11.0 PIPELINE/WHARF AREA

11.1 Site Description

The "Wharf" area is located south of the Former U.S. Military Site, at the beginning of the main access road and on the west side of Hopedale Harbour. During operation of the Former U.S. Military Site, the wharf and land located immediately west of the wharf were likely used as laydown areas during vessel loading/unloading. The wharf is locally referred to as the "American dock" and is currently used by CAI Nunatsiavut Marine for freight/passenger vessel docking.

During operation of the Former U.S. Military Site, fuel used at the Site was received at the wharf and transferred upgradient via aboveground pipelines to two large aboveground fuel storage tanks located at the Main Base. The fuel tanks and pipelines have been removed, with the exception of some sections of the aboveground pipeline present near the wharf. For the purpose of the Phase II/III ESA, the "Pipeline" area was identified as the corridor where the former pipeline crossed the Site.

The approach to the wharf consists of a compacted sand road lined by minor vegetation. The shoreline that extends north from the wharf consists of a thin veneer of organic matter and sand with frequent bedrock outcrops and large boulders. Surface drainage (apparent groundwater flow direction) in the Pipeline/Wharf area is expected to be to the southeast and east towards Hopedale Harbour. Various structures, including the community garage, the Woodwards Oil Ltd. bulk fuel storage and distribution facility and the Newfoundland and Labrador Hydro diesel generating plant are located immediately west (upgradient) of the Pipeline/Wharf area.

11.2 Description of Site Work

In 2012, PCB-impacted soil was removed from the Pipeline/Wharf area. Site remediation was carried out by RJG of St. John's, NL on behalf of NLDEC and was supervised by Stantec personnel, who maintained a record of activities while on-site and collected confirmatory soil samples. A total of 245 one-tonne capacity enviro-bags of PCB-impacted soil were removed from the area (refer to Drawing No. 121411777.610-EE-11 in Appendix 11A). The remedial excavation was terminated on bedrock which ranged in depth from 0 mbgs (i.e., exposed) to 0.8 mbgs. PCB concentrations in soil remaining on-site along the final limits of the remedial excavation ranged from 1.1 mg/kg to 7.5 mg/kg, which are below the applicable SSTL of 9 mg/kg. The remedial excavations located south of the road were backfilled with clean material. Full details of the 2012 site remediation program along with the locations and analytical results of all confirmatory soil samples are provided in the *Implementation of Remedial Action Plan – Year 2, Former U.S. Military Site and Residential Subdivision, Hopedale, Labrador* report (Stantec, 2014a). Based on the analytical results of confirmatory soil sampling, no further remediation for PCB-impacted soil in the Pipeline/Wharf area is deemed necessary.

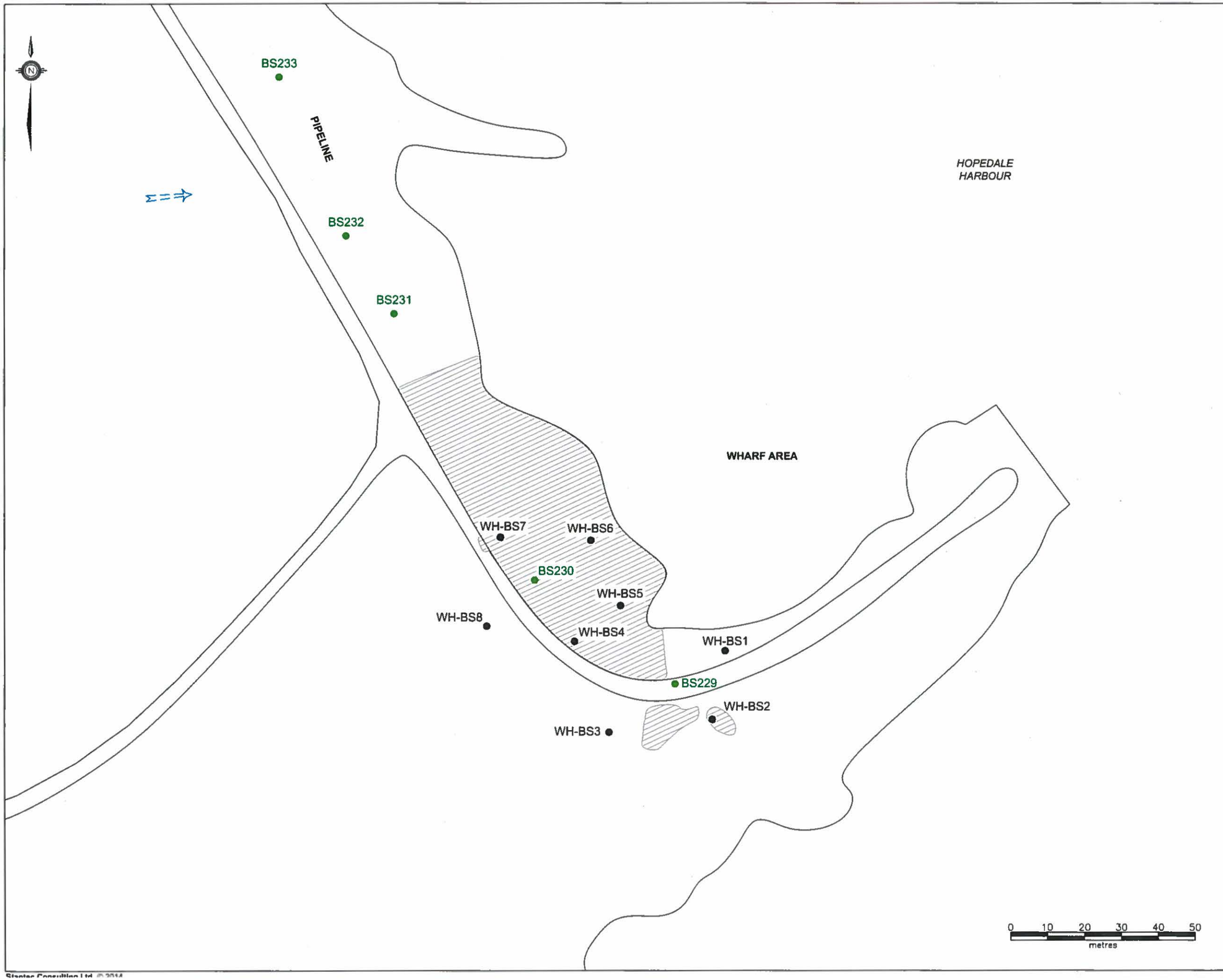
11.3 Summary of Environmental Concerns at the Pipeline/Wharf Area

Based on the results of the Phase II/III ESA and HHERA conducted by Stantec in 2009/10, additional delineation carried out by Stantec in 2011, and confirmatory soil sampling conducted by Stantec in 2012, concentrations of PCBs in soil remaining at in Pipeline/Wharf area are below the SSTLs calculated in the HHERA (see Table 1.3). No further remediation is recommended in the Pipeline/Wharf area.

The soil sample locations and areas of soil removed are shown on Drawing No. 121411777.610-EE-11 in Appendix 11A. Photos showing the remediated areas are provided in Appendix 11B. A laboratory analytical summary table for the COC in the Pipeline/Wharf Area (i.e., PCBs) is provided in Appendix 11C.

APPENDIX 11A

Site Plan – Pipeline/Wharf



LEGEND

- BULK SOIL SAMPLE (STANTEC 2010)
- BULK SOIL SAMPLE (STANTEC 2009)
- INFERRED GROUNDWATER FLOW DIRECTION
- APPROXIMATE EXTENT OF SOIL REMOVED

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

CLIENT:

NEWFOUNDLAND AND LABRADOR DEPARTMENT OF ENVIRONMENT AND CONSERVATION

PROJECT TITLE:

ADDITIONAL DELINEATION AND UPDATED REMEDIAL ACTION PLAN, FORMER U.S. MILITARY SITE, HOPEDALE, NL

DRAWING TITLE:

SITE PLAN - PIPELINE / WHARF AREA

Stantec Consulting Ltd.

SCALE:	DATE:	REV. No.
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DRAWN BY: N.M.	EDITED BY: -	CHECKED BY: AR
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APPENDIX 11B

Site Photos – Pipeline/Wharf

Site Photos – Pipeline/Wharf Area

Photo 1. Shoreline at Pipeline/Wharf area during soil removal in 2012.

Photo 2. Remediated shoreline at Pipeline/Wharf area in 2012.

Site Photos – Pipeline/Wharf Area

Photo 3. Area south of the road at the Pipeline/Wharf area during soil removal in 2012.

Photo 4. Area south of the road at the Pipeline/Wharf area during site reinstatement in 2012.

APPENDIX 11C

Analytical Summary Tables – Pipeline/Wharf

Table 11-1 Results of Laboratory Analysis of PCBs in Soil - Wharf/Pipeline
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	-
	Units	mg/kg	-
	Generic Criteria[1]	1.3	-
	SSTL[2]	9	-
2009 Sampling - Stantec			
MW54-SS2	0.6 - 1.2	<0.05	-
MW55-SS3	1.2 - 1.8	<0.05	-
MW56-SS3	1.2 - 1.8	<0.05	-
MW57-SS3	1.2 - 1.8	<0.05	-
MW69-SS4	1.8 - 2.4	0.2	-
BS229	0.22	***13***	Soil removed
BS230	0.06	***24***	Soil removed
BS231	0.10	***7.9***	-
2010 Sampling - Stantec			
WH-BS2-10	0.0 - 0.25	***24***	Soil removed
WH-BS2-10 Lab-Dup	0.0 - 0.25	***21***	Soil removed
WH-BS4-10	0.0 - 0.25	***26***	Soil removed
WH-BS5-10	0.0 - 0.1	***2.9***	Soil removed
WH-BS6-10	0.0 - 0.1	***26***	Soil removed
WH-BS7-10	0.0 - 0.1	***5.5***	Soil removed

Notes:

1 = CCME Canadian Soil Quality Guideline (CSQG) for a Residential/Parkland Site (CCME on-line 2014)

2 = SSTL calculated for PCBs at the Residential Area of Hopedale (Stantec, 2010)

RDL = Reportable Detection Limit for routine analysis

< # = Not detected above RDL noted

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

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

12.0 RESIDENTIAL SUBDIVISION

The Residential Subdivision is located approximately 500 m west of the main area of the Community of Hopedale. During operation of the Former U.S. Military site, the area contained two (2) approximately 500,000 US gallon above ground bulk fuel tanks (one gasoline and one diesel) that were removed in 2001. Site drawings show these tanks situated between the two (2) westernmost roads. A previously identified landfill area that contains steel drums and other military base debris has been identified adjacent to a small stream on the northeast portion of the Residential Subdivision (see Drawing No. 121411777.610-EE-12 in Appendix 12A). The stream originates in a small pond and boggy area (the Small Pond Bog), and flows through the east side of the subdivision in a north to south direction where it meets the Old Dump Pond outlet and eventually empties into Hopedale Harbour, located approximately 200 m south of the Residential Subdivision.

The ground cover in the Residential Subdivision is mainly exposed bedrock with scattered grasses, shrubs, and small trees. Terrain in the vicinity of the area slopes moderately to the south towards Hopedale Harbour. The stream bank is heavily vegetated with some areas of rocks and cobbles.

12.1 Description of Site Work

In 2012, PCB-impacted soil and sediment was removed from the stream in the Residential Subdivision. Site remediation was carried out by RJG of St. John's, NL on behalf of NLDEC and was supervised by Stantec personnel, who maintained a record of activities while on-site and collected confirmatory soil samples. A total of 218 one-tonne capacity enviro-bags of PCB-impacted soil/sediment were removed from the area (refer to Drawing No. 121411777.610-EE-12 in Appendix 12A). Soil/sediment was removed from to depths ranging from 0.5 to 1.3 mbgs. PCB concentrations in soil remaining on-site along the final limits of the remedial excavation ranged from non-detect to 6.7 mg/kg, which are below the applicable SSTL of 9 mg/kg. Following remediation, clean backfill was placed along the sidewalls and base of the stream for erosion control. Full details of the 2012 site remediation program along with the locations and analytical results of all confirmatory soil samples are provided in the *Implementation of Remedial Action Plan – Year 2, Former U.S. Military Site and Residential Subdivision, Hopedale, Labrador* report (Stantec, 2014a). Based on the analytical results of confirmatory soil sampling, no further remediation for PCB-impacted soil/sediment in the Residential Subdivision is deemed necessary.

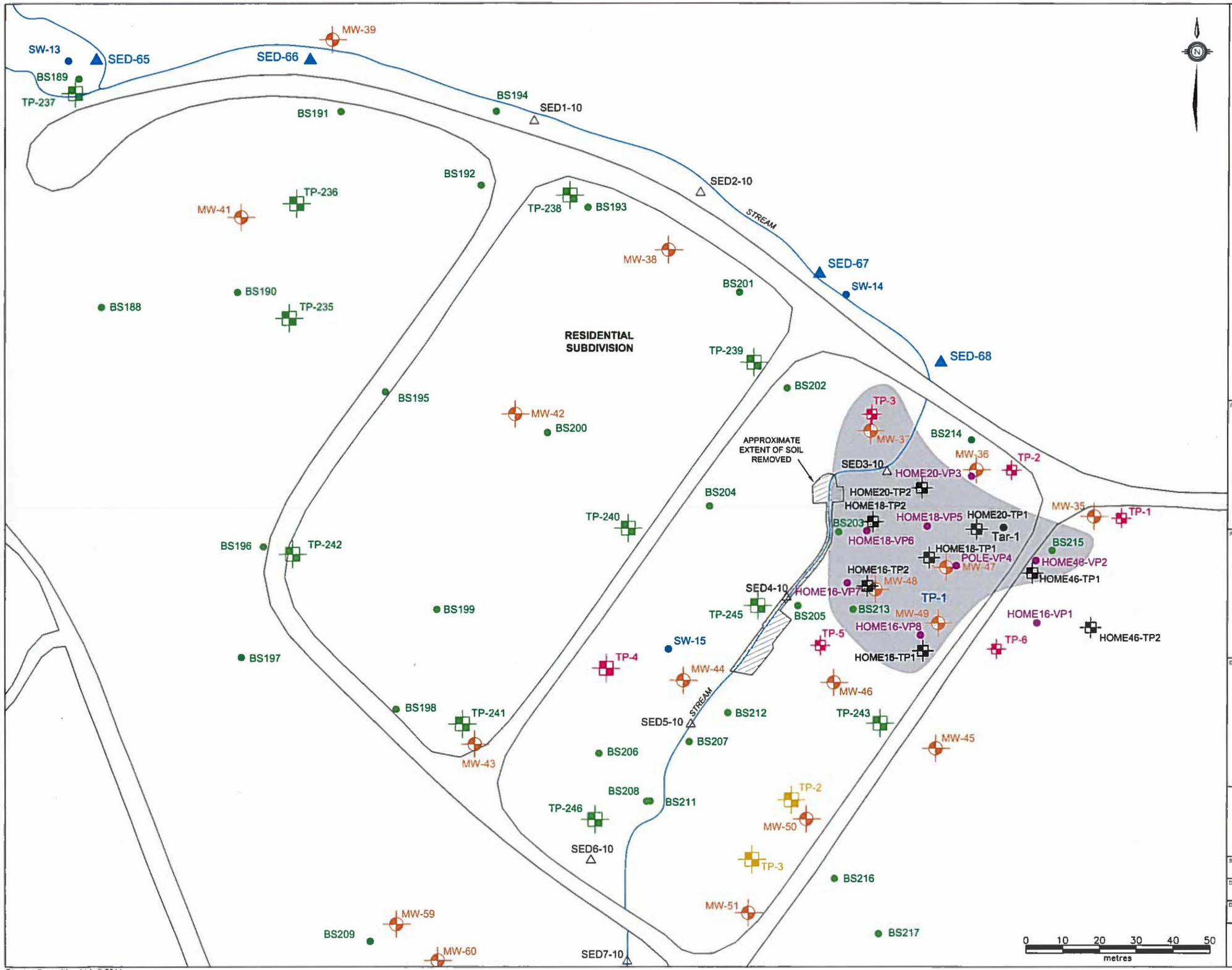
12.2 Summary of Environmental Concerns at the Residential Subdivision

Based on the results of the Phase II/III ESA and HHERA conducted by Stantec in 2009/10, additional delineation carried out by Stantec in 2011, and confirmatory soil sampling conducted by Stantec in 2012, concentrations of PCBs in soil/sediment remaining at in the Residential Subdivision are below the SSTLs calculated in the HHERA (see Table 1.3). No further remediation is recommended in the Residential Subdivision.

The soil sample locations and areas of soil/sediment removed are shown on Drawing No. 121411777.610-EE-12 in Appendix 12A. Photos showing the remediated area are provided in Appendix 12B. A laboratory analytical summary table for the COC in the Residential Subdivision (i.e., PCBs) is provided in Appendix 12C.

APPENDIX 12A

Site Plan – Residential Subdivision



LEGEND

- TEST PIT (STANTEC 2010)
- TEST PIT (STANTEC 2009)
- TEST PIT (2008)
- TEST PIT (2007)
- MONITOR WELL (STANTEC 2009)
- BULK SOIL SAMPLE (STANTEC 2010)
- BULK SOIL SAMPLE (STANTEC 2009)
- WATER SAMPLE (STANTEC 2009)
- SOIL VAPOUR SAMPLE (STANTEC 2010)
- SEDIMENT SAMPLE (STANTEC 2010)
- SEDIMENT SAMPLE (STANTEC 2009)
- INFERRED GROUNDWATER FLOW DIRECTION
- PRESUMED EXTENT OF FORMER LANDFILL (STANTEC 2011)
- APPROXIMATE EXTENT OF SOIL / SEDIMENT REMOVED (STANTEC, 2011)

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

CLIENT

NEWFOUNDLAND AND LABRADOR
DEPARTMENT OF ENVIRONMENT
AND CONSERVATION

PROJECT TITLE:

ADDITIONAL DELINEATION AND UPDATED REMEDIAL ACTION PLAN, FORMER U.S. MILITARY SITE, HOPEDALE, NL

DRAWING TITLE:

SITE PLAN - RESIDENTIAL SUBDIVISION

Stantec Consulting Ltd.

SCALE:	DATE:	REV. No.
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APPENDIX 12B

Site Photos – Residential Subdivision

Site Photos – Residential Subdivision

Photo 1. Upper portion of the stream on during soil removal in 2012.

Photo 2. Lower portion of the stream on during soil removal in 2012.

Site Photos – Residential Subdivision

Photo 3. Stream site reinstatement in 2012, looking southwest.

Photo 4. Stream site following backfilling in 2012, looking north.

APPENDIX 12C

Analytical Summary Tables – Residential Subdivision

Table 12-1 Results of Laboratory Analysis of PCBs in Soil - Residential Subdivision
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	-
	Units	ug/g	-
	Generic Criteria[1]	1.3	-
	SSTL[2]	9	-
2009 Sampling - Stantec			
TP236-BS1	0.0 - 0.2	0.54	-
TP238-BS2	0.5 - 0.8	***2.6***	-
TP239-BS1	0.0 - 0.1	<0.05	-
TP247-BS1	0.0 - 0.5	0.34	-
TP248-BS1	0.1 - 0.5	***2.6***	-
TP249-BS2	2.6 - 2.8	***1.7***	-
BS197	0.0 - 0.12	<0.05	-
MW35-SS3	1.2 - 1.8	<0.05	-
MW37-SS1	0.0 - 0.6	<0.05	-
MW40-SS1	0.0 - 0.05	<0.05	-
MW44-SS1	0.0 - 0.6	<0.05	-
MW46-SS1	0.0 - 0.6	<0.05	-
MW47-SS4	1.8 - 2.4	<0.05	-
MW48-SS3	1.2 - 1.8	<0.05	-
MW50-SS1	0.0 - 0.5	<0.05	-
2009 Sampling - Stantec (STREAM)			
SED-65	-	<0.05	-
SED-66	-	<0.05	-
SED-67	-	0.48	-
SED-68	-	0.4	-
2010 Sampling - Stantec			
HOME16-TP1 BS1	0.0 - 0.3	<0.05	-
HOME16-TP1 BS1 Lab-Dup	0.0 - 0.3	<0.05	-
HOME16-TP2 BS1	0.0 - 0.3	0.39	-
HOME18-TP1 BS1	0.0 - 0.3	<0.05	-
HOME18-TP2 BS1	0.0 - 0.3	0.63	-
HOME20-TP1 BS1	0.0 - 0.3	0.21	-
HOME20-TP2 BS1	0.0 - 0.3	<0.05	-
HOME46-TP1 BS1	0.0 - 0.3	<0.05	-
HOME46-TP2 BS1	0.0 - 0.3	0.29	-
2010 Sampling - Stantec (STREAM)			
SED1-10	-	0.16	-
SED2-10	-	0.92	-
SED3-10	-	0.31	-
SED4-10	-	***17***	Soil/sediment removed
SED5-10	-	***3.5***	-
SED6-10	-	0.53	-
SED7-10	-	0.33	-
SED8-10	-	0.43	-

Notes:
1 = CCME Canadian Soil Quality Guideline (CSQG) for a Residential/Parkland Site (CCME on-line 2014)
2 = SSTL calculated for PCBs at the Residential Area of Hopedale (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 soil at Former Radar Site (Stantec, 2010)

13.0 UPDATED REMEDIAL ACTION/RISK MANAGEMENT PLAN

As part of the current investigation, additional delineation, additional sampling and site inspections were carried out to help refine volume estimates of soil requiring removal at the Former U.S. Military Site. The estimated volumes of soil requiring remediation provided in the 2011 Additional Delineation report (Stantec, 2011) were updated based on information obtained during the current investigation and are presented in Tables 3.1 to 10.1 in this report, and in Table 13-1 in Appendix 13A.

APPENDIX 13A

Updated RAP Summary

Site	Remedial Objectives	Other Issues Identified [1]	Sample Locations	Area (m^2)	Depth (m)	Volume (m^3)	Weight (tonnes) [2]	Fully Delineated?	Maximum Concentration (mg/kg)	Priority Level [3]	Recommended Remedial Option
Former Radar Site											
	TPH	-	MW-64, BMEWS-TP2, BMEWS-TP3, BMWES-TP4	975	0.2	195	351	No	TPH: 32,000	3	Temporary Biopile/Landfill
	TPH	-	TP-102, BMEWS-TP11	350	0.3	105	189	No	TPH: 28,000	3	Temporary Biopile/Landfill
	TPH	-	BS20	120	0.1	12	22	Yes	TPH: 94,000	3	Temporary Biopile/Landfill
	PCBs	Copper, Zinc	BS5, BS14, BMEWS-BS20, BMEWS-BS21, BMEWS-BS26				647		PCBs: 100 Copper: 110	1	Transport to offsite Licensed Treatment Facility
	Cadmium	Zinc	BS1	50	0.2	10	18	Yes	Cadmium: 15 Zinc: 4,800	4	Landfill or offsite
BMEWS	Cadmium	Zinc	BS7	50	0.1	5	9	Yes	Cadmium: 11 Zinc: 1,100	4	Landfill or offsite
	PCBs	Cadmium, Copper, Lead, Zinc	22576, 22577, 22578, 22582, 22583, 22585, 22594, 22609, 22630, BS121, BS122, BS123, BS126, OB1 BS2, OB1-BS6, OB1-BS7	1,720	0.1	172	310	No	PCBs: 6,540 Cadmium: 29 Copper: 200 Lead: 3,000 Zinc: 1,800	2	Transport to offsite Licensed Treatment Facility
Old Base 1	PCBs	-	22567	55	0.1	6	10	No	PCBs: 10.7	2	Transport to offsite Licensed Treatment Facility
	PCBs, TPH	-	22470, 22471, 22478, 22479, 22482, 22483, 22484, 22488, 22492, 22493, 22494, 22496, 22538, 22705, BS110, MB-BS1, MB-BS3, MB-BS5, MB-BS10, 13-MB-BS12, 13-MB-BS13, 13-MB-BS1	2,665	0.3	800	1,439	Yes	PCBs: 41,000 TPH: 71,000	2	Transport to offsite Licensed Treatment Facility
	PCBs	-	22400	50	0.1	5	9	No	PCBs: 15.7	2	Transport to offsite Licensed Treatment Facility
	PCBs	-	22474, 22475	100	0.1	10	18	Yes	PCBs: 12.8	2	Transport to offsite Licensed Treatment Facility
	PCBs	-	6546	5	0.2	1	2	Yes	PCBs: 33	2	Transport to offsite Licensed Treatment Facility
	PCBs	-	22705	40	0.1	4	7	Yes	PCBs: 1,300	2	Transport to offsite Licensed Treatment Facility
	PCBs	-	13-POLW-BS10	50	0.1	5	9	No	PCBs: 22	2	Transport to offsite Licensed Treatment Facility
	PCBs	-	Septic Tank			3	5	Yes	PCBs: 72	2	Transport to offsite Licensed Treatment Facility
	TPH	-	MW-6, MB-TP5	200	0.5	100	180	No	TPH: 12,000	3	Temporary Biopile/Landfill
	TPH	-	13-MB-BS4, 13-MB-BS6	145	0.5	73	131	No	TPH: 21,000	3	Temporary Biopile/Landfill
	TPH	-	13-MB-BS8, 13-MB-BS9	200	0.4	80	144	No	TPH: 37,000	3	Temporary Biopile/Landfill
Main Base	Chromium	TPH, Nickel	TP-10, MB-TP2, MB-TP3	285	0.15	43	77	No	Chromium: 100 TPH: 2,200 Nickel: 81	4	Landfill or offsite
Mid-Canada Line	Cadmium, Chromium, Lead	Copper, Zinc	MCL-BS10, BS135	110	0.05	6	10	No	Cadmium: 13 Chromium: 1,200 Lead: 3,200 Copper: 210 Zinc: 22,000	4	Landfill or offsite
	Cadmium		BS257	77	0.05	4	7	Yes	Chromium: 64	4	Landfill or offsite
	PCBs	-	TP152-BS1	50	1.4	70	126	No	PCBs: 20	3	Transport to offsite Licensed Treatment Facility
Pit No. 1	PCBs	TPH	MW18-SS4	50	2.4	120	216	No	PCBs: 11 TPH: 2,300	3	Transport to offsite Licensed Treatment Facility
	TPH	-	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	3,820	1.0	3,820	6,876	No	TPH: 77,000	3	Temporary Biopile/Landfill
Pit No. 3	TPH	-	BS237, P3-BS3, P3-BS4	250	0.5	125	225	Yes	TPH: 56,000	3	Temporary Biopile/Landfill
	TPH	-	TP-140, TP-141, TP-142, MW-24, POL-TP1, POL-TP4, POL-TP6	1,780	0.2	356	641	No	TPH: 25,000	3	Temporary Biopile/Landfill
	TPH	-	BS42	100	0.2	20	36	Yes	TPH: 12,000	3	Temporary Biopile/Landfill
	Antimony, Chromium, Lead	-	BS39	65	0.1	7	12	No	Antimony: 67 Chromium: 74 Lead: 2,100 Copper: 320	4	Landfill or offsite
POL Compound	Antimony, Chromium, Lead	TPH*	BS41, POL-BS10	120	0.1	12	22	Yes	Antimony: 120 Chromium: 650 Lead: 1,900 Copper: 790 TPH: 12,000*	4	Landfill or offsite
Residential Area											
Subdivision	PCBs	TPH	SED4-10				218	Yes	PCBs: 370	1	Transport to offsite Licensed Treatment Facility
	PCBs	Copper* Nickel* Zinc*	MW-32, MW-61, ODP-TP2				1,100	No	PCBs: 520 TPH: 3,400	1	Transport to offsite Licensed Treatment Facility
	Antimony	Cadmium, Copper, Chromium, Lead Mercury, Molybdenum, Nickel, Tin, Selenium, Zinc	TP-229	25	0.25	13	23	No	Antimony: 99 Cadmium: 15 Chromium: 68 Copper: 2,500 Lead: 8,100 Mercury: 67 Molybdenum: 23 Nickel: 110 Selenium: 7 Tin: 420 Zinc: 3,400	4	Landfill or offsite
Old Dump Pond	Antimony	Cadmium, Copper, Chromium, Lead Nickel, Tin, Zinc	TP-233	25	1.6	13	23	No	Antimony: 42 Cadmium: 11 Chromium: 100 Copper: 380 Lead: 590 Nickel: 87 Tin: 180 Zinc: 2,700	4	Landfill or offsite
Wharf/ Pipeline	PCBs	TPH, Chromium, Zinc	BS229, BS230, WH-BS2, WH-BS4, WH-BS6				245	Yes	PCBs: 96 TPH: 52,000 Chromium: 120 Zinc: 510	1	Transport to offsite Licensed Treatment Facility

Totals for remediation [4]:	**Volume (m^3)**	**Weight (tonnes) [2]**
PCB-impacted soil	1,192	2,146
PCB-impacted sludge (septic tank)	3	5
TPH-impacted soil	4,886	8,794
Metals-impacted soil	111	199

Notes:

1. Site data was screened against typical landfill acceptance criteria (1,000 mg/kg for TPH, 33 mg/kg and CCME Industrial guidelines for metals and PCBs). This information is required during the selection of disposal/treatment options. Exceedances of these values do not necessarily represent a risk to human or ecological health.
2. Based on an estimated soil density of 1.8 tonnes/m^3.
3. Priority based on chemical of concern and location of impacts. Colour coding is as follows: Priority 2 | Priority 3 | Priority 4
4. Excludes soil removed during Years 1 to 3 of the Implementation of the RAP

* Impacts detected in a nearby sample

14.0 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.

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.

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 Anna Roy, B.Sc.E., MIT and reviewed by Jim Slade, P.Eng., P.Geo.

Respectfully submitted,

STANTEC CONSULTING LTD.

Anna Roy, B.Sc.E., MIT
Environmental Engineer-In-Training

Jim Slade, P.Eng., P.Geo.
Group Leader, Site Assessment and Remediation

15.0 REFERENCES

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APPENDIX 16A

Maxxam Analytical Reports

Maxxam

Success Through Science®

Your P.O. #: 16400NR
Your Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your C.O.C. #: ES789413

Attention: Anna Roy
Stantec Consulting Ltd
607 Torbay Rd
St. John's, NL
A1A 4Y6

Report Date: 2013/10/08

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B3G3930
Received: 2013/10/01, 10:20

Sample Matrix: Soil
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Moisture (1)	3	N/A	2013/10/04	ATL SOP 00001	MOE Handbook 1983
PCBs in soil by GC/ECD (1,2)	3	2013/10/04	2013/10/07	ATL SOP 00106	Based on EPA8082

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
PAH in Water by GC/MS (SIM) (1)	1	2013/10/04	2013/10/04	ATL SOP 00103	Based on EPA 8270C
PCBs in water by GC/ECD (1)	1	2013/10/03	2013/10/05	ATL SOP 00107	Based on EPA8082

Remarks:

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

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) This test was performed by 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.

Total cover pages: 1

Maxxam Job #: B3G3930
Report Date: 2013/10/08

Stantec Consulting Ltd
Client Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your P.O. #: 16400NR
Sampler Initials: CAM

RESULTS OF ANALYSES OF SOIL

Maxxam ID		TH2962	TH2963	TH2964		
Sampling Date		2013/09/27	2013/09/27	2013/09/27		
	Units	**13-MB-BS15**	**13-MB-BS16**	**13-MB-BS17**	**RDL**	**QC Batch**
Inorganics						
Moisture	%	10	8	9	1	3372725

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		TH2962	TH2962	TH2963	TH2964		
Sampling Date		2013/09/27	2013/09/27	2013/09/27	2013/09/27		
	Units	**13-MB-BS15**	**13-MB-BS15 Lab-Dup**	**13-MB-BS16**	**13-MB-BS17**	**RDL**	**QC Batch**
PCBs							
Total PCB	ug/g	0.17	0.30	0.19	0.16	0.050	3374416
Surrogate Recovery (%)							
Decachlorobiphenyl	%	82(1)	88	88(1)	88(1)		3374416

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - Aroclor 1260.

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Maxxam Job #: B3G3930
Report Date: 2013/10/08

Stantec Consulting Ltd
Client Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your P.O. #: 16400NR
Sampler Initials: CAM

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TH2952		
Sampling Date		2013/09/27		
	Units	**MW7**	**RDL**	**QC Batch**
Polyaromatic Hydrocarbons				
1-Methylnaphthalene	ug/L	<0.050	0.050	3374073
2-Methylnaphthalene	ug/L	<0.050	0.050	3374073
Acenaphthene	ug/L	<0.010	0.010	3374073
Acenaphthylene	ug/L	<0.010	0.010	3374073
Anthracene	ug/L	<0.010	0.010	3374073
Benzo(a)anthracene	ug/L	<0.010	0.010	3374073
Benzo(a)pyrene	ug/L	<0.010	0.010	3374073
Benzo(b)fluoranthene	ug/L	<0.010	0.010	3374073
Benzo(g,h,i)perylene	ug/L	<0.010	0.010	3374073
Benzo(j)fluoranthene	ug/L	<0.010	0.010	3374073
Benzo(k)fluoranthene	ug/L	<0.010	0.010	3374073
Chrysene	ug/L	<0.010	0.010	3374073
Dibenz(a,h)anthracene	ug/L	<0.010	0.010	3374073
Fluoranthene	ug/L	<0.010	0.010	3374073
Fluorene	ug/L	<0.010	0.010	3374073
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	0.010	3374073
Naphthalene	ug/L	<0.20	0.20	3374073
Perylene	ug/L	<0.010	0.010	3374073
Phenanthrene	ug/L	<0.010	0.010	3374073
Pyrene	ug/L	<0.010	0.010	3374073
Surrogate Recovery (%)				
D10-Anthracene	%	99		3374073
D14-Terphenyl	%	99(1)		3374073
D8-Acenaphthylene	%	96		3374073

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - PAH sample contained sediment.

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Maxxam Job #: B3G3930
Report Date: 2013/10/08

Stantec Consulting Ltd
Client Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your P.O. #: 16400NR
Sampler Initials: CAM

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		TH2952		
Sampling Date		2013/09/27		
	Units	**MW7**	**RDL**	**QC Batch**
PCBs				
Total PCB	ug/L	<0.050	0.050	3372431
Surrogate Recovery (%)				
Decachlorobiphenyl	%	48		3372431

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B3G3930
Report Date: 2013/10/08

Stantec Consulting Ltd
Client Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your P.O. #: 16400NR
Sampler Initials: CAM

Package 1	3.4°C

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

GENERAL COMMENTS

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Maxxam Job #: B3G3930
Report Date: 2013/10/08

Stantec Consulting Ltd
Client Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your P.O. #: 16400NR
Sampler Initials: CAM

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
3372431	Decachlorobiphenyl	2013/10/05	60	30 - 130	41	30 - 130	52	%		
3372431	Total PCB	2013/10/05	107	70 - 130	94	70 - 130	<0.050	ug/L	NC	40
3374073	D10-Anthracene	2013/10/04	99	30 - 130	90	30 - 130	100	%		
3374073	D14-Terphenyl	2013/10/04	106	30 - 130	103	30 - 130	103	%		
3374073	D8-Acenaphthylene	2013/10/04	100	30 - 130	97	30 - 130	102	%		
3374073	1-Methylnaphthalene	2013/10/04	93	30 - 130	92	30 - 130	<0.050	ug/L	NC	40
3374073	2-Methylnaphthalene	2013/10/04	119	30 - 130	101	30 - 130	<0.050	ug/L	NC	40
3374073	Acenaphthene	2013/10/04	107	30 - 130	101	30 - 130	<0.010	ug/L	NC	40
3374073	Acenaphthylene	2013/10/04	109	30 - 130	105	30 - 130	<0.010	ug/L	NC	40
3374073	Anthracene	2013/10/04	95	30 - 130	93	30 - 130	<0.010	ug/L	NC	40
3374073	Benzo(a)anthracene	2013/10/04	111	30 - 130	107	30 - 130	<0.010	ug/L	NC	40
3374073	Benzo(a)pyrene	2013/10/04	93	30 - 130	89	30 - 130	<0.010	ug/L	NC	40
3374073	Benzo(b)fluoranthene	2013/10/04	95	30 - 130	91	30 - 130	<0.010	ug/L	NC	40
3374073	Benzo(g,h,i)perylene	2013/10/04	107	30 - 130	102	30 - 130	<0.010	ug/L	NC	40
3374073	Benzo(j)fluoranthene	2013/10/04	88	30 - 130	86	30 - 130	<0.010	ug/L	NC	40
3374073	Benzo(k)fluoranthene	2013/10/04	90	30 - 130	84	30 - 130	<0.010	ug/L	NC	40
3374073	Chrysene	2013/10/04	108	30 - 130	103	30 - 130	<0.010	ug/L	NC	40
3374073	Dibenz(a,h)anthracene	2013/10/04	96	30 - 130	89	30 - 130	<0.010	ug/L	NC	40
3374073	Fluoranthene	2013/10/04	105	30 - 130	103	30 - 130	<0.010	ug/L	NC	40
3374073	Fluorene	2013/10/04	111	30 - 130	106	30 - 130	<0.010	ug/L	NC	40
3374073	Indeno(1,2,3-cd)pyrene	2013/10/04	102	30 - 130	97	30 - 130	<0.010	ug/L	NC	40
3374073	Naphthalene	2013/10/04	107	30 - 130	100	30 - 130	<0.20	ug/L	NC	40
3374073	Perylene	2013/10/04	94	30 - 130	91	30 - 130	<0.010	ug/L	NC	40
3374073	Phenanthrene	2013/10/04	111	30 - 130	99	30 - 130	<0.010	ug/L	NC	40
3374073	Pyrene	2013/10/04	96	30 - 130	95	30 - 130	<0.010	ug/L	NC	40
3374416	Decachlorobiphenyl	2013/10/07	87	30 - 130	86	30 - 130	90	%		
3374416	Total PCB	2013/10/07	NC	70 - 130	92	70 - 130	<0.050	ug/g	NC	50

N/A = Not Applicable
RPD = Relative Percent Difference
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

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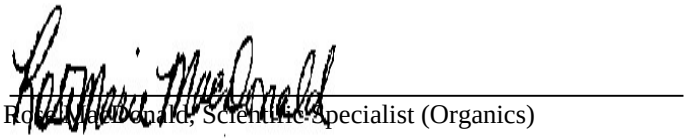
Validation Signature Page

Maxxam Job #: B3G3930

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



Rosalyn MacDonald, Scientific Specialist (Organics)

==========

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 P.O. #: 16400NR
Your Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your C.O.C. #: ES789413

Attention: Anna Roy
Stantec Consulting Ltd
607 Torbay Rd
St. John's, NL
A1A 4Y6

Report Date: 2013/10/07

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B3G5279
Received: 2013/09/30, 9:30

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Water (PIRI)	1	2013/10/02	2013/10/03	ATL SOP 00198	Based on Atl. PIRI
VPH in Water (PIRI) (1)	1	2013/10/03	2013/10/04	ATL SOP 00118	Based on Atl. PIRI
ModTPH (T1) Calc. for Water	1	N/A	2013/10/04	N/A	Based on Atl. PIRI

Remarks:

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

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) This test was performed by Bedford

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

==========

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Total cover pages: 1

Maxxam Job #: B3G5279
Report Date: 2013/10/07

Stantec Consulting Ltd
Client Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your P.O. #: 16400NR
Sampler Initials: CAM

ATLANTIC RBCA HYDROCARBONS (WATER)

Maxxam ID		TG8169		
Sampling Date		2013/09/27		
Received Temperature (°C)		3.4C		
	Units	**MW7**	**RDL**	**QC Batch**
Petroleum Hydrocarbons				
Benzene	mg/L	<0.0010	0.0010	3372471
Toluene	mg/L	<0.0010	0.0010	3372471
Ethylbenzene	mg/L	<0.0010	0.0010	3372471
Xylene (Total)	mg/L	<0.0020	0.0020	3372471
C6 - C10 (less BTEX)	mg/L	<0.010	0.010	3372471
>C10-C16 Hydrocarbons	mg/L	0.14	0.050	3371047
>C16-C21 Hydrocarbons	mg/L	0.21	0.050	3371047
>C21-<C32 Hydrocarbons	mg/L	0.11	0.10	3371047
Modified TPH (Tier1)	mg/L	0.45	0.10	3367815
Reached Baseline at C32	mg/L	YES	N/A	3371047
Hydrocarbon Resemblance	mg/L	SEECOMMENT(1)	N/A	3371047
Surrogate Recovery (%)				
Isobutylbenzene - Extractable	%	111		3371047
Isobutylbenzene - Volatile	%	98		3372471
n-Dotriacontane - Extractable	%	120(2)		3371047

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - One product in fuel/lube oil range.
(2) - TEH sample contained sediment.

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.maxxam.ca

Maxxam Job #: B3G5279
Report Date: 2013/10/07

Stantec Consulting Ltd
Client Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your P.O. #: 16400NR
Sampler Initials: CAM

GENERAL COMMENTS

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.maxxam.ca

Maxxam Job #: B3G5279
Report Date: 2013/10/07

Stantec Consulting Ltd
Client Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your P.O. #: 16400NR
Sampler Initials: CAM

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
3371047	Isobutylbenzene - Extractable	2013/10/03	88	30 - 130	101	30 - 130	103	%		
3371047	n-Dotriacontane - Extractable	2013/10/03	112	30 - 130	103	30 - 130	105	%		
3371047	>C10-C16 Hydrocarbons	2013/10/03	NC	30 - 130	88	30 - 130	<0.050	mg/L	3.0	40
3371047	>C16-C21 Hydrocarbons	2013/10/03	109	30 - 130	103	30 - 130	<0.050	mg/L	NC	40
3371047	>C21-<C32 Hydrocarbons	2013/10/03	96	30 - 130	92	30 - 130	<0.10	mg/L	NC	40
3372471	Isobutylbenzene - Volatile	2013/10/03	101	70 - 130	99	70 - 130	101	%		
3372471	Benzene	2013/10/03	NC	70 - 130	96	70 - 130	<0.0010	mg/L	NC (1)	40
3372471	Toluene	2013/10/03	107	70 - 130	102	70 - 130	<0.0010	mg/L	2.0	40
3372471	Ethylbenzene	2013/10/03	NC	70 - 130	102	70 - 130	<0.0010	mg/L	NC	40
3372471	Xylene (Total)	2013/10/03	119	70 - 130	102	70 - 130	<0.0020	mg/L	1.6	40
3372471	C6 - C10 (less BTEX)	2013/10/03					<0.010	mg/L	NC	40

N/A = Not Applicable
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) - Elevated VPH RDL(s) due to sample dilution.

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Validation Signature Page

Maxxam Job #: B3G5279

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

Paula Chaplin, Project Manager

Rose MacDonald, Scientific Specialist (Organics)

==========

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Your P.O. #: 16400NR
Your Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your C.O.C. #: ES788413

Attention: Anna Roy
Stantec Consulting Ltd
607 Torbay Rd
St. John's, NL
A1A 4Y6

Report Date: 2013/10/07

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B3G5447
Received: 2013/09/30, 9:30

Sample Matrix: Soil
Samples Received: 13

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Soil (PIRI) (1,2)	5	2013/10/03	2013/10/04	ATL SOP-00197	Based on Atl. PIRI
TEH in Soil (PIRI) (1,2)	2	2013/10/03	2013/10/07	ATL SOP-00197	Based on Atl. PIRI
TEH in Soil (PIRI) (1,2)	6	2013/10/04	2013/10/07	ATL SOP-00197	Based on Atl. PIRI
Moisture	13	N/A	2013/10/02	ATL SOP-00196	MOE Handbook 1983
VPH in Soil (PIRI) (1)	7	2013/10/03	2013/10/04	ATL SOP 00199	Based on Atl. PIRI
VPH in Soil (PIRI) (1)	6	2013/10/04	2013/10/07	ATL SOP 00199	Based on Atl. PIRI
ModTPH (T1) Calc. for Soil (3)	13	N/A	2013/10/07	N/A	Based on Atl. PIRI

Remarks:

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

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) Reported on a dry weight basis.
(2) Soils are reported on a dry weight basis unless otherwise specified.
(3) New RDLs in effect due to release of NS Contaminated Sites Regulations. Reduced RDL based on MDL study performance. Low level analytical run checks being implemented.

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

==========

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Total cover pages: 1

Maxxam Job #: B3G5447
Report Date: 2013/10/07

Stantec Consulting Ltd
Client Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your P.O. #: 16400NR
Sampler Initials: AR

RESULTS OF ANALYSES OF SOIL

Maxxam ID		TG8825	TG8833	TG8834	TG8835	TG8836	TG8836	TG8837	TG8838		
Sampling Date		2013/09/25	2013/09/25	2013/09/25	2013/09/25	2013/09/25	2013/09/25	2013/09/25	2013/09/25		
Received Temperature (°C)		6.1C	6.1C	6.1C	6.1C	6.1C	6.1C	6.1C	6.1C		
	Units	**13-MB-BS4B**	**13-MB-BS6**	**13-MB-BS8**	**13-MB-BS9**	**13-POLW-BS1**	**13-POLW-BS1 Lab-Dup**	**13-POLW-BS2**	**13-POLW-BS3**	**RDL**	**QC Batch**
Inorganics											
Moisture	%	16	22	64	50	10	11	19	11	1	3369244

Maxxam ID		TG8839	TG8840	TG8841	TG8842	TG8843	TG8844		
Sampling Date		2013/09/25	2013/09/25	2013/09/25	2013/09/25	2013/09/25	2013/09/25		
Received Temperature (°C)		6.1C	6.1C	6.1C	6.1C	6.1C	6.1C		
	Units	**13-POLW-BS5**	**13-POLW-BS6**	**13-POLW-BS7**	**13-POLW-BS9**	**13-POLW-BS10**	**13-POLW-BS11**	**RDL**	**QC Batch**
Inorganics									
Moisture	%	14	20	12	26	16	15	1	3369244

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B3G5447
Report Date: 2013/10/07

Stantec Consulting Ltd
Client Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your P.O. #: 16400NR
Sampler Initials: AR

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		TG8825	TG8833	TG8834	TG8835	TG8836	TG8837	TG8838		
Sampling Date		2013/09/25	2013/09/25	2013/09/25	2013/09/25	2013/09/25	2013/09/25	2013/09/25		
Received Temperature (°C)		6.1C	6.1C	6.1C	6.1C	6.1C	6.1C	6.1C		
	Units	**13-MB-BS4B**	**13-MB-BS6**	**13-MB-BS8**	**13-MB-BS9**	**13-POLW-BS1**	**13-POLW-BS2**	**13-POLW-BS3**	**RDL**	**QC Batch**
Petroleum Hydrocarbons										
Benzene	mg/kg	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.025	3372961
Toluene	mg/kg	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.025	3372961
Ethylbenzene	mg/kg	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.025	3372961
Xylene (Total)	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3372961
C6 - C10 (less BTEX)	mg/kg	18	<2.5	24	<2.5	<2.5	<2.5	<2.5	2.5	3372961
>C10-C16 Hydrocarbons	mg/kg	14000	2500	26000	1300	<10	81	710	10	3372964
>C16-C21 Hydrocarbons	mg/kg	6900	3100	11000	880	<10	480	570	10	3372964
>C21-<C32 Hydrocarbons	mg/kg	730	310	880	120	<15	150	110	15	3372964
Modified TPH (Tier1)	mg/kg	21000	5900	37000	2300	<15	710	1400	15	3368586
Reached Baseline at C32	mg/kg	YES	YES	YES	YES	YES	YES	YES	N/A	3372964
Hydrocarbon Resemblance	mg/kg	SEECOMMENT(1)	SEECOMMENT(1)	SEECOMMENT(1)	SEECOMMENT(1)		SEECOMMENT(2)	SEECOMMENT(1)	N/A	3372964
Surrogate Recovery (%)										
Isobutylbenzene - Extractable	%	95	99	103	104	100	102	103		3372964
Isobutylbenzene - Volatile	%	70	126	52(3)	90	115	126	114		3372961
n-Dotriacontane - Extractable	%	141(4)	129(5)	137(4)	117(5)	108(5)	110(5)	116(5)		3372964

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - Weathered fuel oil fraction.
(2) - One product in fuel/lube oil range.
(3) - Isobutylbenzene recovery not within acceptance limits; moisture exceeds 50%.
(4) - Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to matrix/co-extractive interference.
(5) - Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.

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Stantec Consulting Ltd
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Site Location: HOPEDALE DELINEATION
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Sampler Initials: AR

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		TG8839	TG8840	TG8841	TG8842	TG8843	TG8844		
Sampling Date		2013/09/25	2013/09/25	2013/09/25	2013/09/25	2013/09/25	2013/09/25		
Received Temperature (°C)		6.1C	6.1C	6.1C	6.1C	6.1C	6.1C		
	Units	**13-POLW-BS5**	**13-POLW-BS6**	**13-POLW-BS7**	**13-POLW-BS9**	**13-POLW-BS10**	**13-POLW-BS11**	**RDL**	**QC Batch**
Petroleum Hydrocarbons									
Benzene	mg/kg	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.025	3374628
Toluene	mg/kg	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.025	3374628
Ethylbenzene	mg/kg	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.025	3374628
Xylene (Total)	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3374628
C6 - C10 (less BTEX)	mg/kg	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	2.5	3374628
>C10-C16 Hydrocarbons	mg/kg	27	110	190	<10	<10	20	10	3374630
>C16-C21 Hydrocarbons	mg/kg	75	280	330	<10	<10	47	10	3374630
>C21-<C32 Hydrocarbons	mg/kg	80	66	120	97	78	93	15	3374630
Modified TPH (Tier1)	mg/kg	180	450	640	97	78	160	15	3368586
Reached Baseline at C32	mg/kg	NO	YES	YES	NO	NO	NO	N/A	3374630
Hydrocarbon Resemblance	mg/kg	SEECOMMENT(1)	SEECOMMENT(2)	SEECOMMENT(2)	SEECOMMENT(3)	SEECOMMENT(4)	SEECOMMENT(1)	N/A	3374630
Surrogate Recovery (%)									
Isobutylbenzene - Extractable	%	98	100	99	100	99	99		3374630
Isobutylbenzene - Volatile	%	95	101	135	126	128	112		3374628
n-Dotriacontane - Extractable	%	111(5)	108(5)	106(5)	105(5)	107(5)	106(5)		3374630

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

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Maxxam Job #: B3G5447
Report Date: 2013/10/07

Stantec Consulting Ltd
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Sampler Initials: AR

Package 1	6.1°C

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

GENERAL COMMENTS

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.maxxam.ca

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Client Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your P.O. #: 16400NR
Sampler Initials: AR

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
3369244	Moisture	2013/10/02							4.9	25
3372961	Isobutylbenzene - Volatile	2013/10/04			96	60 - 140	88	%		
3372961	Benzene	2013/10/04			64	60 - 140	<0.025	mg/kg	NC	50
3372961	Toluene	2013/10/04			65	60 - 140	<0.025	mg/kg	NC	50
3372961	Ethylbenzene	2013/10/04			64	60 - 140	<0.025	mg/kg	NC	50
3372961	Xylene (Total)	2013/10/04			68	60 - 140	<0.050	mg/kg	NC	50
3372961	C6 - C10 (less BTEX)	2013/10/04					<2.5	mg/kg	NC	50
3372964	Isobutylbenzene - Extractable	2013/10/04	97	30 - 130	86	30 - 130	94	%		
3372964	n-Dotriacontane - Extractable	2013/10/04	110	30 - 130	100	30 - 130	99	%		
3372964	>C10-C16 Hydrocarbons	2013/10/04	93	30 - 130	87	30 - 130	<10	mg/kg	NC	50
3372964	>C16-C21 Hydrocarbons	2013/10/04	100	30 - 130	97	30 - 130	<10	mg/kg	NC	50
3372964	>C21-<C32 Hydrocarbons	2013/10/04	93	30 - 130	81	30 - 130	<15	mg/kg	NC	50
3374628	Isobutylbenzene - Volatile	2013/10/07			92	60 - 140	101	%		
3374628	Benzene	2013/10/07			95	60 - 140	<0.025	mg/kg		
3374628	Toluene	2013/10/07			92	60 - 140	<0.025	mg/kg		
3374628	Ethylbenzene	2013/10/07			87	60 - 140	<0.025	mg/kg		
3374628	Xylene (Total)	2013/10/07			93	60 - 140	<0.050	mg/kg		
3374628	C6 - C10 (less BTEX)	2013/10/07					<2.5	mg/kg		
3374630	Isobutylbenzene - Extractable	2013/10/07	104	30 - 130	89	30 - 130	87	%		
3374630	n-Dotriacontane - Extractable	2013/10/07	118(1)	30 - 130	104	30 - 130	93	%		
3374630	>C10-C16 Hydrocarbons	2013/10/07	NC	30 - 130	88	30 - 130	<10	mg/kg	7.7	50
3374630	>C16-C21 Hydrocarbons	2013/10/07	NC	30 - 130	96	30 - 130	<10	mg/kg	8.1	50
3374630	>C21-<C32 Hydrocarbons	2013/10/07	NC	30 - 130	91	30 - 130	<15	mg/kg	6.4	50

N/A = Not Applicable
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) - If the original sample concentration is greater than 2X the matrix spike level, the matrix spike does not need to be repeated.

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Validation Signature Page

Maxxam Job #: B3G5447

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

Rob Whelan, Laboratory Manager

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Your P.O. #: 16400NR
Your Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your C.O.C. #: ES788413

Attention: Anna Roy
Stantec Consulting Ltd
607 Torbay Rd
St. John's, NL
A1A 4Y6

Report Date: 2013/10/15
This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B3G7464
Received: 2013/10/02, 13:43

Sample Matrix: Soil
Samples Received: 41

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Metals Solids Acid Extr. ICPMS (1)	2	2013/10/07	2013/10/07	ATL SOP 00058	Based on EPA6020A
Metals Solids Acid Extr. ICPMS (1)	1	2013/10/07	2013/10/09	ATL SOP 00058	Based on EPA6020A
Moisture (1)	9	N/A	2013/10/07	ATL SOP 00001	MOE Handbook 1983
Moisture (1)	30	N/A	2013/10/08	ATL SOP 00001	MOE Handbook 1983
Moisture (1)	1	N/A	2013/10/11	ATL SOP 00001	MOE Handbook 1983
PAH Compounds by GCMS (SIM) (1,2)	2	2013/10/07	2013/10/08	ATL SOP 00102	Based on EPA8270C
PCBs in soil by GC/ECD (1,2)	9	2013/10/07	2013/10/08	ATL SOP 00106	Based on EPA8082
PCBs in soil by GC/ECD (1,2)	20	2013/10/07	2013/10/09	ATL SOP 00106	Based on EPA8082
PCBs in soil by GC/ECD (1,2)	9	2013/10/08	2013/10/09	ATL SOP 00106	Based on EPA8082
PCBs in soil by GC/ECD (1,2)	1	2013/10/10	2013/10/15	ATL SOP 00106	Based on EPA8082

Remarks:

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

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) This test was performed by 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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Total cover pages: 1

Maxxam Job #: B3G7464
Report Date: 2013/10/15

Stantec Consulting Ltd
Client Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your P.O. #: 16400NR
Sampler Initials: AR

RESULTS OF ANALYSES OF SOIL

Maxxam ID		TH8092	TH8093	TH8094	TH8095		TH8096		TH8097	TH8098		
Sampling Date		2013/09/25	2013/09/25	2013/09/25	2013/09/25		2013/09/25		2013/09/25	2013/09/25		
	Units	**13-MB-BS1**	**13-MB-BS2A**	**13-MB-BS2B**	**13-MB-BS3**	**QC Batch**	**13-MB-BS4A**	**QC Batch**	**13-MB-BS4B**	**13-MB-BS5**	**RDL**	**QC Batch**
Inorganics												
Moisture	%	12	27	33	19	3376385	15	3374560	14	15	1	3376385

Maxxam ID		TH8099		TH8100		TH8101	TH8102		TH8103	TH8104		
Sampling Date		2013/09/25		2013/09/25		2013/09/25	2013/09/25		2013/09/25	2013/09/25		
	Units	**13-MB-BS6**	**QC Batch**	**13-MB-BS7**	**QC Batch**	**13-MB-BS8**	**13-MB-BS9**	**QC Batch**	**13-MB-BS10**	**13-MB-BS11**	**RDL**	**QC Batch**
Inorganics												
Moisture	%	15	3374560	25	3376385	63	52	3374560	37	33	1	3376385

Maxxam ID		TH8105	TH8106	TH8107	TH8108	TH8109	TH8110	TH8111	TH8112	TH8113		
Sampling Date		2013/09/25	2013/09/25	2013/09/25	2013/09/24	2013/09/24	2013/09/24	2013/09/24	2013/09/24	2013/09/24		
	Units	**13-MB-BS12**	**13-MB-BS13**	**13-MB-BS14**	**13-OB1-BS1**	**13-OB1-BS2**	**13-OB1-BS3**	**13-OB1-BS4**	**13-OB1-BS5**	**13-OB1-BS6**	**RDL**	**QC Batch**
Inorganics												
Moisture	%	6	16	4	50	58	82	68	70	74	1	3376385

Maxxam ID		TH8114	TH8115	TH8116	TH8117	TH8118	TH8119	TH8120	TH8121		
Sampling Date		2013/09/24	2013/09/24	2013/09/24	2013/09/24	2013/09/24	2013/09/24	2013/09/24	2013/09/24		
	Units	**13-OB1-BS7**	**13-OB1-BS8**	**13-OB1-BS9**	**13-OB1-BS10**	**13-OB1-BS11**	**13-OB1-BS12**	**13-OB1-BS13**	**13-OB1-BS14**	**RDL**	**QC Batch**
Inorganics											
Moisture	%	62	34	6	63	53	25	47	43	1	3376385

Maxxam ID		TH8122	TH8123		TH8124	TH8126		TH8127		
Sampling Date		2013/09/24	2013/09/24		2013/09/25	2013/09/25		2013/09/25		
	Units	**13-OB1-BS15**	**13-OB1-BS16**	**QC Batch**	**13-POLW-BS1**	**13-POLW-BS3**	**QC Batch**	**13-POLW-BS4**	**RDL**	**QC Batch**
Inorganics										
Moisture	%	43	57	3376385	9	11	3374560	16	1	3376385

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B3G7464
Report Date: 2013/10/15

Stantec Consulting Ltd
Client Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your P.O. #: 16400NR
Sampler Initials: AR

RESULTS OF ANALYSES OF SOIL

Maxxam ID		TH8128		TH8131		TH8132		TH8133		
Sampling Date		2013/09/25		2013/09/25		2013/09/25		2013/09/25		
	Units	**13-POLW-BS5**	**QC Batch**	**13-POLW-BS8**	**QC Batch**	**13-POLW-BS9**	**QC Batch**	**13-POLW-BS10**	**RDL**	**QC Batch**
Inorganics										
Moisture	%	14	3374560	10	3376385	19	3381351	13	1	3374560

Maxxam ID		TH8134		
Sampling Date		2013/09/25		
	Units	**13-POLW-BS11**	**RDL**	**QC Batch**
Inorganics				
Moisture	%	11	1	3374560

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B3G7464
Report Date: 2013/10/15

Stantec Consulting Ltd
Client Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your P.O. #: 16400NR
Sampler Initials: AR

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		TH8125		TH8127		TH8132		
Sampling Date		2013/09/25		2013/09/25		2013/09/25		
	Units	**13-POLW-BS2**	**QC Batch**	**13-POLW-BS4**	**QC Batch**	**13-POLW-BS9**	**RDL**	**QC Batch**
Metals								
Acid Extractable Aluminum (Al)	mg/kg	11000	3376423	9900	3377729	9700	10	3376423
Acid Extractable Antimony (Sb)	mg/kg	<2.0	3376423	<2.0	3377729	<2.0	2.0	3376423
Acid Extractable Arsenic (As)	mg/kg	<2.0	3376423	<2.0	3377729	<2.0	2.0	3376423
Acid Extractable Barium (Ba)	mg/kg	53	3376423	52	3377729	79	5.0	3376423
Acid Extractable Beryllium (Be)	mg/kg	<2.0	3376423	<2.0	3377729	<2.0	2.0	3376423
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	3376423	<2.0	3377729	<2.0	2.0	3376423
Acid Extractable Boron (B)	mg/kg	<50	3376423	<50	3377729	<50	50	3376423
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	3376423	<0.30	3377729	<0.30	0.30	3376423
Acid Extractable Chromium (Cr)	mg/kg	23	3376423	20	3377729	18	2.0	3376423
Acid Extractable Cobalt (Co)	mg/kg	6.4	3376423	6.9	3377729	7.9	1.0	3376423
Acid Extractable Copper (Cu)	mg/kg	19	3376423	22	3377729	28	2.0	3376423
Acid Extractable Iron (Fe)	mg/kg	15000	3376423	15000	3377729	17000	50	3376423
Acid Extractable Lead (Pb)	mg/kg	13	3376423	10	3377729	34	0.50	3376423
Acid Extractable Lithium (Li)	mg/kg	11	3376423	12	3377729	14	2.0	3376423
Acid Extractable Manganese (Mn)	mg/kg	170	3376423	190	3377729	220	2.0	3376423
Acid Extractable Mercury (Hg)	mg/kg	<0.10	3376423	<0.10	3377729	<0.10	0.10	3376423
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	3376423	<2.0	3377729	<2.0	2.0	3376423
Acid Extractable Nickel (Ni)	mg/kg	16	3376423	17	3377729	17	2.0	3376423
Acid Extractable Rubidium (Rb)	mg/kg	19	3376423	22	3377729	28	2.0	3376423
Acid Extractable Selenium (Se)	mg/kg	<1.0	3376423	<1.0	3377729	<1.0	1.0	3376423
Acid Extractable Silver (Ag)	mg/kg	<0.50	3376423	<0.50	3377729	<0.50	0.50	3376423
Acid Extractable Strontium (Sr)	mg/kg	19	3376423	19	3377729	8.7	5.0	3376423
Acid Extractable Thallium (Tl)	mg/kg	0.15	3376423	0.17	3377729	0.24	0.10	3376423
Acid Extractable Tin (Sn)	mg/kg	<2.0	3376423	<2.0	3377729	<2.0	2.0	3376423
Acid Extractable Uranium (U)	mg/kg	0.69	3376423	0.47	3377729	0.56	0.10	3376423
Acid Extractable Vanadium (V)	mg/kg	35	3376423	29	3377729	36	2.0	3376423
Acid Extractable Zinc (Zn)	mg/kg	37	3376423	35	3377729	44	5.0	3376423

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B3G7464
Report Date: 2013/10/15

Stantec Consulting Ltd
Client Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your P.O. #: 16400NR
Sampler Initials: AR

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		TH8127	TH8127	TH8131		
Sampling Date		2013/09/25	2013/09/25	2013/09/25		
	Units	**13-POLW-BS4**	**13-POLW-BS4 Lab-Dup**	**13-POLW-BS8**	**RDL**	**QC Batch**
Polyaromatic Hydrocarbons						
1-Methylnaphthalene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
2-Methylnaphthalene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Acenaphthene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Acenaphthylene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Anthracene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Benzo(a)anthracene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Benzo(a)pyrene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Benzo(b)fluoranthene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Benzo(g,h,i)perylene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Benzo(j)fluoranthene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Benzo(k)fluoranthene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Chrysene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Dibenz(a,h)anthracene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Fluoranthene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Fluorene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Indeno(1,2,3-cd)pyrene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Naphthalene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Perylene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Phenanthrene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Pyrene	mg/kg	<0.010	<0.010	<0.010	0.010	3376815
Surrogate Recovery (%)						
D10-Anthracene	%	108	101	100		3376815
D14-Terphenyl (FS)	%	107	105	90		3376815
D8-Acenaphthylene	%	102	102	103		3376815

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Sampler Initials: AR

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		TH8092	TH8093	TH8094	TH8094	TH8095		TH8096		TH8097		
Sampling Date		2013/09/25	2013/09/25	2013/09/25	2013/09/25	2013/09/25		2013/09/25		2013/09/25		
	Units	**13-MB-BS1**	**13-MB-BS2A**	**13-MB-BS2B**	**13-MB-BS2B Lab-Dup**	**13-MB-BS3**	**QC Batch**	**13-MB-BS4A**	**QC Batch**	**13-MB-BS4B**	**RDL**	**QC Batch**
PCBs												
Total PCB	ug/g	12	3.0	0.26	0.33	2.8	3376836	<0.050	3376273	<0.050	0.050	3376836
Surrogate Recovery (%)												
Decachlorobiphenyl	%	95(1)	89(1)	87(1)	70	81(1)	3376836	74	3376273	85		3376836

Maxxam ID		TH8098		TH8099		TH8100		TH8101	TH8102	TH8102		
Sampling Date		2013/09/25		2013/09/25		2013/09/25		2013/09/25	2013/09/25	2013/09/25		
	Units	**13-MB-BS5**	**QC Batch**	**13-MB-BS6**	**QC Batch**	**13-MB-BS7**	**QC Batch**	**13-MB-BS8**	**13-MB-BS9**	**13-MB-BS9 Lab-Dup**	**RDL**	**QC Batch**
PCBs												
Total PCB	ug/g	<0.050	3376836	<0.050	3376273	<0.050	3376836	<0.050	<0.050	<0.050	0.050	3376273
Surrogate Recovery (%)												
Decachlorobiphenyl	%	86	3376836	76	3376273	92	3376836	76	75	73		3376273

Maxxam ID		TH8103	TH8104	TH8105	TH8106	TH8107	TH8108	TH8109	TH8110		
Sampling Date		2013/09/25	2013/09/25	2013/09/25	2013/09/25	2013/09/25	2013/09/24	2013/09/24	2013/09/24		
	Units	**13-MB-BS10**	**13-MB-BS11**	**13-MB-BS12**	**13-MB-BS13**	**13-MB-BS14**	**13-OB1-BS1**	**13-OB1-BS2**	**13-OB1-BS3**	**RDL**	**QC Batch**
PCBs											
Total PCB	ug/g	0.28	<0.050	8400	5300	8900	<0.050	<0.050	<0.050	0.050	3376836
Surrogate Recovery (%)											
Decachlorobiphenyl	%	88(1)	92	179(2)	131(2)	173(2)	86	79	75		3376836

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - Aroclor 1260.
(2) - Aroclor 1260. PCB surrogate not within acceptance limits. Analysis was repeated with similar results.

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		TH8111	TH8112	TH8113	TH8114	TH8115		TH8116	TH8117		
Sampling Date		2013/09/24	2013/09/24	2013/09/24	2013/09/24	2013/09/24		2013/09/24	2013/09/24		
	Units	**13-OB1-BS4**	**13-OB1-BS5**	**13-OB1-BS6**	**13-OB1-BS7**	**13-OB1-BS8**	**QC Batch**	**13-OB1-BS9**	**13-OB1-BS10**	**RDL**	**QC Batch**
PCBs											
Total PCB	ug/g	<0.050	<0.050	2.2	7.3	<0.050	3376836	0.12	<0.050	0.050	3378077
Surrogate Recovery (%)											
Decachlorobiphenyl	%	80	81	76(1)	79(1)	83	3376836	88(1)	85		3378077

Maxxam ID		TH8118	TH8119	TH8120	TH8121	TH8122	TH8123		
Sampling Date		2013/09/24	2013/09/24	2013/09/24	2013/09/24	2013/09/24	2013/09/24		
	Units	**13-OB1-BS11**	**13-OB1-BS12**	**13-OB1-BS13**	**13-OB1-BS14**	**13-OB1-BS15**	**13-OB1-BS16**	**RDL**	**QC Batch**
PCBs									
Total PCB	ug/g	2.5	1.4	<0.050	0.16	<0.050	1.8	0.050	3378077
Surrogate Recovery (%)									
Decachlorobiphenyl	%	63(2)	67(2)	79	79(1)	81	82(1)		3378077

Maxxam ID		TH8123		TH8124	TH8126	TH8128		
Sampling Date		2013/09/24		2013/09/25	2013/09/25	2013/09/25		
	Units	**13-OB1-BS16 Lab-Dup**	**QC Batch**	**13-POLW-BS1**	**13-POLW-BS3**	**13-POLW-BS5**	**RDL**	**QC Batch**
PCBs								
Total PCB	ug/g	3.4(3)	3378077	0.15	<0.050	2.4	0.050	3376273
Surrogate Recovery (%)								
Decachlorobiphenyl	%	77	3378077	90(1)	70	76(1)		3376273

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - Aroclor 1260.
(2) - Aroclor 1260. PCB surrogate not within acceptance limits. Sample past recommended hold time for repeat analysis.
(3) - Duplicate: results are outside acceptance limit. Analysis was repeated with similar results.

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		TH8131		TH8132		TH8133	TH8134		
Sampling Date		2013/09/25		2013/09/25		2013/09/25	2013/09/25		
	Units	**13-POLW-BS8**	**QC Batch**	**13-POLW-BS9**	**QC Batch**	**13-POLW-BS10**	**13-POLW-BS11**	**RDL**	**QC Batch**
PCBs									
Total PCB	ug/g	0.46	3378077	0.36	3382498	22	1.2	0.050	3376273
Surrogate Recovery (%)									
Decachlorobiphenyl	%	72(1)	3378077	97(2)	3382498	73(3)	73(1)		3376273

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - Aroclor 1260.
(2) - Aroclor 1260. PCB sample analysed past recommended hold time as per client request.
(3) - Aroclor 1254.

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Package 1	6.1°C

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

GENERAL COMMENTS

Revised report: Revised to report PCB analysis for sample TH8132-01R (13-POLW-BS9) as per client request. 2013/10/11

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QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
3376273	Decachlorobiphenyl	2013/10/08	71	30 - 130	95	30 - 130	94	%		
3376273	Total PCB	2013/10/08	95	70 - 130	97	70 - 130	<0.050	ug/g	NC	50
3376423	Acid Extractable Antimony (Sb)	2013/10/08	94	75 - 125	108	75 - 125	<2.0	mg/kg	NC	35
3376423	Acid Extractable Arsenic (As)	2013/10/08	93	75 - 125	97	75 - 125	<2.0	mg/kg	NC	35
3376423	Acid Extractable Barium (Ba)	2013/10/08	NC	75 - 125	102	75 - 125	<5.0	mg/kg	0.1	35
3376423	Acid Extractable Beryllium (Be)	2013/10/08	98	75 - 125	98	75 - 125	<2.0	mg/kg	NC	35
3376423	Acid Extractable Bismuth (Bi)	2013/10/08	106	75 - 125	102	75 - 125	<2.0	mg/kg	NC	35
3376423	Acid Extractable Boron (B)	2013/10/08	92	75 - 125	93	75 - 125	<50	mg/kg	NC	35
3376423	Acid Extractable Cadmium (Cd)	2013/10/08	98	75 - 125	97	75 - 125	<0.30	mg/kg	NC	35
3376423	Acid Extractable Chromium (Cr)	2013/10/08	99	75 - 125	98	75 - 125	<2.0	mg/kg	NC	35
3376423	Acid Extractable Cobalt (Co)	2013/10/08	97	75 - 125	100	75 - 125	<1.0	mg/kg	1.5	35
3376423	Acid Extractable Copper (Cu)	2013/10/08	99	75 - 125	98	75 - 125	<2.0	mg/kg	4.8	35
3376423	Acid Extractable Lead (Pb)	2013/10/08	101	75 - 125	101	75 - 125	<0.50	mg/kg	6.0	35
3376423	Acid Extractable Lithium (Li)	2013/10/08	NC	75 - 125	98	75 - 125	<2.0	mg/kg	1.9	35
3376423	Acid Extractable Manganese (Mn)	2013/10/08	NC	75 - 125	98	75 - 125	<2.0	mg/kg	1.8	35
3376423	Acid Extractable Mercury (Hg)	2013/10/08	93	75 - 125	101	75 - 125	<0.10	mg/kg	NC	35
3376423	Acid Extractable Molybdenum (Mo)	2013/10/08	97	75 - 125	99	75 - 125	<2.0	mg/kg	NC	35
3376423	Acid Extractable Nickel (Ni)	2013/10/08	99	75 - 125	98	75 - 125	<2.0	mg/kg	5.2	35
3376423	Acid Extractable Rubidium (Rb)	2013/10/08	96	75 - 125	98	75 - 125	<2.0	mg/kg	NC	35
3376423	Acid Extractable Selenium (Se)	2013/10/08	91	75 - 125	94	75 - 125	<1.0	mg/kg	NC	35
3376423	Acid Extractable Silver (Ag)	2013/10/08	103	75 - 125	103	75 - 125	<0.50	mg/kg	NC	35
3376423	Acid Extractable Strontium (Sr)	2013/10/08	99	75 - 125	98	75 - 125	<5.0	mg/kg	NC	35
3376423	Acid Extractable Thallium (Tl)	2013/10/08	104	75 - 125	101	75 - 125	<0.10	mg/kg	NC	35
3376423	Acid Extractable Tin (Sn)	2013/10/08	102	75 - 125	104	75 - 125	<2.0	mg/kg	NC	35
3376423	Acid Extractable Uranium (U)	2013/10/08	101	75 - 125	100	75 - 125	<0.10	mg/kg	NC	35
3376423	Acid Extractable Vanadium (V)	2013/10/08	101	75 - 125	100	75 - 125	<2.0	mg/kg	3.5	35
3376423	Acid Extractable Zinc (Zn)	2013/10/08	NC	75 - 125	99	75 - 125	<5.0	mg/kg	1.1	35
3376423	Acid Extractable Aluminum (Al)	2013/10/08					<10	mg/kg	1.3	35
3376423	Acid Extractable Iron (Fe)	2013/10/08					<50	mg/kg	1.5	35
3376815	D10-Anthracene	2013/10/08	96	30 - 130	92	30 - 130	92	%		
3376815	D14-Terphenyl (FS)	2013/10/08	98	30 - 130	92	30 - 130	96	%		
3376815	D8-Acenaphthylene	2013/10/08	99	30 - 130	100	30 - 130	104	%		
3376815	1-Methylnaphthalene	2013/10/08	95	30 - 130	95	30 - 130	<0.010	mg/kg	NC	50
3376815	2-Methylnaphthalene	2013/10/08	109	30 - 130	105	30 - 130	<0.010	mg/kg	NC	50
3376815	Acenaphthene	2013/10/08	99	30 - 130	99	30 - 130	<0.010	mg/kg	NC	50
3376815	Acenaphthylene	2013/10/08	102	30 - 130	101	30 - 130	<0.010	mg/kg	NC	50
3376815	Anthracene	2013/10/08	92	30 - 130	92	30 - 130	<0.010	mg/kg	NC	50
3376815	Benzo(a)anthracene	2013/10/08	109	30 - 130	105	30 - 130	<0.010	mg/kg	NC	50
3376815	Benzo(a)pyrene	2013/10/08	96	30 - 130	98	30 - 130	<0.010	mg/kg	NC	50

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QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
3376815	Benzo(b)fluoranthene	2013/10/08	91	30 - 130	92	30 - 130	<0.010	mg/kg	NC	50
3376815	Benzo(g,h,i)perylene	2013/10/08	96	30 - 130	99	30 - 130	<0.010	mg/kg	NC	50
3376815	Benzo(j)fluoranthene	2013/10/08	95	30 - 130	97	30 - 130	<0.010	mg/kg	NC	50
3376815	Benzo(k)fluoranthene	2013/10/08	95	30 - 130	97	30 - 130	<0.010	mg/kg	NC	50
3376815	Chrysene	2013/10/08	105	30 - 130	105	30 - 130	<0.010	mg/kg	NC	50
3376815	Dibenz(a,h)anthracene	2013/10/08	100	30 - 130	104	30 - 130	<0.010	mg/kg	NC	50
3376815	Fluoranthene	2013/10/08	98	30 - 130	97	30 - 130	<0.010	mg/kg	NC	50
3376815	Fluorene	2013/10/08	98	30 - 130	99	30 - 130	<0.010	mg/kg	NC	50
3376815	Indeno(1,2,3-cd)pyrene	2013/10/08	102	30 - 130	105	30 - 130	<0.010	mg/kg	NC	50
3376815	Naphthalene	2013/10/08	103	30 - 130	100	30 - 130	<0.010	mg/kg	NC	50
3376815	Perylene	2013/10/08	97	30 - 130	99	30 - 130	<0.010	mg/kg	NC	50
3376815	Phenanthrene	2013/10/08	96	30 - 130	98	30 - 130	<0.010	mg/kg	NC	50
3376815	Pyrene	2013/10/08	98	30 - 130	96	30 - 130	<0.010	mg/kg	NC	50
3376836	Decachlorobiphenyl	2013/10/09	80	30 - 130	92	30 - 130	94	%		
3376836	Total PCB	2013/10/09	NC	70 - 130	90	70 - 130	<0.050	ug/g	24.4	50
3377729	Acid Extractable Antimony (Sb)	2013/10/09	99	75 - 125	105	75 - 125	<2.0	mg/kg	NC	35
3377729	Acid Extractable Arsenic (As)	2013/10/09	99	75 - 125	102	75 - 125	<2.0	mg/kg	NC	35
3377729	Acid Extractable Barium (Ba)	2013/10/09	100	75 - 125	97	75 - 125	<5.0	mg/kg	NC	35
3377729	Acid Extractable Beryllium (Be)	2013/10/09	102	75 - 125	100	75 - 125	<2.0	mg/kg	NC	35
3377729	Acid Extractable Bismuth (Bi)	2013/10/09	104	75 - 125	104	75 - 125	<2.0	mg/kg	NC	35
3377729	Acid Extractable Boron (B)	2013/10/09	97	75 - 125	102	75 - 125	<50	mg/kg	NC	35
3377729	Acid Extractable Cadmium (Cd)	2013/10/09	95	75 - 125	101	75 - 125	<0.30	mg/kg	NC	35
3377729	Acid Extractable Chromium (Cr)	2013/10/09	103	75 - 125	100	75 - 125	<2.0	mg/kg	3.5	35
3377729	Acid Extractable Cobalt (Co)	2013/10/09	100	75 - 125	100	75 - 125	<1.0	mg/kg	1.6	35
3377729	Acid Extractable Copper (Cu)	2013/10/09	100	75 - 125	99	75 - 125	<2.0	mg/kg	1.4	35
3377729	Acid Extractable Lead (Pb)	2013/10/09	99	75 - 125	101	75 - 125	<0.50	mg/kg	5.7	35
3377729	Acid Extractable Lithium (Li)	2013/10/09	NC	75 - 125	105	75 - 125	<2.0	mg/kg	0.2	35
3377729	Acid Extractable Manganese (Mn)	2013/10/09	NC	75 - 125	101	75 - 125	<2.0	mg/kg	4.2	35
3377729	Acid Extractable Mercury (Hg)	2013/10/09	87	75 - 125	96	75 - 125	<0.10	mg/kg	NC	35
3377729	Acid Extractable Molybdenum (Mo)	2013/10/09	96	75 - 125	99	75 - 125	<2.0	mg/kg	NC	35
3377729	Acid Extractable Nickel (Ni)	2013/10/09	100	75 - 125	101	75 - 125	<2.0	mg/kg	2.7	35
3377729	Acid Extractable Rubidium (Rb)	2013/10/09	98	75 - 125	100	75 - 125	<2.0	mg/kg	NC	35
3377729	Acid Extractable Selenium (Se)	2013/10/09	98	75 - 125	103	75 - 125	<1.0	mg/kg	NC	35
3377729	Acid Extractable Silver (Ag)	2013/10/09	102	75 - 125	100	75 - 125	<0.50	mg/kg	NC	35
3377729	Acid Extractable Strontium (Sr)	2013/10/09	99	75 - 125	102	75 - 125	<5.0	mg/kg	NC	35
3377729	Acid Extractable Thallium (Tl)	2013/10/09	101	75 - 125	104	75 - 125	<0.10	mg/kg	NC	35
3377729	Acid Extractable Tin (Sn)	2013/10/09	103	75 - 125	102	75 - 125	<2.0	mg/kg	NC	35
3377729	Acid Extractable Uranium (U)	2013/10/09	100	75 - 125	103	75 - 125	<0.10	mg/kg	NC	35
3377729	Acid Extractable Vanadium (V)	2013/10/09	104	75 - 125	99	75 - 125	<2.0	mg/kg	6.6	35

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Maxxam Job #: B3G7464
Report Date: 2013/10/15

Stantec Consulting Ltd
Client Project #: 121411777.610
Site Location: HOPEDALE DELINEATION
Your P.O. #: 16400NR
Sampler Initials: AR

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
3377729	Acid Extractable Zinc (Zn)	2013/10/09	NC	75 - 125	100	75 - 125	<5.0	mg/kg	1.5	35
3377729	Acid Extractable Aluminum (Al)	2013/10/09					<10	mg/kg	3.8	35
3377729	Acid Extractable Iron (Fe)	2013/10/09					<50	mg/kg	5.4	35
3378077	Decachlorobiphenyl	2013/10/09	81	30 - 130	102	30 - 130	93	%		
3378077	Total PCB	2013/10/09	NC	70 - 130	118	70 - 130	<0.050	ug/g	62.8(1, 2)	50
3382498	Decachlorobiphenyl	2013/10/15	98	30 - 130	100	30 - 130	99	%		
3382498	Total PCB	2013/10/15	87	70 - 130	96	70 - 130	<0.050	ug/g	NC	50

N/A = Not Applicable
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) - Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.
(2) - Duplicate: results are outside acceptance limit. Analysis was repeated with similar results.

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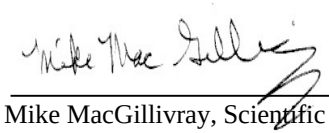
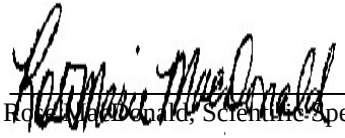
Validation Signature Page

Maxxam Job #: B3G7464

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



Mike MacGillivray, Scientific Specialist (Inorganics)



Ross MacDonald, Scientific Specialist (Organics)

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

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