, the excavation of PCB-impacted soil was carried out on July 13, 2016. The initially staked area was excavated to bedrock, which was encountered at depths ranging from 1.0 m to 1.3 m within the excavation. Groundwater was not encountered in the remedial excavation. Approximately 13 tonnes of PCB-impacted soil was removed from the excavation. The results of the initial round of confirmatory soil sampling at Main Base-Area 4 indicated that soil along the PCB remedial excavation boundary at sample locations 16-MB-BS401 to 16-MB-BS402 contained PCBs below the residential SSTL of 9 mg/kg and the remediation was considered complete in this area. Sample locations and the limits of the remedial excavation are shown on Drawing No. 121413099-800-EE-04 in Appendix A.

At POLW-Area 1 on the Main Base, the excavation of PCB-impacted soil was carried out on July 13, 2016. The initially staked area was excavated to bedrock, which was encountered at depths ranging from 0.0 m to 0.9 m within the excavation. Groundwater was not encountered in the remedial excavation. Approximately 6 tonnes of PCB-impacted soil was removed from the excavation. The results of the initial round of confirmatory soil sampling at POLW-Area 1 indicated that soil along the PCB remedial excavation boundary at sample locations 16-POL-BS101 to 16-POL-BS102 contained PCBs below the residential SSTL of 9 mg/kg and the remediation was considered complete in this area. Sample locations and the limits of the remedial excavation are shown on Drawing No. 121413099-800-EE-04 in Appendix A.

The excavation of PCB-impacted soil at Main Base continued in the northeast portion of Main Base-Area 1 and extended uphill to the north and northeast from July 10 to 21, 2016. The results of the initial round of confirmatory soil sampling at Main Base-Area 1 Northeast indicated that soil along the PCB remedial excavation boundary at sample location 16-MB-BS106 contained PCBs

below the residential SSTL of 9 mg/kg; however, sample 16-MB-BS105 contained PCBs exceeding the SSTL. The excavation extended to bedrock. The overburden thickness at Main Base-Area 1 Northeast ranged from 0.2 m to approximately 2.5 m. Groundwater was not encountered in the remedial excavation. Approximately 713 tonnes of PCB-impacted soil was removed from the excavation. Seven (7) additional samples (i.e., 16-MB-BS111, 16-MB-BS112, 16-MB-BS114, 16-MB-BS115, 16-MB-BS120 to 16-MB-BS122) were collected between July 12, 2016 and August 4, 2016 to help delineate the extent of the PCB impacts in soil. Sample locations 16-MB-BS112, 16-MB-BS115 16-MB-BS120 and 16-MB-BS122 contained PCBs below the residential SSTL of 9 mg/kg; however, samples 16-MB-BS111, 16-MB-BS114 and 16-MB-BS121 contained PCBs exceeding the SSTL. Soil had been removed at sample 16-MB-BS111, but further remediation is needed in the areas of samples 16-MB-BS105, 16-MB-BS114 and 16-MB-BS121. Sample locations and the limits of the remedial excavation are shown on Drawing No. 121413099-800-EE-04 in Appendix A.

Buried metal debris was encountered in the Main Base-Area 1 remedial excavations. Metal debris consisted of pipes, girders and rebar and other small pieces of metal. Metal encountered in the excavation was manually segregated from the soil. Residual soil was shaken/scraped from the metal and placed in soil bags, then the metal was transported to the Laydown Area where it was weighed and stockpiled on tarps for sampling and temporary storage. This metal was kept separate from the metal unearthed at BMEWS in 2014 and was stored with the metal unearthed at the Main Base in 2015. On July 12, 2016, Stantec randomly selected three (3) pieces of metal in the Main Base metal stockpile for PCB sampling. Each piece was swabbed over a 10 cm by 10 cm area (i.e., 100 cm^2) using a swab provided by Maxxam Analytics that was saturated with hexane (16-Swab-1 to 16-Swab-3). Swab samples were frozen and shipped on ice in sample coolers to Maxxam Analytics in Bedford, NS for analysis of PCB content. No PCBs were detected in the swab samples.

2.3.2 Old Base 1

At Old Base 1-Areas 1 and 2, the excavation of PCB-impacted soil was carried out on July 14, 2016. The initially staked area was excavated to bedrock, which was encountered at depths ranging from 0.1 m to 0.15 m. Groundwater was not encountered in the remedial excavation. Approximately 257 tonnes of PCB-impacted soil was removed from the excavation. The results of the initial round of confirmatory soil sampling at Old Base 1-Areas 1 and 2 indicated that soil along the PCB remedial excavation boundary at sample locations 16-OB-BS101 to 16-OB-BS106 and 16-OB-201 contained PCBs below the residential SSTL of 9 mg/kg and the remediation is considered complete in these areas. Sample locations and the limits of the remedial excavation are shown on Drawing No. 121413099-800-EE-04 in Appendix A.

2.3.3 Pit No. 1

As part of the Year 6 field activities, 22 soil samples (i.e., 16-P1-BS101 to 16-P1-BS122) were collected at Pit No. 1 (the Staging Area and Laydown Area) to help delineate PCB impacts in soil. The samples were collected at depths ranging from 0.1 m to 0.6 m. A sample location plan

showing the locations of the soil samples is provided in Drawing No. 121413099-200-EE-08 in Appendix A. The results of the laboratory analysis indicated that PCBs in samples 16-P1-BS111, 16-P1-BS115, 16-P1-BS117, 16-P1-BS118 and 16-P1-BS119 exceeded the SSTL.

2.4 Shipment of PCB-Impacted Soil

A total of 882 bags were filled with PCB-impacted soil during Year 6 of the Implementation of the RAP. Two (2) shipments of PCB-impacted soil was made during Year 6 of the Implementation of the RAP. The shipments were done using a ship (the Long Island) owned and operated by Ray Berkshire Ltd. of Arnold's Cove, NL. The soil bags were transported from the Laydown Area to the American Dock (approximately 1 km) using a flatbed truck and rock truck and were loaded onto the ship using a boom. The first shipment was loaded between July 30 and August 1, 2016, and had an estimated weight of 952.59 tonnes of PCB-impacted soil. The second shipment was loaded on September 20, 2016 and had an estimated weight of 274.55 tonnes of PCB-impacted soil. The loading of the first shipment was monitored by Stantec, but the loading of the second shipment was not. Sanexen provided placards and shipment manifests in accordance with Transportation of Dangerous Goods (TDG) and International Maritime Dangerous Goods (IMDG) codes for the shipments.

The PCB-impacted soil was transported by sea to the Grande-Anse Marine Terminal in Port Saguenay, Quebec (QC) where the soil bags were transferred to B-train tractor trailers and transported approximately 30 km to the Récupère Sol (a division of Benev Capital Inc. (BCI)) thermal treatment facility in Saint-Ambroise, QC. Soil was weighed upon arrival at the facility, for a reported combined total of 1,227.14 tonnes. Récupère Sol operates a thermal oxidation treatment unit that operates in accordance with the Quebec Ministry of Sustainable Development, Environment, Wildlife and Parks "<A" Treatment Criteria (i.e., <0.05 mg/kg). The Certificates of Destruction for the PCB-impacted soil removed during Year 6 of the Implementation of the RAP is provided in Appendix F.

2.5 Shipment of Metal Debris

One (1) shipment of metal debris was made during Year 6 of the Implementation of the RAP. The metal debris was packaged in a container and shipped via the Astron (a cargo ship that services the north coast of Labrador) during the week of September 18, 2016 to Lewisporte, NL. The metal debris had a weight of 27.32 tonnes and was delivered to a licensed metal recycling facility in St. John's, NL. The weigh slips for the metal debris removed during Year 6 of the Implementation of the RAP is provided in Appendix F.

2.6 Biopile Maintenance

Biopile maintenance activities, consisting of the addition of specified nutrients and mechanical aeration, were completed on July 10, 2016 under the supervision of Stantec personnel. A total of three (3) trenches aligned in a north-south orientation were excavated in parallel succession

along the length of the biopile to facilitate the application of nutrients. Each trench measured approximately 1.0 m wide by 1.5 m deep. Excavated soil was temporarily stockpiled in a windrow (i.e., a build-up of material stored along the edge of the newly excavated area) adjacent to the trench from which it was excavated. Caution was taken not to damage the underlying liner during the advancement of each trench. The following nutrients were added evenly to each trench and windrow of excavated soil:

- 29 x 25 kg bags, urea nitrogen fertilizer (46-0-0)
- 3 x 25 kg bags, triple super phosphate fertilizer (0-46-0)
- 2 x 25 kg bags, potassium sulphate fertilizer (0-0-50, plus 17% sulphur)
- 2 x 25 kg bags, ammonium phosphate fertilizer

The trenches were then backfilled with excavated material and the biopile was leveled. Approximately 2:1 slopes were formed along each face of the biopile, as per design specifications. A cover was placed over the containment cell and was secured in place using clean sand. Photos taken of the biopile during Year 6 of the Implementation of the RAP are provided in Appendix B.

2.7 Backfilling and Reinstatement Activities

The Main Base-Area 1 remedial excavation was partially backfilled and levelled following soil removal using clean backfill. Main Base Area 4 was also backfilled. Backfill consisted of clean 100 mm minus sized material obtained from a local rock pit. The remainder of the remedial areas will be backfilled once remediation is completed during subsequent years of the Implementation of the RAP. Topsoil will also be replaced in selected areas of the Site during subsequent years of the Implementation of the RAP.

The following site closure activities were undertaken at the Site prior to departure:

- The northeast sidewall of the Main Base-Area 1 remedial excavation was sloped as a safety precaution and boulders and barricades were placed along the edge to prevent access.
- The remedial sites were tidied up by removing debris or equipment.
- Boulders were placed at the entrance to Pit No.1 to block access.
- Public notice signs were installed at the entrance to Pit No. 1 and the Biopile.

3.0 LABORATORY RESULTS

3.1 Petroleum Hydrocarbons

3.1.1 Biopile

Petroleum hydrocarbon (TPH/BTEX) analysis was conducted on eight (8) composite confirmatory soil samples collected from the biopile in July 2016. Results of the laboratory analysis of biopile soil samples for TPH are presented in Table C.1 in Appendix C.

TPH was detected in the eight (8) composite confirmatory soil samples collected from the biopile. The concentrations of TPH ranged from 6,500 mg/kg in sample 16-BP-COMP-D2 to 10,000 mg/kg in 16-BP-COMP-C1, which exceeded the typical landfill acceptance criteria of 1,000 mg/kg. Based on these results, the soil did not yet meet the acceptance criteria for disposal at the local landfill.

Toluene was detected in eight (8) soil samples at concentrations ranging from 0.094 mg/kg in sample 16-BP-COMP-A1 to 0.45 mg/kg in sample 16-BP-COMP-C2. Xylenes were detected in seven (7) soil samples at concentrations ranging from 0.13 mg/kg in sample 16-BP-COMP-A2 to 0.40 mg/kg in sample 16-BP-COMP-C2. One detected toluene concentration (i.e., 0.45 mg/kg in sample 16-BP-COMP-C2) exceeded the typical landfill acceptance criteria of 0.37 mg/kg (based on CCME CSQGs for a commercial site). Benzene and ethylbenzene were not detected in the soil samples.

3.2 PCBs

3.2.1 Main Base

PCB analysis was conducted on 19 confirmatory soil samples collected from the limits of the remedial excavations at Main Base-Area 1 (16-MB-BS101 to 16-MB-BS119), six (6) delineation samples at Main Base-Area 1 (16-MB-BS120A & B, 16-MB-BS121A & B, 16-MB-BS122A & B, 16-MB-BS401), two (2) soil samples collected from the limits of the remedial excavation at Main Base-Area 4 (16-MB-BS401 and 16-MB-BS402), one (1) delineation sample collected from Main Base-Area 5 (16-MB-BS501) and two (2) samples collected from the limits of the remedial excavations at POLW-Area 1 (16-POLW-BS101 and 16-POLW-102) during Year 6 of the Implementation of the RAP. As well, a sample of a tar-like substance adjacent to a concrete foundation at Main Base-Area 1 (16-MB-TS101) was analyzed for PCBs. One (1) field duplicate sample of 16-MB-101 and five (5) laboratory duplicate samples were also analyzed for PCBs. Results of the laboratory analysis of PCBs in soil are presented in Table C.2 in Appendix C. The corresponding analytical reports from Maxxam Analytics are presented in Appendix D.

PCBs were detected in every soil sample submitted at the Main Base with concentrations ranging from 0.060 mg/kg in sample 16-MB-BS102 to 3,700 mg/kg in 16-MB-BS114. The concentration of PCBs in the following samples exceeded the residential SSTL of 9 mg/kg:

- 16-MB-BS105 - 1,500 mg/kg
- 16-MB-BS107 – 34 mg/kg
- 16-MB-BS108 – 82 mg/kg
- 16-MB-BS111 – 73 mg/kg
- 16-MB-BS113 - 2,600 mg/kg
- 16-MB-BS114 - 3,700 mg/kg
- 16-MB-BS118 – 21 mg/kg
- 16-MB-BS119 – 310 mg/kg
- 16-MB-BS121A – 49 mg/kg
- 16-MB-BS121B – 13 mg/kg

Soil was removed in the area of sample 16-MS-BS111; however, additional soil removal is required to the north of the Main Base-Area 1 excavation in two areas. Soil removal is also necessary at Main Base-Area 5.

3.2.2 Old Base 1

PCB analysis was conducted on five (5) soil samples collected from the limits of the remedial excavation at Old Base 1-Area 1 (16-OB-BS101 to 16-OB-BS106) and one (1) sample collected from the limits of the remedial excavation at Old Base 1-Area 2 (16-OB-BS201) during Year 6 of the Implementation of the RAP. Results of the laboratory analysis of PCBs in soil are presented in Table C.3 in Appendix C. The corresponding analytical reports from Maxxam Analytics are presented in Appendix D.

PCBs were detected in every soil sample submitted at the Old Base with concentrations ranging from 0.27 mg/kg in sample 16-OB-BS105 to 2.2 mg/kg in 16-OB-BS102. None of the detected concentration of PCBs exceeded the residential SSTL of 9 mg/kg. The PCB impacts in soil at Old Base 1-Areas 1 and 2 appear to be remediated to the residential SSTL.

3.2.3 Pit No. 1

PCB analysis was conducted on 22 soil samples collected from Pit No. 1-Area 1 (16-P1-BS101 to 16-P1-BS122) during Year 6 of the Implementation of the RAP and one (1) laboratory duplicate sample. Results of the laboratory analysis of PCBs in soil are presented in Table C.4 in Appendix C. The corresponding analytical reports from Maxxam Analytics are presented in Appendix D.

PCBs were detected in every soil sample submitted with concentrations ranging from 0.090 mg/kg in sample 16-P1-BS120 to 250 mg/kg in 16-P1-BS117. The concentration of PCBs in the following five (5) samples exceeded the residential SSTL of 9 mg/kg:

- 16-P1-BS111 - 12 mg/kg
- 16-P1-BS115 - 140 mg/kg
- 16-P1-BS117 - 205 mg/kg
- 16-P1-BS118 - 12 mg/kg
- 16-P1-BS119 - 160 mg/kg

The extent of PCB impacts in soil at Pit No. 1appears to be delineated.

3.2.4 Swab Samples

PCB analysis was conducted on three (3) swab samples collected from metal unearthed at Main Base-Area 1 (16-SWAB-101 to 16-SWAB-103). Results of the laboratory analysis of the swab samples for total PCB content are presented in Table C.5 in Appendix C. The corresponding analytical report from Maxxam Analytics is presented in Appendix D. For reference, detected concentrations of PCBs were compared to the CCME Recommended Permissible Surface Contamination Criterion recommended for transformer metal components destined for recycling by smelting (10 µg/100 cm^2) (CCME, 1995).

PCBs were not detected in the three (3) samples and thus did not exceed the CCME criterion for transformer metal components (10 µg/100 cm^2). The results of PCB swab sampling indicate that further soil removal was not required from the metal. The metal debris was transported to a licensed recycling facility in St. John's, NL as part of the Year 6 activities.

4.0 SUMMARY OF ADDITIONAL SOIL REQUIRING REMEDIATION

As part of the 2010 HHERA and RAP (Stantec, 2010), certain areas with high concentrations of TPH and metals-impacted soil were selected for remediation in an attempt to achieve area- and site-wide EPCs that would be less than the applicable SSTLs. As a result, not all soil with concentrations of TPH and metals exceeding the SSTLs would necessarily be remediated. The final area- and site-wide EPCs can only be verified once the planned areas of remediation at the site have been completed and confirmatory soil sample results are available to characterize the actual concentrations of COCs remaining on site. As stated in Section 1.2, PCB-impacted soil with concentrations exceeding the residential SSTL of 9 mg/kg is to be remediated from the site; therefore, EPCs for PCBs do not need to be verified once the planned remedial areas are complete.

To date, a number of the areas designated for remediation in the 2010 RAP have been remediated. Confirmatory soil samples have been collected along the limits of these remedial excavations in order to characterize the concentrations of COCs remaining on-site and to be used to re-evaluate area- and site-wide EPCs once the planned site remediation is complete.

The areas designated for remediation in the 2010 RAP that have not yet been remediated or that have been partially remediated are presented in Table 5.1. Revised tonnage estimates are provided for these areas based on the results of the site remediation and site observations (i.e., % soil cover and soil depths). Drawing Nos. 121413099-800-EE-03, 121413099-800-EE-04 and, 121413099-800-EE-07 to 12141309-800-EE-09 in Appendix A show the estimated limits of the areas of soil requiring remediation. Once these areas are remediated, area- and site-wide EPCs will need to be verified and further risk evaluation may be required.

Table 4.1 Summary of TPH, PCB and Metals-Impacted Soil Requiring Remediation Based on SSTLs and EPCs – BMEWS, Main Base, Mid-Canada Line, Pit No. 1, Pit No. 3 and Old Dump Pond

Remedial Area	Remedial Objectives	Sample Locations	Area (m^2)	Depth (m)	Weight[1] (tonnes)
BMEWS	TPH	**BMEWS-AREA 1** (between BMEWS-TP2 and 14-BMEWS-BS107)	100	1	180
	TPH	**BMEWS-AREA 3** (BS20, 14-MB-BS301)	70	0.5	63
Main Base	PCBs	**MB-AREA 1 Centre** (15-MB-110, 16-MB-107, 16-MB-108, 16-MB-BS113, 16-MB-117 to 16-MB-119)	122	0.75	165
	PCBs	**MB-AREA 1 Northeast** (16-BS105, 16-MB-BS114, 16-MB-BS116, 16-MB-BS121)	108	1.5	292
	PCBs	**MB-AREA 5** (6546)	16	0.5	14
	PCBs	**MB-AREA 6** (Septic Tank)	-	-	5
Main Base	TPH	**MB-AREA 9** (MW-6, MB-TP5, 14-MB-BS902, 14-MB-BS903)	482	0.5	434
	TPH	**MB-AREA 7** (14-MB-BS701, 14-MB-BS702, 14-MB-BS703, 14-MB-BS705)	400	0.4	288
Mid-Canada Line	Cadmium, Chromium, Lead	**MCL-AREA 1** (MCL-BS10, BS135)	110	0.05	10
	Chromium	**MCL-AREA 2** (BS257)	77	0.05	7
Pit No. 1	PCBs	**P1-AREA 1** (TP152-BS1, 16-P1-BS115)	54	1.5	146
	PCBs	**P1-AREA 2** (MW18-SS4, 15-P1-TP201, 15-P1-TP202)	120	1.2	259
	PCBs	**P1-LAYDOWN** (16-P1-BS111, 16-P1-BS115, 16-P1-BS117 to 16-P1-BS119)	1,575	0.05	142
Pit No. 3	TPH	**P3-AREA 1** (BS239, BS240, BS241, P3-TP2, P3-TP4, P3-TP6, P3-TP7, P3-TP8, TP-161, TP-162, TP-164, TP-165, TP-166, TP-169, BS271, MW27, MW28, MW29, MW30)	4,135	1.0	7,443
	TPH	**P3-AREA 2** (BS237, P3-BS3, P3-BS4)	250	0.5	225
Old Dump Pond	PCBs	**Pond Shoreline** (12-ODP-BS7, 12-ODP-BS8)	30	1	54
	Antimony	**ODP-AREA 1** (TP-229)	25	0.25	11

Notes:
1. Based on an estimated soil density of 1.8 tonnes/m^3.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

During Year 6 of the Implementation of the RAP at the Former U.S. Military Site in Hopedale, NL, Stantec supervised environmental site remediation and conducted confirmatory soil sampling at Main Base and Old Base 1. Site remediation was carried out in response to recommendations provided in a RAP/RMP prepared by Stantec in 2009, additional delineation programs carried out by Stantec in 2010, 2013 and 2015, remediation programs in 2014, 2015 and 2016 and a mutually agreeable work plan developed by the Stakeholder Committee.

The following is a summary of remedial and on-site activities carried out at the Site in Year 6.

1. The existing biopile was sampled following NLDMAE's standard COA for soil treatment facilities. Concentrations of TPH in the composite soil samples exceeded 1,000 mg/kg; therefore, the soil required additional treatment before it could be disposed. Biopile maintenance activities, consisting of the addition of specified nutrients and mechanical aeration were carried out following the placement of TPH-impacted soil in the biopile containment cell.
2. A total of 1,227 tonnes of PCB-impacted soil was removed from the northeast, centre and northwest areas of Main Base-Area 1, Main Base-Area 4, POLW-Area 1 and Old Base 1-Areas 1 and 2 and was transported to Saint-Ambroise, QC by sea for PCB destruction. Confirmatory soil sampling was carried out along the limits of the remedial excavation to determine if the soil remaining on-site contained concentrations of PCBs below the residential site specific target level (SSTL) of 9 mg/kg. To meet the SSTL, additional soil removal is required to the centre of the Main Base-Area 1 excavation in the vicinity of samples 15-MB-110, 16-MB-107, 16-MB-108, 16-MB-BS113, 16-MB-117 to 16-MB-119 and to the northeast of the Main Base-Area 1 excavation in the vicinity of samples 16-BS105, 16-MB-BS114, 16-MB-BS116, 16-MB-BS121. PCB-soil removal is also required in the vicinity of samples 6546 (referred to as "Main Base-Area 5") and Pit No. 1 used as a laydown area for the PCB-impacted soil. These areas have not yet been remediated. Sludge removal is required at the septic tank along the northern of the Main Base (referred to as "Main Base-Area 6").
3. Metal debris removed from the PCB remedial excavation at Main Base was stockpiled on tarps at the Laydown Area at Pit No. 1 during the remediation activities along with debris stockpiled from Years 4 and 5. The metal debris had a weight of 27.32 tonnes and was shipped from Hopedale, NL to a licensed metal recycling facility in St. John's, NL. Boulders were placed at the entrance to Pit No.1 to block public access over the winter months.

5.2 Recommendations

Based on the results of the Year 6 of the Implementation of the RAP program, Stantec makes the following recommendations:

1. Complete the removal of TPH-impacted soil exceeding the ecological SSTL of 1,700 mg/kg in areas specified for remediation at BMEWS (estimated 243 tonnes), Main Base (estimated 722 tonnes) and Pit No. 3 (estimated 7,700 tonnes) as per Table 5.1. Once clean boundaries are obtained, return the site to its original condition. This will include backfilling, levelling and/or the placement of topsoil, as necessary.
2. Complete the removal of PCB-impacted soil exceeding the residential SSTL of 9 mg/kg at Main Base (estimated 484 tonnes) and Pit No. 1 (estimated 547 tonnes) as per Table 5.1. Once clean boundaries are obtained, return the Site to its original condition. This will include backfilling, levelling and/or the placement of topsoil, as necessary.
3. Complete the removal of metals-impacted soil exceeding the ecological SSTLs of 1.3 mg/kg for cadmium, 20 mg/kg for chromium and 75 mg/kg for lead at the Mid-Canada Line (estimated 17 tonnes) as per Table 5.1. Once clean boundaries are obtained, return the Site to its original condition. This will include backfilling, levelling and/or the placement of topsoil, as necessary.
4. Monitor concentrations of TPH in the biopile and perform maintenance activities, as necessary. Collect composite soil samples for the laboratory analysis of metals leachability to confirm disposal options.
5. Once site remediation is complete, re-evaluate area- and site-wide EPCs for comparison to the SSTLs.
6. Continue remediation efforts at the Former U.S. Military Site in accordance with the RAP/RMP and the recommendations provided by the Stakeholder Scientific Advisory Working Group.

6.0 CLOSURE

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

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

CLOSURE
July 26, 2017

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

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

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

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

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

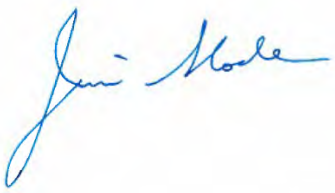
CLOSURE
July 26, 2017

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

This report was prepared by Paula Brennan, M.A.Sc., P.Eng., and reviewed by Jim Slade, P.Eng., P.Geo., and Robert MacLeod, M.Sc., P.Geo.

Respectfully submitted,

AIVEK STANTEC LIMITED PARTNERSHIP



Jim Slade, P.Eng., P.Geo.
Principal, Senior Environmental Engineer

Robert MacLeod, M.Sc., P.Geo.
Senior Principal, Senior Hydrogeologist

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APPENDIX A

Drawings

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

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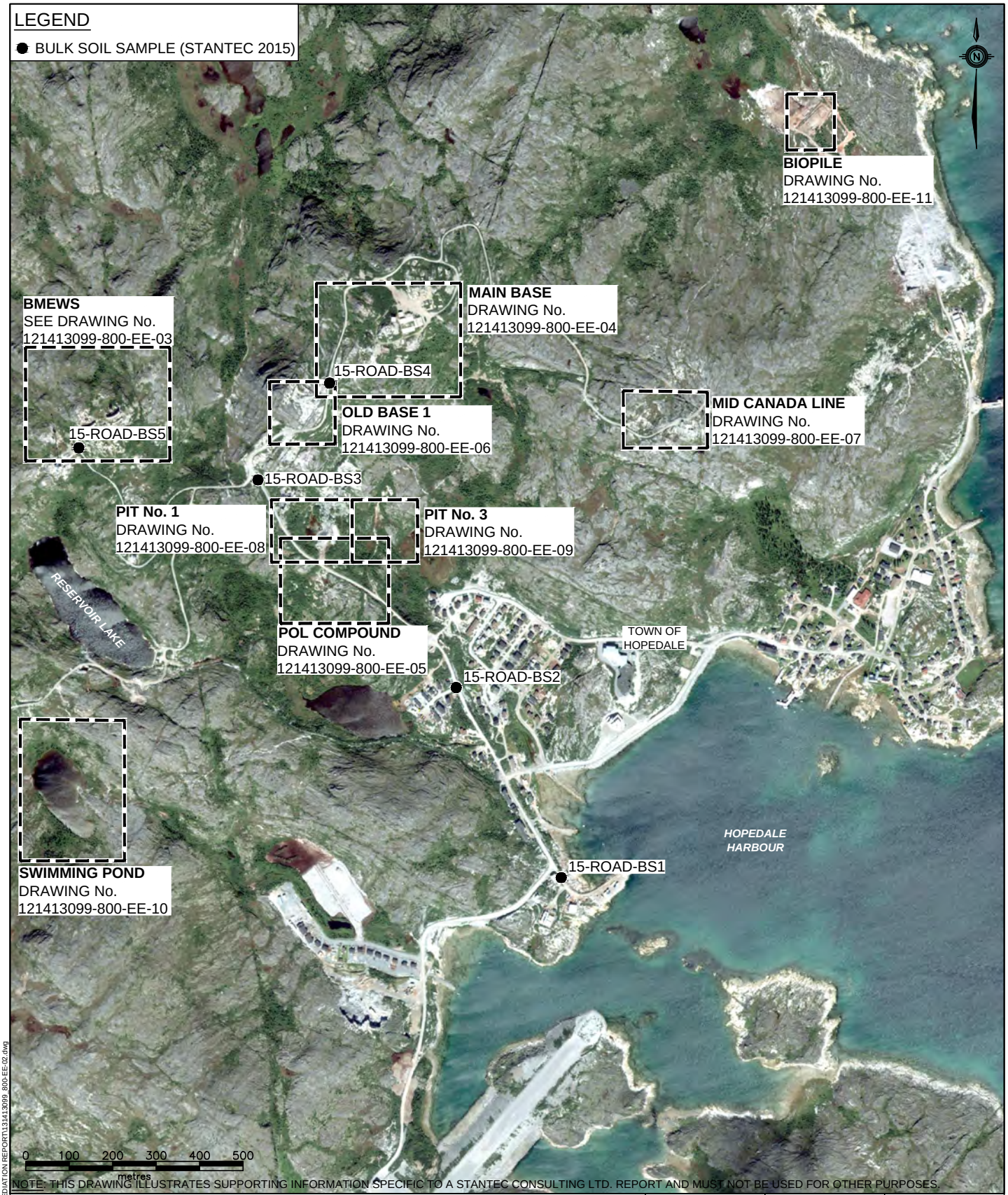

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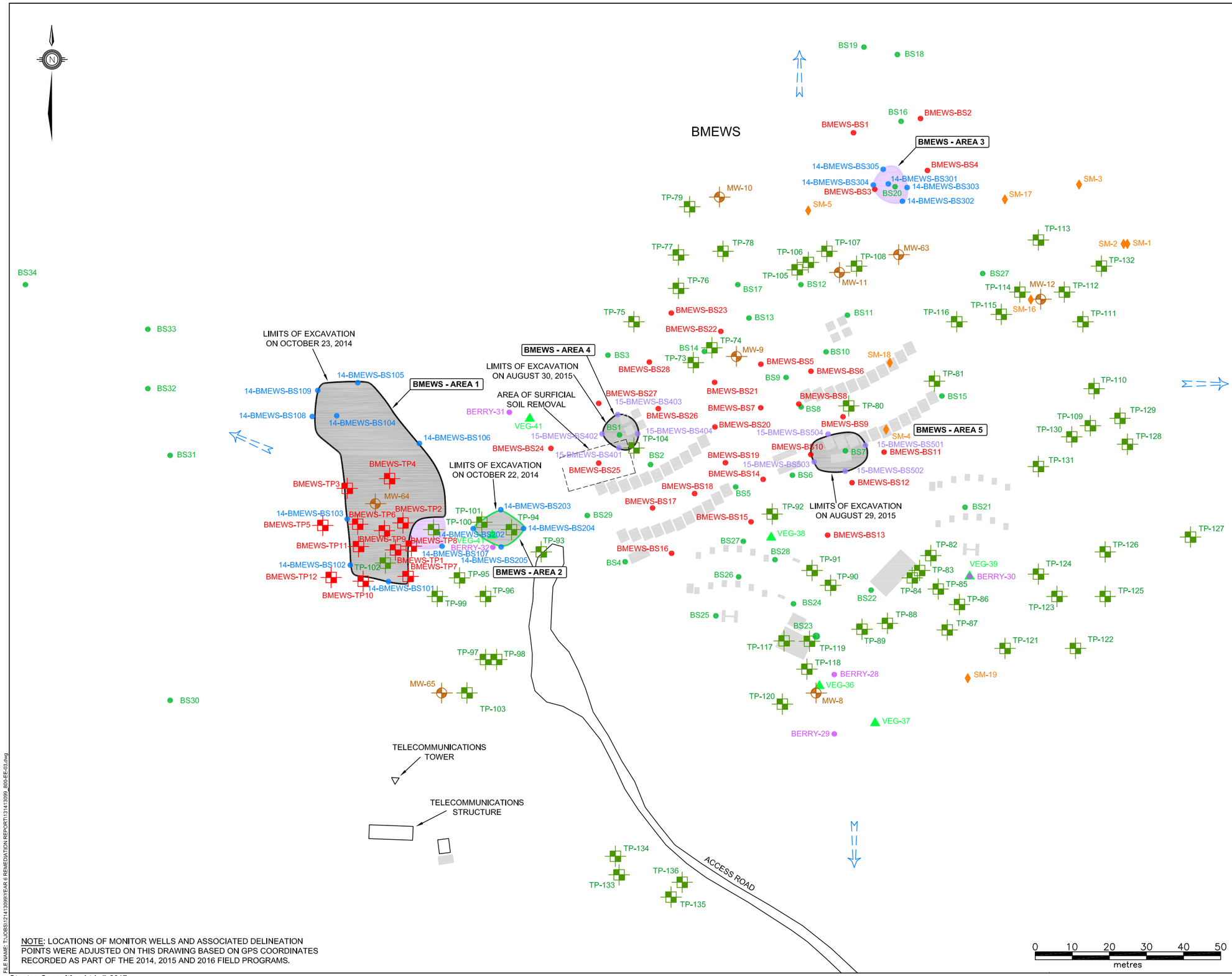

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- SMALL MAMMALS (STANTEC 2009)
- INFERRED GROUNDWATER FLOW DIRECTION
- REMEDIAL EXCAVATION
- CONCRETE FOUNDATION
- ESTIMATED AREA OF TPH-IMPACTED SOIL EXCEEDING SSTLs REQUIRING REMOVAL

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

NOTE: LOCATIONS OF MONITOR WELLS AND ASSOCIATED DELINEATION POINTS WERE ADJUSTED ON THIS DRAWING BASED ON GPS COORDINATES RECORDED AS PART OF THE 2014, 2015 AND 2016 FIELD PROGRAMS.

CLIENT:

NEWFOUNDLAND AND LABRADOR DEPARTMENT OF MUNICIPAL AFFAIRS AND ENVIRONMENT

PROJECT TITLE:

IMPLEMENTATION OF REMEDIAL ACTION PLAN - YEAR 6, FORMER U.S. MILITARY SITE, HOPEDALE, NL

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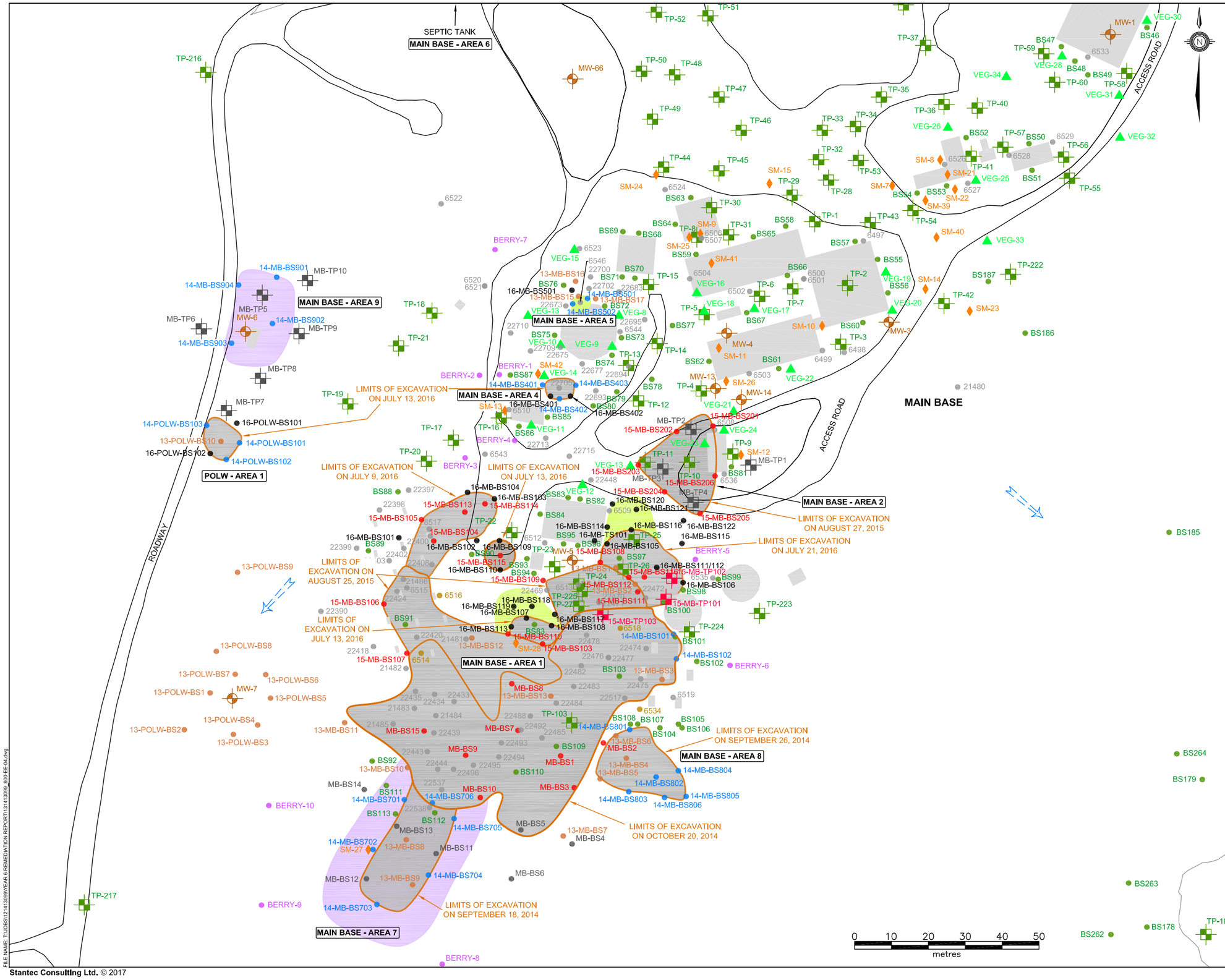

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- REMEDIAL EXCAVATION
- CONCRETE FOUNDATION
- ESTIMATED AREA OF PCB-IMPACTED SOIL EXCEEDING SSTL REQUIRING REMOVAL
- ESTIMATED AREA OF TPH IMPACTED SOIL EXCEEDING SSTLs REQUIRING REMOVAL

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PROJECT TITLE:

IMPLEMENTATION OF
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REMEDIATION AREAS AND
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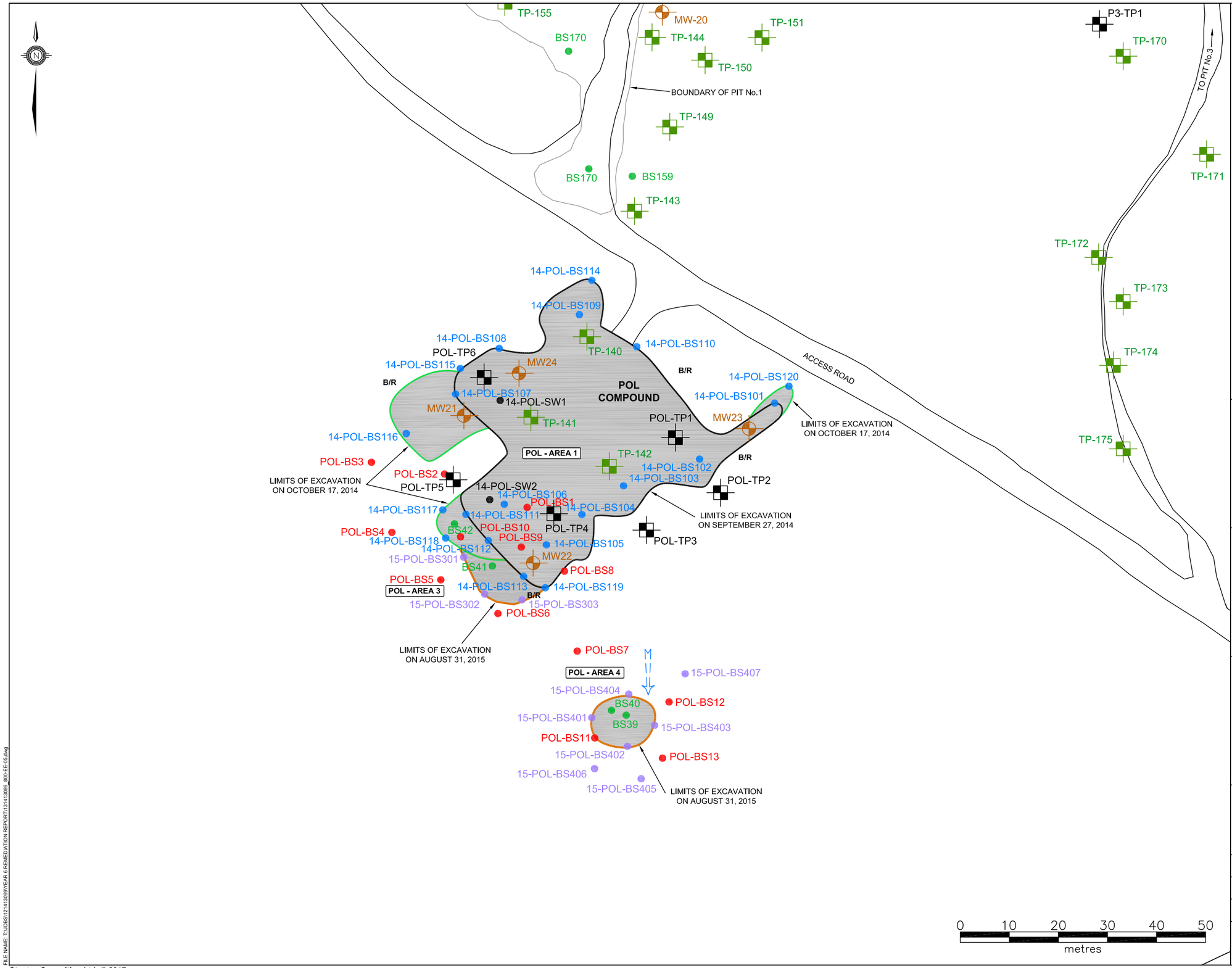

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- REMEDIAL EXCAVATION
- B/R EXPOSED BEDROCK

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IMPLEMENTATION OF
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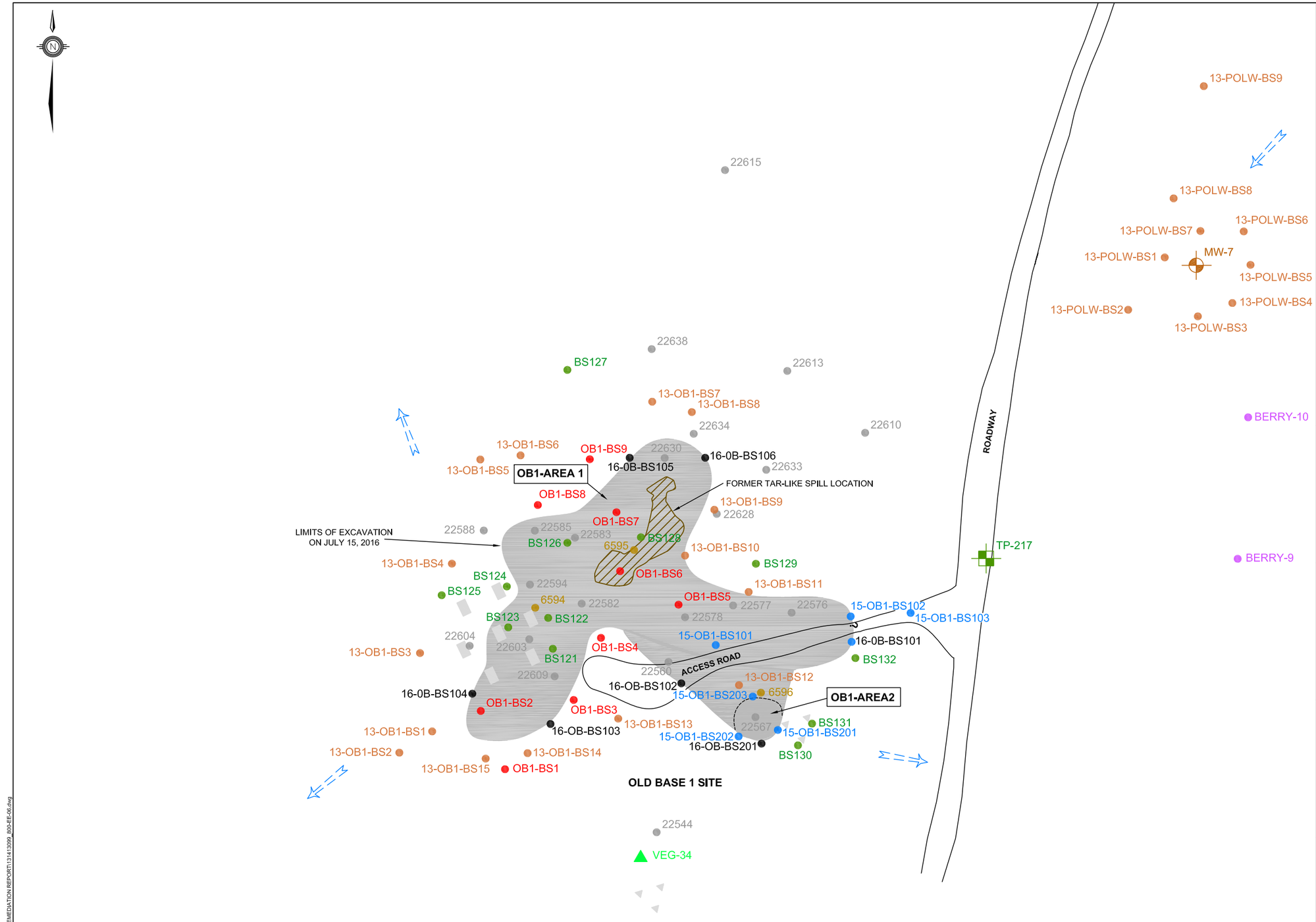

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- UNKNOWN EXTENT OF IMPACTS
- CONCRETE FOUNDATION
- REMEDIAL EXCAVATION

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

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NEWFOUNDLAND AND LABRADOR
DEPARTMENT OF MUNICIPAL
AFFAIRS AND ENVIRONMENT

PROJECT TITLE:

IMPLEMENTATION OF
REMEDIAL ACTION PLAN - YEAR 6,
FORMER U.S. MILITARY SITE, HOPEDALE, NL

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REMEDIATION AREAS AND SAMPLE
LOCATION PLAN - OLD BASE 1

Stantec Consulting Ltd.

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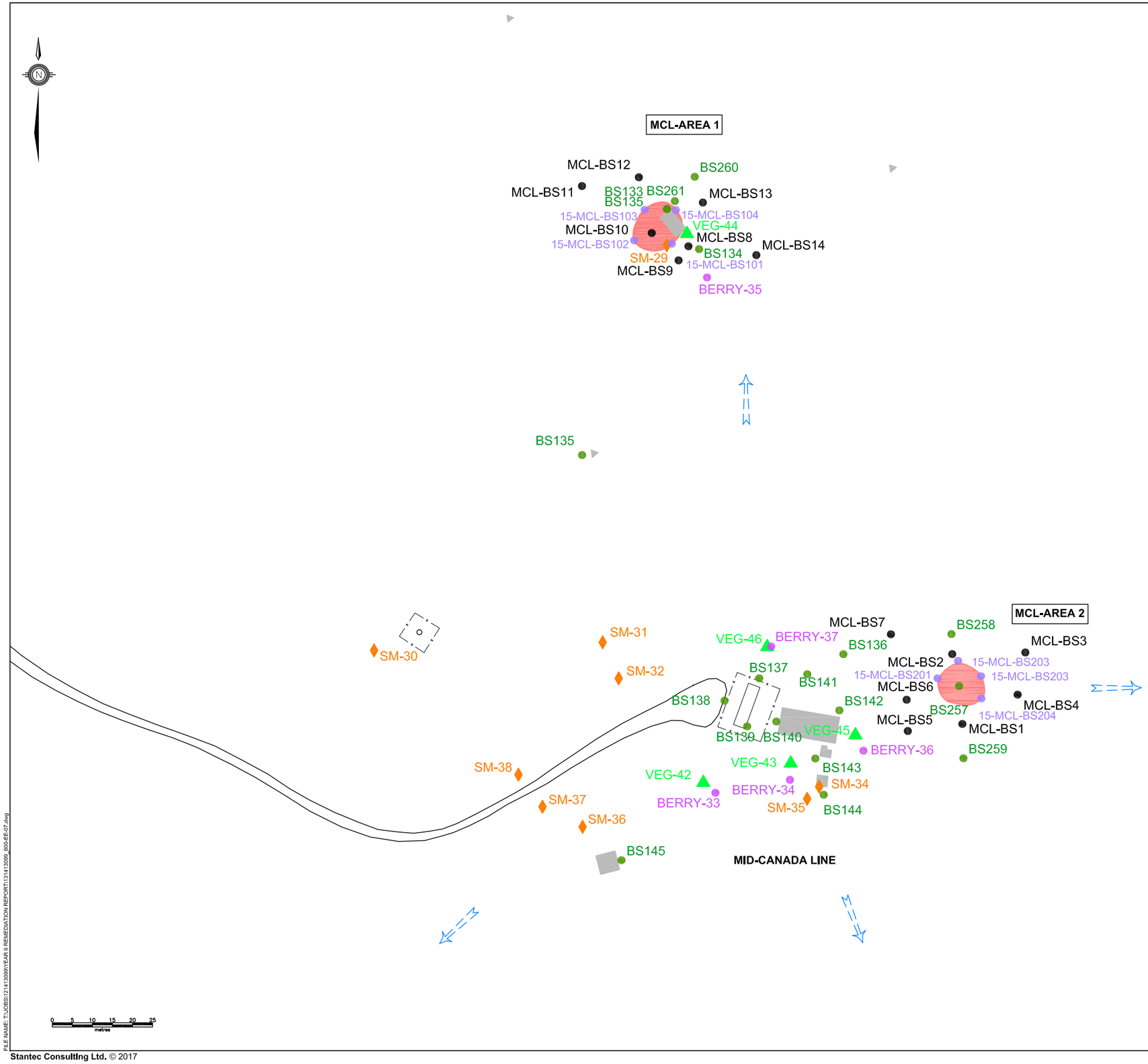

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- INFERRED GROUNDWATER FLOW DIRECTION
- ESTIMATED AREA OF METALS-IMPACTED SOIL EXCEEDING SSTLs REQUIRING REMOVAL

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NEWFOUNDLAND AND LABRADOR
DEPARTMENT OF MUNICIPAL
AFFAIRS AND ENVIRONMENT

PROJECT TITLE:

IMPLEMENTATION OF
REMEDIAL ACTION PLAN - YEAR 6,
FORMER U.S. MILITARY SITE, HOPEDALE, NL

DRAWING TITLE:

SAMPLE LOCATION PLAN - MID-CANADA LINE

Stantec Consulting Ltd.

SCALE:	DATE:	REV. No.
1:1000	MARCH 15, 2017	0
DRAWN BY:	EDITED BY:	CHECKED BY:
N.M.	-	P.B.
DRAWING No:	CAD FILE:	
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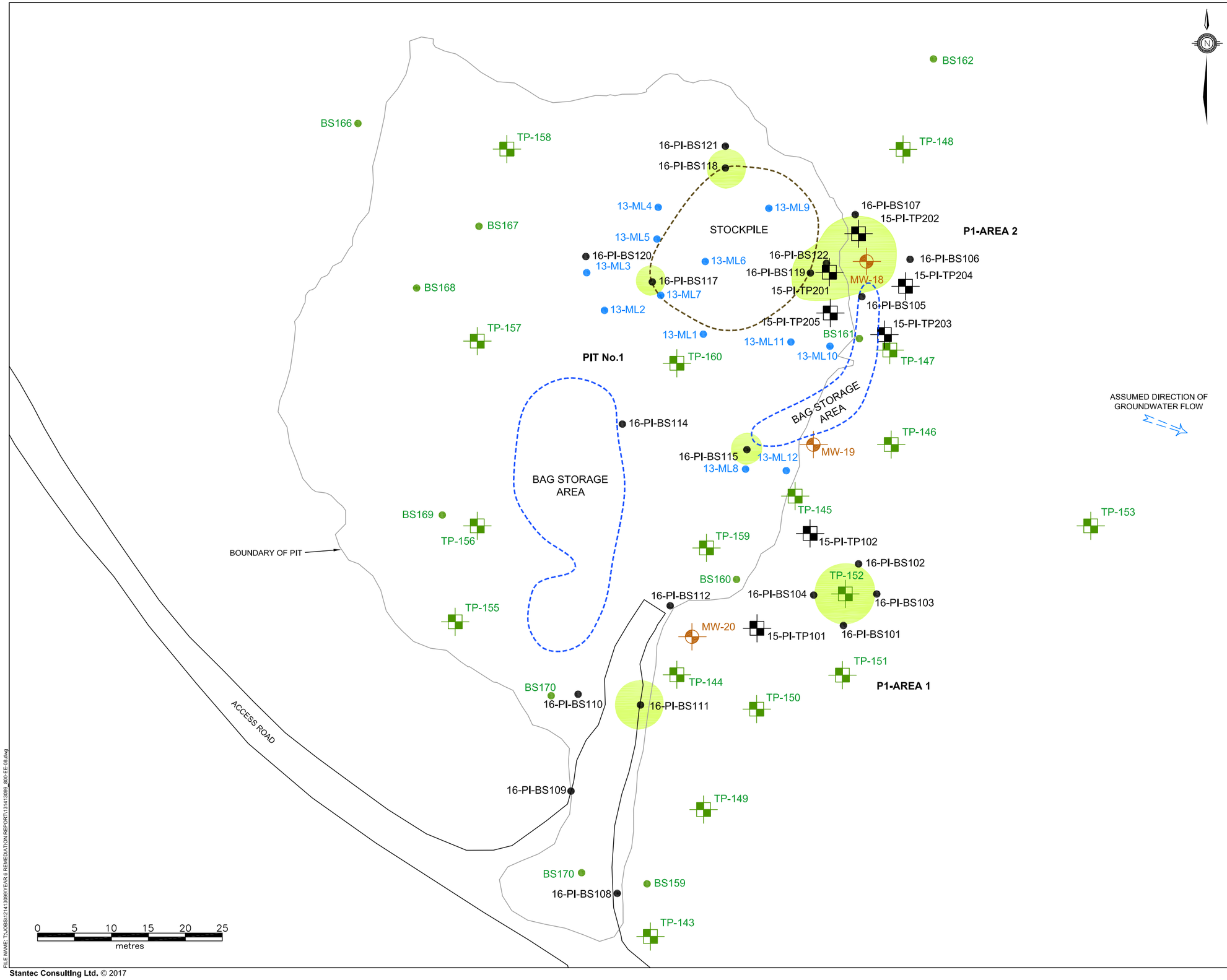

LEGEND

- TEST PIT (STANTEC 2015)
- TEST PIT (STANTEC 2009)
- MONITOR WELL (STANTEC 2009)
- BULK SAMPLE (STANTEC 2009)
- BULK SAMPLE (STANTEC 2013)
- BULK SOIL SAMPLE (STANTEC 2016)
- ESTIMATED AREA OF PCB IMPACTED SOIL EXCEEDING SSTLs REQUIRING REMOVAL
- ASSUMED DIRECTION OF GROUNDWATER FLOW

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NEWFOUNDLAND AND LABRADOR
DEPARTMENT OF MUNICIPAL
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PROJECT TITLE:

IMPLEMENTATION OF
REMEDIAL ACTION PLAN - YEAR 6,
FORMER U.S. MILITARY SITE, HOPEDALE, NL

DRAWING TITLE:

SAMPLE LOCATION PLAN - PIT No. 1

Stantec Consulting Ltd.

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DRAWN BY:	EDITED BY:	CHECKED BY:
N.M.	-	P.B.
DRAWING No:	CAD FILE:	
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Stantec

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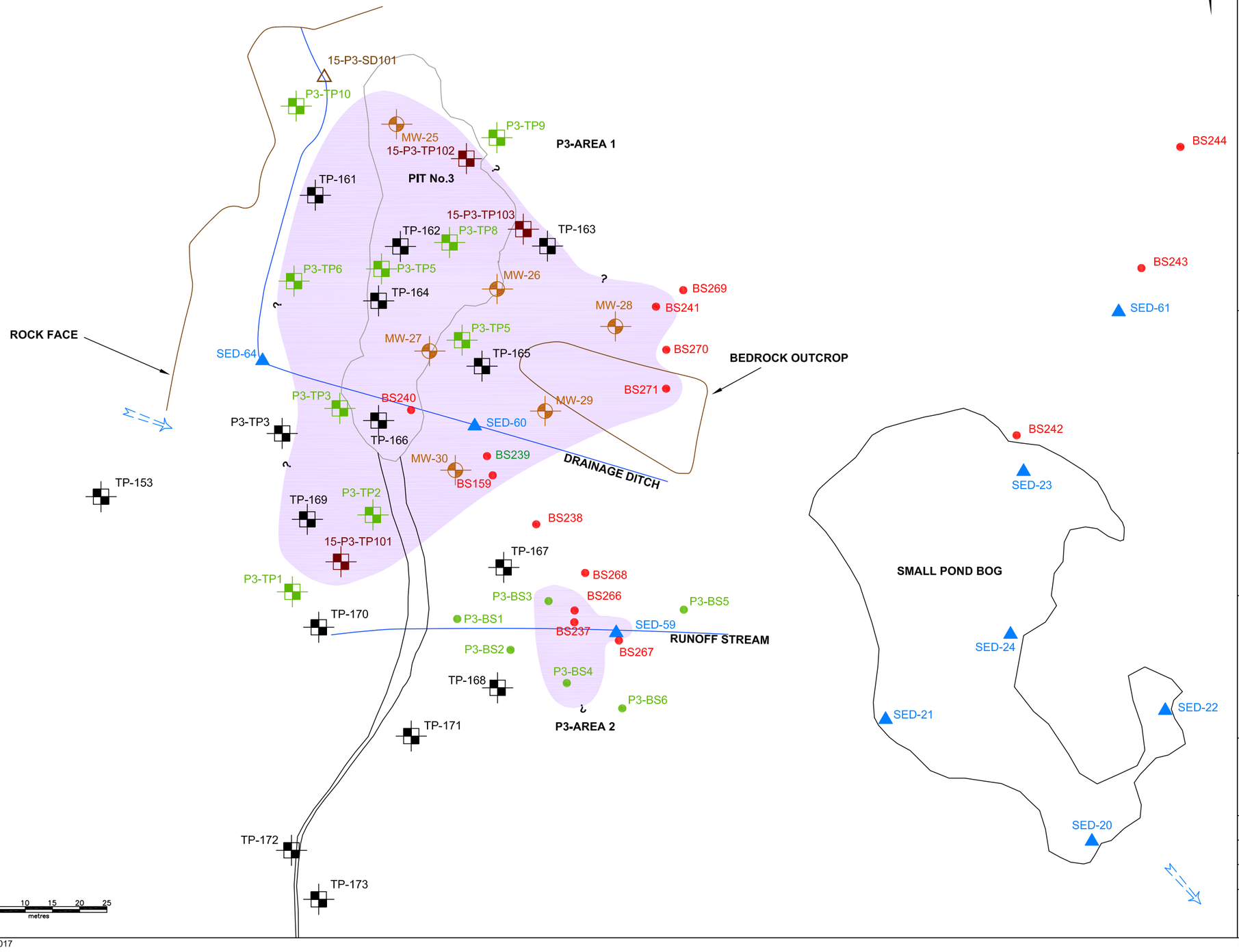
27MAR17 12:00PM



LEGEND

- TEST PIT (STANTEC 2015)
- TEST PIT (STANTEC 2010)
- TEST PIT (STANTEC 2009)
- MONITOR WELL (STANTEC 2009)
- BULK SOIL SAMPLE (STANTEC 2010)
- BULK SOIL SAMPLE (STANTEC 2009)
- SEDIMENT SAMPLE (STANTEC 2009)
- — ? — UNKNOWN EXTENT OF IMPACTS
- ESTIMATED AREA OF TPH IMPACTED SOIL EXCEEDING SSTLs REQUIRING REMOVAL
- INFERRED GROUNDWATER FLOW DIRECTION

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PROJECT TITLE:

IMPLEMENTATION OF
REMEDIAL ACTION PLAN - YEAR 6,
FORMER U.S. MILITARY SITE, HOPEDALE, NL

DRAWING TITLE:

SAMPLE LOCATION PLAN - PIT No. 3

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SCALE:	DATE:	REV. No.
1:750	MARCH 15, 2017	0
DRAWN BY:	EDITED BY:	CHECKED BY:
N.M.	-	P.B.
DRAWING No:	CAD FILE:	
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PROJECT TITLE:
IMPLEMENTATION OF REMEDIAL ACTION PLAN - YEAR 6, FORMER U.S. MILITARY SITE, HOPEDALE, NL

DRAWING TITLE:
SAMPLE LOCATION PLAN - SWIMMING POND

SCALE:	DATE:	REV. No.
1:3000	MAR. 15, 2017	0
DRAWN BY:	EDITED BY:	CHECKED BY:
N.M.	-	P.B.
DRAWING No:	CAD FILE:	
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PROJECT TITLE: IMPLEMENTATION OF REMEDIAL ACTION PLAN - YEAR 6, FORMER U.S. MILITARY SITE, HOPEDALE, NL

DRAWING TITLE: TEST PIT LOCATION PLAN - BIOPILE

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1:500 (approx.)	MAR. 15, 2017	0
DRAWN BY:	EDITED BY:	CHECKED BY:
N.M.	-	P.B.
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APPENDIX B

Site Photographs

Biopile

Photo 1 Biopile in Year 6 prior to soil sampling, July 7, 2016.

Photo 2 Biopile in Year 6 prior to soil sampling, July 7, 2016.

Photo 3 Biopile in Year 6 prior to soil sampling, July 7, 2016.

Photo 4 Placing test pits at the biopile, July 10, 2016.

Photo 5 Application of amendments to the nutrients, July 17, 2016.

Photo 6 Securing the cover on the biopile, August 2, 2016.

Main Base - Area 1 Northwest

Photo 7 Prior to soil removal at Main Base-Area 1 Northwest, July 7, 2016.

Photo 8 Prior to soil removal at Main Base-Area 1 Northwest, July 7, 2016.

Photo 9 Soil removal at Main Base-Area 1 Northwest, July 8, 2016.

Photo 10 After soil removal at Main Base-Area 1 Northwest, July 9, 2016.

Main Base-Area 1 Centre

Photo 11 Prior to soil removal at Main Base-Area 1 Centre, July 12, 2016.

Photo 12 Soil removal at Main Base-Area 1 Centre, July 13, 2016.

Photo13 After soil removal at Main Base-Area 1 Centre, July 13, 2016.

Photo 14 After soil removal at Main Base-Area 1 Centre, July 21, 2016.

Main Base-Area 1 Northeast

Photo 15 Soil removal at Main Base-Area 1 Northeast, July 9, 2016.

Photo 16 Soil removal at Main Base-Area 1 Northeast, July 9, 2016.

Photo 17 Soil removal at Main Base-Area 1 Northeast, July 10, 2016.

Photo 18 Soil removal at Main Base-Area 1 Northeast, July 12, 2016.

Photo 19 After soil removal at Main Base-Area 1 Northeast, July 21, 2016.

Photo 20 After soil removal at Main Base-Area 1 Northeast and remedial excavation boundary blocked by boulders, July 21, 2016.

Main Base-Area 4

Photo 21 Prior to soil removal at Main Base-Area 4, July 10, 2016.

Photo 22 After soil removal at Main Base-Area 4, July 13, 2016.

Photo 23 After soil removal at Main Base-Area 4, July 13, 2016.

Photo 24 After soil removal at Main Base-Area 4, July 13, 2016.

Main Base-Area 5

Photo 25 View of Main Base-Area 5, July 12, 2016.

Photo 26 View of Main Base-Area 5, July 12, 2016.

POLW-Area 1 (Main Base)

Photo 27 Prior to soil removal at Main Base-Area 4, July 12, 2016.

Photo 28 After soil removal at Main Base-Area 4, July 13, 2016.

Old Base-Areas 1 and 2

Photo 29 Soil removal at Old Base, July 14, 2016.

Photo 30 Soil removal at Old Base, July 14, 2016.

Photo 31 Soil removal at Old Base, July 14, 2016

Photo 32 After soil removal at Old Base, July 19, 2016

Pit No. 1

Photo 33 Stockpiled bags of impacted soil at Pit No. 1, July 8, 2016.

Photo 34 Stockpiled bags of impacted soil at Pit No. 1, July 11, 2016.

Photo 35 Pit No. 1, installing liner at staging area, July 11, 2016.

Photo 36 Pit No. 1, impacted soil being placed at staging area, July 22, 2016.

Photo 37 Pit No. 1, stored metal debris, July 22, 2016.

Photo 38 Pit No. 1, storage of impacted soil bags, July 22, 2016.

Photo 39 Storage of soil bags containing PCB-impacted soil for second shipment at Pit No. 1, August 3, 2016.

Photo 40 Pit No. 1 access blocked by boulders, August 4, 2016.

Impacted Soil Shipment

Photo 41 Loading of impacted soil bags from a flat bed truck, July 30, 2016.

Photo 41 PCB-impacted soil bags in Long Island's cargo hold at the American Dock, July 31, 2016.

Photo 43 Loading soil bags, July 31, 2016.

Photo 44 Long Island cargo hold, July 31, 2016.

APPENDIX C

Laboratory Analytical Results Summary Tables

Table C.1 Results of Laboratory Analysis of Petroleum Hydrocarbons in Soil - Biopile
Implementation of the RAP and Additional Delineation - Year 6
Former U.S. Military Site, Hopedale, NL
Project No. 121413099

Sample ID	Sample Date	Sample Depth (mbgs)	BTEX Parameters (mg/kg)				Total Petroleum Hydrocarbons (mg/kg)						Resemblance
			Benzene	Toluene	Ethyl-benzene	Xylenes	F1 (C_6-C_{10})	F2 (C_{10}-C_{16})	F3 (C_{16}-C_{21})	F3 (C_{21}-C_{32})	Reached Baseline at C32?[3]	Modified TPH - Tier I[2]	
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		mg/kg	-
RDL (2011)			0.03	0.03	0.03	0.05	3	10	10	15		20	-
RDL (2012-2014)			0.025	0.025	0.025	0.05	2.5	10	10	15		15	
RDL (2015)			0.025	0.025	0.025	0.05	2.5	50	50	75		75	
Landfill acceptance criteria[1]			0.030	0.37	0.082	11	-	-	-	-		1,000	-
2011 Sampling - Stantec													
11-BIOPILE-BS1	06-Nov-11	grab	<0.03	<0.03	<0.03	<0.05	14	570	91	<15	Yes	670	WFO
11-BIOPILE-BS2	06-Nov-11	grab	<0.03	<0.03	<0.03	<0.05	9	1,300	210	38	Yes	**1,500**	FO
11-BIOPILE-BS3	06-Nov-11	grab	<0.03	<0.03	<0.03	<0.05	48	610	89	23	Yes	770	FO
11-BIOPILE-BS4	06-Nov-11	grab	<0.03	<0.03	<0.03	<0.05	64	1,400	220	41	Yes	**1,700**	FO
11-BIOPILE-BS5	16-Nov-11	grab	<0.03	<0.03	<0.03	<0.05	6	140	30	<15	Yes	180	FO
2012 Sampling - Stantec													
12-BP-TP1A	14-Jul-12	0.0 - 0.5	<0.025	<0.025	0.047	0.15	270	2,600	260	47	Yes	**3,200**	FO
12-BP-TP1B	14-Jul-12	0.5 - 1.0	<0.025	<0.025	<0.025	<0.05	260	3,400	340	58	Yes	**4,000**	FO
12-BP-TP2A	14-Jul-12	0.0 - 0.5	<0.025	<0.025	<0.025	<0.05	22	710	66	<15	Yes	800	FO
12-BP-TP2B	14-Jul-12	0.5 - 1.0	<0.025	<0.025	<0.025	<0.05	49	860	120	<15	Yes	**1,000**	FO
12-BP-TP3A	14-Jul-12	0.0 - 0.5	<0.025	<0.025	<0.025	<0.05	910	6,800	650	84	Yes	**8,400**	FO
12-BP-TP3B	14-Jul-12	0.5 - 1.0	<0.025	<0.025	<0.025	0.16	560	4,100	420	81	Yes	**5,200**	FO
12-BP-TP4A	14-Jul-12	0.0 - 0.5	<0.025	<0.025	<0.025	<0.05	120	2,300	240	37	Yes	**2,700**	FO
12-BP-TP4B	14-Jul-12	0.5 - 1.0	<0.025	<0.025	<0.025	<0.05	100	1,400	150	<15	Yes	**1,700**	FO
12-BP-TP5A	14-Jul-12	0.0 - 0.5	<0.025	<0.025	<0.025	<0.05	21	620	83	22	Yes	740	FO
12-BP-TP5B	14-Jul-12	0.5 - 1.0	<0.025	<0.025	<0.025	<0.05	30	600	120	<15	Yes	750	WFO
12-BP-TP6A	14-Jul-12	0.0 - 0.5	<0.025	<0.025	<0.025	<0.05	22	560	60	17	Yes	660	FO
12-BP-TP6B	14-Jul-12	0.5 - 1.0	<0.025	<0.025	<0.025	<0.05	5	82	<10	<15	Yes	87	WFO
12-BP-COMP A1	21-Oct-12	0.0 - 0.5 (composite)	<0.025	<0.025	<0.025	<0.05	63	1,500	190	51	Yes	**1,800**	FO
12-BP-COMP A2	21-Oct-12	0.0 - 0.5 (composite)	<0.025	<0.025	<0.025	<0.05	110	1,100	150	46	Yes	**1,400**	FO
12-BP-COMP B1	21-Oct-12	0.5 - 1.0 (composite)	<0.025	<0.025	0.036	0.15	230	1,800	220	45	Yes	**2,300**	FO
12-BP-COMP B2	21-Oct-12	0.5 - 1.0 (composite)	<0.025	0.058	<0.025	<0.025	73	1,200	160	42	Yes	**1,400**	FO
12-BP-COMP C1	21-Oct-12	1.0 - 1.5 (composite)	<0.025	<0.025	<0.025	0.062	120	1,400	170	30	Yes	**1,700**	FO
12-BP-COMP C2	21-Oct-12	1.0 - 1.5 (composite)	<0.025	<0.025	<0.025	<0.05	140	1,500	200	53	Yes	**1,900**	FO

Notes:

1 = Typical landfill acceptance criteria. BTEX acceptance criteria based on Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guidelines (CSQGs) for a Commercial Site (1999 and updates) with coarse grained soil and non-potable groundwater

2 = Modified TPH = Total petroleum hydrocarbons excluding total BTEX

3 = If baseline was not reached at C_{32}, sample may contain carbon fractions >C_{32}

"-" = No applicable guideline or does not apply

RDL = Reportable Detection Limit; < ## = Not detected above RDL noted

Metres below ground surface

Bold / Shaded Concentration exceeds typical landfill acceptance criteria

Resemblance

FO = Fuel oil fraction WFO = Weathered fuel oil fraction

Table C.1 Results of Laboratory Analysis of Petroleum Hydrocarbons in Soil - Biopile
Implementation of the RAP and Additional Delineation - Year 6
Former U.S. Military Site, Hopedale, NL
Project No. 121413099

Sample ID	Sample Date	Sample Depth (mbgs)	BTEX Parameters (mg/kg)				Total Petroleum Hydrocarbons (mg/kg)						Resemblance
			Benzene	Toluene	Ethyl-benzene	Xylenes	F1 (C_6-C_{10})	F2 (C_{10}-C_{16})	F3 (C_{16}-C_{21})	F3 (C_{21}-C_{32})	Reached Baseline at C32?[3]	Modified TPH - Tier I[2]	
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		mg/kg	-
RDL (2011)			0.03	0.03	0.03	0.05	3	10	10	15		20	-
RDL (2012-2014)			0.025	0.025	0.025	0.05	2.5	10	10	15		15	
RDL (2015)			0.025	0.025	0.025	0.05	2.5	50	50	75		75	
Landfill acceptance criteria[1]			0.030	0.37	0.082	11	-	-	-	-		1,000	-
2013 Sampling - Stantec													
13-BP-COMP-A1	18-Aug-13	0.0 - 0.5 (composite)	<0.025	<0.025	<0.025	<0.05	15	420	77	26	Yes	540	WFO
13-BP-COMP-A1 Lab-Dup	18-Aug-13	0.0 - 0.5 (composite)	<0.025	<0.025	<0.025	<0.05	16	420	77	23	Yes	-	-
13-BP-COMP-A2	18-Aug-13	0.0 - 0.5 (composite)	<0.025	<0.025	<0.025	<0.05	12	370	71	25	Yes	480	WFO
13-BP-COMP-B1	18-Aug-13	0.5 - 1.0 (composite)	<0.025	<0.025	<0.025	<0.05	43	720	110	30	Yes	900	WFO
13-BP-COMP-B2	18-Aug-13	0.5 - 1.0 (composite)	<0.025	<0.025	<0.025	<0.05	32	560	83	25	Yes	700	WFO
13-BP-COMP-C1	18-Aug-13	1.0 - 1.5 (composite)	<0.025	<0.025	<0.025	<0.05	17	440	67	20	Yes	540	WFO
13-BP-COMP-C2	18-Aug-13	1.0 - 1.5 (composite)	<0.025	<0.025	<0.025	<0.05	20	370	57	21	Yes	460	WFO
2014 Sampling - Stantec													
14-BP-COMPA1	09-Aug-14	0.0 - 0.5 (composite)	<0.025	<0.025	<0.025	<0.05	7.2	440	71	23	Yes	540	FO
14-BP-COMPA2	09-Aug-14	0.0 - 0.5 (composite)	<0.025	<0.025	<0.025	<0.05	5.6	320	58	23	Yes	410	FO
14-BP-COMPB1	09-Aug-14	0.5 - 1.0 (composite)	<0.025	<0.025	<0.025	<0.05	9.1	560	85	24	Yes	680	FO
14-BP-COMPB2	09-Aug-14	0.5 - 1.0 (composite)	<0.025	<0.025	<0.025	<0.05	11	690	110	22	Yes	840	FO
14-BP-COMPC1	09-Aug-14	1.0 - 1.5 (composite)	<0.025	<0.025	<0.025	<0.05	8.1	500	74	nd	Yes	590	FO
14-BP-COMPC2	09-Aug-14	1.0 - 1.5 (composite)	<0.025	<0.025	<0.025	<0.05	8.9	780	120	26	Yes	930	FO

Notes:

1 = Typical landfill acceptance criteria. BTEX acceptance criteria based on CCME CSQGs for a Commercial Site (1999 and updates) with coarse grained soil and non-potable groundwater

2 = Modified TPH = Total petroleum hydrocarbons excluding total BTEX

3 = If baseline was not reached at C_{32}, sample may contain carbon fractions >C_{32}

"-" = No applicable guideline or does not apply

Lab-Dup = Laboratory duplicate sample

RDL = Reportable Detection Limit; < ## = Not detected above RDL noted

Metres below ground surface

Bold / Shaded Concentration exceeds typical landfill acceptance criteria

Resemblance

FO = Fuel oil fraction

WFO = Weathered fuel oil fraction

Table C.1 Results of Laboratory Analysis of Petroleum Hydrocarbons in Soil - Biopile
Implementation of the RAP and Additional Delineation - Year 6
Former U.S. Military Site, Hopedale, NL
Project No. 121413099

Sample ID	Sample Date	Sample Depth (mbgs)	BTEX Parameters (mg/kg)				Total Petroleum Hydrocarbons (mg/kg)						Resemblance
			Benzene	Toluene	Ethyl-benzene	Xylenes	F1 (C_6-C_{10})	F2 (C_{10}-C_{16})	F3 (C_{16}-C_{21})	F3 (C_{21}-C_{32})	Reached Baseline at C32?[3]	Modified TPH - Tier I[2]	
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		mg/kg	-
RDL (2011)			0.03	0.03	0.03	0.05	3	10	10	15		20	-
RDL (2012-2014)			0.025	0.025	0.025	0.05	2.5	10	10	15		15	
RDL (2015)			0.025	0.025	0.025	0.05	2.5	50	50	75		75	
Landfill acceptance criteria[1]			0.030	0.37	0.082	11	-	-	-	-		1,000	-
2015 Sampling - Stantec													
15-BP-COMP-A1	19-Aug-15	0.0 - 0.5 (composite)	<0.025	<0.025	<0.025	<0.05	25	2,000	720	3,000	Yes	**5,800**	WFO/LO
15-BP-COMP-A1 Lab-Dup	19-Aug-15	0.0 - 0.5 (composite)	<0.025	0.040	<0.025	<0.05	28	-	-	-	Yes	-	-
15-BP-COMP-A2	19-Aug-15	0.0 - 0.5 (composite)	<0.025	0.046	<0.025	<0.05	24	2,000	730	2,500	Yes	**5,300**	WFO/LO
15-BP-COMP-B1	19-Aug-15	0.5 - 1.0 (composite)	<0.025	<0.025	<0.025	<0.05	60	2,800	870	1,900	Yes	**5,600**	WFO/LO
15-BP-COMP-B2	19-Aug-15	0.5 - 1.0 (composite)	<0.025	<0.025	<0.025	<0.05	58	2,800	890	1,900	Yes	**5,600**	WFO/LO
15-BP-COMP-C1	19-Aug-15	1.0 - 1.5 (composite)	<0.025	<0.025	<0.025	<0.05	46	3,500	940	1,800	Yes	**6,300**	WFO/LO
15-BP-COMP-C2	19-Aug-15	1.0 - 1.5 (composite)	<0.025	0.040	<0.025	<0.05	48	2,500	740	2,200	Yes	**5,500**	WFO/LO
15-BP-COMP-D1	19-Aug-15	1.5 - 2.0 (composite)	<0.025	0.038	<0.025	<0.05	65	2,600	620	2,000	Yes	**5,300**	WFO/LO
15-BP-COMP-D2	19-Aug-15	1.5 - 2.0 (composite)	<0.025	<0.025	<0.025	<0.05	67	2,700	660	1,600	Yes	**5,100**	WFO/LO
2016 Sampling - Stantec													
16-BP-COMP-A1	10-Jul-16	0.0 - 0.5 (composite)	<0.025	0.094	<0.025	<0.050	60	4,000	1,200	4,200	No	**9,400**	WFO/LO
16-BP-COMP-A2	10-Jul-16	0.0 - 0.5 (composite)	<0.025	0.18	<0.025	0.13	70	3400	960	4100	No	**8,500**	WFO/LO
16-BP-COMP-B1	10-Jul-16	0.5 - 1.0 (composite)	<0.025	0.25	<0.025	0.31	93	3,500	900	3,900	No	**8,400**	WFO/LO
16-BP-COMP-B2	10-Jul-16	0.5 - 1.0 (composite)	<0.025	0.33	<0.025	0.29	100	3,900	1,000	4,300	No	**9,200**	WFO/LO
16-BP-COMP-C1	10-Jul-16	1.0 - 1.5 (composite)	<0.025	0.36	<0.025	0.28	96	4,400	1,100	4,400	Yes	**10,000**	WFO/LO
16-BP-COMP-C2	10-Jul-16	1.0 - 1.5 (composite)	<0.025	**0.45**	<0.025	0.40	120	4,000	970	3,700	No	**8,800**	WFO/LO
16-BP-COMP-D1	10-Jul-16	1.5 - 2.0 (composite)	<0.025	0.26	<0.025	0.22	93	3,700	860	3,000	No	**7,600**	WFO/LO
16-BP-COMP-D2	10-Jul-16	1.5 - 2.0 (composite)	<0.025	0.35	<0.025	0.35	110	2,900	690	2,800	No	**6,500**	WFO/LO

Notes:

1 = Typical landfill acceptance criteria. BTEX acceptance criteria based on CCME CSQGs for a Commercial Site (1999 and updates) with coarse grained soil and non-potable groundwater

2 = Modified TPH = Total petroleum hydrocarbons excluding total BTEX

3 = If baseline was not reached at C_{32}, sample may contain carbon fractions >C_{32}

"-" = No applicable guideline or does not apply

Lab-Dup = Laboratory duplicate sample

RDL = Reportable Detection Limit; < ## = Not detected above RDL noted

Metres below ground surface

Bold / Shaded Concentration exceeds typical landfill acceptance criteria

Resemblance

WFO = Weathered fuel oil fraction

LO = Lube oil fraction

Table C.2 Results of Laboratory Analysis of PCBs in Soil - Main Base
Implementation of the RAP and Additional Delineation - Year 6
Former U.S. Military Site, Hopedale, NL
Project No. 121413099

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	-
	Units	mg/kg	-
	CCME SQG[1]	1.3	-
	SSTL (Residential Area)[2]	9	-
2005 Sampling - ESG			
6497*	0 - 0.1	<0.05	-
6498*	0 - 0.1	<0.05	-
6499*	0 - 0.1	***1.7***	-
6500*	0 - 0.1	<0.05	-
6502*	0 - 0.1	***1.6***	-
6503*	0 - 0.1	<0.05	-
6504	0 - 0.1	0.60	-
6505*	0 - 0.1	<0.05	-
6506*	0 - 0.1	<0.05	-
6507*	0.3	<0.05	-
6508*	0 - 0.1	<0.05	-
6509*	0 - 0.1	***1.8***	-
6510*	0 - 0.1	<0.05	-
6512*	0 - 0.1	<0.05	-
6513*	0 - 0.1	***4.2***	-
6514	0 - 0.1	***12,000***	Soil removed
6515*	0 - 0.1	<0.05	-
6516	0 - 0.1	<0.05	-
6517*	0 - 0.1	<0.05	-
6518	0 - 0.1	***3.5***	Soil removed
6519*	0 - 0.1	***2.2***	-
6520*	0 - 0.1	<0.05	-
6522*	0 - 0.1	<0.05	-
6523*	0 - 0.1	<0.05	-
6524*	0 - 0.1	<0.05	-
6525*	0 - 0.1	<0.05	-
6526*	0 - 0.1	<0.05	-
6527*	0 - 0.1	<0.05	-
6528*	0 - 0.1	<0.05	-
6529*	0 - 0.1	<0.05	-
6530	0 - 0.1	<0.05	-
6532*	0.3	<0.05	-
6533	0 - 0.1	***6.0***	-
6534	0 - 0.1	***4.0***	Soil removed
6535*	0 - 0.1	<0.05	-
6536*	0 - 0.1	<0.05	-
6537*	0.3 - 0.4	<0.05	-
6538*	0 - 0.1	<0.05	-
6539*	0 - 0.1	<0.05	-

Notes:

1 = CCME CSQGs for a Residential/Parkland Site (1999 and updates)

2 = Site-Specific Target Level (SSTL) calculated for PCBs in the Residential Area (Stantec, 2010)

* = Analysis carried out with field test kit

RDL = Reportable Detection Limit for routine analysis

< # = Not detected above RDL noted

Bold/Italics = Value exceeds generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for PCBs at the Residential Area (Stantec, 2010)

Table C.2 Results of Laboratory Analysis of PCBs in Soil - Main Base
Implementation of the RAP and Additional Delineation - Year 6
Former U.S. Military Site, Hopedale, NL
Project No. 121413099

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	-
	Units	mg/kg	-
	CCME SQG[1]	1.3	-
	SSTL (Residential Area)[2]	9	-
2005 Sampling - ESG (...continued)			
6540*	0.4 - 0.5	<0.05	-
6542*	0 - 0.1	<0.05	-
6543*	0 - 0.1	<0.05	-
6544	0 - 0.1	0.60	-
6545*	0 - 0.1	<0.05	-
6546	0 - 0.1	***33***	-
6597*	0 - 0.1	<0.05	-
6598*	0 - 0.1	<0.05	-
6599*	0 - 0.1	<0.05	-
21480	0 - 0.1	***2.0***	-
21482	0 - 0.1	<0.05	-
21483	0 - 0.1	***2.4***	-
21484	0 - 0.1	***28***	-
21485	0 - 0.1	***2.7***	-
21486	0 - 0.1	***2.1***	-
21558	0 - 0.1	1.0	-
21559	0 - 0.1	<0.05	-
21562	0 - 0.1	***1.4***	-
21563	0 - 0.1	<0.05	-
21566	0 - 0.1	<0.05	-
21567	0 - 0.1	0.60	-
2007 Sampling - ESG			
22390	0 - 0.1	0.60	-
22393	0 - 0.1	0.70	-
22397	0 - 0.1	<0.05	-
22398	0 - 0.1	0.60	-
22399	0 - 0.1	<0.05	-
22400	0 - 0.1	***15.7***	-
22402	0 - 0.1	***6.0***	-
22403	0 - 0.1	***2.0***	-
22404	0 - 0.1	<0.05	-
22408	0 - 0.1	***1.8***	-
22418	0 - 0.1	<0.05	-
22420	0 - 0.1	***33***	-
22424	0 - 0.1	***24.3***	-
22433	0 - 0.1	***9.2***	Soil removed
22434	0 - 0.1	<0.05	Soil removed
22435	0 - 0.1	***15.5***	Soil removed
22439	0 - 0.1	***1.5***	Soil removed
22443	0 - 0.1	***9.6***	Soil removed

Notes:

1 = CCME CSQGs for a Residential/Parkland Site (1999 and updates)

2 = Site-Specific Target Level (SSTL) calculated for PCBs in the Residential Area (Stantec, 2010)

* = Analysis carried out with field test kit

RDL = Reportable Detection Limit for routine analysis; < # = Not detected above RDL noted

Bold/Italics = Value exceeds generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for PCBs at the Residential Area (Stantec, 2010)

Table C.2 Results of Laboratory Analysis of PCBs in Soil - Main Base
Implementation of the RAP and Additional Delineation - Year 6
Former U.S. Military Site, Hopedale, NL
Project No. 121413099

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	-
	Units	mg/kg	-
	CCME SQG[1]	1.3	-
	SSTL (Residential Area)[2]	9	-
2007 Sampling - ESG (...continued)			
22444	0 - 0.1	***1,480***	Soil removed
22448	0 - 0.1	<0.05	-
22469	0 - 0.1	***13.5***	-
22470	0 - 0.1	***22.5***	-
22471	0 - 0.1	***22.4***	-
22472	0 - 0.1	<0.05	-
22474	0 - 0.1	***12.8***	Soil removed
22475	0 - 0.1	***12.7***	Soil removed
22476	0 - 0.1	0.60	Soil removed
22477	0 - 0.1	<0.05	-
22478	0 - 0.1	***73.1***	Soil removed
22479	0 - 0.1	***10.4***	Soil removed
22482	0 - 0.1	***152***	Soil removed
22483	0 - 0.1	***30.6***	Soil removed
22484	0 - 0.1	***56.5***	Soil removed
22485	0 - 0.1	0.60	Soil removed
22488	0 - 0.1	***20,200***	Soil removed
22492	0 - 0.1	***6,370***	Soil removed
22493	0 - 0.1	***44.2***	Soil removed
22494	0 - 0.1	***14.9***	Soil removed
22495	0 - 0.1	***3.4***	-
22496	0 - 0.1	***30.8***	Soil removed
22517	0 - 0.1	***8.1***	-
22537	0 - 0.1	***7.2***	Soil removed
22538	0 - 0.1	***82.5***	Soil removed
22673	0 - 0.1	<0.05	-
22675	0 - 0.1	2.2	-
22677	0 - 0.1	4.6	-
22683	0 - 0.1	1.0	-
22693	0 - 0.1	1.3	-
22694	0 - 0.1	4.9	-
22695	0 - 0.1	<0.05	-
22700	0 - 0.1	<0.05	-
22705	0 - 0.1	***1,300***	-
22709	0 - 0.1	<0.05	-
22713	0 - 0.1	<0.05	-
22715	0 - 0.1	0.70	-

Notes:

1 = CCME CSQGs for a Residential/Parkland Site (1999 and updates)

2 = Site-Specific Target Level (SSTL) calculated for PCBs in the Residential Area (Stantec, 2010)

* = Analysis carried out with field test kit

RDL = Reportable Detection Limit for routine analysis; < # = Not detected above RDL noted

Bold/Italics = Value exceeds generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for PCBs at the Residential Area (Stantec, 2010)

Table C.2 Results of Laboratory Analysis of PCBs in Soil - Main Base
Implementation of the RAP and Additional Delineation - Year 6
Former U.S. Military Site, Hopedale, NL
Project No. 121413099

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	-
	Units	mg/kg	-
	CCME SQG[1]	1.3	-
	SSTL (Residential Area)[2]	9	-
2009 Sampling - Stantec			
TP7-BS2	0.6 - 0.8	<0.05	-
TP13-BS2	1.0 - 1.1	***2.3***	-
TP16-BS1	0.1 - 0.3	<0.05	-
TP20-BS2	0.4 - 1.3	***6.2***	-
TP21-BS2	0.9 - 1.0	***3.2***	-
TP24-BS2	1.0 - 1.1	<0.05	-
TP31-BS2	0.8 - 0.9	<0.05	-
TP37-BS1	0.0 - 0.2	<0.05	-
TP41-BS1	0.6 - 0.8	0.95	-
TP43-BS2	1.5 - 1.7	<0.05	-
TP52-BS1	0.1 - 0.2	<0.05	-
TP62-BS1	0.5 - 0.6	0.59	-
TP62-BS1-Lab-Dup	0.5 - 0.6	0.56	-
TP68-BS2	0.7 - 0.8	<0.05	-
TP69-BS2	1.3 - 1.4	0.51	-
TP214-BS1	0.6 - 0.7	<0.05	-
TP220-BS2	1.4 - 1.5	***3.4***	-
TP221-BS2	1.5 - 1.6	0.24	-
TP222-BS2	1.6 - 1.7	0.37	-
TP223-BS1	0.4 - 0.5	<0.05	-
TP224-BS1	0.0 - 0.2	<0.05	-
BS43	0.0 - 0.14	***1.7***	-
BS44	0.0 - 0.05	***2.2***	-
BS46	0.0 - 0.15	0.73	-
BS53	0.0 - 0.08	1.3	-
BS57	0.0 - 0.17	0.77	-
BS61	0.0 - 0.15	<0.05	-
BS65	0.0 - 0.15	0.38	-
BS68	0.0 - 0.22	<0.05	-
BS72	0.0 - 0.15	<0.05	-
BS75	0.0 - 0.05	0.30	-
BS76	0.0 - 0.04	0.090	-
BS78	0.0 - 0.10	0.060	-
BS81	0.0 - 0.12	***1.7***	-
BS84	0.0 - 0.10	0.81	-
BS91	0.0 - 0.12	1.3	-
BS95	0.0 - 0.05	***2.3***	-
BS95-Lab-Dup	0.0 - 0.05	***1.8***	-
BS100	0.0 - 0.15	***5.5***	-
BS110	0.0 - 0.20	***53***	Soil removed

Notes:

1 = CCME CSQGs for a Residential/Parkland Site (1999 and updates)

2 = Site-Specific Target Level (SSTL) calculated for PCBs in the Residential Area (Stantec, 2010)

* = Analysis carried out with field test kit

RDL = Reportable Detection Limit for routine analysis; < # = Not detected above RDL noted

Lab-Dup = Laboratory duplicate sample

Bold/Italics = Value exceeds generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for PCBs at the Residential Area (Stantec, 2010)

Table C.2 Results of Laboratory Analysis of PCBs in Soil - Main Base
Implementation of the RAP and Additional Delineation - Year 6
Former U.S. Military Site, Hopedale, NL
Project No. 121413099

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	-
	Units	mg/kg	-
	CCME SQG[1]	1.3	-
	SSTL (Residential Area)[2]	9	-
2009 Sampling - Stantec (...continued)			
BS113	0.0 - 0.18	***1.4***	Soil removed
BS265	Not recorded	1.1	-
MW1-SS1	0.15 - 0.8	<0.05	-
MW14-SS3	1.2 - 1.4	<0.05	-
Septic Tank	0.0 - 0.1	***72***	-
2010 Sampling - Stantec			
MB-BS1	0.0 - 0.15	***41,000***	Soil removed
MB-BS1 Lab Dup	0.0 - 0.15	***39,000***	Soil removed
MB-BS3	0.0 - 0.15	***650***	Soil removed
MB-BS5	0.0 - 0.15	***1,600***	Soil removed
MB-BS7	0.0 - 0.1	***3.2***	-
MB-BS9	0.0 - 0.1	***6.4***	Soil removed
MB-BS10	0.0 - 0.1	***910***	Soil removed
2013 Sampling - Stantec			
13-MB-BS1	0.0 - 0.3	***12***	Tag No. 16
13-MB-BS2A	0.0 - 0.25	***3.0***	Tag No. 17
13-MB-BS2B	0.25 - 0.5	0.26	Tag No. 17
13-MB-BS2B Lab-Dup		0.33	
13-MB-BS3	0.0 - 0.02	***2.8***	Tag No. 18, Soil removed
13-MB-BS4A	0.15 - 0.25	<0.050	Tag No. 19
13-MB-BS4B	0.25 - 0.5	<0.050	Tag No. 19
13-MB-BS5	0.3 - 0.5	<0.050	Tag No. 20
13-MB-BS6	0.2 - 0.4	<0.050	Tag No. 21
13-MB-BS7	0.0 - 0.05	<0.050	Tag No. 22, Soil removed
13-MB-BS8	0.3 - 0.4	<0.050	Tag No. 23, Soil removed
13-MB-BS9	0.0 - 0.3	<0.050	Tag No. 24
13-MB-BS9 Lab-Dup		<0.050	
13-MB-BS10	0.0 - 0.1	0.28	Tag No. 25
13-MB-BS11	0.0 - 0.1	<0.050	Tag No. 26
13-MB-BS12	0.0 - 0.1	***8,400***	Tag No. 27
13-MB-BS14 (Fld-Dup of 13-MB-BS12)		***8,900***	
13-MB-BS13	0.0 - 0.1	***5,300***	Tag No. 28, Soil removed
13-MB-BS15	0.0 - 0.2	0.17	Tag No. 39
13-MB-BS15 Lab-Dup		0.30	
13-MB-BS16	0.0 - 0.1	0.19	Tag No. 40
13-MB-BS17	0.0 - 0.1	0.16	Tag No. 41
13-POLW-BS1	0.0 - 0.1	0.15	Tag No. 33
13-POLW-BS3	0.0 - 0.1	<0.050	Tag No. 31

Notes:

1 = CCME CSQGs for a Residential/Parkland Site (1999 and updates)

2 = Site-Specific Target Level (SSTL) calculated for PCBs in the Residential Area (Stantec, 2010)

* = Analysis carried out with field test kit

RDL = Reportable Detection Limit for routine analysis; < # = Not detected above RDL noted

Lab-dup = Laboratory duplicate sample

Fld-Dup = Field duplicate sample

Bold/Italics = Value exceeds generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for PCBs at the Residential Area (Stantec, 2010)

Table C.2 Results of Laboratory Analysis of PCBs in Soil - Main Base
Implementation of the RAP and Additional Delineation - Year 6
Former U.S. Military Site, Hopedale, NL
Project No. 121413099

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	-
	Units	mg/kg	-
	CCME SQG[1]	1.3	-
	SSTL (Residential Area)[2]	9	-
2013 Sampling - Stantec (... continued)			
13-POLW-BS5	0.0 - 0.1	***2.4***	Tag No. 29
13-POLW-BS11 (Fld-Dup of 13-POLW-BS5)		1.2	
13-POLW-BS8	0.0 - 0.05	0.46	Tag No. 36
13-POLW-BS9	0.0 - 0.06	0.36	Tag No. 37
13-POLW-BS10	0.0 - 0.1	***22***	Tag No. 38, Soil removed
2014 Sampling - Stantec			
14-MB-BS101	0.5 - 1.0	0.23	-
14-FIELD DUP3 (Fld-Dup of 14-MB-BS101)		0.12	-
14-MB-BS102	0.5 - 1.0	0.33	-
14-MB-BS401	0.0 - 1.2	0.78	-
14-MB-BS402	0.0 - 0.5	0.52	-
14-MB-BS403	0.0 - 0.6	0.17	-
14-MB-BS501	0.0 - 0.1	<0.05	-
14-MB-BS501 Lab-Dup		0.057	-
14-MB-BS502	0.0 - 0.1	**3.9**	-
14-MB-BS706	0.0 - 0.4	<0.05	-
14-MB-BS706 Lab-Dup		<0.05	-
14-POLW-BS101	0.0 - 0.1	**2.1**	-
14-POLW-BS102	0.0 - 0.15	1.0	-
14-POLW-BS103	0.0 - 0.2	0.67	-
2015 Sampling - Stantec			
15-MB-BS103	0.0 - 0.1	***4,900***	Soil removed
15-MB-BS104	0.0 - 0.05	***11***	Soil removed
15-MB-BS105	0.0 - 0.1	***2.8***	-
15-MB-BS106	0.0 - 0.1	***1.4***	-
15-MB-BS107	0.0 - 0.05	***1.6***	-
15-MB-BS108	1.2 - 1.4	***3.6***	-
15-MB-BS109	0.0 - 0.1	***2.2***	-
15-MB-BS110	0.0 - 0.15	0.60	-
15-MB-BS111	1.3 - 1.4	***19***	Soil removed
15-MB-BS112	1.8 - 1.9	***15***	Soil removed
15-MB-BS113	0.0 - 0.02	0.99	-
15-MB-BS114	0.0 - 0.02	***13***	Soil removed
15-MB-BS115	0.0 - 0.03	***13***	Soil removed
15-MB-BS116	0.0 - 0.02	***8.4***	-
15-MB-TP101-BS1	0.8 - 1.0	0.40	-
15-MB-TP102-BS1	0.0 - 0.2	***12***	Soil removed

Notes:

1 = CCME CSQGs for a Residential/Parkland Site (1999 and updates)

2 = Site-Specific Target Level (SSTL) calculated for PCBs in the Residential Area (Stantec, 2010)

* = Analysis carried out with field test kit

RDL = Reportable Detection Limit for routine analysis; < # = Not detected above RDL noted

Lab-Dup = Laboratory duplicate sample

Fld-Dup = Field duplicate sample

Bold/Italics = Value exceeds generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for PCBs at the Residential Area (Stantec, 2010)

Table C.2 Results of Laboratory Analysis of PCBs in Soil - Main Base
Implementation of the RAP and Additional Delineation - Year 6
Former U.S. Military Site, Hopedale, NL
Project No. 121413099

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	-
	Units	mg/kg	-
	CCME SQG[1]	1.3	-
	SSTL (Residential Area)[2]	9	-
2016 Sampling - Stantec			
16-MB-BS101	0.1 - 0.2	0.38	-
16-MB-BS101 DUP	0.1 - 0.2	0.82	-
16-MB-BS102	0.5 - 0.6	0.060	-
16-MB-BS103	0.2 - 0.3	***1.7***	-
16-MB-BS104	0.25 - 0.35	0.071	-
16-MB-BS105	2.0 - 2.2	***1,500***	-
16-MB-BS106	0.1 - 0.2	***2.6***	-
16-MB-BS107	0.3 - 0.4	***34***	-
16-MB-BS108	0.35 - 0.4	***82***	-
16-MB-BS108 Lab-Dup	0.35 - 0.4	***66***	
16-MB-BS109	0.1 - 0.15	1.3	-
16-MB-BS110	0.1 - 0.15	1.1	-
16-MB-BS111	1.0 - 1.1	***73***	-
16-MB-BS112	2.0 - 2.1	***4.7***	-
16-MB-BS113	1.1 - 1.2	***2,600***	-
16-MB-BS114	1.4 - 1.5	***3,700***	-
16-MB-BS114 Lab-Dup	1.4 - 1.5	***2,900***	
16-MB-BS115	1.0 - 1.1	0.73	-
16-MB-BS115 Lab-Dup	1.0 - 1.1	0.54	
16-MB-BS116	1.0 - 1.1	***3.2***	-
16-MB-BS117	0.5 - 0.6	0.069	-
16-MB-BS118	0.7 - 0.8	***21***	-
16-MB-BS119	0.5 - 0.6	***310***	-
16-MB-BS120A	0.0 - 0.5	1.4	-
16-MB-BS120B	0.5 - 1.0	***2.5***	-
16-MB-BS121A	0.0 - 0.5	***49***	-
16-MB-BS121B	0.5 - 1.0	***13***	-
16-MB-BS122A	0.0 - 0.5	0.34	-
16-MB-BS122B	0.5 - 1.0	***2.1***	-
16-MB-BS401	0.8 - 1.0	0.15	-
16-MB-BS402	1.0 - 1.3	***2.4***	-
16-MB-BS501	0.05 - 0.1	0.082	-
16-MB-TS101	0.0 - 0.05	***3.8***	-
16-MB-TS101 Lab-Dup	0.0 - 0.05	***5.6***	-
16-POLW-BS101	0.30 - 0.40	0.65	-
16-POLW-BS102	0.10 - 0.20	**3.1**	-

Notes:

1 = CCME CSQGs for a Residential/Parkland Site (1999 and updates)

2 = Site-Specific Target Level (SSTL) calculated for PCBs in the Residential Area (Stantec, 2010)

* = Analysis carried out with field test kit

RDL = Reportable Detection Limit for routine analysis; < # = Not detected above RDL noted

Lab-Dup = Laboratory duplicate sample

Fld-Dup = Field duplicate sample

Bold/Italics = Value exceeds generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for PCBs at the Residential Area (Stantec, 2010)

Table C.3 Results of Laboratory Analysis of PCBs in Soil - Old Base 1
Implementation of the RAP and Additional Delineation - Year 6
Former U.S. Military Site, Hopedale, NL
Project No. 121413099

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	
	Units	mg/kg	
	CCME SQG[1]	1.3	
	SSTL (Residential Area)[2]	9	
2004 Sampling - ESG			
6594*	0 - 0.1	***4.5***	-
6595	0 - 0.1	***84,000***	Tar removed
6596	0 - 0.1	***5.6***	-
2006 Sampling - ESG			
22544	0 - 0.1	***2.6***	-
22560	0 - 0.1	***1.7***	-
22567	0 - 0.1	***10.7***	Soil removed
22576	0 - 0.1	***13.8***	Soil removed
22577	0 - 0.1	***37.5***	Soil removed
22578	0 - 0.1	***59.7***	Soil removed
22582	0 - 0.1	***6,540***	Soil removed
22583	0 - 0.1	***349***	Soil removed
22585	0 - 0.1	***36.2***	Soil removed
22586	0 - 0.1	<0.5	-
22588	0 - 0.1	0.90	-
22594	0 - 0.1	***74.9***	Soil removed
22603	0 - 0.1	***5.2***	-
22604	0 - 0.1	0.60	-
22609	0 - 0.1	***122***	Soil removed
22610	0 - 0.1	0.60	-
22613	0 - 0.1	1.2	-
22615	0 - 0.1	0.50	-
22628	0 - 0.1	***7.1***	-
22630	0 - 0.1	***15.9***	Soil removed
22633	0 - 0.1	<0.5	-
22634	0 - 0.1	1.0	-
22638	0 - 0.1	***7.7***	-
22743	0 - 0.1	***2.6***	-
22748	0 - 0.1	<0.5	-
22755	0 - 0.1	<0.5	-
22765	0 - 0.1	<0.5	-
22768	0 - 0.1	<0.5	-

Notes:

1 = CCME CSQGs for a Residential/Parkland Site (1999 and updates)

2 = Site-Specific Target Level (SSTL) calculated for PCBs in the Residential Area (Stantec, 2010)

RDL = Reportable Detection Limit for routine analysis

< # = Not detected above RDL noted

(#) = Elevated RDL shown in brackets Elevated RDL used due to matrix/co-extractive interference

"*" = Analysis carried out with field test kit

Bold/Italics = Value exceeds generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for PCBs at Former Radar Site (Stantec, 2010)

Table C.3 Results of Laboratory Analysis of PCBs in Soil - Old Base 1
Implementation of the RAP and Additional Delineation - Year 6
Former U.S. Military Site, Hopedale, NL
Project No. 121413099

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	
	Units	mg/kg	
	CCME SQG[1]	1.3	
	SSTL (Residential Area)[2]	9	
2009 Sampling - Stantec			
BS121	0.0 - 0.03	***170***	Soil removed
BS122	0.0 - 0.11	***16***	Soil removed
BS123	0.0 - 0.05	***13***	Soil removed
BS124	0.0 - 0.07	***4.5***	-
BS125	0.0 - 0.05	<0.05	-
BS126	0.0 - 0.02	***230***	Soil removed
BS127	0.0 - 0.02	<0.05	-
BS129	0.0 - 0.05	***1.5***	-
BS130	0.0 - 0.03	***2.2***	-
BS130-Lab-Dup	0.0 - 0.03	***2.2***	-
BS131	0.0 - 0.05	***4.7***	-
BS132	0.0 - 0.04	***8.7***	-
2010 Sampling - Stantec			
OB1-BS2	0.0- 0.1	***22***	Soil removed
OB1-BS3	0.0 - 0.1	***4.3***	-
OB1-BS4	0.0 - 0.3	***2.0***	-
OB1-BS6	0.0 - 0.1	***210*** (0.1)	Soil removed
OB1-BS7	0.0 - 0.1	***13***	Soil removed
OB1-BS8	0.0 - 0.1	1.3	-

Notes:

1 = CCME CSQGs for a Residential/Parkland Site (1999 and updates)

2 = Site-Specific Target Level (SSTL) calculated for PCBs in the Residential Area (Stantec, 2010)

RDL = Reportable Detection Limit for routine analysis

Lab-Dup = Laboratory duplicate sample

< # = Not detected above RDL noted

(#) = Elevated RDL shown in brackets Elevated RDL used due to matrix/co-extractive interference

"*" = Analysis carried out with field test kit

Bold/Italics = Value exceeds generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for PCBs at Former Radar Site (Stantec, 2010)

Table C.3 Results of Laboratory Analysis of PCBs in Soil - Old Base 1
Implementation of the RAP and Additional Delineation - Year 6
Former U.S. Military Site, Hopedale, NL
Project No. 121413099

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	
	Units	mg/kg	
	CCME SQG[1]	1.3	
	SSTL (Residential Area)[2]	9	
2013 Sampling - Stantec			
13-OB1-BS1	0.0 - 0.1	<0.050	Tag No. 1
13-OB1-BS2	0.0 - 0.1	<0.050	Tag No. 2
13-OB1-BS3	0.0 - 0.1	<0.050	Tag No. 3
13-OB1-BS4	0.0 - 0.25	<0.050	Tag No. 4
13-OB1-BS5	0.0 - 0.2	<0.050	Tag No. 5
13-OB1-BS6	0.0 - 0.1	***2.2***	Tag No. 6
13-OB1-BS7	0.0 - 0.25	***7.3***	Tag No. 7
13-OB1-BS16 (Fld-Dup of 13-OB1-BS7)	0.0 - 0.25	***1.8***	Tag No. 7
13-OB1-BS16 Lab-Dup (Fld-Dup of 13-OB1-BS7)	0.0 - 0.25	***3.4***	Tag No. 7
13-OB1-BS8	0.0 - 0.25	<0.050	Tag No. 8
13-OB1-BS9	0.0 - 0.1	0.12	Tag No. 9
13-OB1-BS10	0.0 - 0.2	<0.050	Tag No. 10
13-OB1-BS11	0.0 - 0.1	***2.5***	Tag No. 11
13-OB1-BS12	0.0 - 0.1	***1.4***	Tag No. 12
13-OB1-BS13	0.0 - 0.1	<0.050	Tag No. 13
13-OB1-BS14	0.0 - 0.1	0.16	Tag No. 14
13-OB1-BS15	0.0 - 0.1	<0.050	Tag No. 15
2015 Sampling - Stantec			
15-OB1-BS101	0.0 - 0.03	***44***	Soil removed
15-OB1-BS102	0.0 - 0.02	***3.3***	-
15-OB1-BS103	0.0 - 0.04	***4.6***	-
15-OB1-BS201	0.0 - 0.02	***4.5***	-
15-OB1-BS202	0.0 - 0.02	***6.9***	-
15-OB1-BS203	0.0 - 0.02	***6.1***	-
2016 Sampling - Stantec			
16-OB-BS101	0.1 - 0.15	0.42	
16-OB-BS102	0.05 - 0.1	***2.2***	
16-OB-BS103	0.05 - 0.1	0.71	
16-OB-BS104	0.05 - 0.1	0.56	
16-OB-BS105	0.1 - 0.15	0.27	
16-OB-BS106	0.1 - 0.15	0.20	
16-OB-BS201	0.05 - 0.1	0.62	

Notes:

1 = CCME CSQGs for a Residential/Parkland Site (1999 and updates)

2 = Site-Specific Target Level (SSTL) calculated for PCBs in the Residential Area (Stantec, 2010)

RDL = Reportable Detection Limit for routine analysis

Fld-Dup = Field duplicate sample

< # = Not detected above RDL noted

(#) = Elevated RDL shown in brackets Elevated RDL used due to matrix/co-extractive interference

"*" = Analysis carried out with field test kit

Bold/Italics = Value exceeds generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for PCBs at Former Radar Site (Stantec, 2010)

Table C.4 Results of Laboratory Analysis of PCBs in Soil - Pit No. 1
Implementation of the RAP and Additional Delineation - Year 6
Former U.S. Military Site, Hopedale, NL
Project No. 121413099

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	-
	Units	mg/kg	-
	Generic Criteria[1]	1.3	-
	Remedial Target[2]	9	-
2009 Sampling - Stantec			
TP149-BS1	0.2 - 0.3	0.69	-
TP152-BS1	0.2 - 0.3	***20***	-
TP153-BS1	0.7 - 0.8	1.1	-
TP157-BS2	2.1 - 2.2	<0.05	-
TP160-BS1	0.9 - 1.0	0.28	-
BS161	0.00 - 0.20	0.18	-
BS163	0.00 - 0.10	0.08	-
BS165	0.00 - 0.20	<0.05	-
MW18-SS4	1.83 - 2.44	***11***	-
2013 Sampling - Stantec			
13-ML1	0.0 - 0.1	***2.0***	Soil removed
13-ML2	0.0 - 0.1	1.3	Soil removed
13-ML3	0.0 - 0.1	***2.0***	Soil removed
13-ML4	0.0 - 0.1	***7.3***	Soil removed
13-ML5	0.0 - 0.1	***1.5***	Soil removed
13-ML6	0.0 - 0.1	***1.5***	Soil removed
13-ML7	0.0 - 0.1	0.78	Soil removed
13-ML8	0.0 - 0.1	0.63	Soil removed
13-ML9	0.0 - 0.1	***2.4***	Soil removed
13-ML10	0.0 - 0.1	0.75	Soil removed
13-ML11	0.0 - 0.1	1.1	Soil removed
13-ML12	0.0 - 0.1	***2.2***	Soil removed

Notes:

1 = CCME CSQGs for a Residential/Parkland Site (1999 and updates)

2 = Site-Specific Target Level (SSTL) calculated for PCBs in the Residential Area (Stantec, 2010)

RDL = Reportable Detection Limit for routine analysis

< # = Not detected above RDL noted

Bold/Italics = Value exceeds generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for PCBs in the Residential Area (Stantec, 2010)

Table C.4 Results of Laboratory Analysis of PCBs in Soil - Pit No. 1
Implementation of the RAP and Additional Delineation - Year 6
Former U.S. Military Site, Hopedale, NL
Project No. 121413099

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	-
	Units	mg/kg	-
	Generic Criteria[1]	1.3	-
	Remedial Target[2]	9	-
2015 Sampling - Stantec			
15-P1-TP101-BS1	0.8 - 1.0	0.52	-
15-P1-TP101-BS2	1.9 - 2.0	0.77	-
15-P1-TP102-BS1	0.2 - 0.3	***3.7***	-
15-P1-TP102-BS2	0.9 - 1.0	***2.8***	-
15-P1-TP102-BS3	1.6 - 1.7	***4.0***	-
15-P1-TP201-BS1	0.2 - 0.3	***9.1***	-
15-P1-TP201-BS2	1.0 - 1.2	***6.5***	-
15-P1-TP202-BS1	0.2 - 0.3	***5.6***	-
15-P1-TP202-BS2	1.0 - 1.1	***27***	-
15-P1-TP202-BS3	1.4 - 1.5	***17***	-
15-P1-TP202-BS3 Lab-Dup	-	***22***	-
15-P1-TP203-BS1	0.2 - 0.3	***1.9***	-
15-P1-TP203-BS2	1.0 - 1.1	***1.6***	-
15-P1-TP203-BS3	2.0 - 2.1	1.1	-
15-P1-TP203-BS4	2.5 - 2.6	1.3	-
15-P1-TP204-BS1	0.3 - 0.4	***1.5***	-
15-P1-TP204-BS2	1.0 - 1.2	***6.1***	-
15-P1-TP204-BS3	1.9 - 2.1	***1.4***	-
15-P1-TP205-BS1	0.3 - 0.4	***4.6***	-
15-P1-TP205-BS2	1.0 - 1.2	***3.4***	-
15-P1-TP205-BS3	1.9 - 2.0	***2.5***	-

Notes:

1 = CCME CSQGs for a Residential/Parkland Site (1999 and updates)

2 = Site-Specific Target Level (SSTL) calculated for PCBs in the Residential Area (Stantec, 2010)

RDL = Reportable Detection Limit for routine analysis

< # = Not detected above RDL noted

Lab-Dup = Laboratory duplicate sample

Bold/Italics = Value exceeds generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for PCBs in the Residential Area (Stantec, 2010)

Table C.4 Results of Laboratory Analysis of PCBs in Soil - Pit No. 1
Implementation of the RAP and Additional Delineation - Year 6
Former U.S. Military Site, Hopedale, NL
Project No. 121413099

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	-
	Units	mg/kg	-
	Generic Criteria[1]	1.3	-
	Remedial Target[2]	9	-
2016 Sampling - Stantec			
16-P1-BS101	0.2 - 0.3	0.65	-
16-P1-BS102	0.3 - 0.4	1.2	-
16-P1-BS103	0.2 - 0.3	***4.2***	-
16-P1-BS104	0.5 - 0.6	0.31	-
16-P1-BS105	0.4 - 0.5	***2.2***	-
16-P1-BS106	0.5 - 0.6	0.61	-
16-P1-BS107	0.4 - 0.5	1.2	-
16-P1-BS108	0.05 - 0.1	***1.5***	-
16-P1-BS108 Lab-Dup	0.05 - 0.1	***2.1***	-
16-P1-BS109	0.1 - 0.15	1.2	-
16-P1-BS110	0.1 - 0.15	0.66	-
16-P1-BS111	0.15 - 0.2	***12***	-
16-P1-BS112	0.15 - 0.2	***4.8***	-
16-P1-BS113	0.1 - 0.15	***6.7***	-
16-P1-BS114	0.1 - 0.15	***2.7***	-
16-P1-BS115	0.0 - 0.05	***140***	-
16-P1-BS116	0.2 - 0.25	1.2	-
16-P1-BS117	0.2 - 0.25	***250***	-
16-P1-BS118	0.1 - 0.15	***12***	-
16-P1-BS119	0.1 - 0.15	***160***	-
16-P1-BS120	0.1 - 0.15	0.09	
16-P1-BS121	0.2 - 0.25	1.1	-
16-P1-BS122	0.2 - 0.3	***2.2***	-

Notes:

1 = CCME CSQGs for a Residential/Parkland Site (1999 and updates)

2 = Site-Specific Target Level (SSTL) calculated for PCBs in the Residential Area (Stantec, 2010)

RDL = Reportable Detection Limit for routine analysis

< # = Not detected above RDL noted

Lab-Dup = Laboratory duplicate sample

Bold/Italics = Value exceeds generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for PCBs in the Residential Area (Stantec, 2010)

Table C.5 Results of Laboratory Analysis of PCBs on Metal Debris
Implementation of the RAP and Additional Delineation - Year 6
Former U.S. Military Site, Hopedale, NL
Project No. 121413099

Sample ID	Sampled Media	Polychlorinated Biphenyls (PCBs)
	RDL	5
	Units	µg/100 cm^2
	CCME Recommended Permissible Surface Contamination Criterion[1]	10
2014 Sampling - Stantec		
14-CABLE1	Cable (BMEWS)	<5
14-SWAB1	4 inch diameter steel pipe (Main Base)	**17**
14-SWAB2	8 inch diameter corrugated steel pipe (Main Base)	**14**
14-SWAB3	Steel tank (Main Base)	<5
14-SWAB4	16 x 24 inch piece of steel (Main Base)	<5
14-SWAB5	Electric pole (Main Base)	<5
2015 Sampling - Stantec		
15-SWAB-1	4 inch diameter yellow pipe (Main Base)	5.7
15-SWAB-2	metal angle bar (Main Base)	9.1
15-SWAB-3	8 inch diameter metal pipe (Main Base)	9
15-SWAB-4	12 inch flat metal bar (Main Base)	5.6
15-SWAB-5	2 inch metal piping (Main Base)	**11**
2016 Sampling - Stantec		
16-SWAB-101	Crushed Drum	<5.0
16-SWAB-102	Yellow Pipe (4 in dia.)	<5.0
16-SWAB-103	Unpainted Pipe (4 in dia.)	<5.0

Notes:

1 = CCME PCB Transformer Decontamination Standards and Protocols (1995) - Recommended Permissible Surface Contamination Criterion for transformer metal components destined for recycling by smelting

RDL = Reportable Detection Limit for routine analysis

< # = Not detected above RDL noted

Bold/Shaded = Value exceeds the CCME Criterion

APPENDIX D

Laboratory Analytical Reports

Your Project #: 121413099
Site Location: HOPEDALE, NL
Your C.O.C. #: D16938

Attention:Jim Slade

Stantec Consulting Ltd
141 Kelsey Drive
St. John's, NL
A1B 0L2

Report Date: 2016/07/18
Report #: R4070839
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6E5409
Received: 2016/07/14, 10:15

Sample Matrix: Soil
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
TEH in Soil (PIRI) (1, 2)	8	2016/07/14	2016/07/15	ATL SOP 00197	Atl. RBCA v3 m
Moisture	8	N/A	2016/07/15	ATL SOP-00196	OMOE Handbook 1983 m
VPH in Soil (PIRI)	8	2016/07/14	2016/07/15	ATL SOP 00199	Atl. RBCA v3 m
ModTPH (T1) Calc. for Soil	8	N/A	2016/07/15	N/A	Atl. RBCA v3 m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) 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.
Rob Whelan, Laboratory 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.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B6E5409
Report Date: 2016/07/18

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

RBCA HYDROCARBONS IN SOIL (SOIL)

Maxxam ID		CRW328	CRW329	CRW330	CRW331			
Sampling Date		2016/07/10	2016/07/10	2016/07/10	2016/07/10			
COC Number		D16938	D16938	D16938	D16938			
	UNITS	**16-BP-COMP-A1**	**16-BP-COMP-A2**	**16-BP-COMP-B1**	**16-BP-COMP-B2**	**RDL**	**QC Batch**	**MDL**
Inorganics								
Moisture	%	20	18	20	21	1.0	4577826	0.20
Petroleum Hydrocarbons								
Benzene	mg/kg	<0.025	<0.025	<0.025	<0.025	0.025	4578598	N/A
Toluene	mg/kg	0.094	0.18	0.25	0.33	0.025	4578598	N/A
Ethylbenzene	mg/kg	<0.025	<0.025	<0.025	<0.025	0.025	4578598	0.025
Total Xylenes	mg/kg	<0.050	0.13	0.31	0.29	0.050	4578598	N/A
C6 - C10 (less BTEX)	mg/kg	60	70	93	100	2.5	4578598	N/A
>C10-C16 Hydrocarbons	mg/kg	4000	3400	3500	3900	10	4578441	N/A
>C16-C21 Hydrocarbons	mg/kg	1200	960	900	1000	10	4578441	N/A
>C21-<C32 Hydrocarbons	mg/kg	4200	4100	3900	4300	15	4578441	N/A
Modified TPH (Tier1)	mg/kg	9400	8500	8400	9200	15	4577844	N/A
Reached Baseline at C32	mg/kg	No	No	No	No	N/A	4578441	N/A
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	COMMENT (1)	COMMENT (1)	COMMENT (1)	N/A	4578441	N/A
Surrogate Recovery (%)								
Isobutylbenzene - Extractable	%	103	104	106	104		4578441	
n-Dotriacontane - Extractable	%	133 (2)	143 (2)	126	117		4578441	
Isobutylbenzene - Volatile	%	111	112	110	116		4578598	

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Weathered fuel oil fraction. Lube oil fraction.
(2) Surrogate recovery(ies) not within acceptance limits due to matrix/co-extractive interference.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B6E5409
Report Date: 2016/07/18

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

RBCA HYDROCARBONS IN SOIL (SOIL)

Maxxam ID		CRW332	CRW333	CRW334	CRW335			
Sampling Date		2016/07/10	2016/07/10	2016/07/10	2016/07/10			
COC Number		D16938	D16938	D16938	D16938			
	UNITS	**16-BP-COMP-C1**	**16-BP-COMP-C2**	**16-BP-COMP-D1**	**16-BP-COMP-D2**	**RDL**	**QC Batch**	**MDL**
Inorganics								
Moisture	%	22	21	21	18	1.0	4577826	0.20
Petroleum Hydrocarbons								
Benzene	mg/kg	<0.025	<0.025	<0.025	<0.025	0.025	4578598	N/A
Toluene	mg/kg	0.36	0.45	0.26	0.35	0.025	4578598	N/A
Ethylbenzene	mg/kg	<0.025	<0.025	<0.025	<0.025	0.025	4578598	0.025
Total Xylenes	mg/kg	0.28	0.40	0.22	0.35	0.050	4578598	N/A
C6 - C10 (less BTEX)	mg/kg	96	120	93	110	2.5	4578598	N/A
>C10-C16 Hydrocarbons	mg/kg	4400	4000	3700	2900	10	4578441	N/A
>C16-C21 Hydrocarbons	mg/kg	1100	970	860	690	10	4578441	N/A
>C21-<C32 Hydrocarbons	mg/kg	4400	3700	3000	2800	15	4578441	N/A
Modified TPH (Tier1)	mg/kg	10000	8800	7600	6500	15	4577844	N/A
Reached Baseline at C32	mg/kg	Yes	No	No	No	N/A	4578441	N/A
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	COMMENT (1)	COMMENT (1)	COMMENT (1)	N/A	4578441	N/A
Surrogate Recovery (%)								
Isobutylbenzene - Extractable	%	100	105	106	105		4578441	
n-Dotriacontane - Extractable	%	126	124	111	121		4578441	
Isobutylbenzene - Volatile	%	116	114	116	114		4578598	

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Weathered fuel oil fraction. Lube oil fraction.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B6E5409
Report Date: 2016/07/18

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

TEST SUMMARY

Maxxam ID: CRW328 **Collected:** 2016/07/10
Sample ID: 16-BP-COMP-A1 **Shipped:**
Matrix: Soil **Received:** 2016/07/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
TEH in Soil (PIRI)	GC/FID	4578441	2016/07/14	2016/07/15	Susan Piercey
Moisture	BAL	4577826	N/A	2016/07/15	Annette Clarke
VPH in Soil (PIRI)	PTGC/MS	4578598	2016/07/14	2016/07/15	Matthew Cloutier
ModTPH (T1) Calc. for Soil	CALC	4577844	N/A	2016/07/15	Automated Statchk

Maxxam ID: CRW329 **Collected:** 2016/07/10
Sample ID: 16-BP-COMP-A2 **Shipped:**
Matrix: Soil **Received:** 2016/07/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
TEH in Soil (PIRI)	GC/FID	4578441	2016/07/14	2016/07/15	Susan Piercey
Moisture	BAL	4577826	N/A	2016/07/15	Annette Clarke
VPH in Soil (PIRI)	PTGC/MS	4578598	2016/07/14	2016/07/15	Matthew Cloutier
ModTPH (T1) Calc. for Soil	CALC	4577844	N/A	2016/07/15	Automated Statchk

Maxxam ID: CRW330 **Collected:** 2016/07/10
Sample ID: 16-BP-COMP-B1 **Shipped:**
Matrix: Soil **Received:** 2016/07/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
TEH in Soil (PIRI)	GC/FID	4578441	2016/07/14	2016/07/15	Susan Piercey
Moisture	BAL	4577826	N/A	2016/07/15	Annette Clarke
VPH in Soil (PIRI)	PTGC/MS	4578598	2016/07/14	2016/07/15	Matthew Cloutier
ModTPH (T1) Calc. for Soil	CALC	4577844	N/A	2016/07/15	Automated Statchk

Maxxam ID: CRW331 **Collected:** 2016/07/10
Sample ID: 16-BP-COMP-B2 **Shipped:**
Matrix: Soil **Received:** 2016/07/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
TEH in Soil (PIRI)	GC/FID	4578441	2016/07/14	2016/07/15	Susan Piercey
Moisture	BAL	4577826	N/A	2016/07/15	Annette Clarke
VPH in Soil (PIRI)	PTGC/MS	4578598	2016/07/14	2016/07/15	Matthew Cloutier
ModTPH (T1) Calc. for Soil	CALC	4577844	N/A	2016/07/15	Automated Statchk

Maxxam ID: CRW332 **Collected:** 2016/07/10
Sample ID: 16-BP-COMP-C1 **Shipped:**
Matrix: Soil **Received:** 2016/07/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
TEH in Soil (PIRI)	GC/FID	4578441	2016/07/14	2016/07/15	Susan Piercey
Moisture	BAL	4577826	N/A	2016/07/15	Annette Clarke
VPH in Soil (PIRI)	PTGC/MS	4578598	2016/07/14	2016/07/15	Matthew Cloutier
ModTPH (T1) Calc. for Soil	CALC	4577844	N/A	2016/07/15	Automated Statchk

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Maxxam Job #: B6E5409
Report Date: 2016/07/18

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

TEST SUMMARY

Maxxam ID: CRW333 **Collected:** 2016/07/10
Sample ID: 16-BP-COMP-C2 **Shipped:**
Matrix: Soil **Received:** 2016/07/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
TEH in Soil (PIRI)	GC/FID	4578441	2016/07/14	2016/07/15	Susan Piercey
Moisture	BAL	4577826	N/A	2016/07/15	Annette Clarke
VPH in Soil (PIRI)	PTGC/MS	4578598	2016/07/14	2016/07/15	Matthew Cloutier
ModTPH (T1) Calc. for Soil	CALC	4577844	N/A	2016/07/15	Automated Statchk

Maxxam ID: CRW334 **Collected:** 2016/07/10
Sample ID: 16-BP-COMP-D1 **Shipped:**
Matrix: Soil **Received:** 2016/07/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
TEH in Soil (PIRI)	GC/FID	4578441	2016/07/14	2016/07/15	Susan Piercey
Moisture	BAL	4577826	N/A	2016/07/15	Annette Clarke
VPH in Soil (PIRI)	PTGC/MS	4578598	2016/07/14	2016/07/15	Matthew Cloutier
ModTPH (T1) Calc. for Soil	CALC	4577844	N/A	2016/07/15	Automated Statchk

Maxxam ID: CRW335 **Collected:** 2016/07/10
Sample ID: 16-BP-COMP-D2 **Shipped:**
Matrix: Soil **Received:** 2016/07/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
TEH in Soil (PIRI)	GC/FID	4578441	2016/07/14	2016/07/15	Susan Piercey
Moisture	BAL	4577826	N/A	2016/07/15	Annette Clarke
VPH in Soil (PIRI)	PTGC/MS	4578598	2016/07/14	2016/07/15	Matthew Cloutier
ModTPH (T1) Calc. for Soil	CALC	4577844	N/A	2016/07/15	Automated Statchk

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Maxxam Job #: B6E5409
Report Date: 2016/07/18

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B6E5409
Report Date: 2016/07/18

QUALITY ASSURANCE REPORT

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4578441	Isobutylbenzene - Extractable	2016/07/15	109	30 - 130	110	30 - 130	111	%		
4578441	n-Dotriacontane - Extractable	2016/07/15	109	30 - 130	114	30 - 130	108	%		
4578598	Isobutylbenzene - Volatile	2016/07/15			99	60 - 130	97	%		
4577826	Moisture	2016/07/15							21	25
4578441	>C10-C16 Hydrocarbons	2016/07/18	101	30 - 130	106	30 - 130	<10	mg/kg	NC	50
4578441	>C16-C21 Hydrocarbons	2016/07/18	102	30 - 130	110	30 - 130	<10	mg/kg	NC	50
4578441	>C21-<C32 Hydrocarbons	2016/07/18	81	30 - 130	82	30 - 130	<15	mg/kg	NC	50
4578598	Benzene	2016/07/15			99	60 - 140	<0.025	mg/kg	NC	50
4578598	C6 - C10 (less BTEX)	2016/07/15					<2.5	mg/kg	NC	50
4578598	Ethylbenzene	2016/07/15			94	60 - 140	<0.025	mg/kg	NC	50
4578598	Toluene	2016/07/15			94	60 - 140	<0.025	mg/kg	NC	50
4578598	Total Xylenes	2016/07/15			98	60 - 140	<0.050	mg/kg	NC	50

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

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

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

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

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Maxxam Job #: B6E5409
Report Date: 2016/07/18

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

VALIDATION SIGNATURE PAGE

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

Paula Chaplin, Project Manager

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

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Your Project #: 121413099
Site Location: HOPEDALE, NL
Your C.O.C. #: D16937

Attention:Jim Slade

Stantec Consulting Ltd
141 Kelsey Drive
St. John's, NL
A1B 0L2

Report Date: 2016/07/19
Report #: R4071885
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6E6962
Received: 2016/07/15, 11:06

Sample Matrix: Soil
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Moisture (1)	9	N/A	2016/07/18	ATL SOP 00001	OMOE Handbook 1983 m
PCBs in soil by GC/ECD (1, 2)	2	2016/07/15	2016/07/18	ATL SOP 00106	EPA 8082A m
PCBs in soil by GC/ECD (1, 2)	7	2016/07/18	2016/07/19	ATL SOP 00106	EPA 8082A m
PCB Aroclor sum (soil) (1)	2	N/A	2016/07/18		Auto Calc.
PCB Aroclor sum (soil) (1)	7	N/A	2016/07/19		Auto Calc.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Maxxam Bedford
(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.
Michelle Hill, Project Manager
Email: MHill@maxxam.ca
Phone# (902)420-0203 Ext:289
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B6E6962
Report Date: 2016/07/19

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

RESULTS OF ANALYSES OF SOIL

Maxxam ID		CSC749	CSC750	CSC751	CSC752	CSC753	CSC754			
Sampling Date		2016/07/09	2016/07/09	2016/07/09	2016/07/09	2016/07/10	2016/07/10			
COC Number		D16937	D16937	D16937	D16937	D16937	D16937			
	UNITS	**16-MB-BS101**	**16-MB-BS102**	**16-MB-BS103**	**16-MB-BS104**	**16-MB-BS105**	**16-MB-BS106**	**RDL**	**QC Batch**	**MDL**
Inorganics										
Moisture	%	27	16	9.6	6.1	28	17	1.0	4580208	0.20

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CSC755	CSC756	CSC757			
Sampling Date		2016/07/10	2016/07/10	2016/07/09			
COC Number		D16937	D16937	D16937			
	UNITS	**16-MB-BS401**	**16-MB-BS402**	**16-MB-BS101 DUP**	**RDL**	**QC Batch**	**MDL**
Inorganics							
Moisture	%	18	23	23	1.0	4580208	0.20

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B6E6962
Report Date: 2016/07/19

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CSC749	CSC750	CSC751	CSC752		CSC753			
Sampling Date		2016/07/09	2016/07/09	2016/07/09	2016/07/09		2016/07/10			
COC Number		D16937	D16937	D16937	D16937		D16937			
	UNITS	**16-MB-BS101**	**16-MB-BS102**	**16-MB-BS103**	**16-MB-BS104**	**QC Batch**	**16-MB-BS105**	**RDL**	**QC Batch**	**MDL**
PCBs										
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	<0.050	4582788	<0.050	0.050	4580505	N/A
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	<0.050	4582788	<0.050	0.050	4580505	N/A
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	<0.050	4582788	<0.050	0.050	4580505	N/A
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	<0.050	4582788	<0.050	0.050	4580505	N/A
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	<0.050	4582788	<0.050	0.050	4580505	N/A
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	<0.050	4582788	<0.050	0.050	4580505	N/A
Aroclor 1260	ug/g	0.38	0.060	1.7	0.071	4582788	1500	0.050	4580505	N/A
Calculated Total PCB	ug/g	0.38	0.060	1.7	0.071	4580150	1500	0.050	4580150	N/A
Surrogate Recovery (%)										
Decachlorobiphenyl	%	81	90	96	112	4582788	130		4580505	

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

Maxxam ID		CSC754		CSC755	CSC756	CSC757			
Sampling Date		2016/07/10		2016/07/10	2016/07/10	2016/07/09			
COC Number		D16937		D16937	D16937	D16937			
	UNITS	**16-MB-BS106**	**QC Batch**	**16-MB-BS401**	**16-MB-BS402**	**16-MB-BS101 DUP**	**RDL**	**QC Batch**	**MDL**
PCBs									
Aroclor 1016	ug/g	<0.050	4580505	<0.050	<0.050	<0.050	0.050	4582788	N/A
Aroclor 1221	ug/g	<0.050	4580505	<0.050	<0.050	<0.050	0.050	4582788	N/A
Aroclor 1232	ug/g	<0.050	4580505	<0.050	<0.050	<0.050	0.050	4582788	N/A
Aroclor 1248	ug/g	<0.050	4580505	<0.050	<0.050	<0.050	0.050	4582788	N/A
Aroclor 1242	ug/g	<0.050	4580505	<0.050	<0.050	<0.050	0.050	4582788	N/A
Aroclor 1254	ug/g	<0.050	4580505	<0.050	<0.050	<0.050	0.050	4582788	N/A
Aroclor 1260	ug/g	2.6	4580505	0.15	2.4	0.82	0.050	4582788	N/A
Calculated Total PCB	ug/g	2.6	4580150	0.15	2.4	0.82	0.050	4580150	N/A
Surrogate Recovery (%)									
Decachlorobiphenyl	%	85	4580505	103	107	105		4582788	

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

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Maxxam Job #: B6E6962
Report Date: 2016/07/19

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

TEST SUMMARY

Maxxam ID: CSC749 **Collected:** 2016/07/09
Sample ID: 16-MB-BS101 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4582788	2016/07/18	2016/07/19	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/19	Automated Statchk

Maxxam ID: CSC750 **Collected:** 2016/07/09
Sample ID: 16-MB-BS102 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4582788	2016/07/18	2016/07/19	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/19	Automated Statchk

Maxxam ID: CSC751 **Collected:** 2016/07/09
Sample ID: 16-MB-BS103 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4582788	2016/07/18	2016/07/19	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/19	Automated Statchk

Maxxam ID: CSC752 **Collected:** 2016/07/09
Sample ID: 16-MB-BS104 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4582788	2016/07/18	2016/07/19	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/19	Automated Statchk

Maxxam ID: CSC753 **Collected:** 2016/07/10
Sample ID: 16-MB-BS105 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/18	Automated Statchk

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Maxxam Job #: B6E6962
Report Date: 2016/07/19

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

TEST SUMMARY

Maxxam ID: CSC754 **Collected:** 2016/07/10
Sample ID: 16-MB-BS106 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/18	Automated Statchk

Maxxam ID: CSC755 **Collected:** 2016/07/10
Sample ID: 16-MB-BS401 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4582788	2016/07/18	2016/07/19	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/19	Automated Statchk

Maxxam ID: CSC756 **Collected:** 2016/07/10
Sample ID: 16-MB-BS402 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4582788	2016/07/18	2016/07/19	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/19	Automated Statchk

Maxxam ID: CSC757 **Collected:** 2016/07/09
Sample ID: 16-MB-BS101 DUP **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4582788	2016/07/18	2016/07/19	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/19	Automated Statchk

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Maxxam Job #: B6E6962
Report Date: 2016/07/19

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

GENERAL COMMENTS

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

Package 1	6.1°C

Results relate only to the items tested.

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Maxxam Job #: B6E6962
Report Date: 2016/07/19

QUALITY ASSURANCE REPORT

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4580505	Decachlorobiphenyl	2016/07/18	86	30 - 130	97	30 - 130	97	%		
4582788	Decachlorobiphenyl	2016/07/19	97	30 - 130	106	30 - 130	91	%		
4580505	Aroclor 1016	2016/07/18					<0.050	ug/g	NC	50
4580505	Aroclor 1221	2016/07/18					<0.050	ug/g	NC	50
4580505	Aroclor 1232	2016/07/18					<0.050	ug/g	NC	50
4580505	Aroclor 1242	2016/07/18					<0.050	ug/g	NC	50
4580505	Aroclor 1248	2016/07/18					<0.050	ug/g	NC	50
4580505	Aroclor 1254	2016/07/18	NC	30 - 130	117	30 - 130	<0.050	ug/g	NC	50
4580505	Aroclor 1260	2016/07/18					<0.050	ug/g	22	50
4582788	Aroclor 1016	2016/07/19					<0.050	ug/g	NC	50
4582788	Aroclor 1221	2016/07/19					<0.050	ug/g	NC	50
4582788	Aroclor 1232	2016/07/19					<0.050	ug/g	NC	50
4582788	Aroclor 1242	2016/07/19					<0.050	ug/g	NC	50
4582788	Aroclor 1248	2016/07/19					<0.050	ug/g	NC	50
4582788	Aroclor 1254	2016/07/19	121	30 - 130	123	30 - 130	<0.050	ug/g	NC	50
4582788	Aroclor 1260	2016/07/19					<0.050	ug/g	NC	50

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 too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Maxxam Job #: B6E6962
Report Date: 2016/07/19

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

VALIDATION SIGNATURE PAGE

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

Phil Deveau

Rosemarie MacDonald, Scientific Specialist (Organics)

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Your Project #: 121413099
Site Location: HOPEDALE, NL
Your C.O.C. #: D16936, D16939

Attention:Jim Slade

Stantec Consulting Ltd
141 Kelsey Drive
St. John's, NL
A1B 0L2

Report Date: 2016/07/19
Report #: R4072149
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B6E7008
Received: 2016/07/15, 11:06

Sample Matrix: Soil
Samples Received: 16

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Moisture (1)	16	N/A	2016/07/18	ATL SOP 00001	OMOE Handbook 1983 m
PCBs in soil by GC/ECD (1, 3)	16	2016/07/15	2016/07/18	ATL SOP 00106	EPA 8082A m
PCB Aroclor sum (soil) (1)	16	N/A	2016/07/18		Auto Calc.

Sample Matrix: Swab
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
PCBs on swabs by GC/ECD (1, 2)	3	2016/07/15	2016/07/18	ATL SOP 00109	EPA 8082A m
PCB Aroclor sum (swabs) (1)	3	N/A	2016/07/18		Auto Calc.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Maxxam Bedford
(2) Non accredited test method. Best laboratory practices and all routine QC procedures were employed.
(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.
Michelle Hill, Project Manager
Email: MHill@maxxam.ca
Phone# (902)420-0203 Ext:289

==========

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Maxxam Job #: B6E7008
Report Date: 2016/07/19

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

RESULTS OF ANALYSES OF SOIL

Maxxam ID		CSC874	CSC875	CSC876	CSC877	CSC878	CSC879			
Sampling Date		2016/07/12	2016/07/12	2016/07/12	2016/07/12	2016/07/12	2016/07/12			
COC Number		D16936	D16936	D16936	D16936	D16936	D16936			
	UNITS	**16-MB-BS107**	**16-MB-BS108**	**16-MB-BS109**	**16-MB-BS110**	**16-MB-BS501**	**16-MB-BS111**	**RDL**	**QC Batch**	**MDL**
Inorganics										
Moisture	%	10	11	9.1	11	9.0	21	1.0	4580208	0.20

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CSC880	CSC893	CSC894	CSC895	CSC896			
Sampling Date		2016/07/12	2016/07/12	2016/07/12	2016/07/12	2016/07/12			
COC Number		D16936	D16939	D16939	D16939	D16939			
	UNITS	**16-MB-BS112**	**16-OB-BS101**	**16-OB-BS201**	**16-OB-BS102**	**16-OB-BS103**	**RDL**	**QC Batch**	**MDL**
Inorganics									
Moisture	%	12	37	39	3.9	38	1.0	4580208	0.20

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CSC897	CSC898	CSC899	CSC900	CSC901			
Sampling Date		2016/07/12	2016/07/12	2016/07/12	2016/07/12	2016/07/12			
COC Number		D16939	D16939	D16939	D16939	D16939			
	UNITS	**16-OB-BS104**	**16-OB-BS105**	**16-OB-BS106**	**16-POLW-BS101**	**16-POLW-BS-102**	**RDL**	**QC Batch**	**MDL**
Inorganics									
Moisture	%	35	66	54	62	16	1.0	4580429	0.20

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B6E7008
Report Date: 2016/07/19

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CSC874	CSC875	CSC875	CSC876	CSC877	CSC878			
Sampling Date		2016/07/12	2016/07/12	2016/07/12	2016/07/12	2016/07/12	2016/07/12			
COC Number		D16936	D16936	D16936	D16936	D16936	D16936			
	UNITS	**16-MB-BS107**	**16-MB-BS108**	**16-MB-BS108 Lab-Dup**	**16-MB-BS109**	**16-MB-BS110**	**16-MB-BS501**	**RDL**	**QC Batch**	**MDL**
PCBs										
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4580505	N/A
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4580505	N/A
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4580505	N/A
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4580505	N/A
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4580505	N/A
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4580505	N/A
Aroclor 1260	ug/g	34	82	66	1.3	1.1	0.082	0.050	4580505	N/A
Calculated Total PCB	ug/g	34	82		1.3	1.1	0.082	0.050	4580150	N/A
Surrogate Recovery (%)										
Decachlorobiphenyl	%	86	94	86	78	87	89		4580505	

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam ID		CSC879	CSC880	CSC893	CSC894	CSC895	CSC896			
Sampling Date		2016/07/12	2016/07/12	2016/07/12	2016/07/12	2016/07/12	2016/07/12			
COC Number		D16936	D16936	D16939	D16939	D16939	D16939			
	UNITS	**16-MB-BS111**	**16-MB-BS112**	**16-OB-BS101**	**16-OB-BS201**	**16-OB-BS102**	**16-OB-BS103**	**RDL**	**QC Batch**	**MDL**
PCBs										
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4580505	N/A
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4580505	N/A
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4580505	N/A
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4580505	N/A
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4580505	N/A
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4580505	N/A
Aroclor 1260	ug/g	73	4.7	0.42	0.62	2.2	0.71	0.050	4580505	N/A
Calculated Total PCB	ug/g	73	4.7	0.42	0.62	2.2	0.71	0.050	4580150	N/A
Surrogate Recovery (%)										
Decachlorobiphenyl	%	91	91	99	97	95	96		4580505	

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

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Maxxam Job #: B6E7008
Report Date: 2016/07/19

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CSC897	CSC898	CSC899	CSC900	CSC901			
Sampling Date		2016/07/12	2016/07/12	2016/07/12	2016/07/12	2016/07/12			
COC Number		D16939	D16939	D16939	D16939	D16939			
	UNITS	**16-OB-BS104**	**16-OB-BS105**	**16-OB-BS106**	**16-POLW-BS101**	**16-POLW-BS-102**	**RDL**	**QC Batch**	**MDL**
PCBs									
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4580505	N/A
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4580505	N/A
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4580505	N/A
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4580505	N/A
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4580505	N/A
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4580505	N/A
Aroclor 1260	ug/g	0.56	0.27	0.20	0.65	3.1	0.050	4580505	N/A
Calculated Total PCB	ug/g	0.56	0.27	0.20	0.65	3.1	0.050	4580150	N/A
Surrogate Recovery (%)									
Decachlorobiphenyl	%	94	84	81	97	100		4580505	

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

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Maxxam Job #: B6E7008
Report Date: 2016/07/19

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

POLYCHLORINATED BIPHENYLS BY GC-ECD (SWAB)

Maxxam ID		CSC881	CSC882	CSC883			
Sampling Date		2016/07/12	2016/07/12	2016/07/12			
COC Number		D16936	D16936	D16936			
	UNITS	**16-SWAB-101**	**16-SWAB-102**	**16-SWAB-103**	**RDL**	**QC Batch**	**MDL**
PCBs							
Aroclor 1016	ug	<5.0	<5.0	<5.0	5.0	4580427	N/A
Aroclor 1221	ug	<5.0	<5.0	<5.0	5.0	4580427	N/A
Aroclor 1232	ug	<5.0	<5.0	<5.0	5.0	4580427	N/A
Aroclor 1248	ug	<5.0	<5.0	<5.0	5.0	4580427	N/A
Aroclor 1242	ug	<5.0	<5.0	<5.0	5.0	4580427	N/A
Aroclor 1254	ug	<5.0	<5.0	<5.0	5.0	4580427	N/A
Aroclor 1260	ug	<5.0	<5.0	<5.0	5.0	4580427	N/A
Calculated Total PCB	ug	<5.0	<5.0	<5.0	5.0	4580178	N/A
Surrogate Recovery (%)							
Decachlorobiphenyl	%	89	73	89		4580427	

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

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Maxxam Job #: B6E7008
Report Date: 2016/07/19

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

TEST SUMMARY

Maxxam ID: CSC874 **Collected:** 2016/07/12
Sample ID: 16-MB-BS107 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/18	Automated Statchk

Maxxam ID: CSC875 **Collected:** 2016/07/12
Sample ID: 16-MB-BS108 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/18	Automated Statchk

Maxxam ID: CSC875 Dup **Collected:** 2016/07/12
Sample ID: 16-MB-BS108 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates

Maxxam ID: CSC876 **Collected:** 2016/07/12
Sample ID: 16-MB-BS109 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/18	Automated Statchk

Maxxam ID: CSC877 **Collected:** 2016/07/12
Sample ID: 16-MB-BS110 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/18	Automated Statchk

Maxxam ID: CSC878 **Collected:** 2016/07/12
Sample ID: 16-MB-BS501 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates

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Maxxam Job #: B6E7008
Report Date: 2016/07/19

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

TEST SUMMARY

Maxxam ID: CSC878 **Collected:** 2016/07/12
Sample ID: 16-MB-BS501 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/18	Automated Statchk

Maxxam ID: CSC879 **Collected:** 2016/07/12
Sample ID: 16-MB-BS111 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/18	Automated Statchk

Maxxam ID: CSC880 **Collected:** 2016/07/12
Sample ID: 16-MB-BS112 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/18	Automated Statchk

Maxxam ID: CSC881 **Collected:** 2016/07/12
Sample ID: 16-SWAB-101 **Shipped:**
Matrix: Swab **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCBs on swabs by GC/ECD	GC/ECD	4580427	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (swabs)	CALC	4580178	N/A	2016/07/18	Automated Statchk

Maxxam ID: CSC882 **Collected:** 2016/07/12
Sample ID: 16-SWAB-102 **Shipped:**
Matrix: Swab **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCBs on swabs by GC/ECD	GC/ECD	4580427	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (swabs)	CALC	4580178	N/A	2016/07/18	Automated Statchk

Maxxam ID: CSC883 **Collected:** 2016/07/12
Sample ID: 16-SWAB-103 **Shipped:**
Matrix: Swab **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCBs on swabs by GC/ECD	GC/ECD	4580427	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (swabs)	CALC	4580178	N/A	2016/07/18	Automated Statchk

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Maxxam Job #: B6E7008
Report Date: 2016/07/19

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

TEST SUMMARY

Maxxam ID: CSC893 **Collected:** 2016/07/12
Sample ID: 16-OB-BS101 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/18	Automated Statchk

Maxxam ID: CSC894 **Collected:** 2016/07/12
Sample ID: 16-OB-BS201 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/18	Automated Statchk

Maxxam ID: CSC895 **Collected:** 2016/07/12
Sample ID: 16-OB-BS102 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/18	Automated Statchk

Maxxam ID: CSC896 **Collected:** 2016/07/12
Sample ID: 16-OB-BS103 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580208	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/18	Automated Statchk

Maxxam ID: CSC897 **Collected:** 2016/07/12
Sample ID: 16-OB-BS104 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580429	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/18	Automated Statchk

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Maxxam Job #: B6E7008
Report Date: 2016/07/19

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

TEST SUMMARY

Maxxam ID: CSC898 **Collected:** 2016/07/12
Sample ID: 16-OB-BS105 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580429	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/18	Automated Statchk

Maxxam ID: CSC899 **Collected:** 2016/07/12
Sample ID: 16-OB-BS106 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580429	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/18	Automated Statchk

Maxxam ID: CSC900 **Collected:** 2016/07/12
Sample ID: 16-POLW-BS101 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580429	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/18	Automated Statchk

Maxxam ID: CSC901 **Collected:** 2016/07/12
Sample ID: 16-POLW-BS-102 **Shipped:**
Matrix: Soil **Received:** 2016/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4580429	N/A	2016/07/18	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4580505	2016/07/15	2016/07/18	Lisa Gates
PCB Aroclor sum (soil)	CALC	4580150	N/A	2016/07/18	Automated Statchk

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Maxxam Job #: B6E7008
Report Date: 2016/07/19

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

GENERAL COMMENTS

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

Package 1	6.1°C

Revised report; sample IDs changed by client, 2016/07/19

Results relate only to the items tested.

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Maxxam Job #: B6E7008
Report Date: 2016/07/19

QUALITY ASSURANCE REPORT

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4580427	Decachlorobiphenyl	2016/07/18			93	30 - 130	94	%		
4580505	Decachlorobiphenyl	2016/07/18	86	30 - 130	97	30 - 130	97	%		
4580427	Aroclor 1016	2016/07/18					<5.0	ug		
4580427	Aroclor 1221	2016/07/18					<5.0	ug		
4580427	Aroclor 1232	2016/07/18					<5.0	ug		
4580427	Aroclor 1242	2016/07/18					<5.0	ug		
4580427	Aroclor 1248	2016/07/18					<5.0	ug		
4580427	Aroclor 1254	2016/07/18					<5.0	ug		
4580427	Aroclor 1260	2016/07/18			87	30 - 130	<5.0	ug		
4580505	Aroclor 1016	2016/07/18					<0.050	ug/g	NC	50
4580505	Aroclor 1221	2016/07/18					<0.050	ug/g	NC	50
4580505	Aroclor 1232	2016/07/18					<0.050	ug/g	NC	50
4580505	Aroclor 1242	2016/07/18					<0.050	ug/g	NC	50
4580505	Aroclor 1248	2016/07/18					<0.050	ug/g	NC	50
4580505	Aroclor 1254	2016/07/18	NC	30 - 130	117	30 - 130	<0.050	ug/g	NC	50
4580505	Aroclor 1260	2016/07/18					<0.050	ug/g	22	50

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 too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Maxxam Job #: B6E7008
Report Date: 2016/07/19

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE, NL
Sampler Initials: AP

VALIDATION SIGNATURE PAGE

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

Rosemarie MacDonald, Scientific Specialist (Organics)

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Maxxam
A Bureau Veritas Group Company

Your Project #: 121413099
Site Location: HOPEDALE NL
Your C.O.C. #: D 16940

Attention:Jim Slade

Stantec Consulting Ltd
141 Kelsey Drive
St. John's, NL
A1B 0L2

Report Date: 2016/07/20
Report #: R4073658
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6E9453
Received: 2016/07/19, 09:32

Sample Matrix: Soil
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Moisture (1)	8	N/A	2016/07/19	ATL SOP 00001	OMOE Handbook 1983 m
PCBs in soil by GC/ECD (1, 2)	8	2016/07/19	2016/07/20	ATL SOP 00106	EPA 8082A m
PCB Aroclor sum (soil) (1)	8	N/A	2016/07/20		Auto Calc.

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

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

(1) This test was performed by Maxxam Bedford
(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.
Michelle Hill, Project Manager
Email: MHill@maxxam.ca
Phone# (902)420-0203 Ext:289

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Maxxam Job #: B6E9453
Report Date: 2016/07/20

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE NL
Sampler Initials: AP

RESULTS OF ANALYSES OF SOIL

Maxxam ID		CSO166	CSO167	CSO168	CSO169	CSO170	CSO171			
Sampling Date		2016/07/13	2016/07/13	2016/07/13	2016/07/13	2016/07/13	2016/07/13			
COC Number		D 16940	D 16940	D 16940	D 16940	D 16940	D 16940			
	UNITS	**16-MB-BS113**	**16-P1-BS101**	**16-P1-BS102**	**16-P1-BS103**	**16-P1-BS104**	**16-P1-BS105**	**RDL**	**QC Batch**	**MDL**
Inorganics										
Moisture	%	22	34	20	19	13	18	1.0	4584158	0.20

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CSO172	CSO173			
Sampling Date		2016/07/13	2016/07/13			
COC Number		D 16940	D 16940			
	UNITS	**16-P1-BS106**	**16-P1-BS107**	**RDL**	**QC Batch**	**MDL**
Inorganics						
Moisture	%	23	29	1.0	4584158	0.20

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B6E9453
Report Date: 2016/07/20

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE NL
Sampler Initials: AP

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CSO166	CSO167	CSO168	CSO169	CSO170	CSO171			
Sampling Date		2016/07/13	2016/07/13	2016/07/13	2016/07/13	2016/07/13	2016/07/13			
COC Number		D 16940	D 16940	D 16940	D 16940	D 16940	D 16940			
	UNITS	**16-MB-BS113**	**16-P1-BS101**	**16-P1-BS102**	**16-P1-BS103**	**16-P1-BS104**	**16-P1-BS105**	**RDL**	**QC Batch**	**MDL**
PCBs										
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4584457	N/A
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4584457	N/A
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4584457	N/A
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4584457	N/A
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4584457	N/A
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4584457	N/A
Aroclor 1260	ug/g	2600	0.65	1.2	4.2	0.31	2.2	0.050	4584457	N/A
Calculated Total PCB	ug/g	2600	0.65	1.2	4.2	0.31	2.2	0.050	4584175	N/A
Surrogate Recovery (%)										
Decachlorobiphenyl	%	125	98	94	81	93	89		4584457	

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

Maxxam ID		CSO172	CSO173			
Sampling Date		2016/07/13	2016/07/13			
COC Number		D 16940	D 16940			
	UNITS	**16-P1-BS106**	**16-P1-BS107**	**RDL**	**QC Batch**	**MDL**
PCBs						
Aroclor 1016	ug/g	<0.050	<0.050	0.050	4584457	N/A
Aroclor 1221	ug/g	<0.050	<0.050	0.050	4584457	N/A
Aroclor 1232	ug/g	<0.050	<0.050	0.050	4584457	N/A
Aroclor 1248	ug/g	<0.050	<0.050	0.050	4584457	N/A
Aroclor 1242	ug/g	<0.050	<0.050	0.050	4584457	N/A
Aroclor 1254	ug/g	<0.050	<0.050	0.050	4584457	N/A
Aroclor 1260	ug/g	0.61	1.2	0.050	4584457	N/A
Calculated Total PCB	ug/g	0.61	1.2	0.050	4584175	N/A
Surrogate Recovery (%)						
Decachlorobiphenyl	%	91	93		4584457	

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

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Maxxam Job #: B6E9453
Report Date: 2016/07/20

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE NL
Sampler Initials: AP

TEST SUMMARY

Maxxam ID: CSO166 **Collected:** 2016/07/13
Sample ID: 16-MB-BS113 **Shipped:**
Matrix: Soil **Received:** 2016/07/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4584158	N/A	2016/07/19	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4584457	2016/07/19	2016/07/20	Lisa Gates
PCB Aroclor sum (soil)	CALC	4584175	N/A	2016/07/20	Automated Statchk

Maxxam ID: CSO167 **Collected:** 2016/07/13
Sample ID: 16-P1-BS101 **Shipped:**
Matrix: Soil **Received:** 2016/07/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4584158	N/A	2016/07/19	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4584457	2016/07/19	2016/07/20	Lisa Gates
PCB Aroclor sum (soil)	CALC	4584175	N/A	2016/07/20	Automated Statchk

Maxxam ID: CSO168 **Collected:** 2016/07/13
Sample ID: 16-P1-BS102 **Shipped:**
Matrix: Soil **Received:** 2016/07/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4584158	N/A	2016/07/19	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4584457	2016/07/19	2016/07/20	Lisa Gates
PCB Aroclor sum (soil)	CALC	4584175	N/A	2016/07/20	Automated Statchk

Maxxam ID: CSO169 **Collected:** 2016/07/13
Sample ID: 16-P1-BS103 **Shipped:**
Matrix: Soil **Received:** 2016/07/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4584158	N/A	2016/07/19	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4584457	2016/07/19	2016/07/20	Lisa Gates
PCB Aroclor sum (soil)	CALC	4584175	N/A	2016/07/20	Automated Statchk

Maxxam ID: CSO170 **Collected:** 2016/07/13
Sample ID: 16-P1-BS104 **Shipped:**
Matrix: Soil **Received:** 2016/07/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4584158	N/A	2016/07/19	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4584457	2016/07/19	2016/07/20	Lisa Gates
PCB Aroclor sum (soil)	CALC	4584175	N/A	2016/07/20	Automated Statchk

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Maxxam Job #: B6E9453
Report Date: 2016/07/20

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE NL
Sampler Initials: AP

TEST SUMMARY

Maxxam ID: CSO171 **Collected:** 2016/07/13
Sample ID: 16-P1-BS105 **Shipped:**
Matrix: Soil **Received:** 2016/07/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4584158	N/A	2016/07/19	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4584457	2016/07/19	2016/07/20	Lisa Gates
PCB Aroclor sum (soil)	CALC	4584175	N/A	2016/07/20	Automated Statchk

Maxxam ID: CSO172 **Collected:** 2016/07/13
Sample ID: 16-P1-BS106 **Shipped:**
Matrix: Soil **Received:** 2016/07/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4584158	N/A	2016/07/19	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4584457	2016/07/19	2016/07/20	Lisa Gates
PCB Aroclor sum (soil)	CALC	4584175	N/A	2016/07/20	Automated Statchk

Maxxam ID: CSO173 **Collected:** 2016/07/13
Sample ID: 16-P1-BS107 **Shipped:**
Matrix: Soil **Received:** 2016/07/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4584158	N/A	2016/07/19	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4584457	2016/07/19	2016/07/20	Lisa Gates
PCB Aroclor sum (soil)	CALC	4584175	N/A	2016/07/20	Automated Statchk

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Maxxam Job #: B6E9453
Report Date: 2016/07/20

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE NL
Sampler Initials: AP

GENERAL COMMENTS

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

Package 1	7.2°C

Results relate only to the items tested.

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Maxxam Job #: B6E9453
Report Date: 2016/07/20

QUALITY ASSURANCE REPORT

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE NL
Sampler Initials: AP

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4584457	Decachlorobiphenyl	2016/07/20	99	30 - 130	101	30 - 130	124	%		
4584457	Aroclor 1016	2016/07/20					<0.050	ug/g	NC	50
4584457	Aroclor 1221	2016/07/20					<0.050	ug/g	NC	50
4584457	Aroclor 1232	2016/07/20					<0.050	ug/g	NC	50
4584457	Aroclor 1242	2016/07/20					<0.050	ug/g	NC	50
4584457	Aroclor 1248	2016/07/20					<0.050	ug/g	NC	50
4584457	Aroclor 1254	2016/07/20	122	30 - 130	118	30 - 130	<0.050	ug/g	NC	50
4584457	Aroclor 1260	2016/07/20					<0.050	ug/g	NC	50

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

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

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

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

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Maxxam Job #: B6E9453
Report Date: 2016/07/20

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE NL
Sampler Initials: AP

VALIDATION SIGNATURE PAGE

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

Rosemarie MacDonald, Scientific Specialist (Organics)

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Your Project #: 121413099
Site Location: HOPEDALE NL
Your C.O.C. #: D16949, D16947, D16948

Attention:Jim Slade

Stantec Consulting Ltd
141 Kelsey Drive
St. John's, NL
A1B 0L2

Report Date: 2016/08/03
Report #: R4090671
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6F5512
Received: 2016/07/26, 10:16

Sample Matrix: Soil
Samples Received: 21

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Moisture (1)	21	N/A	2016/07/27	ATL SOP 00001	OMOE Handbook 1983 m
PCBs in soil by GC/ECD (1, 3)	15	2016/07/26	2016/07/27	ATL SOP 00106	EPA 8082A m
PCBs in soil by GC/ECD (1, 3)	5	2016/07/26	2016/08/03	ATL SOP 00106	EPA 8082A m
PCBs in soil by GC/ECD (1, 3)	1	2016/08/03	2016/08/03	ATL SOP 00106	EPA 8082A m
PCB Aroclor sum (soil) (1)	15	N/A	2016/07/27		Auto Calc.
PCB Aroclor sum (soil) (1)	6	N/A	2016/08/03		Auto Calc.

Sample Matrix: SOLID
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
PCBs in Solid by GC/ECD (1, 2)	1	2016/07/29	2016/08/02	ATL SOP 00105	EPA 8082A m
PCB Aroclor sum (solid) (1)	1	N/A	2016/08/02		Auto Calc.

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

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

(1) This test was performed by Maxxam Bedford
(2) Samples were analyzed for PCB using an accredited standard procedure modified for a non-standard matrix. Best laboratory practice and all routine QC procedures were employed. The accreditation does not extend to the matrix analyzed.
(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.
Michelle Hill, Project Manager
Email: MHill@maxxam.ca
Phone# (902)420-0203 Ext:289

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Maxxam Job #: B6F5512
Report Date: 2016/08/03

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE NL
Sampler Initials: AP

RESULTS OF ANALYSES OF SOIL

Maxxam ID		CTQ215	CTQ216	CTQ217	CTQ218	CTQ219	CTQ220			
Sampling Date		2016/07/22	2016/07/22	2016/07/22	2016/07/22	2016/07/22	2016/07/22			
COC Number		D16949	D16949	D16949	D16949	D16949	D16949			
	UNITS	**16-P1-BS108**	**16-P1-BS109**	**16-P1-BS110**	**16-P1-BS111**	**16-P1-BS112**	**16-P1-BS113**	**RDL**	**QC Batch**	**MDL**
Inorganics										
Moisture	%	10	14	5.4	18	6.3	7.1	1.0	4593869	0.20

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CTQ221	CTQ222	CTQ223	CTQ224	CTQ225			
Sampling Date		2016/07/22	2016/07/22	2016/07/22	2016/07/22	2016/07/22			
COC Number		D16949	D16949	D16949	D16949	D16949			
	UNITS	**16-P1-BS114**	**16-P1-BS115**	**16-P1-BS116**	**16-P1-BS117**	**16-P1-BS118**	**RDL**	**QC Batch**	**MDL**
Inorganics									
Moisture	%	4.7	5.5	20	20	22	1.0	4593869	0.20

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CTQ226	CTQ227	CTQ228		CTQ229	CTQ230			
Sampling Date		2016/07/22	2016/07/22	2016/07/22		2016/07/22	2016/07/21			
COC Number		D16947	D16947	D16947		D16947	D16948			
	UNITS	**16-P1-BS119**	**16-P1-BS120**	**16-P1-BS121**	**QC Batch**	**16-P1-BS122**	**16-MB-BS114**	**RDL**	**QC Batch**	**MDL**
Inorganics										
Moisture	%	13	4.7	14	4594142	18	22	1.0	4593869	0.20

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CTQ231	CTQ232	CTQ233	CTQ234	CTQ235			
Sampling Date		2016/07/21	2016/07/21	2016/07/21	2016/07/21	2016/07/21			
COC Number		D16948	D16948	D16948	D16948	D16948			
	UNITS	**16-MB-BS115**	**16-MB-BS116**	**16-MB-BS117**	**16-MB-BS118**	**16-MB-BS119**	**RDL**	**QC Batch**	**MDL**
Inorganics									
Moisture	%	13	19	7.0	15	19	1.0	4593869	0.20

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2016/08/03

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE NL
Sampler Initials: AP

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CTQ215	CTQ215	CTQ216	CTQ217	CTQ218	CTQ219			
Sampling Date		2016/07/22	2016/07/22	2016/07/22	2016/07/22	2016/07/22	2016/07/22			
COC Number		D16949	D16949	D16949	D16949	D16949	D16949			
	UNITS	**16-P1-BS108**	**16-P1-BS108 Lab-Dup**	**16-P1-BS109**	**16-P1-BS110**	**16-P1-BS111**	**16-P1-BS112**	**RDL**	**QC Batch**	**MDL**
PCBs										
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4594194	N/A
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4594194	N/A
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4594194	N/A
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4594194	N/A
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4594194	N/A
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4594194	N/A
Aroclor 1260	ug/g	1.5	2.1	1.2	0.66	12	4.8	0.050	4594194	N/A
Calculated Total PCB	ug/g	1.5		1.2	0.66	12	4.8	0.050	4594031	N/A
Surrogate Recovery (%)										
Decachlorobiphenyl	%	94	93	81	86	88	89		4594194	

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam ID		CTQ220	CTQ221	CTQ222	CTQ223	CTQ224	CTQ225			
Sampling Date		2016/07/22	2016/07/22	2016/07/22	2016/07/22	2016/07/22	2016/07/22			
COC Number		D16949	D16949	D16949	D16949	D16949	D16949			
	UNITS	**16-P1-BS113**	**16-P1-BS114**	**16-P1-BS115**	**16-P1-BS116**	**16-P1-BS117**	**16-P1-BS118**	**RDL**	**QC Batch**	**MDL**
PCBs										
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4594194	N/A
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4594194	N/A
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4594194	N/A
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4594194	N/A
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4594194	N/A
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4594194	N/A
Aroclor 1260	ug/g	6.7	2.7	140	1.2	250	12	0.050	4594194	N/A
Calculated Total PCB	ug/g	6.7	2.7	140	1.2	250	12	0.050	4594031	N/A
Surrogate Recovery (%)										
Decachlorobiphenyl	%	93	98	96	95	93	96		4594194	

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

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Sampler Initials: AP

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CTQ226	CTQ227	CTQ228	CTQ229		CTQ230			
Sampling Date		2016/07/22	2016/07/22	2016/07/22	2016/07/22		2016/07/21			
COC Number		D16947	D16947	D16947	D16947		D16948			
	UNITS	**16-P1-BS119**	**16-P1-BS120**	**16-P1-BS121**	**16-P1-BS122**	**QC Batch**	**16-MB-BS114**	**RDL**	**QC Batch**	**MDL**
PCBs										
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	<0.050	4594194	<0.050	0.050	4603631	N/A
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	<0.050	4594194	<0.050	0.050	4603631	N/A
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	<0.050	4594194	<0.050	0.050	4603631	N/A
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	<0.050	4594194	<0.050	0.050	4603631	N/A
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	<0.050	4594194	<0.050	0.050	4603631	N/A
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	<0.050	4594194	<0.050	0.050	4603631	N/A
Aroclor 1260	ug/g	160	0.090	1.1	2.2	4594194	3700	0.050	4603631	N/A
Calculated Total PCB	ug/g	160	0.090	1.1	2.2	4594031	3700	0.050	4594031	N/A
Surrogate Recovery (%)										
Decachlorobiphenyl	%	88	90	96	99	4594194	241 (1)		4603631	

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) PCB surrogate not within acceptance limits. Analysis was repeated with similar results.

Maxxam ID		CTQ230		CTQ231	CTQ231	CTQ232	CTQ233			
Sampling Date		2016/07/21		2016/07/21	2016/07/21	2016/07/21	2016/07/21			
COC Number		D16948		D16948	D16948	D16948	D16948			
	UNITS	**16-MB-BS114 Lab-Dup**	**QC Batch**	**16-MB-BS115**	**16-MB-BS115 Lab-Dup**	**16-MB-BS116**	**16-MB-BS117**	**RDL**	**QC Batch**	**MDL**
PCBs										
Aroclor 1016	ug/g	<0.050	4603631	<0.050	<0.050	<0.050	<0.050	0.050	4602385	N/A
Aroclor 1221	ug/g	<0.050	4603631	<0.050	<0.050	<0.050	<0.050	0.050	4602385	N/A
Aroclor 1232	ug/g	<0.050	4603631	<0.050	<0.050	<0.050	<0.050	0.050	4602385	N/A
Aroclor 1248	ug/g	<0.050	4603631	<0.050	<0.050	<0.050	<0.050	0.050	4602385	N/A
Aroclor 1242	ug/g	<0.050	4603631	<0.050	<0.050	<0.050	<0.050	0.050	4602385	N/A
Aroclor 1254	ug/g	<0.050	4603631	<0.050	<0.050	<0.050	<0.050	0.050	4602385	N/A
Aroclor 1260	ug/g	2900	4603631	0.73	0.54	3.2	0.069	0.050	4602385	N/A
Calculated Total PCB	ug/g		4594031	0.73		3.2	0.069	0.050	4594031	N/A
Surrogate Recovery (%)										
Decachlorobiphenyl	%	230 (1)	4603631	88	86	93	95		4602385	

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) PCB surrogate not within acceptance limits. Analysis was repeated with similar results.

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CTQ234	CTQ235			
Sampling Date		2016/07/21	2016/07/21			
COC Number		D16948	D16948			
	UNITS	**16-MB-BS118**	**16-MB-BS119**	**RDL**	**QC Batch**	**MDL**
PCBs						
Aroclor 1016	ug/g	<0.050	<0.050	0.050	4602385	N/A
Aroclor 1221	ug/g	<0.050	<0.050	0.050	4602385	N/A
Aroclor 1232	ug/g	<0.050	<0.050	0.050	4602385	N/A
Aroclor 1248	ug/g	<0.050	<0.050	0.050	4602385	N/A
Aroclor 1242	ug/g	<0.050	<0.050	0.050	4602385	N/A
Aroclor 1254	ug/g	<0.050	<0.050	0.050	4602385	N/A
Aroclor 1260	ug/g	21	310	0.050	4602385	N/A
Calculated Total PCB	ug/g	21	310	0.050	4594031	N/A
Surrogate Recovery (%)						
Decachlorobiphenyl	%	98	100		4602385	

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

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOLID)

Maxxam ID		CTQ236	CTQ236			
Sampling Date		2016/07/21	2016/07/21			
COC Number		D16948	D16948			
	UNITS	**16-MB-TS101**	**16-MB-TS101 Lab-Dup**	**RDL**	**QC Batch**	**MDL**
PCBs						
Aroclor 1016	mg/kg	<0.50	<0.50	0.50	4599412	N/A
Aroclor 1221	mg/kg	<0.50	<0.50	0.50	4599412	N/A
Aroclor 1232	mg/kg	<0.50	<0.50	0.50	4599412	N/A
Aroclor 1248	mg/kg	<0.50	<0.50	0.50	4599412	N/A
Aroclor 1242	mg/kg	<0.50	<0.50	0.50	4599412	N/A
Aroclor 1254	mg/kg	<0.50	<0.50	0.50	4599412	N/A
Aroclor 1260	mg/kg	3.8	5.6	0.50	4599412	N/A
Calculated Total PCB	mg/kg	3.8		0.50	4594032	N/A
Surrogate Recovery (%)						
Decachlorobiphenyl	%	81	72		4599412	

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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Maxxam Job #: B6F5512
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TEST SUMMARY

Maxxam ID: CTQ215 **Collected:** 2016/07/22
Sample ID: 16-P1-BS108 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4593869	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4594194	2016/07/26	2016/07/27	Lisa Gates
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/07/27	Automated Statchk

Maxxam ID: CTQ215 Dup **Collected:** 2016/07/22
Sample ID: 16-P1-BS108 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCBs in soil by GC/ECD	GC/ECD	4594194	2016/07/26	2016/07/27	Lisa Gates

Maxxam ID: CTQ216 **Collected:** 2016/07/22
Sample ID: 16-P1-BS109 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4593869	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4594194	2016/07/26	2016/07/27	Lisa Gates
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/07/27	Automated Statchk

Maxxam ID: CTQ217 **Collected:** 2016/07/22
Sample ID: 16-P1-BS110 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4593869	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4594194	2016/07/26	2016/07/27	Lisa Gates
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/07/27	Automated Statchk

Maxxam ID: CTQ218 **Collected:** 2016/07/22
Sample ID: 16-P1-BS111 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4593869	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4594194	2016/07/26	2016/07/27	Lisa Gates
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/07/27	Automated Statchk

Maxxam ID: CTQ219 **Collected:** 2016/07/22
Sample ID: 16-P1-BS112 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4593869	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4594194	2016/07/26	2016/07/27	Lisa Gates

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Sampler Initials: AP

TEST SUMMARY

Maxxam ID: CTQ219 **Collected:** 2016/07/22
Sample ID: 16-P1-BS112 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/07/27	Automated Statchk

Maxxam ID: CTQ220 **Collected:** 2016/07/22
Sample ID: 16-P1-BS113 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4593869	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4594194	2016/07/26	2016/07/27	Lisa Gates
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/07/27	Automated Statchk

Maxxam ID: CTQ221 **Collected:** 2016/07/22
Sample ID: 16-P1-BS114 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4593869	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4594194	2016/07/26	2016/07/27	Lisa Gates
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/07/27	Automated Statchk

Maxxam ID: CTQ222 **Collected:** 2016/07/22
Sample ID: 16-P1-BS115 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4593869	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4594194	2016/07/26	2016/07/27	Lisa Gates
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/07/27	Automated Statchk

Maxxam ID: CTQ223 **Collected:** 2016/07/22
Sample ID: 16-P1-BS116 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4593869	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4594194	2016/07/26	2016/07/27	Lisa Gates
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/07/27	Automated Statchk

Maxxam ID: CTQ224 **Collected:** 2016/07/22
Sample ID: 16-P1-BS117 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4593869	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4594194	2016/07/26	2016/07/27	Lisa Gates

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TEST SUMMARY

Maxxam ID: CTQ224 **Collected:** 2016/07/22
Sample ID: 16-P1-BS117 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/07/27	Automated Statchk

Maxxam ID: CTQ225 **Collected:** 2016/07/22
Sample ID: 16-P1-BS118 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4593869	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4594194	2016/07/26	2016/07/27	Lisa Gates
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/07/27	Automated Statchk

Maxxam ID: CTQ226 **Collected:** 2016/07/22
Sample ID: 16-P1-BS119 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4594142	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4594194	2016/07/26	2016/07/27	Lisa Gates
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/07/27	Automated Statchk

Maxxam ID: CTQ227 **Collected:** 2016/07/22
Sample ID: 16-P1-BS120 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4594142	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4594194	2016/07/26	2016/07/27	Lisa Gates
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/07/27	Automated Statchk

Maxxam ID: CTQ228 **Collected:** 2016/07/22
Sample ID: 16-P1-BS121 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4594142	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4594194	2016/07/26	2016/07/27	Lisa Gates
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/07/27	Automated Statchk

Maxxam ID: CTQ229 **Collected:** 2016/07/22
Sample ID: 16-P1-BS122 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4593869	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4594194	2016/07/26	2016/07/27	Lisa Gates

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TEST SUMMARY

Maxxam ID: CTQ229 **Collected:** 2016/07/22
Sample ID: 16-P1-BS122 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/07/27	Automated Statchk

Maxxam ID: CTQ230 **Collected:** 2016/07/21
Sample ID: 16-MB-BS114 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4593869	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4603631	2016/08/03	2016/08/03	Lisa Gates
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/08/03	Automated Statchk

Maxxam ID: CTQ230 Dup **Collected:** 2016/07/21
Sample ID: 16-MB-BS114 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCBs in soil by GC/ECD	GC/ECD	4603631	2016/08/03	2016/08/03	Lisa Gates

Maxxam ID: CTQ231 **Collected:** 2016/07/21
Sample ID: 16-MB-BS115 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4593869	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4602385	2016/07/26	2016/08/03	Lisa Gates
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/08/03	Automated Statchk

Maxxam ID: CTQ231 Dup **Collected:** 2016/07/21
Sample ID: 16-MB-BS115 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCBs in soil by GC/ECD	GC/ECD	4602385	2016/08/02	2016/08/03	Lisa Gates

Maxxam ID: CTQ232 **Collected:** 2016/07/21
Sample ID: 16-MB-BS116 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4593869	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4602385	2016/07/26	2016/08/03	Lisa Gates
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/08/03	Automated Statchk

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Maxxam Job #: B6F5512
Report Date: 2016/08/03

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE NL
Sampler Initials: AP

TEST SUMMARY

Maxxam ID: CTQ233 **Collected:** 2016/07/21
Sample ID: 16-MB-BS117 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4593869	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4602385	2016/07/26	2016/08/03	Lisa Gates
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/08/03	Automated Statchk

Maxxam ID: CTQ234 **Collected:** 2016/07/21
Sample ID: 16-MB-BS118 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4593869	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4602385	2016/07/26	2016/08/03	Lisa Gates
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/08/03	Automated Statchk

Maxxam ID: CTQ235 **Collected:** 2016/07/21
Sample ID: 16-MB-BS119 **Shipped:**
Matrix: Soil **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4593869	N/A	2016/07/27	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4602385	2016/07/26	2016/08/03	Lisa Gates
PCB Aroclor sum (soil)	CALC	4594031	N/A	2016/08/03	Automated Statchk

Maxxam ID: CTQ236 **Collected:** 2016/07/21
Sample ID: 16-MB-TS101 **Shipped:**
Matrix: SOLID **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCBs in Solid by GC/ECD	GC/ECD	4599412	2016/07/29	2016/08/02	Lisa Gates
PCB Aroclor sum (solid)	CALC	4594032	N/A	2016/08/02	Automated Statchk

Maxxam ID: CTQ236 Dup **Collected:** 2016/07/21
Sample ID: 16-MB-TS101 **Shipped:**
Matrix: SOLID **Received:** 2016/07/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCBs in Solid by GC/ECD	GC/ECD	4599412	2016/07/29	2016/08/02	Lisa Gates

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Maxxam Job #: B6F5512
Report Date: 2016/08/03

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE NL
Sampler Initials: AP

GENERAL COMMENTS

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

Package 1	3.8°C

Results relate only to the items tested.

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Maxxam Job #: B6F5512
Report Date: 2016/08/03

QUALITY ASSURANCE REPORT

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE NL
Sampler Initials: AP

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4594194	Decachlorobiphenyl	2016/07/27	75	30 - 130	99	30 - 130	110	%		
4599412	Decachlorobiphenyl	2016/08/02	74	30 - 130	108	30 - 130	107	%		
4602385	Decachlorobiphenyl	2016/08/03	92	30 - 130	94	30 - 130	95	%		
4603631	Decachlorobiphenyl	2016/08/03	229 (1)	30 - 130	97	30 - 130	99	%		
4594194	Aroclor 1016	2016/07/27					<0.050	ug/g	NC	50
4594194	Aroclor 1221	2016/07/27					<0.050	ug/g	NC	50
4594194	Aroclor 1232	2016/07/27					<0.050	ug/g	NC	50
4594194	Aroclor 1242	2016/07/27					<0.050	ug/g	NC	50
4594194	Aroclor 1248	2016/07/27					<0.050	ug/g	NC	50
4594194	Aroclor 1254	2016/07/27	NC	30 - 130	115	30 - 130	<0.050	ug/g	NC	50
4594194	Aroclor 1260	2016/07/27					<0.050	ug/g	34	50
4599412	Aroclor 1016	2016/08/02					<0.50	mg/kg	NC	50
4599412	Aroclor 1221	2016/08/02					<0.50	mg/kg	NC	50
4599412	Aroclor 1232	2016/08/02					<0.50	mg/kg	NC	50
4599412	Aroclor 1242	2016/08/02					<0.50	mg/kg	NC	50
4599412	Aroclor 1248	2016/08/02					<0.50	mg/kg	NC	50
4599412	Aroclor 1254	2016/08/02	50	30 - 130	102	30 - 130	<0.50	mg/kg	NC	50
4599412	Aroclor 1260	2016/08/02					<0.50	mg/kg	37	50
4602385	Aroclor 1016	2016/08/03					<0.050	ug/g	NC	50
4602385	Aroclor 1221	2016/08/03					<0.050	ug/g	NC	50
4602385	Aroclor 1232	2016/08/03					<0.050	ug/g	NC	50
4602385	Aroclor 1242	2016/08/03					<0.050	ug/g	NC	50
4602385	Aroclor 1248	2016/08/03					<0.050	ug/g	NC	50
4602385	Aroclor 1254	2016/08/03	NC	30 - 130	95	30 - 130	<0.050	ug/g	NC	50
4602385	Aroclor 1260	2016/08/03					<0.050	ug/g	29	50
4603631	Aroclor 1016	2016/08/03					<0.050	ug/g	NC	50
4603631	Aroclor 1221	2016/08/03					<0.050	ug/g	NC	50
4603631	Aroclor 1232	2016/08/03					<0.050	ug/g	NC	50
4603631	Aroclor 1242	2016/08/03					<0.050	ug/g	NC	50
4603631	Aroclor 1248	2016/08/03					<0.050	ug/g	NC	50
4603631	Aroclor 1254	2016/08/03	NC	30 - 130	101	30 - 130	<0.050	ug/g	NC	50

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Maxxam Job #: B6F5512
Report Date: 2016/08/03

QUALITY ASSURANCE REPORT(CONT'D)

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE NL
Sampler Initials: AP

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4603631	Aroclor 1260	2016/08/03					<0.050	ug/g	26	50

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 too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) PCB surrogate not within acceptance limits. Analysis was repeated with similar results.

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Maxxam Job #: B6F5512
Report Date: 2016/08/03

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE NL
Sampler Initials: AP

VALIDATION SIGNATURE PAGE

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

Rosemarie MacDonald, Scientific Specialist (Organics)

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Your Project #: 121413099
Site Location: HOPEDALE YR 6 MAIN BASE
Your C.O.C. #: N/A

Attention:Jim Slade

Stantec Consulting Ltd
141 Kelsey Drive
St. John's, NL
A1B 0L2

Report Date: 2016/08/25
Report #: R4132634
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6H6764
Received: 2016/08/18, 10:24

Sample Matrix: Soil
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Moisture (1)	6	N/A	2016/08/23	ATL SOP 00001	OMOE Handbook 1983 m
PCBs in soil by GC/ECD (1, 2)	6	2016/08/23	2016/08/25	ATL SOP 00106	EPA 8082A m
PCB Aroclor sum (soil) (1)	6	N/A	2016/08/25		Auto Calc.

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

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

(1) This test was performed by Maxxam Bedford
(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.
Michelle Hill, Project Manager
Email: MHill@maxxam.ca
Phone# (902)420-0203 Ext:289

==========

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Maxxam Job #: B6H6764
Report Date: 2016/08/25

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE YR 6 MAIN BASE
Sampler Initials: JG

RESULTS OF ANALYSES OF SOIL

Maxxam ID		CXO639	CXO640	CXO641	CXO643	CXO648			
Sampling Date		2016/08/04	2016/08/04	2016/08/04	2016/08/04	2016/08/04			
COC Number		N/A	N/A	N/A	N/A	N/A			
	UNITS	**16-MB-BS120A**	**16-MB-BS120B**	**16-MB-BS121A**	**16-MB-BS121B**	**16-MB-BS122A**	**RDL**	**QC Batch**	**MDL**
Inorganics									
Moisture	%	13	15	17	40	13	1.0	4629448	0.20

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CXO652			
Sampling Date		2016/08/04			
COC Number		N/A			
	UNITS	**16-MB-BS122B**	**RDL**	**QC Batch**	**MDL**
Inorganics					
Moisture	%	11	1.0	4629448	0.20

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B6H6764
Report Date: 2016/08/25

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE YR 6 MAIN BASE
Sampler Initials: JG

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CXO639	CXO640	CXO641	CXO643	CXO648			
Sampling Date		2016/08/04	2016/08/04	2016/08/04	2016/08/04	2016/08/04			
COC Number		N/A	N/A	N/A	N/A	N/A			
	UNITS	**16-MB-BS120A**	**16-MB-BS120B**	**16-MB-BS121A**	**16-MB-BS121B**	**16-MB-BS122A**	**RDL**	**QC Batch**	**MDL**
PCBs									
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4630566	N/A
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4630566	N/A
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4630566	N/A
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4630566	N/A
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4630566	N/A
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4630566	N/A
Aroclor 1260	ug/g	1.4	2.5	49	13	0.34	0.050	4630566	N/A
Calculated Total PCB	ug/g	1.4	2.5	49	13	0.34	0.050	4627171	N/A
Surrogate Recovery (%)									
Decachlorobiphenyl	%	102 (1)	100 (1)	103 (1)	73 (1)	96 (1)		4630566	

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) PCB sample analysed past recommended hold time due to lab error.

Maxxam ID		CXO652			
Sampling Date		2016/08/04			
COC Number		N/A			
	UNITS	**16-MB-BS122B**	**RDL**	**QC Batch**	**MDL**
PCBs					
Aroclor 1016	ug/g	<0.050	0.050	4630566	N/A
Aroclor 1221	ug/g	<0.050	0.050	4630566	N/A
Aroclor 1232	ug/g	<0.050	0.050	4630566	N/A
Aroclor 1248	ug/g	<0.050	0.050	4630566	N/A
Aroclor 1242	ug/g	<0.050	0.050	4630566	N/A
Aroclor 1254	ug/g	<0.050	0.050	4630566	N/A
Aroclor 1260	ug/g	2.1	0.050	4630566	N/A
Calculated Total PCB	ug/g	2.1	0.050	4627171	N/A
Surrogate Recovery (%)					
Decachlorobiphenyl	%	91 (1)		4630566	

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) PCB sample analysed past recommended hold time due to lab error.

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Maxxam Job #: B6H6764
Report Date: 2016/08/25

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE YR 6 MAIN BASE
Sampler Initials: JG

TEST SUMMARY

Maxxam ID: CXO639
Sample ID: 16-MB-BS120A
Matrix: Soil

Collected: 2016/08/04
Shipped:
Received: 2016/08/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4629448	N/A	2016/08/23	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4630566	2016/08/23	2016/08/25	Lisa Gates
PCB Aroclor sum (soil)	CALC	4627171	N/A	2016/08/25	Automated Statchk

Maxxam ID: CXO640
Sample ID: 16-MB-BS120B
Matrix: Soil

Collected: 2016/08/04
Shipped:
Received: 2016/08/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4629448	N/A	2016/08/23	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4630566	2016/08/23	2016/08/25	Lisa Gates
PCB Aroclor sum (soil)	CALC	4627171	N/A	2016/08/25	Automated Statchk

Maxxam ID: CXO641
Sample ID: 16-MB-BS121A
Matrix: Soil

Collected: 2016/08/04
Shipped:
Received: 2016/08/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4629448	N/A	2016/08/23	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4630566	2016/08/23	2016/08/25	Lisa Gates
PCB Aroclor sum (soil)	CALC	4627171	N/A	2016/08/25	Automated Statchk

Maxxam ID: CXO643
Sample ID: 16-MB-BS121B
Matrix: Soil

Collected: 2016/08/04
Shipped:
Received: 2016/08/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4629448	N/A	2016/08/23	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4630566	2016/08/23	2016/08/25	Lisa Gates
PCB Aroclor sum (soil)	CALC	4627171	N/A	2016/08/25	Automated Statchk

Maxxam ID: CXO648
Sample ID: 16-MB-BS122A
Matrix: Soil

Collected: 2016/08/04
Shipped:
Received: 2016/08/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4629448	N/A	2016/08/23	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4630566	2016/08/23	2016/08/25	Lisa Gates
PCB Aroclor sum (soil)	CALC	4627171	N/A	2016/08/25	Automated Statchk

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Maxxam Job #: B6H6764
Report Date: 2016/08/25

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE YR 6 MAIN BASE
Sampler Initials: JG

TEST SUMMARY

Maxxam ID: CXO652
Sample ID: 16-MB-BS122B
Matrix: Soil

Collected: 2016/08/04
Shipped:
Received: 2016/08/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4629448	N/A	2016/08/23	Victoria Legge
PCBs in soil by GC/ECD	GC/ECD	4630566	2016/08/23	2016/08/25	Lisa Gates
PCB Aroclor sum (soil)	CALC	4627171	N/A	2016/08/25	Automated Statchk

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Maxxam Job #: B6H6764
Report Date: 2016/08/25

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE YR 6 MAIN BASE
Sampler Initials: JG

GENERAL COMMENTS

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

Package 1	2.3°C

Results relate only to the items tested.

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Maxxam Job #: B6H6764
Report Date: 2016/08/25

QUALITY ASSURANCE REPORT

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE YR 6 MAIN BASE
Sampler Initials: JG

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4630566	Decachlorobiphenyl	2016/08/25	102	30 - 130	107	30 - 130	108	%		
4630566	Aroclor 1016	2016/08/25					<0.050	ug/g	NC	50
4630566	Aroclor 1221	2016/08/25					<0.050	ug/g	NC	50
4630566	Aroclor 1232	2016/08/25					<0.050	ug/g	NC	50
4630566	Aroclor 1242	2016/08/25					<0.050	ug/g	NC	50
4630566	Aroclor 1248	2016/08/25					<0.050	ug/g	NC	50
4630566	Aroclor 1254	2016/08/25	116	30 - 130	117	30 - 130	<0.050	ug/g	NC	50
4630566	Aroclor 1260	2016/08/25					<0.050	ug/g	NC	50

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

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

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

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

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Maxxam Job #: B6H6764
Report Date: 2016/08/25

Stantec Consulting Ltd
Client Project #: 121413099
Site Location: HOPEDALE YR 6 MAIN BASE
Sampler Initials: JG

VALIDATION SIGNATURE PAGE

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

Rosemarie MacDonald, Scientific Specialist (Organics)

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APPENDIX E

PCB Destruction Certificates and

Metal Debris Bill of Lading/Weigh Slip

RÉCUPÈRE SOL

Certificate of Destruction

Saint-Ambroise August 31, 2016

Generator :

Government of NL

P.O. Box 8700
St. JonhNL

Contact :

Advisor :

Sanexen Services Environnementaux In

9935 rue de Châteauneuf,
Brossard (Québec J4Z 3V4

Contact :

We confirm treatment of your soils at our plant located in the industrial park of Saint-Ambroise. The soils were managed and treated in compliance with our Certificate of Authorization delivered by the Quebec Ministry of Sustainable Development, Environment and the Fight against Climate Change :

Permit : **Thermal treatment of PCB and other organochloride impacted soils, issued on October 27, 1997**

Permit Ref. No. : **7610-02-01-0603816**
1142129

Treatment service : Thermal
Soils impacted with : PCB
Treatment criteria : <A In reference to the standards set by the Ministry of the Sustainable Development, Environment and Parks of the Province of Quebec, Canada (<0.05 mg/kg)

Récupère Sol File No. : **160823**

Destruction Certificate No. : **160823.d1**

Volume of Soil Treated (kg) : **952590**

Yours truly,

Éloi Côté, Eng
Process Engineer

80 des Mélèzes St., St. Ambroise, Quebec, Canada, G7P 2N4
Tel.: (418) 695-3302 Fax : (418) 695-3303

Trucks summary

01-sept.-16

File No.	Arrival Time	Generator	Contamination	Weight ticket No.	Manifest No.	Carrier	License No.	Driver	Net weight (kg)
08-août-16									
160823	09:43	Hope Dale (Sanexen)	BPC	34638	PC55604-5	Transport Serro	L292985	Roger Gagnon	38900
160823	09:58	Hope Dale (Sanexen)	BPC	34639	PC55605-2	Transport Serro	L662092	Jean-Michel Lavoie	39680
160823	10:03	Hope Dale (Sanexen)	BPC	34640	PC55606-0	Transport Serro	L607363	Sébastien Pelletier	39590
160823	10:20	Hope Dale (Sanexen)	BPC	34641	PC55607-8	Transport Serro	L631232	Martin Boily	38040
160823	13:01	Hope Dale (Sanexen)	BPC	34643	PC55608-6	Transport Serro	L292985	Roger Gagnon	39350
160823	13:52	Hope Dale (Sanexen)	BPC	34644	PC55609-4	Transport Serro	l662092	Jean-Michel Lavoie	38060
160823	14:05	Hope Dale (Sanexen)	BPC	34645	PC55610-2	Transport Serro	L607363	Sébastien Pelletier	39330
160823	14:54	Hope Dale (Sanexen)	BPC	34646	PC55611-0	Transport Serro	L631232	Martin Boily	39700
160823	15:58	Hope Dale (Sanexen)	BPC	34649	PC55612-8	Transport Serro	L292985	Roger Gagnon	38480
160823	16:49	Hope Dale (Sanexen)	BPC	34650	PC55613-6	Transport Serro	L662092	Jean-Michel Lavoie	37880
160823	16:56	Hope Dale (Sanexen)	BPC	34651	PC55617-7	Transport Serro	L607363	Sébastien Pelletier	37870
									426880
09-août-16									
160823	08:37	Hope Dale (Sanexen)	BPC	34658	PC55618-5	Transport Serro	L292985	Roger Gagnon	37890
160823	09:04	Hope Dale (Sanexen)	BPC	34662	PC55619-3	Transport Serro	L662092	Jean-Michel Lavoie	39130
160823	09:11	Hope Dale (Sanexen)	BPC	34663	PC55621-9	Transport Serro	L631232	Martin Boily	38990
160823	09:30	Hope Dale (Sanexen)	BPC	34664	PC55620-1	Transport Serro	L607363	William Savard	39800
160823	10:16	Hope Dale (Sanexen)	BPC	34666	PC55622-7	Transport Serro	L555014	Donald Girard	39660
160823	11:18	Hope Dale (Sanexen)	BPC	34667	PC55623-5	Transport Serro	L292985	Roger Gagnon	40930
160823	11:39	Hope Dale (Sanexen)	BPC	34669	PC55624-3	Transport Serro	L662092	Jean-Michel Lavoie	43030
160823	12:09	Hope Dale (Sanexen)	BPC	34670	PC55625-0	Transport Serro	L631232	Martin Boily	42070

File No.	Arrival Time	Generator	Contamination	Weight ticket No.	Manifest No.	Carrier	License No.	Driver	Net weight (kg)
160823	13:33	Hope Dale (Sanexen)	BPC	34671	PC55631-8	Transport Serro	L555014	Donald Girard	41640
160823	13:49	Hope Dale (Sanexen)	BPC	34672	PC55626-8	Transport Serro	L607363	William Savard	39690
160823	14:03	Hope Dale (Sanexen)	BPC	34673	PC55627-6	Transport Serro	L292985	Roger Gagnon	40550
160823	14:34	Hope Dale (Sanexen)	BPC	34674	PC55628-4	Transport Serro	L662092	Jean-Michel Lavoie	42400
160823	15:17	Hope Dale (Sanexen)	BPC	34676	PC55629-2	Transport Serro	L631232	Martin Boily	39930
									525710
								Total général:	**952590**

RÉCUPÈRE SOL

Certificate of Destruction

Saint-Ambroise October 26, 2016

Generator :

Government of NL (Hopedale)

P.O. Box 8700
St. JonhNL

Contact :

Advisor :

Sanexen Services Environnementaux In

9935 rue de Châteauneuf,
Brossard (Québec J4Z 3V4

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Récupère Sol File No. : **160823**

Destruction Certificate No. : **160823.d2**

Volume of Soil Treated (kg) : **274550**

Yours truly,

Éloi Côté, Eng
Process Engineer

80 des Mélèzes St., St. Ambroise, Quebec, Canada, G7P 2N4
Tel.: (418) 695-3302 Fax : (418) 695-3303

Bilan des arrivages de sol contaminé

27-sept.-16

N° Dossier	Heure	Generateur	Contamination	N° billet de pesée	N° Manifeste	Remarque	Transporteur	Immatriculation	Conducteur	Poids net (kg)
26-sept.-16										
160823	10:17	Hope Dale (Sanexen)	BPC	34765	PC55634-2	30 poches	Transport Serro	L601010	Guillaume Genois	36800
160823	12:22	Hope Dale (Sanexen)	BPC	34768	PC55635-9	30 poches	Transport Serro	L252127	Frederic Savard	39040
160823	12:43	Hope Dale (Sanexen)	BPC	34769	PC55637-5	30 poches	Transport Serro	L227876	Martin Boily	38970
160823	12:46	Hope Dale (Sanexen)	BPC	34770	PC55675-5	28 poches	Transport Serro	L607363	Sylvain Girard	36440
160823	14:04	Hope Dale (Sanexen)	BPC	34771	PC55636-7	28 poches	Transport Serro	L601010	Guillaume Genois	32810
160823	15:05	Hope Dale (Sanexen)	BPC	34772	PC55630-0	28 poches	Transport Serro	L123123	Ghyslain Gagné	32270
160823	15:44	Hope Dale (Sanexen)	BPC	34773	PC55632-6	28 poches	Transport Serro	L601010	Frederic Savard	33780
160823	15:56	Hope Dale (Sanexen)	BPC	34774	PC55670-6	20 poches	Transport Serro	L607363	Sylvain Girard	24440
										274550
									Total :	**274550**

c

Manuels Metal Recycling
Inbound Weight 18010 kg

Date: 14/11/2016

Time: 13:26:26

c

Manuels Metal Recycling
Inbound Weight 22710 kg

Date: 14/11/2016

Time: 13:27:27

40720

c

Manuels Metal Recycling
Inbound Weight 10760 kg

Date: 14/11/2016

Time: 14:57:03

c

16730

Manuels Metal Recycling
Inbound Weight 5970 kg

Date: 14/11/2016

Time: 14:57:52

23,990

Labrador

c

Manuels Metal Recycling
Inbound Weight 20400 kg

Date: 04/11/2016

Time: 15:05:58

c

Manuels Metal Recycling
Inbound Weight 17070 kg

Date: 04/11/2016

Time: 15:16:27

3,330