

Appendix 5a

Site Photos

– Roadway

Site Photographs – Roadway

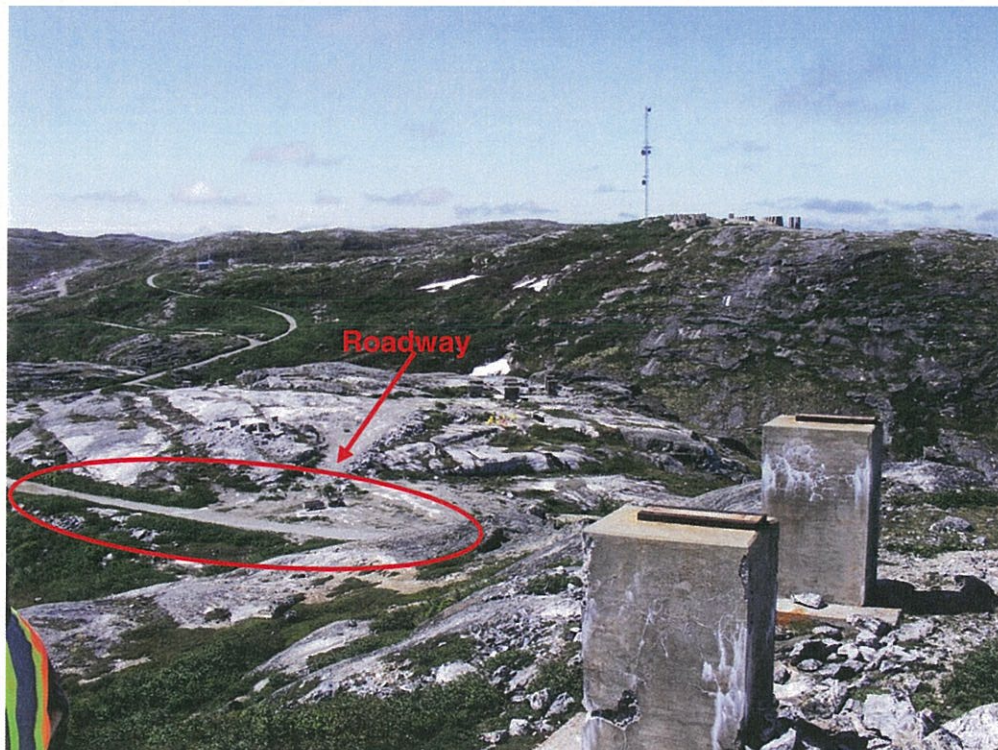


Photo 1 View of roadway from Main Base (looking southwest)

Appendix 5b

Sample Coordinates

– Roadway

Sample Coordinates - Roadway
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-213	0675373	6150262
TP-214	0675248	6150368
TP-215	0675106	6150320
TP-216	0675029	6150223
TP-217	0674998	6150067
TP-218	0674814	6149872
MONITOR WELLS		
MW-7	0675038	6150123

Appendix 5c

Test Pit and Monitor Well Records

– Roadway



SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 1094850

JOB NAME: _____

DATE: July 31, 09TEST PIT NO.: TP213

TEST PIT SIZE: _____

ELEVATION: _____

MACHINE TYPE: _____

CONTRACTOR: _____

DATUM: _____

TEMPERATURE: _____

WEATHER: _____

DEPTH		SOIL DESCRIPTION	SAMPLES		IN SITU DENSITY TEST		REMARKS
FROM	TO		NO.	DEPTH	NO.	DEPTH	
<u>0</u>	<u>0.9</u>		<u>bluish medium silty sand and gravel</u>	<u>BS1</u>	<u>0.9</u> <u>1.0</u>		
LOCATION SKETCH			WATER CONDITIONS IN TEST PIT:				

JOB NO.: _____

TEST PIT NO.: _____

ENGINEER: _____



SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 1044830
 TEST PIT NO.: TP214
 MACHINE TYPE: _____
 TEMPERATURE: _____

JOB NAME: _____
 TEST PIT SIZE: _____
 CONTRACTOR: _____
 WEATHER: _____

DATE: July 31, 09
 ELEVATION: _____
 DATUM: _____

DEPTH		SOIL DESCRIPTION	SAMPLES		IN SITU DENSITY TEST		REMARKS	
FROM	TO		NO.	DEPTH	NO.	DEPTH		
0	0.7	bluish medium silty sand and gravel	BS1	0.67			<i>city@b.c</i>	
LOCATION SKETCH			WATER CONDITIONS IN TEST PIT:					
			<input type="checkbox"/> Test Pit Dry.					

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



SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 1044856
 TEST PIT NO.: TP216
 MACHINE TYPE: _____
 TEMPERATURE: _____

JOB NAME: _____
 TEST PIT SIZE: _____
 CONTRACTOR: _____
 WEATHER: _____

DATE: July 31, 09
 ELEVATION: _____
 DATUM: _____

DEPTH		SOIL DESCRIPTION	SAMPLES		IN SITU DENSITY TEST		REMARKS
FROM	TO		NO.	DEPTH	NO.	DEPTH	
0	0.6		dark brown to black silty sand and gravel. strong fuel odor.	B51	0.5 0.6		
LOCATION SKETCH			WATER CONDITIONS IN TEST PIT:				
			gw @ 0.6m				
			<input type="checkbox"/> Test Pit Dry.				

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



SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 1044856
 TEST PIT NO.: TP217
 MACHINE TYPE: _____
 TEMPERATURE: _____

JOB NAME: _____
 TEST PIT SIZE: _____
 CONTRACTOR: _____
 WEATHER: _____

DATE: July 31, 09
 ELEVATION: _____
 DATUM: _____

DEPTH		SOIL DESCRIPTION	SAMPLES		IN SITU DENSITY TEST		REMARKS
FROM	TO		NO.	DEPTH	NO.	DEPTH	
0	0.3		Light brown medium silty sand	BS1	0.3		
LOCATION SKETCH			WATER CONDITIONS IN TEST PIT:				
			<input checked="" type="checkbox"/> Test Pit Dry.				

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



SHEET: _____ OF _____

FIELD TEST PIT RECORD

JOB NUMBER: 1044856
 TEST PIT NO.: TP218
 MACHINE TYPE: _____
 TEMPERATURE: _____

JOB NAME: _____
 TEST PIT SIZE: _____
 CONTRACTOR: _____
 WEATHER: _____

DATE: July 31, 09
 ELEVATION: _____
 DATUM: _____

DEPTH		SOIL DESCRIPTION	SAMPLES		IN SITU DENSITY TEST		REMARKS	
FROM	TO		NO.	DEPTH	NO.	DEPTH		
0	1.1		light brown medium silty sand	BS1	0.9- 1.1			
LOCATION SKETCH			WATER CONDITIONS IN TEST PIT:					
			<input type="checkbox"/> Test Pit Dry.					

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



MONITOR WELL RECORD

BOREHOLE No. MW07
 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 9-2-09 WATER LEVEL 2.47m 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		Brown, SAND (SP)			SS	1	152	2/150	1		21.2	160	0.61 m STICK UP CAST IRON WELL HEAD
0		Light and dark grey, BEDROCK			RC	2	100%		0	-	-	-	BACKFILL BENTONITE
1		Light and dark grey, trace pink and black, BEDROCK			RC	3	100%		0	-	-	-	
2		Black, white and grey, BEDROCK			RC	4	100%		0	-	-	-	
3		Light and dark grey, BEDROCK			RC	5	100%		0	-	-	-	
4		End of Borehole											50 mm DIAMETER No. 10 SLOT PVC SCREEN IN No. 2 SILICA SAND PACK END CAP
5													
6													
7													
8													
9													
10													

DRAFT

Appendix 5d

Soil Vapour Concentrations

– Roadway

Sample Tipping Results - Roadway
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			
TP213-BS1	0.9-1.0	No	0.8
TP214-BS1	0.6-0.7	No	1.6
TP215-BS1	1.1-1.2	No	1.7
TP216-BS1	0.5-0.6	No	90
TP217-BS1	0.2-0.3	No	12.6
TP218-BS1	0.9-1.1	No	4.9

Appendix 5e

Laboratory Analytical Results Summary Tables

– Roadway

Table 5.1 Results of Laboratory Analysis of TPH/BTEX in Soil - Roadway
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	-	-	-	140	-
TEST PITS										
TP216-BS1	0.5 - 0.6	<0.03	<0.03	<0.03	<0.05	570	15,000	350	16,000	WFO
MONITOR WELLS										
MW7-SS1	0.00 - 0.15	<0.03	<0.03	<0.03	<0.05	<3	110	45	160	WFO, 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, fuel 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

WFO = Weathered fuel oil; LO = Lube oil fraction

Shaded = Value exceeds generic criteria for a residential site with non-potable groundwater, coarse grained soil and fuel oil impacts

Table 5.2 Results of Laboratory Analysis of PCBs in Soil - Roadway
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/ 0.2 ²
	Units	mg/kg
	Criteria ¹	1.3
TEST PITS		
TP216-BS1	0.5 - 0.6	<0.2 ²
TP218-BS1	0.9 - 1.1	0.47
MONITOR WELLS		
MW7-SS1	0.00 - 0.15	<0.05

Notes:

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

2 = Elevated RDL

RDL = Reportable Detection Limit for routine analysis

< # = Not detected above RDL noted

**Table 5.3 Results of Laboratory Analysis of Available Metals in Soil - Roadway
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	MONITOR WELLS
				MW7-SS1
Aluminum	10	mg/kg	-	7000
Antimony	2	mg/kg	20	<2
Arsenic	2	mg/kg	12	<2
Barium	5	mg/kg	500	21
Beryllium	2	mg/kg	4	<2
Bismuth	2	mg/kg	-	<2
Boron	5	mg/kg	-	<5
Cadmium	0.3	mg/kg	10	<0.3
Chromium	2	mg/kg	64	20
Cobalt	1	mg/kg	50	4
Copper	2	mg/kg	63	10
Iron	50	mg/kg	-	8500
Lead	0.5	mg/kg	140	3.4
Lithium	2	mg/kg	-	9
Manganese	2	mg/kg	-	97
Mercury	0.1	mg/kg	6.6	<0.1
Molybdenum	2	mg/kg	10	<2
Nickel	2	mg/kg	50	12
Rubidium	2	mg/kg	-	7
Selenium	2	mg/kg	1	<2
Silver	0.5	mg/kg	20	<0.5
Strontium	5	mg/kg	-	11
Thallium	0.1	mg/kg	1	<0.1
Tin	2	mg/kg	50	<2
Uranium	0.1	mg/kg	23	0.6
Vanadium	2	mg/kg	130	17
Zinc	5	mg/kg	200	23

Notes:

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

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 5.4 Results of Laboratory Analysis of Available Metals in Groundwater - Roadway
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	MONITOR WELLS
				MW7
Aluminum	5	ug/L	-	487
Antimony	2	ug/L	16,000	<2.0
Arsenic	2	ug/L	480	<2.0
Barium	5	ug/L	23,000	22
Beryllium	2	ug/L	53	<2.0
Bismuth	2	ug/L	-	<2.0
Boron	5	ug/L	50,000	42.5
Cadmium	0.017	ug/L	11	0.023
Chromium	1	ug/L	2,000	<1.0
Cobalt	0.4	ug/L	100	1.2
Copper	2	ug/L	23	11.8
Iron	50	ug/L	-	759
Lead	0.5	ug/L	32	0.55
Manganese	2	ug/L	-	129
Molybdenum	2	ug/L	7,300	8.5
Nickel	2	ug/L	1,600	5.9
Selenium	1	ug/L	50	<1.0
Silver	0.1	ug/L	1.2	0.28
Strontium	5	ug/L	-	79.3
Thallium	0.1	ug/L	400	<0.10
Tin	2	ug/L	-	<2.0
Titanium	2	ug/L	-	10.6
Uranium	0.1	ug/L	-	2.09
Vanadium	2	ug/L	200	<2.0
Zinc	5	ug/L	1,100	14.5

Notes:

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

2 = Elevated RDLs

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