

Appendix 10a

Site Photos

– Pit No. 1/Helipad

Site Photographs – Pit No. 1/Helipad



Photo 1 Pit No. 1 (looking north)



Photo 2 Pit No. 1 (looking north)

Site Photographs – Pit No. 1/Helipad



Photo 3 Pit No. 1 (looking south)

Appendix 10b

Sample Coordinates

– Pit No. 1/Helipad

Sample Coordinates - Pit No. 1

Phase II/III ESA, HHERA and RAP/RMP

Former US Military Site and Residential Subdivision, Hopedale, NL

Project No. 121410103

Sample ID	Coordinates	
	Easting	Northing
TEST PITS		
TP-143	0675008	6149651
TP-144	0674992	6149701
TP-145	0675010	6149715
TP-146	0675021	6149712
TP-147	0675026	6149720
TP-148	0675026	6149734
TP-149	0675004	6149659
TP-150	0675004	6149669
TP-151	0675016	6149671
TP-152	0675007	6149683
TP-153	0675048	6149701
TP-154	0675039	6149750
TP-155	0674962	6149688
TP-156	0674965	6149701
TP-157	0674965	6149726
TP-158	0674969	6149752
TP-159	0674996	6149698
TP-160	0674992	6149723
SURFACE SOIL		
BS159	0675017	6149665
BS160	0675003	6149699
BS161	0675013	6149702
BS162	0675024	6149712
BS163	0675030	6149756
BS164	0675039	6149766
BS165	0674971	6149779
BS166	0674954	6149769
BS167	0674959	6149767
BS168	0674966	6149734
BS169	0674973	6149703
BS170	0674975	6149678
MONITOR WELLS		
MW-18	0675024	6149738
MW-19	0675030	6149715
MW-20	0674994	6149686

Appendix 10c

Test Pit and Monitor Well Records

– Pit No. 1/Helipad

SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 10448520

JOB NAME: _____

DATE: July 27, 09

TEST PIT NO.: TP143

TEST PIT SIZE: _____

ELEVATION: 0

MACHINE TYPE: _____

CONTRACTOR: _____

DATUM: _____

TEMPERATURE: _____

WEATHER:

[illegible]

JOB NO.: _____

TEST PIT NO.: _____

ENGINEER: _____

SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 1044856

JOB NAME: _____

DATE: July 27, 09

TEST PIT NO.: TP144

TEST PIT SIZE: _____

ELEVATION:

MACHINE TYPE: _____

CONTRACTOR: _____

DATUM: _____

TEMPERATURE: _____

WEATHER: _____ DAYTIME: _____

[illegible]

JOB NO.: _____
TEST PIT NO.: _____
ENGINEER: _____

SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 102141852

JOB NAME:

DATE: 4/27/09

TEST PIT NO.: JP1415

TEST PIT SIZE: _____

ELEVATION: 5000

MACHINE TYPE:

CONTRACTOR: _____

DATUM: _____

TEMPERATURE: _____

WEATHER:

[illegible]

JOB NO.: _____

TEST PIT NO.: _____

ENGINEER: _____

SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 10448526

JOB NAME: _____

DATE: July 27, 09

TEST PIT NO.: TP146

TEST PIT SIZE: _____

ELEVATION:

MACHINE TYPE:

CONTRACTOR: _____

DATUM: _____

TEMPERATURE: _____

WEATHER:

[illegible]

JOB NO.: _____

TEST PIT NO.: _____

ENGINEER: _____

SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 1044852

JOB NAME: _____

DATE: 4/4/09

TEST PIT NO.: TP14-7

TEST PIT SIZE: _____

ELEVATION:

MACHINE TYPE: _____

CONTRACTOR: _____

DATUM: _____

TEMPERATURE: _____

WEATHER: _____

[illegible]

JOB NO.: _____

TEST PIT NO.: _____

ENGINEER: _____

SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 1044856

JOB NAME: _____

DATE: July 27, 1967

TEST PIT NO.: TP148

TEST PIT SIZE: _____

ELEVATION: 9

MACHINE TYPE: _____

CONTRACTOR: _____

DATUM: _____

TEMPERATURE: _____

WEATHER: _____

[illegible]

JOB NO.: _____

TEST PIT NO.: _____

ENGINEER: _____

SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 1041418320

JOB NAME: _____

DATE: July 28, 09

TEST PIT NO.: TP 149

TEST PIT SIZE: _____

ELEVATION: 0 _____

MACHINE TYPE: _____

CONTRACTOR: _____

DATUM: _____

TEMPERATURE: _____

WEATHER: _____

[illegible]

JOB NO.: _____

TEST PIT NO.: _____

ENGINEER: _____

SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 104618526

JOB NAME: _____

DATE: July 28, 09

TEST PIT NO.: TP156

TEST PIT SIZE: _____

ELEVATION: 5,000

MACHINE TYPE: _____

CONTRACTOR: _____

DATUM: _____

TEMPERATURE: _____

WEATHER: _____

[illegible]

JOB NO.: _____

TEST PIT NO.: _____

ENGINEER: _____

SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 1044856

JOB NAME: _____

DATE: July 28, 09

TEST PIT NO.: TP157

TEST PIT SIZE: _____

ELEVATION: 9500

MACHINE TYPE: _____

CONTRACTOR: _____

DATUM: _____

TEMPERATURE: _____

WEATHER: _____

[illegible]

JOB NO.: _____

TEST PIT NO.: _____

ENGINEER: _____

SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 1044856

JOB NAME: _____

DATE: July 28, 09

TEST PIT NO.: TP152

TEST PIT SIZE: _____

ELEVATION: 3000

MACHINE TYPE: _____

CONTRACTOR: _____

DATUM: _____

TEMPERATURE: _____

WEATHER: _____

[illegible]

JOB NO.: _____

TEST PIT NO.: _____

ENGINEER: _____

SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 10414852.

JOB NAME: _____

DATE: July 23, 07

TEST PIT NO.: TP153

TEST PIT SIZE: _____

ELEVATION: 5

MACHINE TYPE: _____

CONTRACTOR: _____

DATUM: _____

TEMPERATURE: _____

WEATHER:

[illegible]

JOB NO.: _____

TEST PIT NO.: _____

ENGINEER: _____

SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 1044856

JOB NAME:

DATE: July 28, 09

TEST PIT NO.: TP154

TEST PIT SIZE:

ELEVATION:

MACHINE TYPE: _____

CONTRACTOR:

DATUM:

TEMPERATURE: _____

WEATHER:

[illegible]

JOB NO.: _____

TEST PIT NO.: _____

ENGINEER: _____

SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 1044856

JOB NAME: _____

DATE: July 28, 09

TEST PIT NO.: TP155

TEST PIT SIZE: _____

ELEVATION: _____

MACHINE TYPE: _____

CONTRACTOR: _____

DATUM: _____

TEMPERATURE: _____

WEATHER: _____

[illegible]

JOB NO.: _____

TEST PIT NO.: _____

ENGINEER: _____

SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 104141856

JOB NAME: _____

DATE: July 28, 09

TEST PIT NO.: TP156

TEST PIT SIZE: _____

ELEVATION:

MACHINE TYPE:

CONTRACTOR: _____

DATUM: _____

TEMPERATURE:

WEATHER:

[illegible]

JOB NO.: _____

TEST PIT NO.: _____

ENGINEER: _____

SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 104141856

JOB NAME: _____

DATE: July 28, 09

TEST PIT NO.: TP157

TEST PIT SIZE: _____

ELEVATION: 9,175

MACHINE TYPE: _____

CONTRACTOR: _____

DATUM: _____

TEMPERATURE: _____

WEATHER:

[illegible]

JOB NO.: _____

TEST PIT NO.: _____

ENGINEER: _____

SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 164418526

TEST PIT NO.: TP158

MACHINE TYPE: _____

TEMPERATURE: _____

JOB NAME: _____

TEST PIT SIZE: _____

CONTRACTOR: _____

WEATHER: _____

DATE: July 28, 09

ELEVATION: _____

DATUM: _____

[illegible]

JOB NO.: _____

TEST PIT NO.: _____

ENGINEER: _____

SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 10441856

JOB NAME: _____

DATE: July 28, 09

TEST PIT NO.: TP159

TEST PIT SIZE: _____

ELEVATION:

MACHINE TYPE:

CONTRACTOR:

DATUM:

TEMPERATURE: _____

WEATHER:

[illegible]

JOB NO.: _____
TEST PIT NO.: _____
ENGINEER: _____

SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 104148526

JOB NAME: _____

DATE: July 28, 09

TEST PIT NO.: TP106

TEST PIT SIZE: _____

ELEVATION: _____

MACHINE TYPE:

CONTRACTOR: _____

DATUM: _____

TEMPERATURE: _____

WEATHER: _____

[illegible]

JOB NO.: _____

TEST PIT NO.: _____

ENGINEER: _____



MONITOR WELL RECORD

BOREHOLE No. **MW18**
PAGE **1** of **1**
PROJECT No. **121410103**
DRILLING METHOD
SIZE
DATUM **N/A**

CLIENT **Newfoundland and Labrador Department of Environment and Conservation**
PROJECT **Phase II/III ESAs, HHERA and RAP/RMP**
LOCATION **Former U.S. Military Site and Residential Subdivision, Hopedale, NL**
DATES (mm-dd-yy): BORING **9-6-09** WATER LEVEL **8.07m** **10-15-09**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0		Dark brown, Organic Soil (OL); trace sand					mm						0.61 m STICK UP CAST IRON WELL HEAD
1					SS	1	279	2	0		0.7	-	BACKFILL
					SS	2	508	4	0		1.2	-	
					SS	3	330	4	0		0.6	-	
2		Dark brown, SAND (SP); some cobbles and organics			SS	4	279	20	0		0.8	2 300	BENTONITE
		Pink and grey, BEDROCK			SS	5	38%		0		-	-	
3					RC	6	100%		0		-	-	
4		White, pink and grey, BEDROCK			RC	7	100%		0		-	-	50 mm DIAMETER No. 10 SLOT PVC SCREEN IN No. 2 SILICA SAND PACK
					RC	8	100%		0		-	-	
					RC	9	100%		0		-	-	
8													END CAP
9		End of Borehole											
10													

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MONITOR WELL RECORD

BOREHOLE No. MW19
PAGE 1 of 1
PROJECT No. 121410103
DRILLING METHOD _____
SIZE _____
DATUM N/A

CLIENT Newfoundland and Labrador Department of Environment and Conservation
PROJECT Phase II/III ESAs, HHERA and RAP/RMP
LOCATION Former U.S. Military Site and Residential Subdivision, Hopedale, NL
DATES (mm-dd-yy): BORING 9-6-09 to 9-7-09 WATER LEVEL N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0		Dark brown, SAND (SP); some cobbles and organics			SS	1	178	22/305	0		1.5	-	 0.61 m STICK UP CAST IRON WELL HEAD BACKFILL BENTONITE 50 mm DIAMETER No. 10 SLOT PVC SCREEN IN No. 2 SILICA SAND PACK END CAP
		White and grey, BEDROCK					mm						
1					RC	2	94%		0		-	-	
2		Light and dark grey, BEDROCK			RC	3	92%		0		-	-	
3		Pink, white and grey, BEDROCK			RC	4	100%		0		-	-	
4		Pink and light to dark grey, BEDROCK			RC	5	100%		0		-	-	
5													
6		End of Borehole											
7													
8													
9													
10													

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MONITOR WELL RECORD

BOREHOLE No. MW20
PAGE 1 of 1
PROJECT No. 121410103
DRILLING METHOD _____
SIZE _____
DATUM N/A

CLIENT Newfoundland and Labrador Department of Environment and Conservation
PROJECT Phase II/III ESAs, HHERA and RAP/RMP
LOCATION Former U.S. Military Site and Residential Subdivision, Hopedale, NL
DATES (mm-dd-yy): BORING 9-7-09 WATER LEVEL 5.93m 10-15-09

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0							mm						0.61 m STICK UP CAST IRON WELL HEAD
		Brown, SAND (SP); some cobbles, trace organics			SS	1	203	8	0		1.7	-	BACKFILL
1					SS	2	406	7	0		1.2	-	
		Dark brown, SAND (SP); some cobbles			SS	3	330	8	0		0.3	-	BENTONITE
2					SS	4	254	32	0		1.6	210	
		Light to dark grey, BEDROCK			RC	5	100%		0		-	-	50 mm DIAMETER No. 10 SLOT PVC SCREEN IN No. 2 SILICA SAND PACK
3					RC	6	95%		0		-	-	
4		Light to dark grey and pink, BEDROCK			RC	7	100%		0		-	-	
5					RC	8	100%		0		-	-	
		Pink and grey, BEDROCK			RC	9	100%		0		-	-	END CAP
6					RC	10	100%		0		-	-	
7		Light to dark grey and pink, BEDROCK											
8													
9		End of Borehole											
10													

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Appendix 10d

Soil Vapour Concentrations

– Pit No. 1/Helipad

Sample Tipping Results - Pit No. 1

Phase II/III ESA, HHERA and RAP/RMP

Former US Military Site and Residential Subdivision, Hopedale, NL

Project No. 121410103

Sample ID	Sample Depth (mbgs)	Hydrocarbon Odour	Soil Vapour Concentration (ppm)
TEST PITS			
TP143-BS1	0.2-0.3	No	1.6
TP143-BS2	0.7-0.8	No	8.5
TP144-BS1	0.2-0.3	No	2.6
TP144-BS2	1.3-1.5	No	1.9
TP145-BS1	0.5-0.6	No	1.8
TP146-BS1	0.2-0.3	No	1.4
TP146-BS2	0.9-1.0	No	0.9
TP147-BS1	0.2-0.3	No	1.4
TP147-BS2	1.9-2.0	No	2.7
TP148-BS1	0.2-0.3	No	1.2
TP148-BS2	1.3-1.4	No	1.1
TP149-BS1	0.2-0.3	No	9.1
TP150-BS1	0.5-0.6	No	9.5
TP151-BS1	0.0-0.5	No	10.3
TP152-BS1	0.2-0.3	No	10.7
TP152-BS2	1.3-1.4	No	11.7
TP153-BS1	0.7-0.8	No	11.9
TP154-BS1	0.3-0.4	No	0.0
TP155-BS1	0.5-0.6	No	0.0
TP156-BS1	0.2-0.3	No	0.0
TP157-BS1	0.2-0.3	No	0.0
TP157-BS2	2.1-2.2	No	0.0
TP158-BS1	1.3-1.5	No	0.0
TP159-BS1	0.3-0.4	No	0.0
TP160-BS1	0.9-1.0	No	0.0
SURFACE SOIL			
BS159	0.00-0.05	No	0.9
BS160	0.00-0.15	No	0.6
BS161	0.00-0.20	No	0.7
BS162	0.00-0.15	No	0.7
BS163	0.00-0.10	No	0.8
BS164	0.00-0.05	No	0.6
BS165	0.00-0.20	No	0.6
BS166	0.00-0.13	No	0.5
BS167	0.00-0.15	No	0.5
BS168	0.00-0.18	No	1.2
BS169	0.00-0.15	No	2.0
BS170	0.00-0.14	No	1.5

Appendix 10e

Laboratory Analytical Results Summary Tables

– Pit No. 1/Helipad

Table 10.1 Results of Laboratory Analysis of TPH/BTEX in Soil - Pit 1
Phase II/III ESA, HHERA and RAP/RMP
Former US Military Site and Residential Subdivision, Hopedale, NL
Project No. 121410103

Sample ID	Sample Depth (m)	Benzene	Toluene	Ethylbenzene	Xylenes	C ₆ -C ₁₀ (Gas Range)	C ₁₀ -C ₂₁ (Fuel Range)	C ₂₁ -C ₃₂ (Lube Range)	Modified TPH - Tier I ²	Resemblance
RDL		0.03	0.03	0.03	0.05	3	15	15	20	-
Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-
Tier I RBSLs ¹		0.16	14	58	17	-	-	-	690	-
TEST PITS										
TP143-BS2	0.7 - 0.8	<0.03	<0.03	<0.03	<0.05	<3	1,200	1,600	2,800	WFO, Possible LO. (1)
TP144-BS2	1.3 - 1.5	<0.03	<0.03	<0.03	<0.05	<3	110	91	200	WFO, Possible LO
TP147-BS2	1.9 - 2.0	<0.03	<0.03	<0.03	<0.05	<3	990	600	1,600	OP F/L, LO
TP149-BS1	0.2 - 0.3	<0.03	<0.03	<0.03	<0.05	<3	87	550	640	OP F/L, LO
TP151-BS1	0.0 - 0.5	<0.03	<0.03	<0.03	<0.05	<3	47	230	270	OP F/L, (1)
TP152-BS2	1.3 - 1.4	<0.03	<0.03	<0.03	<0.05	<3	510	320	830	WFO, Possible LO
TP153-BS1	0.7 - 0.8	<0.03	<0.03	<0.03	<0.05	<3	150	140	290	OP F/L
TP157-BS2	2.1 - 2.2	<0.03	<0.03	<0.03	<0.05	<3	45	180	230	OP F/L, (1)
TP158-BS1	1.3 - 1.5	<0.03	<0.03	<0.03	<0.05	<3	<15	<15	<20	DNR
	0.9 - 1.0	<0.03	<0.03	<0.03	<0.05	<3	<15	41	41	LO
SURFACE SAMPLES										
BS159	0.00 - 0.05	<0.03	<0.03	<0.03	<0.05	<3	<15	120	120	LO
BS168	0.00 - 0.18	<0.03	<0.03	<0.03	<0.05	<3	<15	68	68	LO
BS169	0.00 - 0.15	<0.03	<0.03	<0.03	<0.05	<3	400	1,300	1,700	WFO, LO
BS170	0.00 - 0.14	<0.03	<0.03	<0.03	<0.05	<3	50	180	230	WFO, LO
MONITOR WELLS										
MW18-SS4	1.83 - 2.44	<0.03	<0.03	<0.03	<0.05	<3	1,300	1,000	2,300	WFO, LO
MW20-SS4	1.83 - 2.44	<0.03	<0.03	<0.03	<0.05	<3	48	160	210	WFO, LO
MW20-SS4-Lab-Dup	1.83 - 2.44	-	-	-	-	-	59	140	-	-

Notes:

1 = Partnership in RBCA (Risk-Based Corrective Action) Implementation (PIRI) Tier I Risk Based Screening Levels (RBSLs) for a residential site with non-potable groundwater and coarse grained soil, lube oil impacts (September, 2003)

2 = Modified TPH - Tier I does not include BTEX

RDL = Reportable Detection Limit for routine analysis

Lab-dup = laboratory duplicate sample

< # = Not detected above RDL noted

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

WFO=Weathered fuel oil fraction; LO=Lube oil fraction; OP F/L=One product in fuel/lube oil range

(1)= Unidentified compound(s) in fuel/lube range.

Table 10.2 Results of Laboratory Analysis of PCBs in Soil - Pit 1
Phase II/III ESA, HHERA and RAP/RMP
Former US Military Site and Residential Subdivision, Hopedale, NL
Project No. 121410103

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)
	RDL	0.05
	Units	mg/kg
	Criteria ¹	1.3
TEST PITS		
TP149-BS1	0.2 - 0.3	0.69
TP152-BS1	0.2 - 0.3	20.0
TP153-BS1	0.7 - 0.8	1.10
TP157-BS2	2.1 - 2.2	<0.05
TP160-BS1	0.9 - 1.0	0.28
SURFACE SAMPLES		
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	11.0

Notes:

1 = CCME Canadian Soil Quality Guidelines for a Residential/Parkland Site (2007)

RDL = Reportable Detection Limit for routine analysis

Lab-dup = Laboratory duplicate sample

< # = Not detected above RDL noted

Shaded = Value exceeds applicable criteria

Table 10.3 Results of Laboratory Analysis of PAHs in Soil - Pit 1
Phase II/III ESA, HHERA and RAP/RMP
Former US Military Site and Residential Subdivision, Hopedale, NL
Project No. 121410103

Parameters	RDL	RDL ⁵	Units	Criteria ^{1,3}	Criteria ^{2,3}	TEST PITS		
						TP144-BS2	TP144-BS2- Lab-Dup	TP154-BS1 ⁵
Non-carcinogenic PAHs								
1-Methylnaphthalene	0.005	0.01	mg/kg	-	-	<0.005	<0.005	<0.01
2-Methylnaphthalene	0.005	0.01	mg/kg	-	-	<0.005	<0.005	<0.01
Acenaphthene	0.005	0.01	mg/kg	-	-	<0.005	0.007	<0.01
Acenaphthylene	0.005	0.01	mg/kg	-	-	<0.005	0.11(6)	<0.01
Anthracene	0.005	0.01	mg/kg	2.5	-	<0.005	<0.005	<0.01
Fluoranthene	0.005	0.01	mg/kg	50	-	<0.005	<0.005	<0.01
Fluorene	0.005	0.01	mg/kg	-	-	<0.005	<0.005	<0.01
Naphthalene	0.005	0.01	mg/kg	-	-	<0.005	<0.005	<0.01
Perylene	0.005	0.01	mg/kg	-	-	<0.005	<0.005	<0.01
Phenanthrene	0.005	0.01	mg/kg	-	-	<0.005	<0.005	<0.01
Pyrene	0.005	0.01	mg/kg	-	-	<0.005	0.044(6)	<0.01
Benzo(a)anthracene	0.005	0.01	mg/kg	-	-	<0.005	<0.005	<0.01
Benzo(a)pyrene	0.005	0.01	mg/kg	20	-	<0.005	0.007	<0.01
Benzo(b)fluoranthene	0.005	0.01	mg/kg	-	-	<0.005	<0.005	<0.01
Benzo(k)fluoranthene	0.005	0.01	mg/kg	-	-	<0.005	<0.005	<0.01
Benzo(g,h,i)perylene	0.005	0.01	mg/kg	-	-	<0.005	<0.005	<0.01
Chrysene	0.005	0.01	mg/kg	-	-	<0.005	0.036(6)	<0.01
Dibenz(a,h,)anthracene	0.005	0.01	mg/kg	-	-	<0.005	<0.005	<0.01
Indeno(1,2,3-c,d) pyrene	0.005	0.01	mg/kg	-	-	<0.005	<0.005	<0.01
Benzo (a)pyrene TPE ⁴				-	5.3	0.006	0.011	0.012

Notes:

1 = CCME Canadian Soil Quality Guidelines for the Protection of Environmental Health at a Residential/Parkland Site (2008)

2 = CCME Canadian Soil Quality Guidelines for Protection of Human Health for a Residential Site (Direct Soil Contact) (2008)

3 = As per CCME recommendations, soil samples are compared against the SQG for the protection of human health and environmental health separately

4 = Carcinogenic PAHs Assessed as Benzo(a)pyrene Total Potency Equivalent (TPE)

5 - Elevated RDL(s) due to sample dilution

(6) = Duplicate: results are outside acceptable limit. Sample was past recommended hold time to repeat analysis

RDL = Reportable Detection Limit for routine analysis

< # = Not detected above RDL noted

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

Shaded = Value exceeds applicable criteria

Table 10.4 Results of Laboratory Analysis of Available Metals in Soil - Pit 1
Phase II/III ESA, HHERA and RAP/RMP
Former US Military Site and Residential Subdivision, Hopedale, NL
Project No. 121410103

Parameters	RDL	Units	Criteria ¹	TEST PITS								
				TP144-BS2	TP147-BS2	TP149-BS1	TP151-BS1	TP153-BS1	TP154-BS1	TP155-BS1	TP157-BS2	TP160-BS1
Aluminum	10	mg/kg	-	12,000	9,600	7,000	5,600	14,000	3,700	7,900	19,000	7,800
Antimony	2	mg/kg	20	<2	<2	<2	<2	<2	<2	<2	<2	<2
Arsenic	2	mg/kg	12	<2	<2	<2	<2	<2	<2	<2	<2	<2
Barium	5	mg/kg	500	29	37	27	41	49	10	29	24	38
Beryllium	2	mg/kg	4	<2	<2	<2	<2	<2	<2	<2	<2	<2
Bismuth	2	mg/kg	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Boron	5	mg/kg	-	<5	<5	<5	<5	<5	<5	<5	<5	<5
Cadmium	0.3	mg/kg	10	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium	2	mg/kg	64	21	20	41	26	26	11	18	21	50
Cobalt	1	mg/kg	50	5	6	5	5	8	2	5	5	6
Copper	2	mg/kg	63	11	13	25	50	15	10	17	18	20
	50	mg/kg	-	14,000	11,000	10,000	9,200	16,000	5,100	10,000	23,000	13,000
Lead	0.5	mg/kg	140	5.7	12	17	6.0	11	4.4	9.1	3.6	61
Lithium	2	mg/kg	-	9	8	10	11	10	5	9	7	12
Manganese	2	mg/kg	-	120	150	120	110	220	69	120	110	190
Mercury	0.1/0.2 ²	mg/kg	6.6	<0.1	<0.1	<0.1	<0.2 ²	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	2	mg/kg	10	<2	<2	<2	<2	<2	<2	<2	<2	5
Nickel	2	mg/kg	50	14	13	19	19	18	7	13	14	17
Rubidium	2	mg/kg	-	8	8	11	16	12	3	8	6	11
Selenium	2	mg/kg	1	<2	<2	<2	<2	<2	<2	<2	<2	<2
Silver	0.5	mg/kg	20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium	5	mg/kg	-	20	27	9	13	35	10	12	13	10
Thallium	0.1	mg/kg	1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin	2	mg/kg	50	<2	<2	<2	4	<2	<2	<2	<2	<2
Uranium	0.1	mg/kg	23	0.4	0.9	0.5	0.6	0.9	0.4	0.5	1.8	0.4
Vanadium	2	mg/kg	130	23	23	22	17	31	10	20	26	22
Zinc	5	mg/kg	200	26	35	45	25	39	15	30	24	38

Notes:

1 = CCME Canadian Soil Quality Guidelines for a Residential/Parkland Site (2007)

2 = Elevated RDL due to matrix interfaces

RDL = Reportable Detection Limit for routine analysis

< # = Not detected above RDL noted

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

Table 10.4 Results of Laboratory Analysis of Available Metals in Soil
Phase II/III ESA, HHERA and RAP/RMP
Former US Military Site and Residential Subdivision, Hopedale, NL
Project No. 121410103

Parameters	RDL	Units	Criteria ¹	SURFACE SAMPLES			MONITOR WELLS
				BS160	BS162	BS164	MW19-SS1
Aluminum	10	mg/kg	-	9,600	13,000	4,500	9,300
Antimony	2	mg/kg	20	<2	<2	<2	<2
Arsenic	2	mg/kg	12	<2	<2	<2	<2
Barium	5	mg/kg	500	24	43	26	34
Beryllium	2	mg/kg	4	<2	<2	<2	<2
Bismuth	2	mg/kg	-	<2	<2	<2	<2
Boron	5	mg/kg	-	<5	<5	<5	6
Cadmium	0.3	mg/kg	10	<0.3	<0.3	<0.3	<0.3
Chromium	2	mg/kg	64	23	24	5	23
Cobalt	1	mg/kg	50	6	8	3	7
Copper	2	mg/kg	63	15	18	36	19
	50	mg/kg	-	11,000	15,000	7,900	13,000
Lead	0.5	mg/kg	140	4.5	10	8.1	9.7
Lithium	2	mg/kg	-	9	12	13	9
Manganese	2	mg/kg	-	150	210	110	150
Mercury	0.1/0.2 ²	mg/kg	6.6	<0.1	<0.1	<0.1	<0.1
Molybdenum	2	mg/kg	10	<2	<2	<2	2
Nickel	2	mg/kg	50	20	17	5	17
Rubidium	2	mg/kg	-	7	11	17	10
Selenium	2	mg/kg	1	<2	<2	<2	<2
Silver	0.5	mg/kg	20	<0.5	<0.5	<0.5	<0.5
Strontium	5	mg/kg	-	19	32	<5	24
Thallium	0.1	mg/kg	1	<0.1	<0.1	<0.1	<0.1
Tin	2	mg/kg	50	<2	<2	<2	3
Uranium	0.1	mg/kg	23	0.6	1.1	1.2	1.3
Vanadium	2	mg/kg	130	22	30	14	22
Zinc	5	mg/kg	200	32	42	30	62

Notes:

1 = CCME Canadian Soil Quality Guidelines for a Residential/Parkland Site (2007)

2 = Elevated RDL due to matrix interfaces

RDL = Reportable Detection Limit for routine analysis

< # = Not detected above RDL noted

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

Table 10.5 Results of Laboratory Analysis of TPH/BTEX in Groundwater - Pit 1
Phase II/III ESA, HHERA and RAP/RMP
Former US Military Site and Residential Subdivision, Hopedale, NL
Project No. 121410103

Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes	C ₆ -C ₁₀ (Gas Range)	C ₁₁ -C ₂₀ (Fuel Range)	C ₂₁ -C ₃₂ (Lube Range)	Modified TPH - Tier I ²	Resemblance
RDL	0.001	0.001	0.001	0.002	0.01	0.05	0.1	0.1	-
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-
Criteria ¹	1	20	20	20	-	-	-	20	-
MONITOR WELLS									
MW18	<0.001	0.002	<0.001	<0.002	0.2	0.05	0.1	0.4	Possible LO
MW20	<0.001	0.006	<0.001	0.003	<0.01	0.06	0.1	0.2	Possible LO

Notes:

1 = Partnership in RBCA (Risk-Based Corrective Action) Implementation (PIRI) Tier I Risk Based Screening Levels (RBSLs) for a residential site with non-potable groundwater and coarse grained soil, lube oil impacts (September, 2003)

2 = Modified TPH - Tier I does not include BTEX

RDL = Reportable Detection Limit for routine analysis

< # = Not detected above RDL noted

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

Table 10.6 Results of Laboratory Analysis of PCBs in Groundwater - Pit 1
Phase II/III ESA, HHERA and RAP/RMP
Former US Military Site and Residential Subdivision, Hopedale, NL
Project No. 121410103

Sample ID	Polychlorinated Biphenyls (PCBs)
RDL	0.05
Units	ug/L
Criteria ¹	0.2
MONITOR WELLS	
MW20	<0.05

Notes:

1 = OMOE Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*, Non-Potable Groundwater (2004)

RDL = Reportable Detection Limit

na = No applicable guideline

< # = Not detected above RDL noted