

APPENDIX 27

Ecological Risk Assessment

Drawings



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

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NEWFOUNDLAND AND LABRADOR
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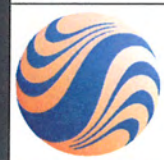
PROJECT TITLE:

PHASE III ENVIRONMENTAL SITE
ASSESSMENTS, HUMAN HEALTH AND
ECOLOGICAL RISK ASSESSMENT AND
REMEDIAL ACTION / RISK MANAGEMENT PLAN
FOR THE FORMER U.S. MILITARY SITE AND
RESIDENTIAL SUBDIVISION, HOPEDALE, NL

DRAWING TITLE:

POTENTIAL AQUATIC HABITATS
ASSESSED IN THE AQUATIC
ECOLOGICAL RISK ASSESSMENT

Stantec Consulting Ltd.



SCALE:	1:10,000	DATE:	APR. 23, 2010
DRAWN BY:	N.M.	CHECKED BY:	KJ
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CLIENT:

**NEWFOUNDLAND AND LABRADOR
DEPARTMENT OF ENVIRONMENT
AND CONSERVATION**

PROJECT TITLE:

**PHASE III ENVIRONMENTAL SITE
ASSESSMENTS, HUMAN HEALTH AND
ECOLOGICAL RISK ASSESSMENT AND
REMEDIAL ACTION / RISK MANAGEMENT PLAN
FOR THE FORMER U.S. MILITARY SITE AND
RESIDENTIAL SUBDIVISION, HOPEDALE, NL**

DRAWING TITLE:

**AREAS ASSESSED FOR TERRESTRIAL
ECOLOGICAL RISK ASSESSMENT**

Stantec Consulting Ltd.



Stantec

SCALE:	1:10,000	DATE:	APR. 23, 2010
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Aquatic Screening and Risk Assessment Tables

Table 27.1. Sediment Screening and Risk Assessment Table - Subdivision Stream

Chemical	Screening			Risk Assessment				Comments
	Maximum (mg/kg)	Screening Value (mg/kg) ¹	Background Values (mg/kg)	Carried Forward as COC?	EPC (mg/kg) ²	Toxicity Value (mg/kg) ³	Hazard Quotient	Potential Unacceptable Risk
Benzene	<0.03	-	-	no	-	46	-	NO
Toluene	<0.03	-	-	no	-	57	-	NO
Ethylbenzene	<0.03	-	-	no	-	68	-	NO
Xylene	<0.05	-	-	no	-	69	-	NO
TPH	110	-	-	yes	110	500	0.22	NO
PCBs ⁴	0.48	0.277	-	yes	0.48	-	-	YES
Aluminum	8300	-	6200, 8100, 11000	no	-	53000	-	NO
Antimony	<2	-	<2	no	-	4300	-	NO
Arsenic	<2	17	<2	no	-	620	-	NO
Barium	40	-	19, 24, 36	yes	40	2500	0.016	NO
Beryllium	<2	-	<2	no	-	5.4	-	NO
Bismuth	<2	-	<2	no	-	-	-	NO
Boron	<5	-	<5	no	-	-	-	NO
Cadmium	<0.3	3.5	<0.3	no	-	83	-	NO
Chromium	16	90	16, 16, 22	no	-	4300	-	NO
Cobalt	8	-	4, 4, 5	yes	8	480	0.02	NO
Copper	13	197	8, 8, 11	no	-	98	-	NO
Iron	12000	-	5000, 6300, 11000	no	-	-	-	NO
Lead	4.4	91.3	9.1, 10, 11	no	-	6400	-	NO
Lithium	10	-	5, 7, 8	no	-	-	-	NO
Manganese	240	-	52, 66, 100	no	-	-	-	NO
Mercury	<0.1	0.486	<0.1	no	-	150	-	NO
Molybdenum	<0.5	-	<0.5	no	-	7000	-	NO
Nickel	13	-	12, 11, 15	no	-	300	-	NO
Rubidium	13	-	2, 4, 7	no	-	-	-	NO
Selenium	<2	-	<2	no	-	15	-	NO
Silver	<0.5	-	<0.5	no	-	-	-	NO
Strontium	18	-	24, 32, 32	no	-	-	-	NO
Thallium	0.1	-	<0.1	no	-	-	-	NO
Tin	<2	-	<2	no	-	-	-	NO
Uranium	5.7	-	2.5, 2.2, 2.3	yes	5.7	100	0.06	NO
Vanadium	22	-	11, 14, 23	yes	22	98	0.22	NO
Zinc	46	315	52, 28, 37	no	-	780	-	NO

1. CCME Probable Effects Level

2. Where the number of samples analysed is less than 10, the EPC is the maximum concentration. Where the number of samples is ten or more, the EPC is calculated as the appropriate upper confidence limit

3. References for toxicity values are presented in Appendix 16

4. PCB toxicity value is 3800 mg/kg organic carbon. No organic carbon value was available for the stream. It was therefore not possible to calculate a toxicity value for Subdivision Stream.

Note that VOCs and PAHs were not detected in sediment and are not included in this screening table

"-": no applicable value or not analysed

Table 27.2. Sediment Screening and Risk Assessment Table - Old Dump Pond

Chemical	Screening			Carried Forward as COC?	Risk Assessment				Comments
	Maximum (mg/kg)	Screening Value (mg/kg) ¹	Background Values (mg/kg)		EPC (mg/kg) ²	Toxicity Value (mg/kg) ³	Hazard Quotient	Potential Unacceptable Risk?	
Benzene	<0.03	na	-	no	-	46	-	NO	Benzene was not detected
Toluene	<0.03	na	-	no	-	57	-	NO	Toluene was not detected
Ethylbenzene	<0.03	na	-	no	-	68	-	NO	Ethylbenzene was not detected
Xylene	<0.05	na	-	no	-	69	-	NO	Xylene was not detected
TPH ⁴	180	na	-	yes	180	500	0.36	NO	TPH was less than the toxicity value
PCBs ⁴	16	0.277	-	yes	16	597	0.03	NO	PCBs are less than the toxicity value
Aluminum	12000	-	6200, 8100, 11000	no	-	-	-	NO	Aluminum is considered an element of low toxicity
Antimony ⁵	6	-	<2	yes	6	4300	0.001	NO	Antimony was less than the toxicity value
Arsenic	3	17	<2	no	-	620	-	NO	Arsenic was less than the screening guideline
Barium	66	-	19, 24, 36	yes	43	2500	0.02	NO	Barium was less than the toxicity value
Beryllium	<2	-	<2	no	-	5.4	-	NO	Beryllium was not detected
Bismuth	<2	-	<2	no	-	-	-	NO	Bismuth was not detected
Boron ⁵	12	-	<5	yes	12	-	-	NO	There is no guideline or toxicity value for boron. Boron was detected in three samples of thirteen analysed. Therefore, it is localised and not considered a concern.
Cadmium	10	3.5	<0.3	yes	4	83	0.05	NO	Cadmium was less than the toxicity value
Chromium	35	90	16, 16, 22	no	-	4300	-	NO	Cadmium was less than the screening guideline
Cobalt	7	-	4, 4, 5	yes	5.5	460	0.01	NO	Cadmium was less than the toxicity value
Copper	79	197	8, 8, 11	no	-	98	-	NO	Cadmium was less than the screening guideline
Iron	49000	-	5000, 6300, 11000	no	-	-	-	NO	Iron is considered an essential element and non-toxic
Lead	160	91.3	9.1, 10, 11	yes	80	6400	0.01	NO	Lead is less than the toxicity value
Lithium	11	-	5, 7, 8	no	-	-	-	NO	Lithium concentrations are comparable to background
Manganese	300	-	52, 66, 100	no	-	-	-	NO	Manganese is considered an essential element and non-toxic
Mercury	0.8	0.486	<0.1	yes	0.4	150	0.003	NO	Mercury is less than the toxicity value
Molybdenum ⁵	4	-	<2	yes	4	7000	0.001	NO	Molybdenum is less than the toxicity value
Nickel	20	-	12, 11, 15	yes	17	300	0.057	NO	Nickel is less than the toxicity value
Rubidium	12	-	2, 4, 7	no	-	-	-	NO	No toxicity information exists for rubidium. It may be a result of sea spray.
Selenium	<2	-	<2	no	-	15	-	NO	Selenium was not detected
Silver ⁵	1.4	-	<0.5	yes	1.4	-	-	NO	There is no guideline or toxicity value for silver. Silver was detected in one sample of thirteen analysed. Therefore, it is localised and is not considered a concern.
Strontium	26	-	24, 32, 32	no	-	-	-	NO	Strontium concentrations are comparable to the background range
Thallium	0.1	-	<0.1	no	-	-	-	NO	Thallium concentrations are considered low (i.e., detected at the RDL of 0.1 mg/kg)
Tin	91	-	<2	yes	38	-	-	YES	There is no guideline or toxicity value for tin
Uranium	4.5	-	2.5, 2.2, 2.3	yes	2.7	100	0.027	NO	Uranium is less than the toxicity value
Vanadium	25	-	11, 14, 23	yes	18	98	0.184	NO	Vanadium is less than the toxicity value
Zinc	790	315	52, 28, 37	yes	390	780	0.500	NO	Zinc is less than the toxicity value

1. CCME Probable Effects Level

2. Where the number of samples analysed is less than 10, the EPC is the maximum concentration. Where the number of samples is ten or more, the EPC is calculated as the appropriate upper confidence limit

3. References for toxicity values are presented in Appendix 16

4. Antimony, Boron, Molybdenum, and Silver were detected in four or less samples of thirteen samples analysed. Therefore, the maximum was used as the EPC.

5. PCB toxicity value is 3800 mg/kg organic carbon. For Old Dump Pond, the average organic carbon is equal to 157 g/kg or 15.7% organic carbon. This is equivalent to a toxicity value of 597 mg/kg. "na" = no applicable value or not analysed

Note that VOCs were not detected in sediment and are not included in this screening table

Table 27.3. Sediment Screening and Risk Assessment Table - Small Pond Bog

Chemical	Screening			Risk Assessment			Comments
	Maximum (mg/kg)	Screening Value (mg/kg) ¹	Background Values (mg/kg)	Carried Forward as COC?	EPC (mg/kg) ²	Toxicity Value (mg/kg) ³ Hazard Quotient	Potential Unacceptable Risk?
Benzene	<0.1	na	-	no	-	46	NO
Toluene	<0.1	na	-	no	-	57	NO
Ethylbenzene	<0.1	na	-	no	-	68	NO
Xylenes	<0.3	na	-	no	-	69	NO
TPH	16000	na	-	yes	10460	500	YES
PCBs ^{4,5}	0.68	0.277	-	yes	0.68	255	NO
Aluminum	17000	-	6200, 8100, 11000	no	-	0.003	NO
Antimony	<2	-	<2	no	-	4300	NO
Arsenic	<2	17	<2	no	-	620	NO
Barium	65	-	19, 24, 36	yes	40	2500	NO
Beryllium	<2	-	<2	no	-	5.4	NO
Bismuth	<2	-	<2	no	-	-	NO
Boron	5	-	<5	no	-	-	NO
Cadmium	0.3	3.5	<0.3	no	-	83	NO
Chromium	30	90	16, 16, 22	no	-	4300	NO
Cobalt	11	-	4, 4, 5	yes	7.3	460	NO
Copper	57	197	8, 8, 11	yes	31	98	NO
Iron	32000	-	5000, 6300, 11000	no	-	-	NO
Lead	42	91.3	9.1, 10, 11	no	-	6400	NO
Lithium	13	-	5, 7, 8	no	-	-	NO
Manganese	330	-	52, 66, 100	no	-	-	NO
Mercury	0.2	0.486	<0.1	no	-	150	NO
Molybdenum ⁶	6	-	<2	yes	6	7000	NO
Nickel	26	-	12, 11, 15	yes	17	300	NO
Rubidium	14	-	2, 4, 7	no	-	-	NO
Selenium	<2	-	<2	no	-	15	NO
Silver	<0.5	-	<0.5	no	-	-	NO
Strontium	39	-	24, 32, 32	no	-	-	NO
Thallium	0.1	-	<0.1	no	-	-	NO
Tin	<2	-	<2	no	-	-	NO
Uranium	6	-	2.5, 2.2, 2.3	yes	3	100	NO
Vanadium	34	-	11, 14, 23	yes	24	98	NO
Zinc	97	315	52, 26, 37	no	-	780	NO

1. CCME Probable Effects Level

2. Where the number of samples analysed is less than 10, the EPC is the maximum concentration. Where the number of samples is ten or more, the EPC is calculated as the appropriate upper confidence limit

3. References for toxicity values are presented in Appendix 16

4. Eleven samples were analysed for PCBs but calculation of an EPC was not possible because PCBs were detected in only two samples

5. PCB toxicity value is 3800 mg/kg organic carbon. For Small Pond Bog, the average organic carbon is equal to 67 g/kg or 6.7% organic carbon. This is equivalent to a toxicity value of 255 mg/kg.

6. Eleven samples were analysed for molybdenum but calculation of an EPC was not possible because molybdenum was detected in only one sample

".": no applicable value or not analysed

Note that VOCs and PAHs were not detected in sediment and are not included in this screening table

Table 27.4 Sediment Screening and Risk Assessment Table - Old Dam

Chemical	Screening			Risk Assessment				Comments
	Maximum (mg/kg)	Screening Value (mg/kg) ¹	Background Values (mg/kg)	Carried Forward as COC?	EPC (mg/kg) ²	Toxicity Value (mg/kg) ³	Hazard Quotient	Potential Unacceptable Risk?
Benzene	<0.03	na	-	no	-	46	-	NO
Toluene	0.07	na	-	yes	0.07	57	0.001	NO
Ethylbenzene	<0.03	na	-	no	-	58	-	NO
Xylene	<0.05	na	-	no	-	69	-	NO
TPH	1000	na	-	yes	1000	500	2.00	YES
PCBs	<0.05	0.277	-	no	-	na	-	NO
Aluminum	9400	-	6200, 8100, 11000	no	-	53000	-	NO
Antimony	<2	-	<2	no	-	4300	-	NO
Arsenic	<2	17	<2	no	-	620	-	NO
Barium	32	-	19, 24, 36	no	-	2500	-	NO
Beryllium	<2	-	<2	no	-	5.4	-	NO
Bismuth	<2	-	<2	no	-	-	-	NO
Boron	<5	-	<5	no	-	-	-	NO
Cadmium	0.3	3.5	<0.3	no	-	83	-	NO
Chromium	20	90	16, 16, 22	no	-	4300	-	NO
Cobalt	9	-	4, 4, 5	yes	9	460	0.02	NO
Copper	13	197	8, 8, 11	no	-	98	-	NO
Iron	26000	-	5000, 6300, 11000	no	-	-	-	NO
Lead	77	91.3	9.1, 10, 11	no	-	6400	-	NO
Lithium	7	-	5, 7, 8	no	-	-	-	NO
Manganese	170	-	52, 66, 100	no	-	-	-	NO
Mercury	0.1	0.486	<0.1	no	-	150	-	NO
Molybdenum	<2	-	<2	no	-	7000	-	NO
Nickel	26	-	12, 11, 15	yes	26	300	0.09	NO
Rubidium	6	-	2, 4, 7	no	-	-	-	NO
Selenium	<5	-	<5	no	-	15	-	NO
Silver	<0.5	-	<0.5	no	-	-	-	NO
Strontium	32	-	24, 32, 32	no	-	-	-	NO
Thallium	0.1	-	<0.1	no	-	-	-	NO
Tin	<2	-	<2	no	-	-	-	NO
Uranium	1.7	-	2.5, 2.2, 2.3	no	-	-	-	NO
Vanadium	26	-	11, 14, 23	yes	26	98	-	NO
Zinc	47	315	52, 28, 37	no	-	780	-	NO

1. CCME Probable Effects Level

2. Where the number of samples analysed is less than 10, the EPC is the maximum concentration. Where the number of samples is ten or more, the EPC is calculated as the appropriate upper confidence limit

3. References for toxicity values are presented in Appendix 16

"-": no applicable value or not analysed

Table 27.5. Sediment Screening and Risk Assessment Table - Valley Drainage Ponds

Chemical	Screening			Risk Assessment				Comments
	Maximum (mg/kg)	Screening Value (mg/kg) ¹	Background Values (mg/kg)	Carried Forward as COC?	EPC (mg/kg) ²	Toxicity Value (mg/kg) ³	Hazard Quotient	Potential Unacceptable Risk?
Benzene	<0.03	na	-	no	-	46	-	NO
Toluene	<0.03	na	-	no	-	57	-	NO
Ethylbenzene	<0.03	na	-	no	-	68	-	NO
Xylene	<0.05	na	-	no	-	69	-	NO
TPH	360	na	-	yes	360	500	0.72	NO
PCBs	<0.05	0.277	-	no	-	na	-	NO
Aluminum	5700	-	6200, 8100, 11000	no	-	53000	-	NO
Antimony	<2	-	<2	no	-	4300	-	NO
Arsenic	<2	17	<2	no	-	620	-	NO
Barium	13	-	19, 24, 36	no	-	2500	-	NO
Beryllium	<2	-	<2	no	-	5.4	-	NO
Bismuth	<2	-	<2	no	-	-	-	NO
Boron	<5	-	<5	no	-	-	-	NO
Cadmium	<0.3	3.5	<0.3	no	-	83	-	NO
Chromium	14	90	16, 16, 22	no	-	4300	-	NO
Cobalt	4	-	4, 4, 5	no	-	460	-	NO
Copper	10	197	8, 8, 11	no	-	98	-	NO
Iron	14000	-	5000, 6300, 11000	no	-	-	-	NO
Lead	8.3	91.3	9.1, 10, 11	no	-	6400	-	NO
Lithium	4	-	5, 7, 8	no	-	-	-	NO
Manganese	170	-	52, 66, 100	no	-	-	-	NO
Mercury	<0.1	0.486	<0.1	no	-	150	-	NO
Molybdenum	<2	-	<2	no	-	7000	-	NO
Nickel	7	-	12, 11, 15	no	-	3000	-	NO
Rubidium	4	-	2, 4, 7	no	-	-	-	NO
Selenium	<2	-	<2	no	-	15	-	NO
Silver	<0.5	-	<0.5	no	-	-	-	NO
Strontium	8	-	24, 32, 32	no	-	-	-	NO
Thallium	<0.1	-	<0.1	no	-	-	-	NO
Tin	<2	-	<2	no	-	-	-	NO
Uranium	1.2	-	2.5, 2.2, 2.3	no	-	-	-	NO
Vanadium	25	-	11, 14, 23	yes	25	98	0.255102	NO
Zinc	14	315	52, 28, 37	no	-	780	-	NO

1. CCME Probable Effects Level

2. Where the number of samples analysed is less than 10, the EPC is the maximum concentration. Where the number of samples is ten or more, the EPC is calculated as the appropriate upper confidence limit

3. References for toxicity values are presented in Appendix 16

4. VOCs were not detected in sediment and are not included in this screening table
 "...": no applicable value or not analysed

Table 27.6. Sediment Screening and Risk Assessment Table - Reservoir

Chemical	Screening			Risk Assessment				Comments
	Maximum (mg/kg)	Screening Value (mg/kg) ¹	Background Values (mg/kg)	Carried Forward as COC?	EPC (mg/kg) ²	Toxicity Value (mg/kg) ³	Hazard Quotient	Potential Unacceptable Risk?
Benzene	-	na	-	-	-	46	-	Not tested
Toluene	-	na	-	-	-	57	-	Not tested
Ethylbenzene	-	na	-	-	-	68	-	Not tested
Xylene	-	na	-	-	-	69	-	Not tested
TPH	-	na	-	-	-	500	-	Not tested
PCBs	<0.05	0.277	-	-	-	na	-	PCBS were not detected
Aluminum	25000	-	6200, 8100, 11000	no	-	-	-	Aluminum is considered an element of low toxicity
Antimony	<2	-	<2	no	-	4300	-	Antimony was not detected
Arsenic	<2	17	<2	no	-	620	-	Arsenic was not detected
Barium	37	-	19, 24, 36	yes	37	2500	0.01	Barium was less than the toxicity value
Beryllium	<2	-	<2	no	-	5.4	-	Beryllium was not detected
Bismuth	<2	-	<2	no	-	-	-	Bismuth was not detected
Boron	<5	-	<5	no	-	-	-	Boron was not detected
Cadmium	0.6	3.5	<0.3	no	-	83	-	Cadmium was less than the screening guideline
Chromium	58	90	16, 16, 22	no	-	4300	-	Chromium was less than the screening guideline
Cobalt	16	-	4, 4, 5	yes	16	460	0.03	Cobalt was less than the toxicity value
Copper	38	197	8, 8, 11	no	-	98	-	Copper was less than the screening guideline
Iron	73000	-	5000, 6300, 11000	no	-	-	-	Iron is considered an essential element and non-toxic
Lead	17	91.3	9.1, 10, 11	no	-	6400	-	Lead is less than the screening guideline
Lithium	8	-	5, 7, 8	no	-	-	-	Concentrations of lithium are comparable to background
Manganese	500	-	52, 66, 100	no	-	-	-	Manganese is considered an essential element and non-toxic
Mercury	0.2	0.466	<0.1	no	-	150	-	Mercury was less than the screening guideline
Molybdenum	8	-	<2	yes	8	7000	0.001	Molybdenum was less than the toxicity value
Nickel	25	-	12, 11, 15	yes	25	300	0.08	Nickel is less than the toxicity value
Rubidium	8	-	2, 4, 7	no	-	-	-	Concentrations of rubidium are comparable to background
Selenium	3	-	<2	yes	3	15	0.20	Selenium was less than the toxicity value
Silver	<0.5	-	<0.5	no	-	-	-	Silver was not detected
Strontium	17	-	24, 32, 32	no	-	-	-	Strontium concentrations are less than the background range
Thallium	0.2	-	<0.1	no	-	-	-	Thallium concentrations are considered low (i.e. detected slightly above the RDL of 0.1 mg/kg)
Tin	<2	-	<2	no	-	-	-	Tin was not detected
Uranium	5.7	-	2.5, 2.2, 2.3	yes	5.7	100	0.06	Uranium was less than the toxicity value
Vanadium	95	-	11, 14, 23	yes	95	98	0.97	Vanadium is less than the toxicity value
Zinc	140	315	52, 28, 37	no	-	780	-	Zinc is less than the screening guideline

1. CCME Probable Effects Level

2. Where the number of samples analysed is less than 10, the EPC is the maximum concentration. Where the number of samples is ten or more, the EPC is calculated as the appropriate upper confidence limit

3. References for toxicity values are presented in Appendix 16

"-": no applicable value or not analysed

Table 27.7. Sediment Screening and Risk Assessment Table - Second Reservoir

Chemical	Screening			Risk Assessment				Comments
	Maximum (mg/kg)	Screening Value (mg/kg) ¹	Background Values (mg/kg)	Carried Forward as COC?	EPC (mg/kg) ²	Toxicity Value (mg/kg) ³	Hazard Quotient	Potential Unacceptable Risk?
Benzene	-	na	-	-	-	46	-	Not tested
Toluene	-	na	-	-	-	57	-	Not tested
Ethylbenzene	-	na	-	-	-	68	-	Not tested
Xylene	-	na	-	-	-	69	-	Not tested
TPH	-	na	-	-	-	500	-	Not tested
PCBs	<0.05	0.277	-	no	-	na	-	PCBs were not detected
Aluminum	26000	-	6200, 8100, 11000	no	-	-	-	Aluminum is considered an element of low toxicity
Antimony	<2	-	<2	no	-	4300	-	Antimony was not detected
Arsenic	<2	17	<2	no	-	620	-	Arsenic was not detected
Barium	26	-	19, 24, 36	no	-	2500	-	Barium concentrations are comparable to background
Beryllium	<2	-	<2	no	-	5.4	-	Beryllium was not detected
Bismuth	<2	-	<2	no	-	-	-	Bismuth was not detected
Boron	<5	-	<5	no	-	-	-	Boron was not detected
Cadmium	1.3	3.5	<0.3	no	-	83	-	Cadmium was less than the screening guideline
Chromium	27	90	16, 16, 22	no	-	4300	-	Chromium was less than the screening guideline
Cobalt	8	-	4, 4, 5	yes	8	480	0.02	Cobalt was less than the toxicity value
Copper	38	197	8, 8, 11	no	-	98	-	Copper was less than the screening guideline
Iron	12000	-	5000, 6300, 11000	no	-	-	-	Iron is considered an essential element and non-toxic
Lead	11	91.3	9.1, 10, 11	no	-	6400	-	Lead is less than the screening guideline
Lithium	6	-	5, 7, 8	no	-	-	-	Lithium concentrations are comparable to background
Manganese	180	-	52, 66, 100	no	-	-	-	Manganese is considered an essential element and non-toxic
Mercury	<0.1	0.486	<0.1	no	-	150	-	Mercury was not detected
Molybdenum	<2	-	<2	no	-	7000	-	Molybdenum was not detected
Nickel	21	-	12, 11, 15	yes	21	300	0.07	Nickel is less than the toxicity value
Rubidium	4	-	2, 4, 7	no	-	-	-	Rubidium concentrations are comparable to background
Selenium	3	-	<2	yes	3	15	0.20	Selenium was less than the toxicity value
Silver	<0.5	-	<0.5	no	-	-	-	Silver was not detected
Strontium	16	-	24, 32, 32	no	-	-	-	Strontium concentrations are less than the background range
Thallium	0.2	-	<0.1	no	-	-	-	Thallium concentrations are considered low (i.e., detected slightly above the RDL of 0.1 mg/kg)
Tin	<2	-	<2	no	-	-	-	Tin was not detected
Uranium	8.8	-	2.5, 2.2, 2.3	yes	8.8	100	0.09	Uranium is less than the toxicity value
Vanadium	56	-	11, 14, 23	yes	56	98	0.57	Vanadium is less than the toxicity value
Zinc	160	315	52, 28, 37	no	-	780	-	Zinc is less than the screening guideline

1. CCME Probable Effects Level

2. Where the number of samples analysed is less than 10, the EPC is the maximum concentration. Where the number of samples is ten or more, the EPC is calculated as the appropriate upper confidence limit

3. References for toxicity values are presented in Appendix 16

"na" = no applicable value or not analysed

Table 27.8. Sediment Screening and Risk Assessment Table - Big Lake

Chemical	Screening			Risk Assessment				Comments
	Maximum (mg/kg)	Screening Value (mg/kg) ¹	Background Values (mg/kg)	Carried Forward as COC?	EPC (mg/kg) ²	Toxicity Value (mg/kg) ³	Hazard Quotient	Potential Unacceptable Risk?
Benzene	-	na	-	-	-	46	-	Not tested
Toluene	-	na	-	-	-	57	-	Not tested
Ethylbenzene	-	na	-	-	-	68	-	Not tested
Xylene	-	na	-	-	-	69	-	Not tested
TPH	-	na	-	-	-	500	-	Not tested
PCBs	<0.05	0.277	-	-	-	na	-	PCBS were not detected
Aluminum	18000	-	6200, 8100, 11000	no	-	-	-	Aluminum is considered an element of low toxicity
Antimony	<2	-	<2	no	-	4300	-	Antimony was not detected
Arsenic	<2	17	<2	no	-	620	-	Arsenic was not detected
Barium	53	-	19, 24, 36	yes	53	2500	0.02	Barium was less than the toxicity value
Beryllium	<2	-	<2	no	-	5.4	-	Beryllium was not detected
Bismuth	<2	-	<2	no	-	-	-	Bismuth was not detected
Boron	5	-	<5	no	-	-	-	Boron concentrations are considered low (i.e., detected at the RDL of 5 mg/kg)
Cadmium	<0.3	3.5	<0.3	no	-	83	-	Cadmium was not detected
Chromium	39	90	16, 16, 22	no	-	4300	-	Chromium was less than the screening guideline
Cobalt	8	-	4, 4, 5	yes	8	460	0.02	Cobalt was less than the toxicity value
Copper	25	197	8, 8, 11	no	-	98	-	Copper was less than the screening guideline
Iron	13000	-	5000, 6300, 11000	no	-	-	-	Iron is considered an essential element and non-toxic
Lead	3.8	91.3	9.1, 10, 11	no	-	6400	-	Lead is less than the screening guideline
Lithium	9	-	5, 7, 8	no	-	-	-	Lithium concentrations are comparable to background
Manganese	100	-	52, 66, 100	no	-	-	-	Manganese is considered an essential element and
Mercury	<0.1	0.486	<0.1	no	-	150	-	Mercury was not detected
Molybdenum	<2	-	<2	no	-	7000	-	Molybdenum was not detected
Nickel	26	-	12, 11, 15	yes	26	300	0.09	Nickel is less than the toxicity value
Rubidium	7	-	2, 4, 7	no	-	-	-	Rubidium concentrations are comparable to background
Selenium	<2	-	<2	no	-	15	-	Selenium was not detected
Silver	<0.5	-	<0.5	no	-	-	-	Silver was not detected
Strontium	23	-	24, 32, 32	no	-	-	-	Strontium concentrations are comparable to the background range
Thallium	0.1	-	<0.1	no	-	-	-	Thallium concentrations are considered low (i.e., detected at the RDL of 0.1 mg/kg)
Tin	<2	-	<2	no	-	-	-	Tin was not detected
Uranium	2.7	-	2.5, 2.2, 2.3	no	-	-	-	Uranium concentrations are comparable to the background range
Vanadium	33	-	11, 14, 23	yes	33	98	0.34	Vanadium is less than the toxicity value
Zinc	51	315	52, 28, 37	no	-	760	-	Zinc is less than the screening guideline

1. CCME Probable Effects Level

2. Where the number of samples analysed is less than 10, the EPC is the maximum concentration. Where the number of samples is ten or more, the EPC is calculated as the appropriate upper confidence limit

3. References for toxicity values are presented in Appendix 16

"-" = no applicable value or not analysed

Table 27 9. Sediment Screening and Risk Assessment Table - Wharf Area

Chemical	Screening		Carried forward as COC?	Risk Assessment				Comments
	Maximum (mg/kg)	Screening Value (mg/kg) ¹	Background Values	EPC (mg/kg) ²	Toxicity Value (mg/kg) ³	Hazard Quotient	Potential Unacceptable Risk?	
Benzene	<0.03	-	-	-	6.5	-	NO	Benzene was not detected
Toluene	<0.03	-	-	-	8.1	-	NO	Toluene was not detected
Ethylbenzene	<0.03	-	-	-	9.7	-	NO	Ethylbenzene was not detected
Xylene	<0.05	-	-	-	9.8	-	NO	Xylene was not detected
TPH	570	-	-	570	500	1.14	YES	TPH exceeded the toxicity value
PCBs	0.44	0.189	-	0.44	-	-	YES	PCBs exceeded the screening guideline
Aluminium	10000	-	6200, 8100, 11000	-	-	-	NO	Aluminium is considered an element of low toxicity
Antimony	<2	-	<2	-	4300	-	NO	Antimony was not detected
Arsenic	3	41.6	<2	-	620	-	NO	Arsenic was less than the screening guideline
Barium	650	-	19, 24, 36	650	2300	0.28	NO	Barium is less than the toxicity value
Beryllium	<2	-	<2	-	-	-	NO	Beryllium was not detected
Bismuth	<2	-	<2	-	-	-	NO	Bismuth was not detected
Boron	10	-	<5	-	-	-	NO	Boron is considered an element of low toxicity
Cadmium	<0.3	4.2	<0.3	-	230	-	NO	Cadmium was not detected
Chromium	19	160	16, 16, 22	-	4300	-	NO	Chromium was less than the screening guideline
Cobalt	6	-	4, 4, 5	-	330	-	NO	Cobalt is comparable to background
Copper	44	108	8, 8, 11	-	98	-	NO	Copper was less than the screening guideline
Iron	12000	-	5000, 6300, 11000	-	-	-	NO	Iron is considered an element of low toxicity
Lead	40	112	9.1, 10, 11	-	6400	-	NO	Lead is less than the screening guideline
Lithium	10	-	5, 7, 8	-	-	-	NO	No toxicity information exists for lithium. Lithium is often found associated with sea salt.
Manganese	150	-	52, 66, 100	-	2900	-	NO	Manganese is considered an element of low toxicity
Mercury	<0.1	0.7	<0.1	-	30	-	NO	Mercury was not detected
Molybdenum	<2	-	<2	-	7000	-	NO	Molybdenum was not detected
Nickel	15	-	12, 11, 15	17	300	0.06	NO	Nickel is less than the toxicity value
Rubidium	9	-	2, 4, 7	-	-	-	NO	No toxicity information exists for rubidium. Rubidium is often found associated with sea salt.
Selenium	<2	-	<2	-	14	-	NO	Selenium was not detected
Silver	<0.5	-	<0.5	-	5.5	-	NO	Silver was not detected
Strontium	41	-	24, 32, 32	-	-	-	NO	No toxicity information exists for strontium. Strontium is often found associated with sea salt.
Thallium	0.1	-	<0.1	-	1	-	NO	Thallium concentrations are considered low (i.e., detected at the RDL of 0.1 mg/kg)
Tin	4	-	<2	-	-	-	NO	Tin was detected in one sample of eight analysed
Uranium	0.6	-	2.5, 2.2, 2.3	-	-	-	NO	Uranium concentrations are less than the background range
Vanadium	25	-	11, 14, 23	28	98	0.29	NO	Vanadium is less than the toxicity value
Zinc	68	271	52, 28, 37	-	780	-	NO	Zinc is less than the screening value

1. CCME Probable Effects Level

2. Where the number of samples analysed is less than 10, the EPC is the maximum concentration. Where the number of samples is ten or more, the EPC is calculated as the appropriate upper confidence limit

3. References for toxicity values are presented in Appendix 16

"-": no applicable value or not analysed

Table 27.10. Surface Water Screening and Risk Assessment Table - Subdivision Stream

Chemical	Screening			Risk Assessment				Comments
	Maximum (mg/L)	Screening Value (mg/L) ¹	Carried Forward as COC?	EPC (mg/L) ²	Toxicity Value (mg/L) ³	Hazard Quotient	Potential Unacceptable Risk?	
Benzene	<0.001	0.37	no	-	5.3	-	no	Benzene was not detected
Toluene	0.005	0.002	yes	0.005	1.8	0.003	no	Toluene is less than the toxicity value
Ethylbenzene	<0.001	0.09	no	-	0.87	-	no	Ethylbenzene was not detected
Xylene	0.005	na	yes	0.005	0.7	0.01	no	Xylene is less than the toxicity value
TPH	<0.1	-	no	-	1	-	no	-
PCBs	<0.00005	-	no	-	0.00000012	-	no	PCBs were not detected
Aluminum	131	5-100	no	-	-	-	no	Aluminum is generally not toxic at pH greater than 6
Antimony	<0.002	-	no	-	80	-	no	pH was not measured in the stream but the pH at other areas of the was greater than 6
Arsenic	<0.002	5	no	-	150	-	no	Antimony was not detected
Barium	5.2	-	yes	5.2	220	0.02	no	Arsenic was not detected
Beryllium	<0.002	-	no	-	3.6	-	no	Barium was less than the toxicity value
Bismuth	<0.002	-	no	-	-	-	no	Beryllium was not detected
Boron	5.1	-	no	-	-	-	no	Bismuth was not detected
Cadmium	0.039	0.0017	yes	0.039	1.7	0.02	no	There is limited toxicity available for boron. Concentrations on the site are unlikely to be related to site activities.
Chromium	1	8.9	no	-	74	-	no	Cadmium was less than the toxicity value
Cobalt	<0.0004	-	no	-	2.8	-	no	Chromium was less than the toxicity value
Copper	6.2	2.4	yes	6.2	9	0.69	no	Cobalt was not detected
Iron	469	300	no	-	-	-	no	Copper was less than the toxicity value
Lead	0.84	1-7	no	-	11	-	no	Iron is considered an element of low toxicity
Manganese	7.8	-	no	-	-	-	no	Lead is less than the screening value
Molybdenum	<0.002	73	no	-	290	-	no	Manganese is considered an element of low toxicity
Nickel	<0.002	25-150	no	-	52	-	no	Molybdenum was not detected
Selenium	<0.001	1	no	-	5.3	-	no	Nickel was not detected
Silver	<0.0001	0.1	no	-	-	-	no	Selenium was not detected
Strontium	20.8	-	no	-	-	-	no	Silver was not detected
Thallium	<0.0001	0.8	no	-	-	-	no	Strontium concentrations in sediment were comparable to background. Strontium in surface water is not considered a concern
Tin	<0.002	-	no	-	-	-	no	Thallium was not detected
Titanium	3.1	-	no	-	-	-	no	Tin was not detected
Uranium	0.23	-	yes	0.23	5	0.046	no	Titanium is not soluble and not toxic
Vanadium	<0.002	-	no	-	12	-	no	Uranium is less than the toxicity value
Zinc	35.8	30	yes	30	120	0.25	no	Vanadium was not detected
							no	Zinc is less than the toxicity value

1. CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life

2. Where the number of samples analysed is less than 10, the EPC is the maximum concentration. Where the number of samples is ten or more, the EPC is calculated as the appropriate upper confidence limit

3. References for toxicity values are presented in Appendix 16

Table 27.11. Surface Water Screening and Risk Assessment Table - Old Dump Pond

Chemical	Screening			Risk Assessment				Comments
	Maximum (mg/L)	Screening Value (mg/L) ¹	Carried Forward as COC?	EPC (mg/L) ²	Toxicity Value (mg/L) ³	Hazard Quotient	Potential Unacceptable Risk?	
Benzene	-	0.37	-	-	5.3	-	-	Not tested
Toluene	-	0.002	-	-	1.8	-	-	Not tested
Ethylbenzene	-	0.09	-	-	0.87	-	-	Not tested
Xylene	-	na	-	-	0.7	-	-	Not tested
TPH	-	-	-	-	1	-	-	Not tested
PCBs	-	-	-	-	0.00000012	-	-	Not tested
Aluminum	176	5-100	no	-	-	-	no	Aluminum is generally not toxic at pH greater than 6 pH at Old Dump Pond ranged from 7 to 7.2
Antimony	<0.002	-	no	-	80	-	no	Antimony was not detected
Arsenic	<0.002	5	no	-	150	-	no	Arsenic was not detected
Barium	<0.005	-	no	-	220	-	no	Barium was not detected
Beryllium	<0.002	-	no	-	3.6	-	no	Beryllium was not detected
Bismuth	<0.002	-	no	-	-	-	no	Bismuth was not detected
Boron	6.6	-	no	-	-	-	no	There is limited toxicity available for boron. Concentrations on the site are unlikely to be related to site activities.
Cadmium	0.027	0.0017	yes	0.027	1.7	0.02	no	Cadmium was less than the toxicity value
Chromium	<0.001	8.9	no	-	74	-	no	Chromium was not detected
Cobalt	<0.0004	-	no	-	2.8	-	no	Cobalt was not detected
Copper	3	2.4	yes	3	9	0.33	no	Copper was less than the toxicity value
Iron	804	300	no	-	-	-	no	Iron is considered an element of low toxicity
Lead	1.38	1-7	yes	1.38	11	0.13	no	Lead is less than the toxicity value
Manganese	3.9	-	no	-	-	-	no	Manganese is considered an element of low toxicity
Molybdenum	<0.002	73	no	-	290	-	no	Molybdenum was not detected
Nickel	<0.002	25-150	no	-	52	-	no	Nickel was not detected
Selenium	<0.001	1	no	-	5.3	-	no	Selenium was not detected
Silver	<0.0001	0.1	no	-	-	-	no	Silver was not detected
Strontium	16	-	no	-	-	-	no	Strontium concentrations in sediment were comparable to background. Strontium in surface water is not considered a concern
Thallium	<0.0001	0.8	no	-	-	-	no	Thallium was not detected
Tin	<0.002	-	no	-	-	-	no	Tin was not detected
Titanium	3.5	-	no	-	-	-	no	Titanium is not soluble and not toxic
Uranium	0.23	-	yes	0.23	5	0.046	no	Uranium is less than the toxicity value
Vanadium	<0.002	-	no	-	12	-	no	Vanadium was not detected
Zinc	11.1	30	no	-	120	-	no	Zinc is less than the toxicity value

1. CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life

2. Where the number of samples analysed is less than 10, the EPC is the maximum concentration. Where the number of samples is ten or more, the EPC is calculated as the appropriate upper confidence limit

3. References for toxicity values are presented in Appendix 16

Table 27.12. Surface Water and Risk Assessment Screening Table - Reservoir

Chemical	Screening			Risk Assessment				Comments
	Maximum (mg/L)	Screening Value (mg/L) ¹	Carried Forward as COC?	EPC (mg/L) ²	Toxicity Value (mg/L) ³	Hazard Quotient	Potential Unacceptable Risk?	
Benzene	-	0.37	-	-	5.3	-	-	Not tested
Toluene	-	0.002	-	-	1.8	-	-	Not tested
Ethylbenzene	-	0.09	-	-	0.87	-	-	Not tested
Xylene	-	na	-	-	0.7	-	-	Not tested
TPH	-	-	-	-	1	-	-	Not tested
PCBs	<0.00005	-	-	-	0.00000012	-	-	PCBs were not detected
Aluminum	86	5-100	no	-	-	-	no	Aluminum is generally not toxic at pH greater than 6. the pH in the reservoir ranged from 6.3 to 6.4.
Antimony	<0.002	-	no	-	80	-	no	Antimony was not detected
Arsenic	<0.002	5	no	-	150	-	no	Arsenic was not detected
Barium	<0.005	-	no	-	220	-	no	Barium was not detected
Beryllium	<0.002	-	no	-	3.6	-	no	Beryllium was not detected
Bismuth	<0.002	-	no	-	-	-	no	Bismuth was not detected
Boron	<0.005	-	no	-	-	-	no	Boron was not detected
Cadmium	<0.000017	0.0017	no	-	1.7	-	no	Cadmium was not detected
Chromium	<0.001	8.9	no	-	74	-	no	Chromium was not detected
Cobalt	<0.0004	-	no	-	2.8	-	no	Cobalt was not detected
Copper	<0.002	2.4	no	-	9	-	no	Copper was not detected
Iron	93	300	no	-	-	-	no	Iron was less than the screening guideline
Lead	<0.0005	1-7	no	-	11	-	no	Lead was not detected
Manganese	7.3	-	no	-	-	-	no	Manganese is considered an element of low toxicity
Molybdenum	<0.002	73	no	no	290	-	no	Molybdenum was not detected
Nickel	<0.002	25-150	no	no	52	-	no	Nickel was not detected
Selenium	<0.001	1	no	no	5.3	-	no	Selenium was not detected
Silver	<0.0001	0.1	no	no	-	-	no	Silver was not detected
Strontium	<0.005	-	no	no	-	-	no	Strontium was not detected
Thallium	<0.0001	0.8	no	no	-	-	no	Thallium was not detected
Tin	<0.002	-	no	no	-	-	no	Tin was not detected
Titanium	<0.002	-	no	no	-	-	no	Titanium was not detected
Uranium	<0.0001	-	no	no	-	-	no	Uranium was not detected
Vanadium	<0.002	-	no	no	12	-	no	Vanadium was not detected
Zinc	5.1	30	no	no	120	-	no	Zinc is less than the screening guideline

1. CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life

2. Where the number of samples analysed is less than 10, the EPC is the maximum concentration. Where the number of samples is ten or more, the EPC is calculated as the appropriate upper confidence limit

3. References for toxicity values are presented in Appendix 14

Table 27.13. Surface Water Screening and Risk Assessment Table - Second Reservoir

Chemical	Screening			Risk Assessment				Comments
	Maximum (mg/L)	Screening Value (mg/L) ¹	Carried Forward as COC?	EPC (mg/L) ²	Toxicity Value (mg/L) ³	Hazard Quotient	Potential Unacceptable Risk?	
Benzene	-	0.37	-	-	5.3	-	-	Not tested
Toluene	-	0.002	-	-	1.8	-	-	Not tested
Ethylbenzene	-	0.09	-	-	0.87	-	-	Not tested
Xylene	-	na	-	-	0.7	-	-	Not tested
TPH	-	-	-	-	1	-	-	Not tested
PCBs	<0.00005	-	no	-	0.00000012	-	-	PCBs were not detected
Aluminum	48.7	5-100	no	-	-	-	no	Aluminum is generally not toxic at pH greater than 6. The pH in the second reservoir was 6.4
Antimony	<0.002	-	no	-	80	-	no	Antimony was not detected
Arsenic	<0.002	5	no	-	150	-	no	Arsenic was not detected
Barium	<0.005	-	no	-	220	-	no	Barium was not detected
Beryllium	<0.002	-	no	-	3.6	-	no	Beryllium was not detected
Bismuth	<0.002	-	no	-	-	-	no	Bismuth was not detected
Boron	<0.005	-	no	-	-	-	no	Boron was not detected
Cadmium	<0.000017	0.0017	no	-	1.7	-	no	Cadmium was not detected
Chromium	<0.001	8.9	no	-	74	-	no	Chromium was not detected
Cobalt	<0.0004	-	no	-	2.8	-	no	Cobalt was not detected
Copper	<0.002	2-4	no	-	9	-	no	Copper was not detected
Iron	<0.1	300	no	-	0	-	no	Iron was not detected
Lead	0.76	1-7	no	-	11	-	no	Lead is less than the screening guideline
Manganese	3.3	-	no	-	-	-	no	Manganese is considered an element of low tox
Molybdenum	<0.002	73	no	-	290	-	no	Molybdenum was not detected
Nickel	<0.002	25-150	no	-	52	-	no	Nickel was not detected
Selenium	<0.001	1	no	-	5.3	-	no	Selenium was not detected
Silver	<0.0001	0.1	no	-	-	-	no	Silver was not detected
Strontium	<0.005	-	no	-	-	-	no	Strontium was not detected
Thallium	<0.0001	0.8	no	-	-	-	no	Thallium was not detected
Tin	<0.002	-	no	-	-	-	no	Tin was not detected
Titanium	<0.002	-	no	-	-	-	no	Titanium was not detected
Uranium	<0.0001	-	no	-	-	-	no	Uranium was not detected
Vanadium	<0.002	-	no	-	12	-	no	Vanadium was not detected
Zinc	<0.005	30	no	-	120	-	no	Zinc was not detected

1. CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life

2. Where the number of samples analysed is less than 10, the EPC is the maximum concentration. Where the number of samples is ten or more, the EPC is calculated as the appropriate upper confidence limit

3. References for toxicity values are presented in Appendix 16

Table 27.14. Surface Water Screening and Risk Assessment Table - Big Lake

Chemical	Screening			Risk Assessment				Comments
	Maximum (mg/L)	Screening Value (mg/L) ¹	Carried Forward as COC?	EPC (mg/L) ²	Toxicity Value (mg/L) ³	Hazard Quotient	Potential Unacceptable Risk?	
Benzene	-	0.37	-	-	5.3	-	-	Not tested
Toluene	-	0.002	-	-	1.8	-	-	Not tested
Ethylbenzene	-	0.09	-	-	0.87	-	-	Not tested
Xylene	-	na	-	-	0.7	-	-	Not tested
TPH	-	-	-	-	1	-	-	Not tested
PCBs	<0.00005	-	-	-	0.00000012	-	-	PCBs were not detected
Aluminum	123	5-100	no	-	-	-	NO	Aluminum is generally not toxic at pH greater than 6. The pH in Big Lake was 6.7
Antimony	<0.002	-	no	-	80	-	NO	Antimony was not detected
Arsenic	<0.002	5	no	-	150	-	NO	Arsenic was not detected
Barium	<0.005	-	no	-	220	-	NO	Barium was not detected
Beryllium	<0.002	-	no	-	3.6	-	NO	Beryllium was not detected
Bismuth	<0.002	-	no	-	-	-	NO	Bismuth was not detected
Boron	<0.005	-	no	-	-	-	NO	Boron was not detected
Cadmium	<0.000017	0.0017	no	-	1.7	-	NO	Cadmium was not detected
Chromium	1.1	8.9	no	-	74	-	NO	Chromium was less than the screening guideline
Cobalt	<0.0004	-	no	-	2.8	-	NO	Cobalt was not detected
Copper	<0.002	2-4	no	-	9	-	NO	Copper was not detected
Iron	55	300	no	-	-	-	NO	Iron was less than the screening guideline
Lead	1.19	1-7	yes	1.19	11	0.11	NO	Lead is less than the toxicity value
Manganese	4	-	no	-	-	-	NO	Manganese is considered an element of low toxicity
Molybdenum	<0.002	73	no	-	290	-	NO	Molybdenum was not detected
Nickel	<0.002	25-150	no	-	52	-	NO	Nickel was not detected
Selenium	<0.001	1	no	-	5.3	-	NO	Selenium was not detected
Silver	<0.0001	0.1	no	-	-	-	NO	Silver was not detected
Strontium	5.3	-	no	-	-	-	NO	Strontium concentrations in sediment were comparable to background. Strontium in surface water is not considered a concern
Thallium	<0.0001	0.8	no	-	-	-	NO	Thallium was not detected
Tin	<0.002	-	no	-	-	-	NO	Tin was not detected
Titanium	2.3	-	no	-	-	-	NO	Titanium is not soluble and therefore is not toxic
Uranium	<0.0001	-	no	-	-	-	NO	Uranium was not detected
Vanadium	<0.002	-	no	-	12	-	NO	Vanadium was not detected
Zinc	10.7	30	no	-	120	-	NO	Zinc is less than the toxicity value

1. CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life
2. Where the number of samples analysed is less than 10, the EPC is the maximum concentration. Where the number of samples is ten or more, the EPC is calculated as the appropriate upper confidence limit
3. References for toxicity values are presented in Appendix 16

References for Marine Toxicity Values

Constituent	Log Kow (L/kg)	Molecular Weight (g/mole)	Class Correction Factor (unitless)	Screening Benchmark (mg/L)	Screening Benchmark (mg/L)	References for Benchmark	Screening Benchmark	Reference for Benchmark
Benzene	2.13	78.06	1	26.75181499	5.26E+00	Di Toro et al., 2000	6.53E+00	Di Toro et al., 2000
Ethylbenzene	3.1	106.168	1	4.408271573	8.66E-01	Di Toro et al., 2000	9.67E+00	Di Toro et al., 2000
Toluene	2.7	92.141	1	9.135401235	1.79E+00	Di Toro et al., 2000	8.10E+00	Di Toro et al., 2000
Xylenes	3.2	106.17	1	3.54630858	6.97E-01	Di Toro et al., 2000	9.76E+00	Di Toro et al., 2000
Aroclor 1254	6.5	321.98	NA	0.0001527	3.00E-05	US EPA 2002		
Antimony	NA	NA	NA		1.10E+00	van Vlaardingen et al. 2005	4.32E+03	Van Vlaardingen et al. 2005
Arsenic	NA	NA	NA		3.60E-02	US EPA 2002	6.19E+02	Verbruggen et al. 2001
Barium	NA	NA	NA		1.50E+00	van Vlaardingen et al. 2005	2.29E+03	Van Vlaardingen et al. 2005
Beryllium	NA	NA	NA		4.90E-03	van Vlaardingen et al. 2005		
Boron	NA	NA	NA		5.65E+00	van de Plassche et al. 1999		van de Plassche et al. 1999
Cadmium	NA	NA	NA		8.80E-03	US EPA 2002	2.31E+02	Verbruggen et al. 2001
Chromium (Total)	NA	NA	NA		2.20E-02	Verbruggen et al. 2001	4.30E+03	Verbruggen et al. 2001
Chromium VI	NA	NA	NA		5.00E-02	US EPA 2002		
Cobalt	NA	NA	NA		7.50E-02	van Vlaardingen et al. 2005	3.29E+02	Verbruggen et al. 2001
Copper	NA	NA	NA		3.10E-03	US EPA 2002	9.80E+01	Verbruggen et al. 2001
Lead	NA	NA	NA		8.10E-03	US EPA 2002	6.39E+03	Verbruggen et al. 2001
Manganese	NA	NA	NA		1.25E+00	Doyle et al. 2003	2.92E+03	Doyle et al. 2003
Mercury - Inorganic	NA	NA	NA		9.40E-04	US EPA 2002	3.03E+01	Verbruggen et al. 2001
Molybdenum	NA	NA	NA		5.40E+00	van Vlaardingen et al. 2005	7.00E+03	Verbruggen et al. 2001
Nickel	NA	NA	NA		8.20E-03	US EPA 2002	2.95E+02	Verbruggen et al. 2001
Selenium	NA	NA	NA		7.10E-02	US EPA 2002	1.42E+01	Van Vlaardingen et al. 2005
Silver	NA	NA	NA		1.20E-03	van de Plassche et al. 1999	5.50E+00	van de Plassche et al. 1999
Thallium	NA	NA	NA		6.50E-04	van Vlaardingen et al. 2005	1.00E+00	Van Vlaardingen et al. 2005
Tin	NA	NA	NA		4.00E-02	van Vlaardingen et al. 2005	1.48E+04	Van Vlaardingen et al. 2005
Vanadium	NA	NA	NA		9.80E-03	van Vlaardingen et al. 2005	9.80E+01	Van Vlaardingen et al. 2005
Zinc	NA	NA	NA		8.10E-02	US EPA 2002	7.80E+02	Verbruggen et al. 2001

Notes

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References for Freshwater Toxicity Values

Constituent	Log Kow (L/kg)	Molecular Weight (g/mole)	Narcotic Chem. Class Correction Factor (unitless)	Freshwater Acute Screening Benchmark (mg/L)	Freshwater Chronic Screening Benchmark (mg/L)	Effect Reported	Reference for Benchmark	Freshwater Sediment Screening Benchmark (mg/kg)	Reference for Benchmark
Benzene	2.13	78.06	1	2.7E+01	5.3E+00	Target Lipid Model Narcosis	Di Toro et al., 2000	4.6E+01	Di Toro et al., 2000
Ethylbenzene	3.1	106.168	1	4.4E+00	8.7E-01	Target Lipid Model Narcosis	Di Toro et al., 2000	6.8E+01	Di Toro et al., 2000
Toluene	2.7	92.141	1	9.1E+00	1.8E+00	Target Lipid Model Narcosis	Di Toro et al., 2000	5.7E+01	Di Toro et al., 2000
Xylenes	3.2	106.17	1	3.5E+00	7.0E-01	Target Lipid Model Narcosis	Di Toro et al., 2000	6.9E+01	Di Toro et al., 2000
Aluminum	NA	NA	NA	NA	7.5E-01	above 6.5.	USEPA (2002)	53000	Ohio EPA (2003)
Antimony	NA	NA	NA	NA	8.0E-02	Generic ecological screening level for water	USEPA Region 5 (2003)	4303	vanVlaardingen et al. 2005
Arsenic	NA	NA	NA	NA	1.5E-01	Continuous Chronic Criterion	USEPA (2002)	619	Verbuggen et al. 2001
Barium	NA	NA	NA	NA	2.2E-01	Toxicity data and statistical extrapolation	Crommentuijn et al. (1997)	2455	vanVlaardingen et al. 2005
Beryllium	NA	NA	NA	NA	3.6E-03	Generic ecological screening level for water	USEPA Region 5 (2003)	5.4	vanVlaardingen et al. 2005
Boron	NA	NA	NA	NA					
Cadmium	NA	NA	NA	NA	1.7E-03	MATC for 3 generations of brook trout	Benoit et al. 1976	82.8	Verbuggen et al. 2001
Chromium (Total)	NA	NA	NA	NA	7.4E-02	Continuous Chronic Criterion	USEPA (2002)	4300	Verbuggen et al. 2001
Chromium VI	NA	NA	NA	NA	1.1E-02	Continuous Chronic Criterion	USEPA (2002)	4004	Besser et al. 2004
Cobalt	NA	NA	NA	NA	2.8E-03	Toxicity data and statistical extrapolation	Crommentuijn et al. (1997)	459	vanVlaardingen et al. 2005
Copper	NA	NA	NA	NA	9.0E-03	Continuous Chronic Criterion	USEPA (2002)	98	Verbuggen et al. 2001
Lead	NA	NA	NA	NA	1.1E-02	extrapolation	Crommentuijn et al. (1997)	6385	Verbuggen et al. 2001
Manganese	NA	NA	NA	NA	1.0E+00	Survival and growth	WHO 2004	Not Assessed	
Mercury - Inorganic	NA	NA	NA	NA	7.7E-04	Continuous Chronic Criterion	USEPA (2002)	150.3	Verbuggen et al. 2001
Methyl Mercury	NA	NA	NA	NA	2.0E-05	extrapolation	Crommentuijn et al. (1997)	1.4	(1997)
Molybdenum	NA	NA	NA	NA	2.9E-01	extrapolation	Crommentuijn et al. (1997)	7000.5	2005
Nickel	NA	NA	NA	NA	5.2E-02	Continuous Chronic Criterion	USEPA (2002)	295	Verbuggen et al. 2001
Selenium	NA	NA	NA	NA	5.3E-03	extrapolation	Crommentuijn et al. (1997)	14.7	2005
Vanadium	NA	NA	NA	NA	1.2E-02	level for water	USEPA Region 5 (2003)	98	2005
Zinc	NA	NA	NA	NA	1.2E-01	Continuous Chronic Criterion	USEPA (2002)	780	Verbuggen et al. 2001

Notes

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TPH in Freshwater Sediment:

Currently there are no Canadian guidelines for TPH concentrations in sediment although there is an Ontario guideline (OME 1993) that states that the total oil and grease concentration of sediments to be used as lake fill material should not exceed 0.15% (i.e., 1,500 mg/kg). Empirical studies appear to converge at lower TPH concentrations. Rozas et al. (2000) found few statistically significant negative relationships between hydrocarbon concentration and abundance of fish or benthic infauna in salt marshes of Galveston Bay. Most of the sites investigated in that study (Rozas et al. 2000) had TPH concentrations of less than 500 mg/kg, which the authors felt were too low to be toxic. Another study by Pettigrove and Hoffman (2005) found that threshold effects of high molecular weight hydrocarbons in urban freshwater bodies began at a TPH concentration of 860 mg/kg whereas significant reductions in the total numbers of taxa and abundance were the result of higher TPH concentrations (ranging from 1,858 to 14,266 mg/kg). In the same study, Pettigrove and Hoffman proposed a TPH concentration of 840 mg/kg as an interim guideline value to indicate possible ecological impairment. This proposed guideline was further validated by Anson et al. (2008) through testing a broader range of hydrocarbon products under similar conditions. Based upon these results, it is believed that significant ecosystem-level effects on benthic invertebrates and fish are not likely at TPH concentrations in sediment of less than 500 mg/kg.

References

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Terrestrial Screening Tables

Table 27.15 Ecological Screening for Chemicals in Soil - Area 1

Constituent	Maximum Concentration in Surface Soil (mg/kg)	Selected Soil Quality Guidelines - Residential/ Parkland Site (mg/kg)	Max > Guideline (or was a substance with no guideline detected)?	Background Soil Concentration (mg/kg)	MAX > Background?	Is element major mineral forming element or of low inherent toxicity?	Carried forward in ERA?
BTEX/PH							
Benzene	<0.1	31 ¹	NO	-	-	-	NO
Toluene	<0.1	75 ¹	NO	-	-	-	NO
Ethylbenzene	<0.1	55 ¹	NO	-	-	-	NO
Xylenes	0.2	95 ¹	NO	-	-	-	NO
C6-C10	89	210 (F1) ²	NO	-	-	-	NO
C10-C21	93,000	150 (F2) ²	YES	-	-	NO	YES
C21-C32	1,300	300 (F3) ²	YES	-	-	NO	YES
PAHs							
1-Methylnaphthalene	<0.1	N/A	NO	-	-	-	NO
2-Methylnaphthalene	<0.1	N/A	NO	-	-	-	
Acenaphthene	<0.005	N/A	NO	-	-	-	
Acenaphthylene	<0.1	N/A	NO	-	-	-	
Anthracene	<0.005	2.5 ¹	NO	-	-	-	
Benz[a]anthracene	<0.005	40 ³	NO	-	-	-	
Benz[a]pyrene	<0.005	20 ¹	NO	-	-	-	
Benz[b]fluoranthene	<0.005	N/A	NO	-	-	-	
Benz[k]fluoranthene	<0.005	40 ³	NO	-	-	-	
Benz[ghi]perylene	<0.005	40 ³	NO	-	-	-	
Chrysene	<0.005	40 ³	NO	-	-	-	
Dibenz[a,h]anthracene	<0.005	N/A	NO	-	-	-	
Fluoranthene	<0.005	50 ¹	NO	-	-	-	
Fluorene	<0.005	N/A	NO	-	-	-	
Indeno[1,2,3-cd]pyrene	<0.005	40 ³	NO	-	-	-	
Naphthalene	<0.1	40 ³	NO	-	-	-	
Perylene	<0.005	N/A	NO	-	-	-	
Phenanthrene	<0.005	40 ³	NO	-	-	-	
Pyrene	<0.005	N/A	NO	-	-	-	
Other							
PCBs	100	1.3 ¹	YES	-	-	NO	YES

Notes:

- CCME Soil Quality Guidelines for the Protection of Environmental and Human Health - Residential/Parkland land use, non-potable groundwater (if applicable), lowest of available ecological guidelines (note: where no
- CCME CWS Tier 1 Levels - Ecological Soil Contact - Residential land use, coarse-grained surface soils [F1 (>C6-C10), F2 (>C10-C16), F3 (>C16-C34)]
- Ontario Ministry of Environment Soil Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Residential/Parkland/Institutional Land Use, lowest of available ecotoxicity criteria
- Alberta Tier 1 Surface Soil Guidelines for Residential Land Use - Ecological guidelines
- Aluminum, iron and manganese are considered major mineral forming elements of low inherent toxicity and were not carried forward. These elements are typically associated with seawater spray and could be expected to be present at the site due to its proximity to the ocean, and not as a result of historical site activities
- There are no applicable guidelines for boron, lithium, rubidium and strontium. These elements are typically associated with seawater spray and could be expected to be present at the site due to its proximity to the ocean, and not as a result of historical site activities
- ND = not detected above laboratory detection limits
- N/A = no ecological-based guideline available
- = not applicable

Table 27.15 Ecological Screening for Chemicals in Soil - Area 1

Constituent	Maximum Concentration in Surface Soil (mg/kg)	Selected Soil Quality Guidelines - Residential/ Parkland Site (mg/kg)	Max > Guideline (or was a substance with no guideline detected)?	Background Soil Concentration (mg/kg)	MAX > Background?	Is element major mineral forming element or of low inherent toxicity?	Carried forward in ERA?
Inorganics							
Aluminium	11,000	N/A	YES	1,400 - 7,300	YES	YES	NO ⁵
Antimony	5	20 ⁴	NO	<2	-	NO	NO
Arsenic	3	17 ¹	NO	<2	-	NO	NO
Barium	120	500 ⁴	NO	10 - 67	-	NO	NO
Beryllium	<2	5 ⁴	NO	<2	-	NO	NO
Bismuth	<2	N/A	NO	<2	-	NO	NO
Boron	<5	2 ⁴	NO	6 - 15	-	NO	NO
Cadmium	15	10 ¹	YES	0.4 - 0.6	YES	NO	YES
Chromium (Total)	49	64 ¹	NO	3-22	-	NO	NO
Cobalt	7	20 ⁴	NO	1 - 3	-	NO	NO
Copper	57	63 ¹	NO	6 - 85	-	NO	NO
Iron	14,000	N/A	YES	1,300 - 1,700	YES	YES	NO ⁵
Lead	84	300 ¹	NO	4.4 - 43	-	NO	NO
Lithium	14	N/A	YES	4.0	YES	NO	NO ⁶
Manganese	220	N/A	YES	5 - 79	YES	YES	NO ⁵
Mercury	0.4	12 ¹	NO	0.1 - 0.5	-	NO	NO
Molybdenum	2	4 ⁴	NO	2 - 4	-	NO	NO
Nickel	37	50 ¹	NO	3 - 28	-	NO	NO
Rubidium	26	N/A	YES	<2	YES	NO	NO ⁶
Selenium	<2	1 ¹	NO	<2	-	NO	NO
Silver	<0.5	20 ⁴	NO	<0.5	-	NO	NO
Strontium	110	N/A	YES	10 - 35	YES	NO	NO ⁶
Thallium	0.2	1.4 ¹	NO	<0.1	-	NO	NO
Tin	17	5 ⁴	YES	3	YES	NO	YES
Uranium	2.5	500 ¹	NO	0.5 - 26	-	NO	NO
Vanadium	40	130 ¹	NO	2 - 12	-	NO	NO
Zinc	4,800	200 ¹	YES	11 - 24	YES	NO	YES

Notes:

- CCME Soil Quality Guidelines for the Protection of Environmental and Human Health - Residential/Parkland land use, non-potable groundwater (if applicable), lowest of available ecological guidelines (note: where no
- CCME CWS Tier 1 Levels - Ecological Soil Contact - Residential land use, coarse-grained surface soils [F1 (>C6-C10); F2 (>C10-C16); F3 (>C16-C34)]
- Ontario Ministry of Environment Soil Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Residential/Parkland/Institutional Land Use, lowest of available ecotoxicity criteria
- Alberta Tier 1 Surface Soil Guidelines for Residential Land Use - Ecological guidelines
- Aluminium, iron and manganese are considered major mineral forming elements of low inherent toxicity and were not carried forward
- There are no applicable guidelines for boron, lithium, rubidium and strontium. These elements are typically associated with seawater spray and could be expected to be present at the site due to its proximity to the ocean, and not as a result of historical site activities
- ND = not detected above laboratory detection limits
- N/A = no ecological-based guideline available
- = not applicable

Table 27.16 Ecological Screening for Chemicals in Soil - Area 2

Constituent	Maximum Concentration in Surface Soil (mg/kg)	Selected Soil Quality Guidelines - Residential/Parkland Site (mg/kg)	Max > Guideline (or was a substance with no guideline detected)?	Background Soil Concentration (mg/kg)	MAX > Background?	Is element major mineral forming element or of low inherent toxicity?	Carried forward in ERA?
BTEX/TPH							
Benzene	0.04	31	NO	-	-	-	NO
Toluene	0.14	75	NO	-	-	-	NO
Ethylbenzene	<0.1	55	NO	-	-	-	NO
Xylenes	0.18	95	NO	-	-	-	NO
C6-C10	9	210 (F1) 2	NO	-	-	-	NO
C10-C21	67,000	150 (F2) 2	YES	-	-	NO	YES
C21-C32	3,700	300 (F3) 2	YES	-	-	NO	YES
PAHs							
1-Methylnaphthalene	<0.01	N/A	NO	-	-	-	NO
2-Methylnaphthalene	<0.05	N/A	NO	-	-	-	
Acenaphthene	<0.01	N/A	NO	-	-	-	
Acenaphthylene	<0.01	N/A	NO	-	-	-	
Anthracene	<0.04	2.5	NO	-	-	-	
Benz[a]anthracene	<0.01	40	NO	-	-	-	
Benz[a]pyrene	<0.01	20	NO	-	-	-	
Benz[b]fluoranthene	<0.01	N/A	NO	-	-	-	
Benz[k]fluoranthene	<0.01	40	NO	-	-	-	
Benz[ghi]perylene	<0.01	40	NO	-	-	-	
Chrysene	<0.01	40	NO	-	-	-	
Dibenz[a,h]anthracene	<0.01	N/A	NO	-	-	-	
Fluoranthene	<0.01	50	NO	-	-	-	
Indeno[1,2,3-cd]pyrene	<0.01	N/A	NO	-	-	-	
Naphthalene	<0.01	40	NO	-	-	-	
Perylene	<0.01	N/A	NO	-	-	-	
Phenanthrene	<0.01	40	NO	-	-	-	
Pyrene	<0.01	N/A	NO	-	-	-	
Other							
PCBs	53	1.3	YES	-	-	NO	YES

Notes:

- CCME Soil Quality Guidelines for the Protection of Environmental and Human Health - Residential/Parkland land use, non-potable groundwater (if applicable), lowest of available ecological guidelines (note: where no CCME CWS Tier 1 Levels - Ecological Soil Contact - Residential land use, coarse-grained surface soils [F1 (>C6-C10), F2 (>C10-C16), F3 (>C16-C34)]
- Ontario Ministry of Environment Soil Standards for Use Under Part XV 1 of the Environmental Protection Act, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Residential/Parkland/Institutional Land Use, lowest of available ecotoxicity criteria
- Alberta Tier 1 Surface Soil Guidelines for Residential Land Use - Ecological guidelines
- Aluminum, iron and manganese are considered major mineral forming elements of low inherent toxicity and were not carried forward
- There are no applicable guidelines for boron, lithium, rubidium and strontium. These elements are typically associated with seawater spray and could be expected to be present at the site due to its proximity to the ocean, and not as a result of historical site activities
- ND = not detected above laboratory detection limits
- N/A = no ecological-based guideline available
- = not applicable

Table 27-16 Ecological Screening for Chemicals in Soil - Area 2

Constituent	Maximum Concentration in Surface Soil (mg/kg)	Selected Soil Quality Guidelines - Residential/Parkland Site (mg/kg)	Max > Guideline (or was a substance with no guideline detected)?	Background Soil Concentration (mg/kg)	MAX > Background?	Is element major mineral forming element or of low inherent toxicity?	Carried forward in ERA?
Inorganics							
Aluminum	29,000	N/A	YES	1,400 - 7,300	YES	YES	NO ⁵
Antimony	6	20	NO	<2	-	NO	NO
Arsenic	4	17	NO	<2	-	NO	NO
Barium	230	500	NO	10 - 67	-	NO	NO
Beryllium	<2	5	NO	<2	-	NO	NO
Bismuth	2	N/A	YES	<2	YES	NO	NO ⁶
Boron	40	2	YES	6 - 15	YES	NO	NO ⁶
Cadmium	29	10	YES	0.4 - 0.6	YES	NO	YES
Chromium (Total)	1,200	64	YES	3 - 22	YES	NO	YES
Cobalt	47	20	YES	1 - 3	YES	NO	YES
Copper	2,200	63	YES	6 - 85	YES	NO	YES
Iron	33,000	N/A	YES	1,300 - 1,700	YES	YES	NO ⁵
Lead	3,000	300	YES	4.4 - 43	YES	NO	YES
Lithium	19	N/A	YES	40	YES	NO	NO ⁶
Manganese	2,800	N/A	YES	5 - 79	YES	YES	NO ⁵
Mercury	1	12	NO	0.1 - 0.5	-	NO	NO
Molybdenum	81	4	YES	2 - 4	YES	NO	YES
Nickel	28	50	NO	3 - 28	-	NO	NO
Rubidium	26	N/A	YES	<2	YES	NO	NO ⁶
Selenium	2	1	YES	<2	YES	YES	YES
Silver	4	20	NO	<0.5	-	NO	NO
Strontium	170	N/A	YES	10 - 35	YES	NO	NO ⁶
Thallium	0.2	1.4	NO	<0.1	-	NO	NO
Tin	64	5	YES	3	YES	NO	YES
Uranium	4	500	NO	0.5 - 26	-	NO	NO
Vanadium	82	130	NO	2 - 12	-	NO	NO
Zinc	22,000	200	YES	11 - 24	YES	NO	YES

Notes:

- CCME Soil Quality Guidelines for the Protection of Environmental and Human Health - Residential/Parkland land use, non-potable groundwater (if applicable), lowest of available ecological guidelines (note: where no CCME CWS Tier 1 Levels - Ecological Soil Contact - Residential land use, coarse-grained surface soils (F1 (>C6-C10), F2 (>C10-C16), F3 (>C16-C34))
- Ontario Ministry of Environment Soil Standards for Use Under Part XV 1 of the Environmental Protection Act, Table 3 - Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Residential/Parkland/Institutional Land Use, lowest of available ecotoxicity criteria
- Alberta Tier 1 Surface Soil Guidelines for Residential Land Use - Ecological guidelines
- Aluminum, iron and manganese are considered major mineral forming elements of low inherent toxicity and were not carried forward
- There are no applicable guidelines for boron, lithium, rubidium and strontium. These elements are typically associated with seawater spray and could be expected to be present at the site due to its proximity to the ocean, and not as a result of historical site activities
- ND = not detected above laboratory detection limits
- N/A = no ecological-based guideline available
- = not applicable

Table 27.17 Ecological Screening for Chemicals in Soil - Area 3

Constituent	Maximum Concentration in Surface Soil (mg/kg)	Selected Soil Quality Guidelines - Residential/ Parkland Site (mg/kg)	Max > Guideline (or was a substance with no guideline detected)?	Background Soil Concentration (mg/kg)	MAX > Background?	Is element major mineral forming element or of low inherent toxicity?	Carried forward in ERA?
BTEX/TPH							
Benzene	<0.3	31 ¹	NO	-	-	-	NO
Toluene	1.2	75 ¹	NO	-	-	-	NO
Ethylbenzene	<0.3	55 ¹	NO	-	-	-	NO
Xylenes	0.5	95 ¹	NO	-	-	-	NO
C6-C10	270	210 (F1) ²	YES	-	-	NO	YES
C10-C21	24,000	150 (F2) ²	YES	-	-	NO	YES
C21-C32	15,000	300 (F3) ²	YES	-	-	NO	YES
PAHs							
1-Methylnaphthalene	3.7	N/A	YES	-	-	-	YES ⁵
2-Methylnaphthalene	5.5	N/A	YES	-	-	-	
Acenaphthene	0.4	N/A	YES	-	-	-	
Acenaphthylene	0.3	N/A	YES	-	-	-	
Anthracene	0.01	2.5 ¹	NO	-	-	-	
Benz[a]anthracene	0.2	40 ³	NO	-	-	-	
Benzofluoranthene	0.5	20 ¹	NO	-	-	-	
Benzol[ghi]perylene	<0.1	N/A	NO	-	-	-	
Benzol[k]fluoranthene	<0.1	40 ³	NO	-	-	-	
Benzol[ghi]perylene	0.3	40 ³	NO	-	-	-	
Chrysene	0.9	40 ³	NO	-	-	-	
Dibenz[a,h]anthracene	0.01	N/A	YES	-	-	-	
Fluoranthene	0.2	50 ¹	NO	-	-	-	
Fluorene	0.5	N/A	YES	-	-	-	
Indeno[1,2,3-cd]pyrene	0.1	40 ³	NO	-	-	-	
Naphthalene	1.2	40 ³	NO	-	-	-	
Perylene	0.2	N/A	YES	-	-	-	
Phenanthrene	0.3	40 ³	NO	-	-	-	
Pyrene	0.4	N/A	YES	-	-	-	
Other							
PCBs	20	1.3 ¹	YES	-	-	NO	YES

Notes:

- CCME Soil Quality Guidelines for the Protection of Environmental and Human Health - Residential/Parkland land use, non-potable groundwater (if applicable), lowest of available ecological guidelines (note: where no CCME CWS Tier 1 Levels - Ecological Soil Contact - Residential land use, coarse-grained surface soils [F1 (>C6-C10), F2 (>C10-C16), F3 (>C16-C34)])
- Ontario Ministry of Environment Soil Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Residential/Parkland/Institutional Land Use, lowest of available ecotoxicity criteria
- Alberta Tier 1 Surface Soil Guidelines for Residential Land Use - Ecological guidelines
- Even though all PAHs do not exceed applicable guidelines, all are carried forward since they act cumulatively for ecological receptors
- Aluminum, iron and manganese are considered major mineral forming elements of low inherent toxicity and were not carried forward
- There are no applicable guidelines for boron, lithium, rubidium and strontium. These elements are typically associated with seawater spray and could be expected to be present at the site due to its proximity to the ocean, and not as a result of historical site activities
- ND = not detected above laboratory detection limits
- N/A = no ecological-based guideline available
- = not applicable

Table 27 17 Ecological Screening for Chemicals in Soil - Area 3

Constituent	Maximum Concentration in Surface Soil (mg/kg)	Selected Soil Quality Guidelines - Residential/Parkland Site (mg/kg)	Max > Guideline (or was a substance with no guideline detected)?	Background Soil Concentration (mg/kg)	MAX > Background?	Is element major mineral forming element or of low inherent toxicity?	Carried forward in ERA?
Inorganics							
Aluminium	13,000	N/A	YES	1,400 - 7,300	YES	YES	NO ⁶
Antimony	120	20 ⁴	YES	<2	YES	NO	YES
Arsenic	15	17 ¹	NO	<2	-	-	NO
Barium	340	500 ⁴	NO	10 - 67	-	-	NO
Beryllium	<2	5 ⁴	NO	<2	-	-	NO
Bismuth	<2	N/A	NO	<2	-	-	NO
Boron	27	2 ⁴	YES	6 - 15	YES	NO	NO ⁷
Cadmium	56	10 ¹	NO	0.4 - 0.6	-	-	NO
Chromium (Total)	350	64 ¹	YES	3 - 22	YES	NO	YES
Cobalt	17	20 ⁴	NO	1 - 3	-	-	NO
Copper	790	63 ¹	YES	6 - 85	YES	NO	YES
Iron	16,000	N/A	YES	1,300 - 1,700	YES	YES	NO ⁶
Lead	2,100	300 ¹	YES	4.4 - 43	YES	NO	YES
Lithium	13	N/A	YES	4.0	YES	NO	NO ⁷
Manganese	660	N/A	YES	5 - 79	YES	YES	NO ⁶
Mercury	0.7	12 ¹	NO	0.1 - 0.5	-	-	NO
Molybdenum	12	4 ²	YES	2 - 4	YES	NO	YES
Nickel	110	50 ¹	YES	3 - 28	YES	NO	YES
Rubidium	17	N/A	YES	<2	YES	NO	NO ⁷
Selenium	2	1 ¹	YES	<2	YES	NO	YES
Silver	1	20 ⁴	NO	<0.5	-	-	NO
Strontium	46	N/A	YES	10 - 35	YES	NO	NO ⁷
Thallium	0.1	1.4 ¹	NO	<0.1	-	-	NO
Tin	230	5 ⁴	YES	3	YES	NO	YES
Uranium	3.1	500 ¹	NO	0.5 - 26	-	-	NO
Vanadium	30	130 ¹	NO	2 - 12	-	-	NO
Zinc	1,700	200 ¹	YES	11 - 24	YES	NO	YES

Notes:

- CCME Soil Quality Guidelines for the Protection of Environmental and Human Health - Residential/Parkland land use, non-potable groundwater (if applicable), lowest of available ecological guidelines (note: where no CCME CWS Tier 1 Levels - Ecological Soil Contact - Residential land use, coarse-grained surface soils [F1 (>C6-C10), F2 (>C10-C16), F3 (>C16-C34)])
 - CCME CWS Tier 1 Levels - Ecological Soil Contact - Residential land use, coarse-grained surface soils [F1 (>C6-C10), F2 (>C10-C16), F3 (>C16-C34)]
 - Ontario Ministry of Environment Soil Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Residential/Parkland/Institutional Land Use, lowest of available ecotoxicity criteria
 - Alberta Tier 1 Surface Soil Guidelines for Residential Land Use - Ecological guidelines
 - Even though all PAHs do not exceed applicable guidelines, all are carried forward since they act cumulatively for ecological receptors
 - Aluminium, iron and manganese are considered major mineral forming elements of low inherent toxicity and were not carried forward
 - There are no applicable guidelines for boron, lithium, rubidium and strontium. These elements are typically associated with seawater spray and could be expected to be present at the site due to its proximity to the ocean, and not as a result of historical site activities
- ND = not detected above laboratory detection limits
N/A = no ecological-based guideline available
- = not applicable

Table 27.18 Ecological Screening for Chemicals in Soil - Entire Site

Constituent	Maximum Concentration in Surface Soil (mg/kg)	Selected Soil Quality Guidelines - Residential/ Parkland Site (mg/kg)	Max > Guideline (or was a substance with no guideline detected)?	Background Soil Concentration (mg/kg)	MAX > Background?	Is element major mineral forming element or of low inherent toxicity?	Carried forward in ERA?
BTEX/TPH							
Benzene	0.04	31 ¹	NO	-	-	-	NO
Toluene	1.2	75 ¹	NO	-	-	-	NO
Ethylbenzene	<0.1	55 ¹	NO	-	-	-	NO
Xylenes	0.5	95 ¹	NO	-	-	-	NO
C6-C10	270	210 (F1) ²	YES	-	-	NO	YES
C10-C21	93,000	150 (F2) ²	YES	-	-	NO	YES
C21-C32	15,000	300 (F3) ²	YES	-	-	NO	YES
PAHs							
1-Methylnaphthalene	3.7	N/A	YES	-	-	-	YES ⁵
2-Methylnaphthalene	5.5	N/A	YES	-	-	-	
Acenaphthene	0.4	N/A	YES	-	-	-	
Acenaphthylene	0.3	N/A	YES	-	-	-	
Anthracene	0.01	2.5 ³	NO	-	-	-	
Benz[a]anthracene	0.2	40 ³	NO	-	-	-	
Benzofluoranthene	0.5	20 ³	NO	-	-	-	
Benzofluoranthene	<0.005	N/A	NO	-	-	-	
Benzofluoranthene	<0.005	40 ³	NO	-	-	-	
Benzofluoranthene	0.3	40 ³	NO	-	-	-	
Chrysene	0.9	40 ³	NO	-	-	-	
Dibenz[a,h]anthracene	0.01	N/A	YES	-	-	-	
Fluoranthene	0.2	50 ³	NO	-	-	-	
Fluorene	0.5	N/A	YES	-	-	-	
Indeno[1,2,3-cd]pyrene	0.1	40 ³	NO	-	-	-	
Naphthalene	1.2	40 ³	NO	-	-	-	
Perylene	0.2	N/A	YES	-	-	-	
Phenanthrene	0.3	40 ³	NO	-	-	-	
Pyrene	0.4	N/A	YES	-	-	-	
Other							
PCBs	100	1.3 ¹	YES	-	-	NO	YES

Notes:

- CCME Soil Quality Guidelines for the Protection of Environmental and Human Health - Residential/Parkland land use, non-potable groundwater (if applicable), lowest of available ecological guidelines (note: where no CCME ecological guideline exists, OMOE has been consulted).
- CCME CWS Tier 1 Levels - Ecological Soil Contact - Residential land use, coarse-grained surface soils [F1 (>C6-C10), F2 (>C10-C16), F3 (>C16-C34)]
- Ontario Ministry of Environment Soil Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Residential/Parkland/Institutional Land Use, lowest of available ecotoxicity criteria
- Alberta Tier 1 Surface Soil Guidelines for Residential Land Use - Ecological guidelines
- Even though all PAHs do not exceed applicable guidelines, all are carried forward since they act cumulatively for ecological receptors.
- Aluminium, iron and manganese are considered major mineral forming elements of low inherent toxicity and were not carried forward.
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- ND = not detected above laboratory detection limits
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Table 27.18 Ecological Screening for Chemicals in Soil - Entire Site

Constituent	Maximum Concentration in Surface Soil (mg/kg)	Selected Soil Quality Guidelines - Residential/Parkland Site (mg/kg)	Max > Guideline (or was a substance with no guideline detected)?	Background Soil Concentration (mg/kg)	MAX > Background?	Is element major mineral forming element or of low inherent toxicity?	Carried forward in ERA?
Inorganics							
Aluminium	29,000	N/A	YES	1,400 - 7,300	YES	YES	NO ⁶
Antimony	120	20 ⁴	YES	<2	YES	NO	YES
Arsenic	15	17 ¹	NO	<2	-	-	NO
Barium	340	500 ⁴	NO	10 - 67	-	-	NO
Beryllium	<2	5 ⁴	NO	<2	-	-	NO
Bismuth	2	N/A	YES	<2	YES	NO	NO ⁷
Boron	40	2 ⁴	YES	6 - 15	YES	NO	NO ⁷
Cadmium	15	10 ¹	YES	0.4 - 0.6	YES	NO	YES
Chromium (Total)	1200	64 ¹	YES	3 - 22	YES	NO	YES
Cobalt	47	20 ⁴	YES	1 - 3	YES	NO	YES
Copper	2,200	63 ¹	YES	6 - 85	YES	NO	YES
Iron	33,000	N/A	YES	1,300 - 1,700	YES	YES	NO ⁶
Lead	2,100	300 ¹	YES	4.4 - 43	YES	NO	YES
Lithium	19	N/A	YES	4.0	YES	NO	NO ⁷
Manganese	2,800	N/A	YES	5 - 79	YES	YES	NO ⁷
Mercury	1	12 ¹	NO	0.1 - 0.5	-	-	NO
Molybdenum	81	4 ⁴	YES	2 - 4	YES	NO	YES
Nickel	110	50 ¹	YES	3 - 28	YES	NO	YES
Rubidium	26	N/A	YES	<2	YES	NO	NO ⁷
Selenium	2	1 ¹	YES	<2	YES	NO	YES
Silver	4	20 ⁴	NO	<0.5	-	-	NO
Strontium	110	N/A	YES	10 - 35	YES	NO	NO ⁷
Thallium	0.2	1.4 ¹	NO	<0.1	-	-	NO
Tin	230	5 ⁴	YES	3	YES	NO	YES
Uranium	4	500 ¹	NO	0.5 - 26	-	-	NO
Vanadium	82	130 ¹	NO	2 - 12	-	-	NO
Zinc	22,000	200 ¹	YES	11 - 24	YES	NO	YES

Notes:

- CCME Soil Quality Guidelines for the Protection of Environmental and Human Health - Residential/Parkland land use, non-potable groundwater (if applicable), lowest of available ecological guidelines (note: where no CCME ecological guideline exists, OMOE has been consulted).
- CCME CWS Tier 1 Levels - Ecological Soil Contact - Residential land use, coarse-grained surface soils [F1 (>C6-C10), F2 (>C10-C16), F3 (>C16-C34)]
- Ontario Ministry of Environment Soil Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition. Residential/Parkland/Institutional Land Use, lowest of available ecotoxicity criteria
- Alberta Tier 1 Surface Soil Guidelines for Residential Land Use - Ecological guidelines
- Even though all PAHs do not exceed applicable guidelines, all are carried forward since they act cumulatively for ecological receptors.
- Aluminium, iron and manganese are considered major mineral forming elements of low inherent toxicity and were not carried forward.
- There are no applicable guidelines for boron, lithium, rubidium and strontium. These elements are typically associated with seawater spray and could be expected to be present at the site due to its proximity to the ocean, and not as a result of historical site activities

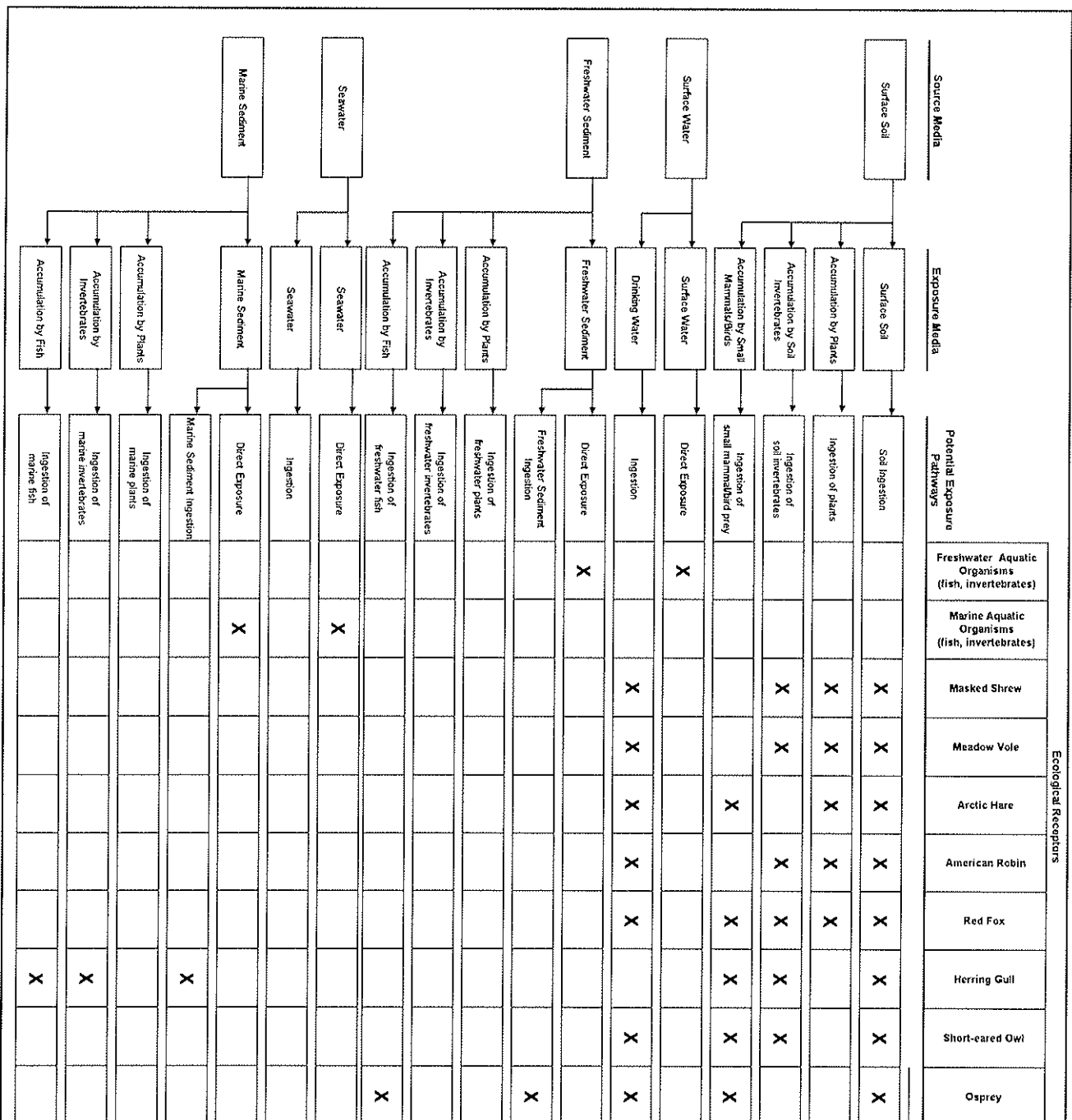
ND = not detected above laboratory detection limits

N/A = no ecological-based guideline available

- = not applicable

Conceptual Site Model

Figure 27.1 - Conceptual Site Model for Ecological Receptors



Terrestrial ERA Models

Jacques Whitford's Ecological Risk Assessment Model (Version 5.0)

Intake Parameters for the American Robin		
Receptor Name	American Robin	
Name of Study Area	Hopedale Whole Site	
Entire Local Study Area or Project Alone		
Fraction of organic carbon in the soil	0.01	(unitless)
Fraction organic carbon in freshwater (dry) sediment	0.0706	(unitless, usual range is 0.003 to 0.03)
Fraction organic carbon in marine (dry) sediment	0.01	(unitless, usual range is 0.003 to 0.03)
Fraction lipid in freshwater invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Fraction lipid in marine invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Soil Moisture Content	0.25	(cm ³ /cm ³) or (ml/cm ³)
Soil Bulk Density	1.487	(g/cm ³)
Calculate TU based on	1	(1-top 5% most sensitive species, 2-Rainbow Trout, 3-Daphnia magna)
Receptor Type	1	(1-Bird, 2-Mammal)
Small Mammal Type	1	(1-General, 2-Herbivore, 3-Insectivore) Default value should be 1
Fish based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Benthic invertebrates based on Sediment or Surface Water Uptake	1	(1-Freshwater Sediment, 2-Surface Water) Default value should be 1
Aquatic Plants based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Fish based on Sediment or Seawater Uptake	2	(1-Marine Sediment, 2-Seawater) Default value should be 2
Marine Benthic invertebrates based on Sediment or Seawater Uptake	1	(1-Marine Sediment, 2-Seawater) Default value should be 1
General Parameters		
Body weight	0.08	kg
Food intake rate	6.5E-02	kg wet-wt/day
Water intake rate	1.0E-02	L/day
Ingestion of Soil		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction diet that is dry solid	2.6E-01	
Fraction of food intake rate	2.9E-02	
Ingestion rate	4.8E-04	kg dry-wt/day
Fraction from site	0.5	
Intake factor (IFing-sl)	3.0E-03	kg/kg-day
Ingestion of Terrestrial Plants		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	5.2E-01	
Ingestion rate	3.4E-02	kg wet-wt/day
Fraction from site	0.5	
Intake factor (IFing-tp)	2.1E-01	kg/kg-day
Ingestion of Terrestrial Invertebrates		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	4.8E-01	
Ingestion rate	3.1E-02	kg wet-wt/day
Fraction from site	0.5	
Intake factor (IFing-ti)	1.9E-01	kg/kg-day
Ingestion of Terrestrial Mammals/Birds		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	0.5	
Intake factor (IFing-tm)	0.0E+00	kg/kg-day
Ingestion of Surface Water		
Applicable pathway?	1	(0 = no, 1 = yes)
Ingestion rate	1.0E-02	L/day
Fraction from site	0.5	
Intake factor (IFing-sw)	6.3E-02	L/kg-day
Ingestion of Freshwater Sediment		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction diet that is dry solid	0.0E+00	
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg dry-wt/day
Fraction from site	0.5	
Intake factor (IFing-sed)	0.0E+00	kg/kg-day
Ingestion of Freshwater Aquatic Plants		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	0.5	
Intake factor (IFing-ap)	0.0E+00	kg/kg-day
Ingestion of Freshwater Benthic Invertebrates		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	0.5	
Intake factor (IFing-ai)	0.0E+00	kg/kg-day
Ingestion of Freshwater Fish		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	0.5	
Intake factor (IFing-fsh)	0.0E+00	kg/kg-day

Detailed Hazard Quotients for the American Robin Exposed to CoPCs at Hopedale Whole Site Receptor Location

Constituent	Reference Toxicity Dose (mg/kg-day)	Average Daily Dose (mg/kg-day)	Surface Soil Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Plant Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Invertebrate Ingestion HQ	Average Daily Dose (mg/kg-day)	Surface Water Ingestion HQ	Marine Fish Ingestion HQ	Total Hazard Quotient
TPH - CCME CWS											
Aliph-C06-C08 - F1	3.0E+01	5.0E-02	2.0E-03	4.8E-01	1.5E-02	8.9E-01	3.0E-02	1.7E-07	5.7E-09	---	4.7E-02
Aliph-C08-C10 - F1	3.0E+01	3.9E-02	1.3E-03	2.5E-02	8.2E-04	9.2E-01	3.1E-02	1.1E-07	3.8E-09	---	3.3E-02
Arom-C08-C10 - F1	5.0E+01	9.8E-03	1.8E-04	2.6E-01	4.3E-03	4.3E-02	7.2E-04	2.8E-08	4.7E-10	---	8.2E-03
F1 - Total											5.5E-02
Aliph-C10-C12 - F2	1.5E+02	2.0E+01	1.3E-01	5.3E-01	3.5E-03	5.7E+02	3.1E+00	5.0E-07	3.8E-09	---	3.2E+00
Aliph-C12-C16 - F2	1.5E+02	2.0E+01	1.6E-01	1.5E-01	1.0E-03	3.5E+00	3.5E+00	6.9E-07	4.9E-09	---	3.7E+00
Arom-C10-C12 - F2	3.0E+01	5.0E+00	1.7E-01	8.4E+01	2.8E+00	1.3E+01	4.4E-01	1.4E-07	4.7E-09	---	3.4E+00
Arom-C12-C16 - F2	3.0E+01	6.1E+00	2.0E-01	4.7E+01	1.6E+00	1.6E+01	5.3E-01	1.7E-07	5.7E-09	---	2.3E+00
F2 - Total											1.3E+01
Aliph-C16-C21 - F3	6.0E+02	2.3E+00	3.8E-03	1.4E-02	2.3E-05	7.1E+00	1.2E-02	1.8E-06	2.9E-09	---	1.6E-02
Aliph-C21-C24 - F3	6.0E+02	9.7E-01	1.6E-03	6.0E-03	1.0E-05	1.5E+00	2.5E-03	7.3E-07	1.9E-09	---	4.2E-03
Arom-C16-C21 - F3	3.0E+01	5.7E-01	1.9E-02	1.0E+00	3.3E-02	1.2E+00	3.9E-02	4.4E-07	1.9E-08	---	9.1E-02
Arom-C21-C24 - F3	3.0E+01	2.4E-01	8.1E-03	7.5E-03	2.5E-04	5.0E-01	1.7E-02	1.9E-07	6.3E-09	---	2.5E-02
F3 - Total											1.4E-01
Polycyclic Aromatic Hydrocarbons											
Low Molecular Weight PAHs											
Acenaphthene	---	1.2E-03	---	5.6E-03	---	2.5E-03	---	---	---	---	---
Acenaphthylene	---	9.1E-04	---	4.9E-03	---	1.9E-03	---	---	---	---	---
Anthracene	---	3.0E-05	---	1.0E-03	---	6.3E-05	---	---	---	---	---
Fluoranthene	---	6.1E-04	---	4.1E-03	---	1.3E-03	---	---	---	---	---
Fluorene	---	1.9E-03	---	6.2E-03	---	3.2E-03	---	---	---	---	---
1-Methylnaphthalene	---	1.1E-02	---	1.5E-02	---	2.4E-02	---	---	---	---	---
2-Methylnaphthalene	---	1.7E-02	---	1.8E-02	---	3.5E-02	---	---	---	---	---
Naphthalene	---	3.8E-03	---	9.2E-03	---	7.9E-03	---	---	---	---	---
Phenanthrene	---	9.1E-04	---	4.9E-03	---	1.9E-03	---	---	---	---	---
Benz[a]anthracene	---	6.1E-04	---	1.3E-03	---	6.3E-04	---	---	---	---	---
Benz[ghi]perylene	---	1.5E-03	---	3.0E-03	---	7.9E-03	---	---	---	---	---
Benzofluoranthene	---	1.5E-04	---	3.4E-04	---	1.6E-04	---	---	---	---	---
Benzok[fluoranthene]	---	---	---	---	---	---	---	---	---	---	---
Chrysene	---	1.5E-04	---	3.4E-04	---	1.6E-04	---	---	---	---	---
Dibenz[a,h]anthracene	---	2.7E-03	---	5.3E-03	---	2.8E-03	---	---	---	---	---
Indeno[1,2,3-cd]pyrene	---	3.0E-05	---	7.4E-03	---	1.6E-04	---	---	---	---	---
Perylene	---	3.0E-04	---	6.8E-04	---	1.6E-03	---	---	---	---	---
Pyrene	---	6.1E-04	---	1.3E-03	---	3.1E-03	---	---	---	---	---
PCB	---	1.2E-03	---	2.4E-03	---	1.3E-03	---	---	---	---	---
Aroclor 1254 (Total PCBs)	1.8E+00	5.5E-02	3.0E-02	3.0E-01	1.7E-01	6.5E+00	3.6E+00	1.9E-06	8.7E-07	---	3.8E+00
Inorganics											
Antimony	---	3.6E-02	---	1.7E+00	---	3.7E-01	---	6.3E-05	---	---	---
Barium	1.4E+02	9.4E-03	6.8E-05	1.5E+00	1.1E-02	8.8E-03	6.3E-05	3.3E-04	2.3E-06	---	1.1E-02
Chromium	1.5E+00	9.1E-03	6.2E-03	4.0E+00	2.7E+00	6.2E-01	4.2E-01	2.1E-06	1.7E-06	---	3.2E+00
Chromium (Total)	2.7E+00	3.3E-01	1.2E-01	3.2E+00	1.2E+00	1.0E+00	3.9E-01	6.9E-05	2.9E-05	---	1.7E+00
Cobalt	7.6E+00	2.3E-02	3.1E-03	5.3E-01	7.0E-02	2.9E-02	3.8E-03	1.9E-05	1.8E-06	---	7.7E-02
Copper	1.9E+01	7.9E-01	4.3E-02	8.9E+00	4.8E-01	7.2E-01	3.9E-02	3.9E-04	2.1E-05	---	5.6E-01
Lead	1.1E+01	3.8E-01	3.4E-02	1.0E+01	9.5E-01	1.2E+00	1.1E-01	6.9E-05	8.0E-06	---	1.1E+00
Molybdenum	3.5E+01	2.5E-01	7.0E-03	1.5E+00	4.2E-02	2.4E-00	6.9E-02	6.3E-05	1.8E-06	---	1.2E-01
Nickel	6.7E+00	6.7E-02	9.9E-03	1.4E+00	2.0E-01	7.2E-01	6.1E-02	3.1E-05	9.3E-06	---	3.2E-01
Selenium	1.0E+00	6.1E-03	6.1E-03	1.5E+00	2.1E-01	6.1E-02	6.1E-02	3.1E-06	3.1E-05	---	2.8E-01
Silver	6.7E+00	2.9E-02	4.3E-03	5.3E-02	7.9E-03	5.0E-01	9.0E-02	4.1E-06	4.8E-07	---	1.0E-01
Tin	1.7E+01	1.9E-01	1.1E-02	4.1E-02	2.4E-03	7.0E-01	2.1E-05	6.3E-05	3.7E-06	---	5.5E-02
Uranium	5.3E+01	3.3E-03	6.2E-05	4.2E-02	8.0E-04	1.1E-03	2.1E-05	1.1E-05	2.1E-07	---	8.8E-04
Vanadium	1.2E+00	7.3E-02	6.1E-02	1.1E+00	9.3E-01	3.1E-02	2.6E-02	6.9E-05	5.3E-05	---	1.0E+00
Zinc	1.3E+02	1.6E+00	1.2E-02	5.3E+01	4.1E-01	2.1E+01	1.9E-01	8.1E-04	6.2E-06	---	5.8E-01
Total TPH HQ = 1.3E+01											

Jacques Whitford's Ecological Risk Assessment Model (Version 5.0)

Intake Parameters for the Short-eared Owl		
Receptor Name	Short-eared Owl	
Name of Study Area	Hopedale Whole Site	
Entire Local Study Area or Project Alone		
Fraction of organic carbon in the soil	0.01	(unitless)
Fraction organic carbon in freshwater (dry) sediment	0.0706	(unitless, usual range is 0.003 to 0.03)
Fraction organic carbon in marine (dry) sediment	0.01	(unitless, usual range is 0.003 to 0.03)
Fraction lipid in freshwater invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Fraction lipid in marine invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Soil Moisture Content	0.25	(cm ³ /cm ³) or (ml/cm ³)
Soil Bulk Density	1.487	(g/cm ³)
Calculate TU based on	1	(1-top 5% most sensitive species, 2-Rainbow Trout, 3-Daphnia magna)
Receptor Type	1	(1-Bird, 2-Mammal)
Is Receptor Sensitive Species for the Project?	1	(1-Yes, 0-No)
Small Mammal Type	1	(1-General, 2-Herbivore, 3-Insectivore) Default value should be 1
Fish based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Benthic Invertebrates based on Sediment or Surface Water Uptake	1	(1-Freshwater Sediment, 2-Surface Water) Default value should be 1
Aquatic Plants based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Fish based on Sediment or Seawater Uptake	2	(1-Marine Sediment, 2-Seawater) Default value should be 2
Marine Benthic Invertebrates based on Sediment or Seawater Uptake	1	(1-Marine Sediment, 2-Seawater) Default value should be 1
General Parameters		
Body weight	0.35	kg
Food intake rate	9.0E-02	kg wet-wt/day
Water intake rate	3.0E-02	L/day
Ingestion of Soil		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction diet that is dry solid	3.2E-01	
Fraction of food intake rate	1.2E-02	
Ingestion rate	3.6E-04	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sl)	1.0E-03	kg/kg-day
Ingestion of Terrestrial Plants		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-lp)	0.0E+00	kg/kg-day
Ingestion of Terrestrial Invertebrates		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	5.0E-02	
Ingestion rate	4.5E-03	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-li)	1.3E-02	kg/kg-day
Ingestion of Terrestrial Mammals/Birds		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	9.5E-01	
Ingestion rate	8.6E-02	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-lm)	2.4E-01	kg/kg-day
Ingestion of Surface Water		
Applicable pathway?	1	(0 = no, 1 = yes)
Ingestion rate	3.0E-02	L/day
Fraction from site	1	
Intake factor (IFing-sw)	8.6E-02	L/kg-day
Ingestion of Freshwater Sediment		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction diet that is dry solid	0.0E+00	
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sed)	0.0E+00	kg/kg-day
Ingestion of Freshwater Aquatic Plants		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ap)	0.0E+00	kg/kg-day
Ingestion of Freshwater Benthic Invertebrates		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ai)	0.0E+00	kg/kg-day
Ingestion of Freshwater Fish		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-fsh)	0.0E+00	kg/kg-day

Detailed Hazard Quotients for the Owl Exposed to COPCs at Hopedale Whole Site

Constituent	Reference Toxicity Dose (mg/kg-day)	Average Daily Dose (mg/kg-day)	Surface Soil Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Invertebrate Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Mammal Ingestion HQ	Average Daily Dose (mg/kg-day)	Surface Water Ingestion HQ	Average Daily Dose (mg/kg-day)	Marine Benthic Invertebrate Ingestion HQ	Average Daily Dose (mg/kg-day)	Marine Fish Ingestion HQ	Total Hazard Quotient
TPH - COME CWS														
Asph-C08-C08-F1	1.0E+01	2.1E-02	2.1E-03	6.9E-02	5.9E-03	1.9E-02	1.9E-03	2.4E-07	2.4E-08	---	---	---	---	9.9E-03
Asph-C08-C10-F1	1.0E+01	1.9E-02	1.9E-03	6.1E-02	6.1E-03	2.0E-02	2.0E-03	1.9E-07	1.9E-09	---	---	---	---	7.6E-03
Asph-C08-C10-F1	2.0E+01	3.4E-01	1.7E-04	1.4E-03	4.0E-03	4.0E-03	2.0E-04	3.9E-08	1.9E-09	---	---	---	---	5.1E-04
F1, Total														
Asph-C12-F2	5.0E+01	6.0E-03	1.4E-01	3.1E-01	6.2E-01	1.8E-01	3.6E-03	7.7E-07	1.9E-08	---	---	---	---	1.8E-07
Asph-C12-C16-F2	5.0E+01	8.7E-01	1.7E-01	3.0E-01	7.0E-01	1.7E-01	3.3E-03	9.4E-07	1.9E-08	---	---	---	---	6.7E-01
Asph-C12-C16-F2	5.0E+01	8.7E-01	1.7E-01	3.0E-01	7.0E-01	1.7E-01	3.3E-03	9.4E-07	1.9E-08	---	---	---	---	6.7E-01
Asph-C12-C16-F2	1.0E+01	2.1E-02	1.7E-01	8.8E-02	8.8E-02	8.8E-02	8.8E-02	1.9E-07	2.4E-08	---	---	---	---	3.9E-01
F2, Total														
Asph-C16-C21-F3	2.0E+02	7.8E-01	3.9E-03	4.7E-01	2.3E-03	1.5E-02	7.7E-05	2.4E-06	1.2E-08	---	---	---	---	6.9E-03
Asph-C21-C34-F3	2.0E+02	3.9E-01	1.0E-01	1.0E-01	5.0E-04	3.3E-03	1.7E-05	1.0E-06	5.1E-09	---	---	---	---	2.9E-02
Asph-C16-C21-F3	1.0E+01	1.9E-02	1.9E-02	7.8E-02	1.8E-03	2.1E-02	2.1E-03	6.0E-07	5.0E-08	---	---	---	---	2.9E-02
Asph-C16-C21-F3	1.0E+01	8.9E-02	8.9E-02	3.9E-02	3.9E-03	2.1E-02	2.1E-04	2.9E-07	2.0E-08	---	---	---	---	5.0E-02
F3, Total														
Polyyclic Aromatic Hydrocarbons														
Low Molecular Weight PAHs														
Acenaphthene	---	4.2E-04	---	---	---	3.5E-04	---	---	---	---	---	---	---	---
Acenaphthylene	---	3.1E-04	---	---	---	3.2E-04	---	---	---	---	---	---	---	---
Benzo[a]anthracene	---	1.0E-05	---	---	---	3.4E-05	---	---	---	---	---	---	---	---
Benzo[a]pyrene	---	5.1E-04	---	---	---	4.7E-04	---	---	---	---	---	---	---	---
1-Methylphenanthrene	---	3.8E-03	---	---	---	1.1E-03	---	---	---	---	---	---	---	---
2-Methylphenanthrene	---	5.7E-03	---	---	---	1.4E-03	---	---	---	---	---	---	---	---
Naphthalene	---	1.2E-03	---	---	---	3.8E-04	---	---	---	---	---	---	---	---
Phenanthrene	---	3.1E-04	---	---	---	4.2E-04	---	---	---	---	---	---	---	---
High Molecular Weight PAHs														
Benzo[e]anthracene	---	2.1E-04	---	---	---	1.4E-04	---	---	---	---	---	---	---	---
Benzo[k]fluoranthene	---	1.0E-05	---	---	---	3.5E-05	---	---	---	---	---	---	---	---
Benzo[b]fluoranthene	---	5.2E-05	---	---	---	3.5E-05	---	---	---	---	---	---	---	---
Benzo[a]fluoranthene	---	9.3E-04	---	---	---	6.1E-04	---	---	---	---	---	---	---	---
Chrysene	---	1.0E-05	---	---	---	3.2E-05	---	---	---	---	---	---	---	---
Dibenz[a,h]anthracene	---	1.0E-05	---	---	---	2.9E-05	---	---	---	---	---	---	---	---
Indeno[1,2,3-cd]pyrene	---	2.1E-04	---	---	---	6.2E-04	---	---	---	---	---	---	---	---
Perylene	---	4.2E-04	---	---	---	2.7E-04	---	---	---	---	---	---	---	---
Pyrene	---	4.2E-04	---	---	---	2.7E-04	---	---	---	---	---	---	---	---
PCBs														
Aroclor 1254 (Total PCBs)	6.0E-01	1.9E-02	3.1E-02	4.3E-01	7.2E-01	1.9E+00	3.1E+00	2.1E+00	3.1E+00	---	---	---	---	3.9E+00
Inorganics														
Antimony	---	1.2E-02	---	---	---	6.1E-02	---	---	---	---	---	---	---	---
Barium	3.6E+01	3.2E-03	9.1E-05	2.8E-02	1.5E-05	1.1E-01	3.0E-03	4.5E-04	1.3E-05	---	---	---	---	3.1E-03
Cadmium	1.5E+00	3.1E-03	2.1E-03	4.1E-02	2.8E-02	9.5E-02	6.5E-02	3.3E-06	2.3E-06	---	---	---	---	9.9E-02
Chromium (Total)	2.2E+00	1.2E-01	4.3E-02	7.0E-02	2.6E-02	7.7E-01	6.5E-02	9.4E-03	3.9E-03	---	---	---	---	1.9E-01
Cobalt	1.5E+00	9.2E-01	1.9E-03	4.8E-02	2.8E-02	8.1E-01	4.2E-03	5.2E-02	2.9E-03	---	---	---	---	4.9E-03
Copper	1.5E+00	9.2E-01	1.9E-03	4.8E-02	2.8E-02	8.1E-01	4.2E-03	5.2E-02	2.9E-03	---	---	---	---	4.9E-03
Lead	1.1E+01	1.3E-01	1.2E-02	8.1E-02	2.4E-03	1.7E-01	1.6E-02	1.2E-04	1.1E-05	---	---	---	---	3.1E-02
Manganese	1.2E+01	8.4E-02	7.1E-03	1.6E-01	1.3E-02	6.1E-02	5.2E-03	8.6E-05	7.3E-06	---	---	---	---	2.6E-02
Nickel	6.7E+00	2.9E-02	3.4E-03	4.8E-02	7.1E-03	6.1E-02	9.1E-03	8.6E-05	1.3E-05	---	---	---	---	2.6E-02
Selenium	9.3E+01	2.1E-03	6.2E-03	4.1E-03	1.2E-02	6.1E-02	1.8E-01	4.3E-05	1.3E-04	---	---	---	---	2.0E-01
Silver	2.2E+00	9.9E-03	4.4E-03	4.0E-02	1.8E-02	1.5E-02	6.5E-03	4.3E-06	1.9E-06	---	---	---	---	2.9E-02
Tin	4.6E+00	6.4E-02	1.4E-02	4.6E-02	1.0E-02	6.1E-02	1.3E-02	8.6E-05	1.9E-05	---	---	---	---	3.8E-02
Vanadium	3.3E+01	2.1E-03	2.1E-03	7.7E-03	1.4E-03	6.1E-02	4.4E-03	8.2E-05	2.9E-05	---	---	---	---	7.6E-04
Zinc	4.4E+01	5.9E-01	1.9E-02	1.4E-02	3.2E-02	6.8E+00	1.6E+01	1.1E+01	2.0E+01	---	---	---	---	2.0E+01

Jacques Whitford's Ecological Risk Assessment Model (Version 5.0)

Intake Parameters for the Marine Herring Gull		
Receptor Name	Marine Herring Gull	
Name of Study Area	Hopdale Whole Site	
Entire Local Study Area or Project Alone		
Fraction of organic carbon in the soil	0.01	(unitless)
Fraction organic carbon in freshwater (dry) sediment	0.0706	(unitless, usual range is 0.003 to 0.03)
Fraction organic carbon in marine (dry) sediment	0.01	(unitless, usual range is 0.003 to 0.03)
Fraction lipid in freshwater invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Fraction lipid in marine invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Soil Moisture Content	0.25	(cm ³ /cm ³) or (ml/cm ³)
Soil Bulk Density	1.487	(g/cm ³)
Calculate TU based on	1	(1-top 5% most sensitive species, 2-Rainbow Trout, 3-Daphnia magna)
Receptor Type	1	(1-Bird, 2-Mammal)
Small Mammal Type	1	(1-General, 2-Herbivore, 3-Insectivore) Default value should be 1
Fish based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Benthic invertebrates based on Sediment or Surface Water Uptake	1	(1-Freshwater Sediment, 2-Surface Water) Default value should be 1
Aquatic Plants based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Fish based on Sediment or Seawater Uptake	2	(1-Marine Sediment, 2-Seawater) Default value should be 2
Marine Benthic invertebrates based on Sediment or Seawater Uptake	1	(1-Marine Sediment, 2-Seawater) Default value should be 1
General Parameters		
Body weight	1.1	kg
Food intake rate	2.5E-01	kg wet-wt/day
Water intake rate	6.0E-02	L/day
Ingestion of Soil		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction diet that is dry solid	2.8E-01	
Fraction of food intake rate	5.2E-03	
Ingestion rate	3.6E-04	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sl)	3.3E-04	kg/kg-day
Ingestion of Terrestrial Plants		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-tp)	0.0E+00	kg/kg-day
Ingestion of Terrestrial Invertebrates		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	7.5E-02	
Ingestion rate	1.9E-02	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ti)	1.7E-02	kg/kg-day
Ingestion of Terrestrial Mammals/Birds		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	1.5E-01	
Ingestion rate	3.8E-02	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-tm)	3.4E-02	kg/kg-day
Ingestion of Surface Water		
Applicable pathway?	0	(0 = no, 1 = yes)
Ingestion rate	0.0E+00	L/day
Fraction from site	1	
Intake factor (IFing-sw)	0.0E+00	L/kg-day
Ingestion of Freshwater Sediment		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction diet that is dry solid	0.0E+00	
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sed)	0.0E+00	kg/kg-day
Ingestion of Freshwater Aquatic Plants		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ap)	0.0E+00	kg/kg-day
Ingestion of Freshwater Benthic Invertebrates		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ai)	0.0E+00	kg/kg-day
Ingestion of Freshwater Fish		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-fsh)	0.0E+00	kg/kg-day

Detailed Hazard Quotients for the Marine Herring Gull Exposed to COPCs at Hopdale Whole Site

Coast/Bent	Reinforce Topology Dose (mg/kg-day)	Average Daily Dose (mg/kg-day)	Surface Soil Ingestion HQ	Average Daily Dose (mg/kg-day)	Transdermal Ingestion HQ	Average Daily Dose (mg/kg-day)	Transdermal Ingestion HQ	Fractured Rock Ingestion HQ	Average Daily Dose (mg/kg-day)	Seawater Ingestion HQ	Average Daily Dose (mg/kg-day)	Marine Sediment Ingestion HQ	Average Daily Dose (mg/kg-day)	Marine Biota Ingestion Sequence HQ	Amalgam Daily Dose (mg/kg-day)	Malware Risk Ingestion HQ	Total Hazard Quotient
TTH - CORAL CREEK	3.3E-21	6.5E-21	7.7E-24	3.7E-21	2.7E-20	7.7E-21	3.7E-20	---	---	---	---	3.7E-21	3.7E-21	2.7E-20	---	---	1.7E-20
	1.5E-20	3.0E-20	1.8E-23	1.6E-20	1.2E-19	1.6E-20	1.2E-19	---	---	---	---	1.6E-20	1.6E-20	1.2E-19	---	---	3.0E-20
	5.2E-21	1.0E-20	1.8E-23	3.8E-21	5.2E-21	3.8E-21	5.2E-21	---	---	---	---	3.8E-21	3.8E-21	5.2E-21	---	---	1.0E-20
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
TTH - CORAL CREEK	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
TTH - CORAL CREEK	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
TTH - CORAL CREEK	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
TTH - CORAL CREEK	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
TTH - CORAL CREEK	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
TTH - CORAL CREEK	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
TTH - CORAL CREEK	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
	1.5E-21	3.0E-21	1.8E-23	3.8E-21	1.5E-20	3.8E-21	1.5E-20	---	---	---	---	3.8E-21	3.8E-21	1.5E-20	---	---	3.0E-21
TTH - CORAL CREEK																	

Jacques Whitford's Ecological Risk Assessment Model (Version 5.0)

Intake Parameters for the Common Merganser		
Receptor Name	Common Merganser	
Name of Study Area	Hopdale Whole Site	
Entire Local Study Area or Project Alone		
Fraction of organic carbon in the soil	0.01	(unitless)
Fraction organic carbon in freshwater (dry) sediment	0.0706	(unitless, usual range is 0.003 to 0.03)
Fraction organic carbon in marine (dry) sediment	0.01	(unitless, usual range is 0.003 to 0.03)
Fraction lipid in freshwater invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Fraction lipid in marine invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Soil Moisture Content	0.25	(cm ³ /cm ³) or (mi/cm ³)
Soil Bulk Density	1.487	(g/cm ³)
Calculate TU based on	1	(1-top 5% most sensitive species, 2-Rainbow Trout, 3-Daphnia magna)
Receptor Type	1	(1-Bird, 2-Mammal)
Small Mammal Type	1	(1-General, 2-Herbivore, 3-Insectivore) Default value should be 1
Fish based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Benthic Invertebrates based on Sediment or Surface Water Uptake	1	(1-Freshwater Sediment, 2-Surface Water) Default value should be 1
Aquatic Plants based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Fish based on Sediment or Seawater Uptake	2	(1-Marine Sediment, 2-Seawater) Default value should be 2
Marine Benthic Invertebrates based on Sediment or Seawater Uptake	1	(1-Marine Sediment, 2-Seawater) Default value should be 1
General Parameters		
Body weight	1.5	kg
Food intake rate	3.0E-01	kg wet-wt/day
Water intake rate	8.0E-02	L/day
Ingestion of Soil		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction diet that is dry solid	0.0E+00	
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sl)	0.0E+00	kg/kg-day
Ingestion of Terrestrial Plants		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-tp)	0.0E+00	kg/kg-day
Ingestion of Terrestrial Invertebrates		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ti)	0.0E+00	kg/kg-day
Ingestion of Terrestrial Mammals/Birds		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-tm)	0.0E+00	kg/kg-day
Ingestion of Surface Water		
Applicable pathway?	1	(0 = no, 1 = yes)
Ingestion rate	8.0E-02	L/day
Fraction from site	1	
Intake factor (IFing-sw)	8.3E-02	L/kg-day
Ingestion of Freshwater Sediment		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction diet that is dry solid	2.9E-01	
Fraction of food intake rate	1.0E-02	
Ingestion rate	8.6E-04	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sed)	0.0E+00	kg/kg-day
Ingestion of Freshwater Aquatic Plants		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ap)	0.0E+00	kg/kg-day
Ingestion of Freshwater Benthic Invertebrates		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ai)	0.0E+00	kg/kg-day
Ingestion of Freshwater Fish		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	1.0E+00	
Ingestion rate	3.0E-01	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-fsh)	2.0E-01	kg/kg-day

Detailed Hazard Quotients for the Common Merganser Exposed to CoPCs at Hopedale Whole Site Receptor Location

Constituent	Reference Toxicity Dose (mg/kg-day)	Average Daily Dose (mg/kg-day)	Surface Water Ingestion HQ	Average Daily Dose (mg/kg-day)	Freshwater Fish Ingestion HQ	Average Daily Dose (mg/kg-day)	Scumwater Ingestion HQ	Average Daily Dose (mg/kg-day)	Marine Sediment Ingestion HQ	Average Daily Dose (mg/kg-day)	Marine Benthic Invertebrate Ingestion HQ	Average Daily Dose (mg/kg-day)	Marine Fish Ingestion HQ	Total Hazard Quotient
TPH (CONE CMS)	3.7E-01	1.5E-07	3.5E-09	9.2E-05	3.5E-06	---	---	---	---	---	---	---	---	3.5E-06
Alkyl-C10-C19-F1	2.7E-01	2.6E-09	4.5E-10	6.8E-07	1.5E-08	---	---	---	---	---	---	---	---	2.6E-09
Arom-C10-C19-F1	5.4E-01	2.4E-08	4.4E-10	6.8E-07	1.5E-08	---	---	---	---	---	---	---	---	2.4E-08
F1 - Total	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Alkyl-C10-C12-F2	1.4E-02	4.8E-07	3.5E-09	4.0E-02	2.9E-04	---	---	---	---	---	---	---	---	2.9E-04
Arom-C12-C16-F2	2.7E-01	1.3E-07	4.4E-09	5.9E-06	2.5E-07	---	---	---	---	---	---	---	---	2.5E-07
Arom-C10-C12-F2	2.7E-01	1.3E-07	4.4E-09	5.9E-06	2.5E-07	---	---	---	---	---	---	---	---	2.5E-07
F2 - Total	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Alkyl-C12-C16-F3	3.4E-02	1.2E-06	2.9E-09	2.5E-03	---	---	---	---	---	---	---	---	---	2.5E-03
Arom-C16-C21-F3	2.7E-01	1.3E-07	4.4E-09	5.9E-06	2.5E-07	---	---	---	---	---	---	---	---	2.5E-07
Arom-C21-C24-F3	2.7E-01	1.3E-07	4.4E-09	5.9E-06	2.5E-07	---	---	---	---	---	---	---	---	2.5E-07
F3 - Total	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Total TPH HQ = 1.4E-02														
Polyyclic Aromatic Hydrocarbons														
Low Molecular Weight PAHs														
Acenaphthene	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Acenaphthylene	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Fluorene	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1-Methylphenanthrene	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2-Methylphenanthrene	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Naphthalene	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Phenanthrene	---	---	---	---	---	---	---	---	---	---	---	---	---	---
High Molecular Weight PAHs														
Benzo[a]pyrene	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Benzo[b]fluoranthene	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Benzo[k]fluoranthene	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Chrysene	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Dibenz[a,h]anthracene	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Indeno[1,2,3-cd]pyrene	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Pyrene	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Perylene	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TPH (CONE CMS)	1.6E-02	1.3E-06	8.2E-07	1.2E-03	7.9E-01	---	---	---	---	---	---	---	---	7.9E-01
Metals														
Asbestos	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Barium	7.4E-01	5.2E-05	3.2E-06	5.0E-02	1.5E-03	---	---	---	---	---	---	---	---	1.5E-03
Cadmium	1.9E-02	2.1E-05	1.2E-05	1.1E-02	1.1E-02	---	---	---	---	---	---	---	---	1.1E-02
Chromium (Total)	2.7E-02	5.9E-05	2.2E-05	5.0E-02	1.9E-02	---	---	---	---	---	---	---	---	1.9E-02
Copper	7.9E-01	1.1E-05	1.4E-06	2.0E-02	2.8E-03	---	---	---	---	---	---	---	---	2.8E-03
Lead	1.9E-01	3.9E-04	1.8E-05	4.8E-01	2.8E-02	---	---	---	---	---	---	---	---	2.8E-02
Manganese	1.1E-01	7.9E-05	6.9E-06	5.8E-02	1.5E-03	---	---	---	---	---	---	---	---	1.5E-03
Mercury	3.2E-01	3.2E-05	2.9E-06	3.0E-02	7.2E-03	---	---	---	---	---	---	---	---	7.2E-03
Selenium	8.0E-01	8.7E-05	4.2E-07	1.4E-02	1.8E-01	---	---	---	---	---	---	---	---	1.8E-01
Silver	8.7E-01	2.7E-05	4.5E-06	5.0E-02	5.1E-03	---	---	---	---	---	---	---	---	5.1E-03
Tin	9.5E-02	6.6E-06	1.9E-07	2.0E-02	3.9E-05	---	---	---	---	---	---	---	---	3.9E-05
Uranium	5.1E-01	6.6E-06	1.9E-07	5.0E-02	4.2E-02	---	---	---	---	---	---	---	---	4.2E-02
Vanadium	1.9E-02	6.6E-04	5.5E-05	1.5E-01	1.2E-01	---	---	---	---	---	---	---	---	1.2E-01
Zinc	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Jacques Whitford's Ecological Risk Assessment Model (Version 5.0)

Intake Parameters for the Arctic Hare		
Receptor Name	Arctic Hare	
Name of Study Area	Hopetown Whole Site	
Entire Local Study Area or Project Alone		
Fraction of organic carbon in the soil	0.01	(unitless)
Fraction organic carbon in freshwater (dry) sediment	0.0706	(unitless, usual range is 0.003 to 0.03)
Fraction organic carbon in marine (dry) sediment	0.01	(unitless, usual range is 0.003 to 0.03)
Fraction lipid in freshwater invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Fraction lipid in marine invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Soil Moisture Content	0.25	(cm ³ /cm ³) or (ml/cm ³)
Soil Bulk Density	1.487	(g/cm ³)
Calculate TU based on	1	(1-top 5% most sensitive species, 2-Rainbow Trout, 3-Daphnia magna)
Receptor Type	2	(1-Bird, 2-Mammal)
Small Mammal Type	1	(1-General, 2-Herbivore, 3-Insectivore) Default value should be 1
Fish based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Benthic Invertebrates based on Sediment or Surface Water Uptake	1	(1-Freshwater Sediment, 2-Surface Water) Default value should be 1
Aquatic Plants based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Fish based on Sediment or Seawater Uptake	2	(1-Marine Sediment, 2-Seawater) Default value should be 2
Marine Benthic Invertebrates based on Sediment or Seawater Uptake	1	(1-Marine Sediment, 2-Seawater) Default value should be 1
General Parameters		
Body weight	4.3	kg
Food intake rate	7.0E-01	kg wet-wt/day
Water intake rate	4.0E-01	L/day
Ingestion of Soil		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction diet that is dry solid	3.7E-01	
Fraction of food intake rate	1.9E-02	
Ingestion rate	5.0E-03	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sl)	1.2E-03	kg/kg-day
Ingestion of Terrestrial Plants		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	9.5E-01	
Ingestion rate	6.7E-01	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-tp)	1.5E-01	kg/kg-day
Ingestion of Terrestrial Invertebrates		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ti)	0.0E+00	kg/kg-day
Ingestion of Terrestrial Mammals/Birds		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	5.0E-02	
Ingestion rate	3.5E-02	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-lm)	8.1E-03	kg/kg-day
Ingestion of Surface Water		
Applicable pathway?	1	(0 = no, 1 = yes)
Ingestion rate	4.0E-01	L/day
Fraction from site	1	
Intake factor (IFing-sw)	9.3E-02	L/kg-day
Ingestion of Freshwater Sediment		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction diet that is dry solid	0.0E+00	
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sed)	0.0E+00	kg/kg-day
Ingestion of Freshwater Aquatic Plants		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ap)	0.0E+00	kg/kg-day
Ingestion of Freshwater Benthic Invertebrates		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-bi)	0.0E+00	kg/kg-day
Ingestion of Freshwater Fish		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-fsh)	0.0E+00	kg/kg-day

Detailed Hazard Quotients for the Arctic Hare Exposed to COPCs at Hopedale Whole Site

Constituent	Reference Toxicity Dose (mg/kg-day)	Average Daily Dose (mg/kg-day)	Surface Soil Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Plant Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Invertebrate Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Mammal Ingestion HQ	Average Daily Dose (mg/kg-day)	Surface Water Ingestion HQ	Marine Fish Ingestion HQ	Total Hazard Quotient
TPH - GCME CWS													
Aliph-C09-C08-F1	2.7E-01	2.3E-02	8.7E-04	3.3E-01	1.3E-02	6.4E-04	2.4E-05	2.6E-07	2.4E-05	9.8E-09	---	---	1.3E-02
Aliph-C09-C10-F1	5.7E-01	1.9E-02	7.1E-05	1.9E-01	3.5E-03	6.7E-05	2.5E-06	1.7E-07	2.5E-06	6.3E-09	---	---	1.2E-03
Aliph-C08-C10-F1	5.3E-01	3.9E-03	7.1E-05	1.9E-01	3.5E-03	1.3E-04	2.5E-06	4.2E-08	2.5E-06	7.8E-10	---	---	3.6E-03
F1 - Total	---	---	---	---	---	---	---	---	---	---	---	---	---
Aliph-C10-C12-F2	1.9E-02	7.7E-03	5.8E-02	3.8E-01	2.9E-03	5.9E-03	4.4E-05	8.4E-07	4.4E-05	6.3E-09	---	---	1.8E-02
Aliph-C12-C16-F2	1.9E-02	9.4E-03	7.1E-02	1.4E-01	6.2E-03	5.5E-03	4.2E-05	1.0E-05	4.2E-05	7.7E-09	---	---	7.2E-02
Aliph-C10-C12-F2	2.7E-01	1.9E-03	7.2E-02	6.1E-01	2.3E-03	2.9E-02	1.1E-03	2.1E-07	1.1E-03	7.8E-09	---	---	2.4E-02
Aliph-C12-C16-F2	2.7E-01	2.5E-03	6.9E-02	3.4E-01	1.3E-03	2.4E-02	9.9E-04	2.8E-07	9.9E-04	9.8E-09	---	---	1.4E-03
F2 - Total	---	---	---	---	---	---	---	---	---	---	---	---	---
Aliph-C09-C08-F3	5.3E-02	8.7E-01	1.6E-03	1.0E-02	1.5E-05	5.1E-04	2.6E-08	2.6E-06	2.6E-08	4.9E-08	---	---	1.0E-04
Aliph-C09-C10-F3	3.7E-01	3.7E-04	7.0E-03	4.4E-03	5.1E-06	1.1E-04	2.1E-07	1.1E-06	2.1E-07	2.1E-08	---	---	7.1E-03
Aliph-C10-C12-F3	2.7E-01	2.2E-01	6.2E-03	7.4E-01	2.7E-02	6.9E-04	2.6E-05	6.5E-07	2.6E-05	2.4E-08	---	---	3.5E-02
Aliph-C12-C16-F3	2.7E-01	9.4E-02	3.5E-03	5.5E-03	2.1E-04	7.1E-05	2.7E-06	2.8E-07	2.7E-06	1.0E-08	---	---	3.2E-03
F3 - Total	---	---	---	---	---	---	---	---	---	---	---	---	---
Polyyclic Aromatic Hydrocarbons													
Low Molecular Weight PAHs													
Acenaphthene	1.7E-02	4.7E-04	2.8E-09	4.1E-03	2.4E-05	1.2E-05	6.8E-08	---	6.8E-08	---	---	---	2.7E-05
Acenaphthylene	1.7E-02	3.9E-04	2.1E-06	3.6E-03	2.1E-05	1.1E-05	3.6E-08	---	3.6E-08	---	---	---	2.3E-05
Anthracene	1.7E-02	1.9E-05	6.9E-08	7.0E-04	4.5E-06	2.8E-05	1.6E-08	---	1.6E-08	---	---	---	4.6E-06
Fluoranthene	1.7E-02	2.3E-04	1.4E-06	3.0E-03	1.6E-05	1.2E-05	6.8E-08	---	6.8E-08	---	---	---	1.9E-05
Pyrene	1.7E-02	3.9E-04	2.1E-06	3.6E-03	2.1E-05	1.1E-05	3.6E-08	---	3.6E-08	---	---	---	2.3E-05
2-Methylanthracene	1.7E-02	1.9E-05	6.9E-08	7.0E-04	4.5E-06	2.8E-05	1.6E-08	---	1.6E-08	---	---	---	4.6E-06
3-Methylanthracene	1.7E-02	6.2E-03	3.8E-05	1.3E-03	7.9E-05	4.8E-05	2.8E-07	---	2.8E-07	---	---	---	1.3E-04
Naphthalene	1.7E-02	1.4E-03	8.3E-06	6.7E-03	4.0E-05	1.3E-05	7.4E-08	---	7.4E-08	---	---	---	4.8E-06
Phenanthrene	1.7E-02	3.5E-04	2.1E-06	3.6E-03	2.1E-05	1.4E-05	8.2E-08	---	8.2E-08	---	---	---	2.3E-05
High Molecular Weight PAHs													
Benzo(a)anthracene	1.8E-01	2.3E-04	1.3E-05	9.2E-04	5.1E-05	4.8E-06	2.7E-07	---	2.7E-07	---	---	---	6.4E-05
Benzo(a)pyrene	1.8E-01	5.9E-04	3.9E-05	2.2E-03	1.2E-04	5.4E-05	3.0E-06	---	3.0E-06	---	---	---	1.6E-04
Benzo(b)fluoranthene	1.8E-01	5.9E-05	3.9E-06	2.5E-04	1.4E-05	1.2E-06	6.4E-08	---	6.4E-08	---	---	---	1.7E-05
Benzo(k)fluoranthene	1.8E-01	5.9E-05	3.9E-06	2.5E-04	1.4E-05	1.2E-06	6.4E-08	---	6.4E-08	---	---	---	1.7E-05
Chrysene	1.8E-01	1.2E-05	6.5E-07	5.4E-03	2.0E-06	1.1E-02	5.9E-08	---	5.9E-08	---	---	---	3.4E-05
Dibenz(a,h)anthracene	1.8E-01	1.2E-04	6.5E-06	4.8E-04	2.7E-05	9.6E-05	3.3E-07	---	3.3E-07	---	---	---	3.4E-05
Indeno(1,2,3-cd)pyrene	1.8E-01	1.2E-04	6.5E-06	4.8E-04	2.7E-05	9.6E-05	3.3E-07	---	3.3E-07	---	---	---	3.4E-05
Pyrene	1.8E-01	2.3E-04	1.3E-05	9.2E-04	5.1E-05	2.1E-05	1.2E-06	---	1.2E-06	---	---	---	6.5E-06
Pyrene	1.8E-01	4.7E-04	2.8E-05	1.8E-03	9.6E-05	8.5E-05	5.0E-07	---	5.0E-07	---	---	---	1.3E-04
PCB													
Aroclor 1254 (Total PCBs)	2.0E-01	2.1E-02	1.1E-01	2.2E-01	1.1E-02	6.3E-02	3.2E-01	2.3E-05	3.2E-01	1.2E-05	---	---	1.5E-02
Inorganics													
Antimony	3.2E-01	1.4E-02	4.4E-02	1.2E-03	3.9E-03	2.0E-03	3.4E-03	9.3E-05	3.4E-03	2.9E-04	---	---	4.0E-03
Barium	5.2E-01	3.6E-03	7.0E-05	1.1E-03	2.2E-02	3.6E-03	6.8E-05	4.8E-05	6.8E-05	8.8E-06	---	---	2.2E-02
Cadmium	3.2E-01	3.2E-03	5.9E-03	2.9E-03	3.2E-03	6.4E-03	3.2E-03	3.0E-04	3.2E-03	0.8E-05	---	---	1.6E-03
Cobalt	7.1E-01	9.0E-03	1.3E-03	3.9E-03	5.5E-02	8.1E-04	1.9E-04	1.9E-05	1.9E-04	2.8E-06	---	---	5.6E-02
Copper	9.3E-01	3.0E-01	3.3E-02	6.5E-03	7.0E-01	2.7E-02	2.9E-03	5.8E-04	2.9E-03	6.2E-05	---	---	7.3E-01
Lead	4.1E-01	1.5E-01	3.4E-03	7.6E-03	1.9E-01	5.6E-03	1.4E-04	1.3E-04	1.4E-04	3.2E-06	---	---	1.9E-01
Molybdenum	7.5E-01	9.5E-02	1.3E-01	1.1E-03	1.4E-03	2.0E-03	2.7E-03	9.3E-05	2.7E-03	1.2E-04	---	---	1.3E-02
Nickel	1.0E-01	2.3E-02	2.3E-03	9.9E-01	9.7E-02	2.0E-03	2.0E-03	4.7E-05	2.0E-03	9.1E-06	---	---	1.0E-01
Selenium	1.8E-01	1.3E-03	8.8E-01	1.5E-01	1.5E-02	2.0E-03	1.2E-02	4.7E-05	1.2E-02	2.8E-04	---	---	9.0E-01
Silver	5.3E-01	1.1E-02	2.1E-04	3.9E-02	7.2E-04	4.9E-04	9.1E-06	4.7E-05	9.1E-06	8.7E-08	---	---	9.4E-04
Tin	1.0E-01	7.3E-02	7.3E-02	3.0E-02	3.0E-03	2.0E-03	2.0E-03	9.3E-05	2.0E-03	9.2E-06	---	---	1.0E-02
Uranium	1.8E-01	1.3E-03	7.3E-04	3.1E-02	1.7E-02	4.2E-04	2.4E-04	1.7E-05	2.4E-04	9.9E-08	---	---	1.8E-02
Vanadium	2.2E-01	2.8E-02	1.0E-02	8.0E-01	2.9E-01	2.0E-03	7.5E-04	9.3E-05	7.5E-04	3.4E-05	---	---	3.1E-01
Zinc	1.7E-02	2.8E-01	1.0E-03	3.0E-01	2.3E-01	2.3E-01	1.3E-03	1.3E-03	1.3E-03	7.1E-03	---	---	2.3E-01
Total TPH HQ = 3.3E-02													
Total LPAH HQ = 3.9E-04													
Total HPAH HQ = 7.6E-04													
Total PAH HQ = 1.1E-03													

Jacques Whitford's Ecological Risk Assessment Model (Version 5.0)

Intake Parameters for the Red Fox		
Receptor Name	Red Fox	
Name of Study Area	Hopetown Area 1	
Entire Local Study Area or Project Alone		
Fraction of organic carbon in the soil	0.01	(unitless)
Fraction organic carbon in freshwater (dry) sediment	0.0706	(unitless, usual range is 0.003 to 0.03)
Fraction organic carbon in marine (dry) sediment	0.01	(unitless, usual range is 0.003 to 0.03)
Fraction lipid in freshwater invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Fraction lipid in marine invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Soil Moisture Content	0.25	(cm ³ /cm ³) or (ml/cm ³)
Soil Bulk Density	1.487	(g/cm ³)
Calculate TU based on	1	(1-top 5% most sensitive species, 2-Rainbow Trout, 3-Daphnia magna)
Receptor Type	2	(1-Bird, 2-Mammal)
Small Mammal Type	1	(1-General, 2-Herbivore, 3-Insectivore) Default value should be 1
Fish based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Benthic Invertebrates based on Sediment or Surface Water Uptake	1	(1-Freshwater Sediment, 2-Surface Water) Default value should be 1
Aquatic Plants based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Fish based on Sediment or Seawater Uptake	2	(1-Marine Sediment, 2-Seawater) Default value should be 2
Marine Benthic Invertebrates based on Sediment or Seawater Uptake	1	(1-Marine Sediment, 2-Seawater) Default value should be 1
General Parameters		
Body weight	4.5	kg
Food intake rate	7.6E-01	kg wet-wt/day
Water intake rate	3.6E-01	L/day
Ingestion of Soil		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction diet that is dry solid	3.1E-01	
Fraction of food intake rate	1.3E-02	
Ingestion rate	3.0E-03	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sl)	6.7E-04	kg/kg-day
Ingestion of Terrestrial Plants		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	1.0E-01	
Ingestion rate	7.6E-02	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-tp)	1.7E-02	kg/kg-day
Ingestion of Terrestrial Invertebrates		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	5.0E-02	
Ingestion rate	3.6E-02	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ti)	8.4E-03	kg/kg-day
Ingestion of Terrestrial Mammals/Birds		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	8.5E-01	
Ingestion rate	6.5E-01	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-tm)	1.4E-01	kg/kg-day
Ingestion of Surface Water		
Applicable pathway?	1	(0 = no, 1 = yes)
Ingestion rate	3.8E-01	L/day
Fraction from site	1	
Intake factor (IFing-sw)	8.5E-02	L/kg-day
Ingestion of Freshwater Sediment		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction diet that is dry solid	0.0E+00	
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sed)	0.0E+00	kg/kg-day
Ingestion of Freshwater Aquatic Plants		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ap)	0.0E+00	kg/kg-day
Ingestion of Freshwater Benthic Invertebrates		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-bi)	0.0E+00	kg/kg-day
Ingestion of Freshwater Fish		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-fsh)	0.0E+00	kg/kg-day

Detailed Hazard Quotients for the Red Fox Exposed to COPCs at Hopedale Area 1

Constituent	Reference Toxicity Dose (mg/kg-day)	Average Daily Dose (mg/kg-day)	Surface Soil Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Plant Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Invertebrate Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Mammal Ingestion HQ	Total Hazard Quotient
TPH - CGME CWS										
Aliph>C06-C08 - F1	2.6E+01	---	---	---	---	---	---	---	---	---
Aliph>C08-C10 - F1	2.6E+01	---	---	---	---	---	---	---	---	---
Arom>C08-C10 - F1	5.3E+01	---	---	---	---	---	---	---	---	---
F1 - Total	---	---	---	---	---	---	---	---	---	---
Aliph>C10-C12 - F2	1.3E+02	2.2E+01	1.7E-01	2.1E-01	1.8E-03	1.0E+02	7.8E-01	5.3E-01	4.0E-03	9.5E-01
Aliph>C12-C16 - F2	1.3E+02	2.7E+01	2.1E-01	6.1E-02	4.9E-04	1.2E+02	8.9E-01	5.0E-01	3.8E-03	1.1E+00
Arom>C10-C12 - F2	2.6E+01	5.6E+00	2.1E-01	3.4E+01	1.3E+00	2.9E+00	1.1E-01	2.6E+00	9.9E-02	1.7E+00
Arom>C12-C16 - F2	2.6E+01	6.8E+00	2.6E-01	1.8E+01	7.1E-01	3.5E+00	1.3E-01	2.1E+00	8.1E-02	1.2E+00
F2 - Total	---	---	---	---	---	---	---	---	---	---
Aliph>C16-C21 - F3	5.3E+02	4.8E+00	9.2E-03	1.1E-02	2.9E-05	3.0E+00	5.7E-03	8.8E-02	1.7E-04	4.9E+00
Aliph>C21-C34 - F3	5.3E+02	2.1E+00	3.9E-03	4.6E-03	8.9E-06	6.4E-01	1.2E-03	1.9E-02	3.6E-05	1.5E-02
Arom>C16-C21 - F3	2.6E+01	1.2E+00	4.6E-02	7.7E-01	2.9E-02	5.0E-01	1.9E-02	1.2E-01	4.9E-03	9.9E-02
Arom>C21-C34 - F3	2.6E+01	5.2E-01	2.0E-02	5.9E-03	2.2E-04	2.1E-01	8.1E-03	1.2E-02	4.8E-04	2.8E-02
F3 - Total	---	---	---	---	---	---	---	---	---	---
PCB										
Aroclor 1254 (Total PCBs)	1.9E-01	3.9E-02	2.0E-01	2.5E-02	1.3E-02	1.4E+00	7.2E+00	2.0E-01	1.0E+00	8.4E+00
Inorganics										
Cadmium	5.3E-01	7.3E-03	1.4E-02	2.9E-02	4.8E-02	7.5E-02	1.4E-01	8.6E-03	1.6E-02	2.2E-01
Tr	1.0E+01	1.1E-02	1.1E-03	9.0E-04	9.0E-05	1.1E-02	1.1E-03	3.6E-02	3.6E-03	5.9E-03
Zinc	1.7E+02	1.9E+00	1.1E-02	2.7E+00	1.6E-02	1.6E+00	9.4E-03	4.2E+00	2.5E-02	6.2E-02

Jacques Whitford's Ecological Risk Assessment Model (Version 5.0)

Intake Parameters for the Masked Shrew		
Receptor Name	Masked Shrew	
Name of Study Area	Hopedale Area 1	
Entire Local Study Area or Project Alone		
Fraction of organic carbon in the soil	0.01	(unitless)
Fraction organic carbon in freshwater (dry) sediment	0.0706	(unitless, usual range is 0.003 to 0.03)
Fraction organic carbon in marine (dry) sediment	0.01	(unitless, usual range is 0.003 to 0.03)
Fraction lipid in freshwater invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Fraction lipid in marine invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Soil Moisture Content	0.25	(cm ³ /cm ³) or (ml/cm ³)
Soil Bulk Density	1.487	(g/cm ³)
Calculate TU based on	1	(1-top 5% most sensitive species, 2-Rainbow Trout, 3-Daphnia magna)
Receptor Type	2	(1-Bird, 2-Mammal)
Small Mammal Type	1	(1-General, 2-Herbivore, 3-Insectivore) Default value should be 1
Fish based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Benthic Invertebrates based on Sediment or Surface Water Uptake	1	(1-Freshwater Sediment, 2-Surface Water) Default value should be 1
Aquatic Plants based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Fish based on Sediment or Seawater Uptake	2	(1-Marine Sediment, 2-Seawater) Default value should be 2
Marine Benthic Invertebrates based on Sediment or Seawater Uptake	1	(1-Marine Sediment, 2-Seawater) Default value should be 1
General Parameters		
Body weight	0.005	kg
Food intake rate	3.0E-03	kg wet-wt/day
Water intake rate	1.0E-03	L/day
Ingestion of Soil		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction diet that is dry solid	3.0E-01	
Fraction of food intake rate	4.9E-02	
Ingestion rate	4.4E-05	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sl)	8.9E-03	kg/kg-day
Ingestion of Terrestrial Plants		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	2.5E-02	
Ingestion rate	7.5E-05	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-lp)	1.5E-02	kg/kg-day
Ingestion of Terrestrial Invertebrates		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	9.8E-01	
Ingestion rate	2.9E-03	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ti)	5.9E-01	kg/kg-day
Ingestion of Terrestrial Mammals/Birds		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-tm)	0.0E+00	kg/kg-day
Ingestion of Surface Water		
Applicable pathway?	1	(0 = no, 1 = yes)
Ingestion rate	1.0E-03	L/day
Fraction from site	1	
Intake factor (IFing-sw)	2.0E-01	L/kg-day
Ingestion of Freshwater Sediment		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction diet that is dry solid	0.0E+00	
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sed)	0.0E+00	kg/kg-day
Ingestion of Freshwater Aquatic Plants		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ap)	0.0E+00	kg/kg-day
Ingestion of Freshwater Benthic Invertebrates		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ai)	0.0E+00	kg/kg-day
Ingestion of Freshwater Fish		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-fsh)	0.0E+00	kg/kg-day

Detailed Hazard Quotients for the Masked Shrew Exposed to CoPCs at Hopedale Area 1 Receptor Location

Constituent	Reference Toxicity Dose (mg/kg-day)	Average Daily Dose (mg/kg-day)	Surface Soil Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Plant Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Invertebrate Ingestion HQ	Average Daily Dose (mg/kg-day)	Surface Water Ingestion HQ	Marine Fish Ingestion HQ	Total Hazard Quotient
TPH - CCME CWS											
Aliph>C08-C08 - F1	5.0E+01										
Aliph>C08-C10 - F1	5.0E+01										
Arom>C08-C10 - F1	1.0E+02										
F1 - Total											
Aliph>C10-C12 - F2	2.3E+02	3.0E+02	1.2E+00	1.9E-01	7.5E-04	7.1E+03	2.8E+01				3.0E+01
Aliph>C12-C16 - F2	2.3E+02	3.6E+02	1.5E+00	5.4E-02	2.2E-04	8.1E+03	3.2E+01				3.4E+01
Arom>C10-C12 - F2	5.0E+01	7.4E+01	1.5E+00	3.0E-01	5.0E-01	2.0E+02	4.1E+00				6.2E+00
Arom>C12-C16 - F2	5.0E+01	9.1E+01	1.3E+00	1.7E-01	3.3E-01	2.5E+02	4.9E+00				7.4E+00
F2 - Total											
Aliph>C16-C21 - F3	1.0E+03	6.5E+01	6.5E-02	9.8E-03	9.6E-06	2.1E+02	2.1E-01				2.7E-01
Aliph>C21-C24 - F3	1.0E+03	2.3E+01	2.3E-02	4.1E-03	4.1E-06	4.5E+01	4.5E-02				7.2E-02
Arom>C16-C21 - F3	5.0E+01	1.6E+01	3.2E-01	6.9E-01	1.4E-02	3.5E+01	6.9E-01				1.0E+00
Arom>C21-C24 - F3	5.0E+01	6.9E+00	1.4E-01	5.2E-03	1.0E-04	1.5E+01	3.0E-01				4.3E-01
F3 - Total											
PCB											
Aroclor 1254 (Total PCBs)	6.8E-01	5.1E-01	7.6E-01	2.3E-03	3.3E-03	9.6E+01	1.4E+02		7.4E-06		1.4E+02
Inorganics											
Cadmium	1.0E+00	9.8E-02	9.8E-02	2.3E-02	2.3E-02	5.2E+00	5.2E+00		1.7E-06		5.3E+00
Tin	3.5E+01	1.5E-01	4.3E-03	8.0E-04	2.3E-05	7.4E-01	2.1E-02		5.7E-06		2.5E-02
Zinc	3.2E+02	2.6E+01	8.1E-02	2.4E+00	7.8E-03	1.1E+02	3.4E-01		3.2E-06		4.3E-01
Total TPH HQ =											

Jacques Whitford's Ecological Risk Assessment Model (Version 5.0)

Intake Parameters for the Meadow Vole		
Receptor Name	Meadow Vole	
Name of Study Area	Hopedale Area 1	
Entire Local Study Area or Project Alone		
Fraction of organic carbon in the soil	0.01	(unitless)
Fraction organic carbon in freshwater (dry) sediment	0.0706	(unitless, usual range is 0.003 to 0.03)
Fraction organic carbon in marine (dry) sediment	0.01	(unitless, usual range is 0.003 to 0.03)
Fraction lipid in freshwater invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Fraction lipid in marine invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Soil Moisture Content	0.25	(cm ³ /cm ³) or (mL/cm ³)
Soil Bulk Density	1.487	(g/cm ³)
Calculate TU based on	1	(1-top 5% most sensitive species, 2-Rainbow Trout, 3-Daphnia magna)
Receptor Type	2	(1-Bird, 2-Mammal)
Small Mammal Type	1	(1-General, 2-Herbivore, 3-Insectivore) Default value should be 1
Fish based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Benthic Invertebrates based on Sediment or Surface Water Uptake	1	(1-Freshwater Sediment, 2-Surface Water) Default value should be 1
Aquatic Plants based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Fish based on Sediment or Seawater Uptake	2	(1-Marine Sediment, 2-Seawater) Default value should be 2
Marine Benthic Invertebrates based on Sediment or Seawater Uptake	1	(1-Marine Sediment, 2-Seawater) Default value should be 1
General Parameters		
Body weight	0.042	kg
Food intake rate	1.1E-02	kg wet-wt/day
Water intake rate	6.0E-03	L/day
Ingestion of Soil		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction diet that is dry solid	4.8E-01	
Fraction of food intake rate	6.0E-02	
Ingestion rate	3.1E-04	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sl)	7.5E-03	kg/kg-day
Ingestion of Terrestrial Plants		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	9.8E-01	
Ingestion rate	1.1E-02	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-tp)	2.6E-01	kg/kg-day
Ingestion of Terrestrial Invertebrates		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	2.0E-02	
Ingestion rate	2.2E-04	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ti)	5.2E-03	kg/kg-day
Ingestion of Terrestrial Mammals/Birds		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-tm)	0.0E+00	kg/kg-day
Ingestion of Surface Water		
Applicable pathway?	1	(0 = no, 1 = yes)
Ingestion rate	6.0E-03	L/day
Fraction from site	1	
Intake factor (IFing-sw)	1.4E-01	L/kg-day
Ingestion of Freshwater Sediment		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction diet that is dry solid	0.0E+00	
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sed)	0.0E+00	kg/kg-day
Ingestion of Freshwater Aquatic Plants		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ap)	0.0E+00	kg/kg-day
Ingestion of Freshwater Benthic Invertebrates		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ai)	0.0E+00	kg/kg-day
Ingestion of Freshwater Fish		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-fsh)	0.0E+00	kg/kg-day

Detailed Hazard Quotients for the Meadow Vole Exposed to CoPCs at Hopedale Area 1 Receptor Location

Constituent	Reference Toxicity Dose (mg/kg-day)	Average Daily Dose (mg/kg-day)	Surface Soil Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Plant Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Invertebrate Ingestion HQ	Average Daily Dose (mg/kg-day)	Surface Water Ingestion HQ	Marine Fish Ingestion HQ	Total Hazard Quotient
TPH - OCME CWS											
Aliph-C08-C08 - F1	5.0E-01	---	---	---	---	---	---	---	---	---	---
Aliph-C08-C10 - F1	5.0E-01	---	---	---	---	---	---	---	---	---	---
Arom-C08-C10 - F1	1.0E-02	---	---	---	---	---	---	---	---	---	---
F1 - Total	---	---	---	---	---	---	---	---	---	---	---
Aliph-C10-C12 - F2	2.5E-02	2.5E+02	1.0E+00	3.2E+00	1.3E-02	6.4E-01	2.9E-01	2.9E-01	---	---	1.3E+00
Aliph-C12-C16 - F2	2.5E-02	3.1E+02	1.2E+00	9.2E-01	3.7E-03	7.3E-01	2.9E-01	2.9E-01	---	---	1.5E+00
Arom-C10-C12 - F2	5.0E-01	6.3E+01	1.3E+00	5.1E-02	1.0E-01	1.8E+00	3.7E-02	3.7E-02	---	---	1.2E+01
Arom-C12-C16 - F2	5.0E-01	7.7E+01	1.5E+00	2.9E-02	5.7E-00	2.2E+00	4.4E-02	4.4E-02	---	---	7.3E+00
F2 - Total	---	---	---	---	---	---	---	---	---	---	2.2E+01
Aliph-C16-C21 - F3	1.0E-03	5.5E+01	5.5E-02	1.6E-01	1.6E-04	1.9E+00	1.9E-03	1.9E-03	---	---	5.7E-02
Aliph-C21-C24 - F3	1.0E-03	2.3E+01	2.3E-02	7.0E-02	7.0E-05	4.0E-01	4.0E-04	4.0E-04	---	---	2.4E-02
Arom-C16-C21 - F3	5.0E+01	1.4E+01	2.7E-01	1.2E-01	2.4E-01	3.1E-01	6.2E-03	6.2E-03	---	---	5.1E-01
Arom-C21-C24 - F3	5.0E+01	5.8E+00	1.2E-01	8.9E-02	1.9E-03	1.3E-01	2.7E-03	2.7E-03	---	---	3.2E-01
F3 - Total	---	---	---	---	---	---	---	---	---	---	7.2E-01
PCB											
Aroclor 1254 (Total PCBs)	6.3E-01	4.3E-01	6.9E-01	3.9E-02	6.2E-02	8.6E-01	1.4E+00	3.6E-06	5.7E-06	---	2.2E+01
Inorganics											
Cadmium	1.0E+00	8.2E-02	8.2E-02	3.9E-01	3.9E-01	4.7E-02	4.7E-02	1.2E-06	1.2E-06	---	5.1E-01
Tin	3.2E+01	1.3E-01	4.0E-03	1.4E-02	4.2E-04	8.6E-03	2.1E-04	1.4E-04	4.4E-06	---	4.6E-03
Zinc	3.2E+02	2.2E+01	6.8E-02	4.2E+01	1.3E-01	9.8E-01	3.1E-03	7.3E-04	2.3E-06	---	2.0E-01
Total TPH HQ =											
2.1E+00											

Jacques Whitford's Ecological Risk Assessment Model (Version 5.0)

Intake Parameters for the Red Fox		
Receptor Name	Red Fox	
Name of Study Area	Hopedale Area 2	
Entire Local Study Area or Project Alone		
Fraction of organic carbon in the soil	0.01	(unitless)
Fraction organic carbon in freshwater (dry) sediment	0.0706	(unitless, usual range is 0.003 to 0.03)
Fraction organic carbon in marine (dry) sediment	0.01	(unitless, usual range is 0.003 to 0.03)
Fraction lipid in freshwater invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Fraction lipid in marine invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Soil Moisture Content	0.25	(cm ³ /cm ³) or (mi/cm ³)
Soil Bulk Density	1.467	(g/cm ³)
Calculate TU based on	1	(1-top 5% most sensitive species, 2-Rainbow Trout, 3-Daphnia magna)
Receptor Type	2	(1-Bird, 2-Mammal)
Small Mammal Type	1	(1-General, 2-Herbivore, 3-Insectivore) Default value should be 1
Fish based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Benthic Invertebrates based on Sediment or Surface Water Uptake	1	(1-Freshwater Sediment, 2-Surface Water) Default value should be 1
Aquatic Plants based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Fish based on Sediment or Seawater Uptake	2	(1-Marine Sediment, 2-Seawater) Default value should be 2
Marine Benthic Invertebrates based on Sediment or Seawater Uptake	1	(1-Marine Sediment, 2-Seawater) Default value should be 1
General Parameters		
Body weight	4.5	kg
Food intake rate	7.6E-01	kg wet-wt/day
Water intake rate	3.8E-01	L/day
Ingestion of Soil		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction diet that is dry solid	3.1E-01	
Fraction of food intake rate	1.3E-02	
Ingestion rate	3.0E-03	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sl)	6.7E-04	kg/kg-day
Ingestion of Terrestrial Plants		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	1.0E-01	
Ingestion rate	7.6E-02	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-lp)	1.7E-02	kg/kg-day
Ingestion of Terrestrial Invertebrates		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	5.0E-02	
Ingestion rate	3.8E-02	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ti)	8.4E-03	kg/kg-day
Ingestion of Terrestrial Mammals/Birds		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	8.5E-01	
Ingestion rate	6.5E-01	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-lm)	1.4E-01	kg/kg-day
Ingestion of Surface Water		
Applicable pathway?	1	(0 = no, 1 = yes)
Ingestion rate	3.8E-01	L/day
Fraction from site	1	
Intake factor (IFing-sw)	8.5E-02	L/kg-day
Ingestion of Freshwater Sediment		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction diet that is dry solid	0.0E+00	
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sed)	0.0E+00	kg/kg-day
Ingestion of Freshwater Aquatic Plants		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ap)	0.0E+00	kg/kg-day
Ingestion of Freshwater Benthic Invertebrates		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-bi)	0.0E+00	kg/kg-day
Ingestion of Freshwater Fish		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-fsh)	0.0E+00	kg/kg-day

Detailed Hazard Quotients for the Red Fox Exposed to COPCs at Hopedale Area 2

Constituent	Reference Toxicity Dose (mg/kg-day)	Average Daily Dose (mg/kg-day)	Surface Soil Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Plant Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Invertebrate Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Mammal Ingestion HQ	Marine Fish Ingestion HQ	Total Hazard Quotient
TPH - CCME CWS	2.6E+01	---	---	---	---	---	---	---	---	---	---
	2.6E+01	---	---	---	---	---	---	---	---	---	---
	5.3E+01	---	---	---	---	---	---	---	---	---	---
	F1 - Total										
	1.9E+02	4.4E+00	3.9E-02	4.2E-02	3.2E-04	2.0E+01	1.5E-01	1.0E-01	7.9E-04	---	---
	1.9E+02	5.3E+00	4.0E-02	1.2E-02	9.0E-05	2.9E+01	1.7E-01	9.7E-02	7.4E-04	---	---
	2.6E+01	1.1E+00	4.1E-02	6.6E+00	2.5E-01	5.8E-01	2.2E-02	5.1E-01	1.9E-02	---	---
	2.6E+01	1.3E+00	5.1E-02	3.7E+00	1.4E-01	6.9E-01	2.6E-02	4.2E-01	1.6E-02	---	---
	F2 - Total										
	5.8E+02	2.3E-01	4.4E-04	5.2E-04	9.9E-07	1.5E-01	2.7E-04	4.3E-03	8.1E-06	---	---
F3 - Total	5.3E+02	1.0E-01	1.9E-04	2.2E-04	4.2E-07	3.1E-02	5.9E-05	9.2E-04	1.7E-05	---	---
	2.6E+01	5.9E-02	2.2E-03	3.7E-02	1.4E-03	2.4E-02	9.2E-04	5.7E-03	2.2E-04	---	---
	2.6E+01	2.5E-02	9.5E-04	2.8E-04	1.1E-05	1.0E-02	3.9E-04	5.9E-04	2.2E-05	---	---
	F3 - Total										
	Total TPH HQ =										
	---	---	---	---	---	---	---	---	---	---	---
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PCB											
Aroclor 1254 (Total PCBs)	1.9E-01	1.1E-02	5.5E-02	2.0E-02	1.0E-01	2.4E-01	1.2E+00	6.9E-01	3.5E+00	---	3.9E+00
Inorganics											
Cadmium	5.3E-01	8.0E-03	1.5E-02	5.4E-01	1.0E+00	8.1E-02	1.5E-01	5.8E-02	1.1E-01	---	---
Chromium (Total)	2.5E+00	1.0E-01	4.3E-02	3.7E-01	1.9E-01	6.4E-02	2.7E-02	3.9E-02	1.5E-02	---	---
Cobalt	7.0E+00	6.3E-03	9.0E-04	5.8E-02	7.7E-03	1.0E-03	2.2E-04	1.4E-02	2.1E-03	---	---
Copper	9.3E+00	3.7E-01	3.9E-02	9.9E-01	9.9E-02	3.8E-02	4.1E-03	4.7E-01	5.1E-02	---	---
Lead	4.1E+01	9.6E-03	9.5E-03	2.8E+00	6.1E-02	1.9E-01	4.6E-03	1.4E-01	3.5E-03	---	---
Molybdenum	7.4E-01	5.5E-02	7.9E-02	1.2E-01	1.6E-01	1.0E-01	1.4E-01	3.6E-02	4.8E-02	---	---
Selenium	1.7E-01	1.7E-03	7.6E-03	1.7E-02	9.7E-02	2.7E-03	1.5E-02	3.6E-02	2.1E-01	---	---
Tin	1.0E+01	1.3E-02	1.3E-02	1.1E-03	1.1E-04	1.2E-02	1.2E-03	3.6E-02	6.2E-03	---	---
Zinc	1.7E+02	3.9E+00	2.1E-02	5.7E+00	3.4E-01	1.9E+00	1.1E-02	4.2E+00	2.5E-02	---	---

Jacques Whitford's Ecological Risk Assessment Model (Version 5.0)

Intake Parameters for the Masked Shrew		
Receptor Name	Masked Shrew	
Name of Study Area	Hopedale Area 2	
Entire Local Study Area or Project Alone		
Fraction of organic carbon in the soil	0.01	(unitless)
Fraction organic carbon in freshwater (dry) sediment	0.0706	(unitless, usual range is 0.003 to 0.03)
Fraction organic carbon in marine (dry) sediment	0.01	(unitless, usual range is 0.003 to 0.03)
Fraction lipid in freshwater invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Fraction lipid in marine invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Soil Moisture Content	0.25	(cm³/cm³) or (ml/cm³)
Soil Bulk Density	1.487	(g/cm³)
Calculate TU based on	1	(1-top 5% most sensitive species, 2-Rainbow Trout, 3-Daphnia magna)
Receptor Type	2	(1-Bird, 2-Mammal)
Small Mammal Type	1	(1-General, 2-Herbivore, 3-Insectivore) Default value should be 1
Fish based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Benthic invertebrates based on Sediment or Surface Water Uptake	1	(1-Freshwater Sediment, 2-Surface Water) Default value should be 1
Aquatic Plants based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Fish based on Sediment or Seawater Uptake	2	(1-Marine Sediment, 2-Seawater) Default value should be 2
Marine Benthic invertebrates based on Sediment or Seawater Uptake	1	(1-Marine Sediment, 2-Seawater) Default value should be 1
General Parameters		
Body weight	0.005	kg
Food intake rate	3.0E-03	kg wet-wt/day
Water intake rate	1.0E-03	L/day
Ingestion of Soil		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction diet that is dry solid	3.0E-01	
Fraction of food intake rate	4.9E-02	
Ingestion rate	4.4E-05	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sl)	8.9E-03	kg/kg-day
Ingestion of Terrestrial Plants		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	2.5E-02	
Ingestion rate	7.5E-05	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-lp)	1.5E-02	kg/kg-day
Ingestion of Terrestrial Invertebrates		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	9.8E-01	
Ingestion rate	2.9E-03	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-li)	5.9E-01	kg/kg-day
Ingestion of Terrestrial Mammals/Birds		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-lm)	0.0E+00	kg/kg-day
Ingestion of Surface Water		
Applicable pathway?	1	(0 = no, 1 = yes)
Ingestion rate	1.0E-03	L/day
Fraction from site	1	
Intake factor (IFing-sw)	2.0E-01	L/kg-day
Ingestion of Freshwater Sediment		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction diet that is dry solid	0.0E+00	
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sed)	0.0E+00	kg/kg-day
Ingestion of Freshwater Aquatic Plants		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ap)	0.0E+00	kg/kg-day
Ingestion of Freshwater Benthic Invertebrates		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ai)	0.0E+00	kg/kg-day
Ingestion of Freshwater Fish		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-fsh)	0.0E+00	kg/kg-day

Detailed Hazard Quotients for the Masked Shrew Exposed to CoPCs at Hopedale Area 2 Receptor Location

Constituent	Reference Toxicity Dose (mg/kg-day)	Average Daily Dose (mg/kg-day)	Surface Soil Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Plant Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Invertebrate Ingestion HQ	Marine Fish Ingestion HQ	Total Hazard Quotient
TPH - CCME CWS									
Aliph>C06-C08 - F1	5.0E+01	---	---	---	---	---	---	---	---
Aliph>C08-C10 - F1	5.0E+01	---	---	---	---	---	---	---	---
Arom>C08-C10 - F1	1.0E+02	---	---	---	---	---	---	---	---
F1 - Total									
Aliph>C10-C12 - F2	2.5E+02	5.8E+01	2.3E-01	3.7E-02	1.5E-04	1.4E+03	5.6E+03	---	6.8E+00
Aliph>C12-C16 - F2	2.5E+02	7.1E+01	2.9E-01	1.1E-02	4.2E-05	1.6E+03	6.4E+00	---	6.7E+00
Arom>C10-C12 - F2	5.0E+01	1.9E+01	2.9E-01	5.9E+00	1.2E-01	4.0E+01	8.0E-01	---	1.2E+00
Arom>C12-C16 - F2	5.0E+01	1.8E+01	3.6E-01	3.3E+00	6.6E-02	4.8E+01	9.6E-01	---	1.4E+00
F2 - Total									1.5E+01
Aliph>C16-C21 - F3	1.0E+03	3.1E+00	3.1E-03	4.6E-04	4.6E-07	1.0E+01	1.0E-02	---	1.3E-02
Aliph>C21-C34 - F3	1.0E+03	1.3E+00	1.3E-03	2.0E-04	2.0E-07	2.2E+00	2.2E-03	---	3.5E-03
Arom>C16-C21 - F3	5.0E+01	7.8E-01	1.6E-02	3.3E-02	6.6E-04	1.7E+00	3.3E-02	---	5.0E-02
Arom>C21-C34 - F3	5.0E+01	3.3E-01	6.7E-03	2.5E-04	5.0E-06	7.2E-01	1.4E-02	---	2.1E-02
F3 - Total									8.7E-02
PCB									
Aroclor 1254 (Total PCBs)	6.8E-01	1.4E-01	2.1E-01	1.8E-02	2.6E-02	1.7E+01	2.5E+01	---	1.5E+01
Inorganics									
Cadmium	1.0E+00	1.1E-01	1.1E-01	4.8E-01	4.8E-01	5.6E+00	5.6E+00	---	8.2E+00
Chromium (Total)	2.4E+00	1.4E+00	5.7E-01	3.3E-01	1.4E-01	4.4E+00	1.8E+00	---	2.8E+00
Cobalt	1.3E+01	8.4E-02	6.4E-03	4.8E-02	3.6E-03	1.1E-01	8.2E-03	---	1.8E-02
Copper	9.3E+00	4.9E+00	5.3E-01	8.3E-01	8.8E-02	2.8E+00	2.8E-01	---	9.0E-01
Lead	4.1E+01	5.2E+00	1.3E-01	2.2E+00	5.5E-02	1.3E+01	3.2E-01	---	5.0E-01
Molybdenum	2.6E+00	7.2E-01	2.8E-01	1.1E-01	4.0E-02	7.2E+00	2.8E+00	---	3.1E+00
Selenium	3.3E+01	1.8E-02	5.4E-02	1.5E-02	4.5E-02	1.8E-01	5.6E-01	---	6.6E-01
Tin	3.5E+01	1.8E-01	5.1E-03	9.4E-04	2.7E-05	8.4E-01	2.4E-02	---	2.9E-02
Zinc	3.2E+02	4.7E+01	1.5E-01	5.1E+00	1.6E-02	1.3E+02	4.2E-01	---	5.8E-01
Total TPH HQ =									
									2.5E+01

Jacques Whitford's Ecological Risk Assessment Model (Version 5.0)

Intake Parameters for the Meadow Vole		
Receptor Name	Meadow Vole	
Name of Study Area	Hopedale Area 2	
Entire Local Study Area or Project Alone		
Fraction of organic carbon in the soil	0.01	(unitless)
Fraction organic carbon in freshwater (dry) sediment	0.0706	(unitless, usual range is 0.003 to 0.03)
Fraction organic carbon in marine (dry) sediment	0.01	(unitless, usual range is 0.003 to 0.03)
Fraction lipid in freshwater invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Fraction lipid in marine invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Soil Moisture Content	0.25	(cm³/cm³) or (mL/cm³)
Soil Bulk Density	1.487	(g/cm³)
Calculate TU based on	1	(1-top 5% most sensitive species, 2-Rainbow Trout, 3-Daphnia magna)
Receptor Type	2	(1-Bird, 2-Mammal)
Small Mammal Type	1	(1-General, 2-Herbivore, 3-Insectivore) Default value should be 1
Fish based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Benthic Invertebrates based on Sediment or Surface Water Uptake	1	(1-Freshwater Sediment, 2-Surface Water) Default value should be 1
Aquatic Plants based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Fish based on Sediment or Seawater Uptake	2	(1-Marine Sediment, 2-Seawater) Default value should be 2
Marine Benthic Invertebrates based on Sediment or Seawater Uptake	1	(1-Marine Sediment, 2-Seawater) Default value should be 1
General Parameters		
Body weight	0.042	kg
Food intake rate	1.1E-02	kg wet-wt/day
Water intake rate	6.0E-03	L/day
Ingestion of Soil		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction diet that is dry solid	4.8E-01	
Fraction of food intake rate	6.0E-02	
Ingestion rate	3.1E-04	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sl)	7.5E-03	kg/kg-day
Ingestion of Terrestrial Plants		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	9.8E-01	
Ingestion rate	1.1E-02	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-tp)	2.8E-01	kg/kg-day
Ingestion of Terrestrial Invertebrates		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	2.0E-02	
Ingestion rate	2.2E-04	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ti)	5.2E-03	kg/kg-day
Ingestion of Terrestrial Mammals/Birds		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-tm)	0.0E+00	kg/kg-day
Ingestion of Surface Water		
Applicable pathway?	1	(0 = no, 1 = yes)
Ingestion rate	6.0E-03	L/day
Fraction from site	1	
Intake factor (IFing-sw)	1.4E-01	L/kg-day
Ingestion of Freshwater Sediment		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction diet that is dry solid	0.0E+00	
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sed)	0.0E+00	kg/kg-day
Ingestion of Freshwater Aquatic Plants		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ap)	0.0E+00	kg/kg-day
Ingestion of Freshwater Benthic Invertebrates		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-bi)	0.0E+00	kg/kg-day
Ingestion of Freshwater Fish		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-fsh)	0.0E+00	kg/kg-day

Detailed Hazard Quotients for the Meadow Vole Exposed to CoPCs at Hopedale Area 2 Receptor Location

Constituent	Reference Toxicity Dose (mg/kg-day)	Average Daily Dose (mg/kg-day)	Surface Soil Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Plant Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Invertebrate Ingestion HQ	Marine Fish Ingestion HQ	Total Hazard Quotient
TPH - CCME CWS									
Alpha-C08-C08 - F1	5.0E+01	---	---	---	---	---	---	---	---
Alpha-C08-C10 - F1	5.0E+01	---	---	---	---	---	---	---	---
Arom-C08-C10 - F1	1.0E+02	---	---	---	---	---	---	---	---
F1 - Total									
Alpha-C10-C12 - F2	2.5E+02	4.9E+01	2.0E-01	6.3E-01	2.5E-03	1.3E+01	5.0E-02	---	2.5E-01
Alpha-C12-C16 - F2	2.5E+02	6.0E+01	2.4E-01	1.8E-01	7.2E-04	1.4E+01	5.7E-02	---	3.0E-01
Arom-C10-C12 - F2	5.0E+01	1.2E+01	2.9E-01	1.0E+02	2.0E+00	3.5E-01	7.2E-03	---	2.3E+00
Arom-C12-C16 - F2	5.0E+01	1.5E+01	3.0E-01	5.6E+01	1.1E+00	4.3E-01	8.6E-03	---	1.4E+00
F2 - Total									4.2E+00
Alpha-C16-C21 - F3	1.0E+03	2.6E+00	2.8E-03	7.9E-03	7.9E-06	9.0E-02	9.0E-05	---	2.7E-03
Alpha-C21-C34 - F3	1.0E+03	1.1E+00	1.1E-03	3.4E-03	3.4E-06	1.9E-02	1.9E-05	---	1.2E-03
Arom-C16-C21 - F3	5.0E+01	6.6E-01	1.3E-02	5.7E-01	1.1E-02	1.5E-02	3.0E-04	---	2.5E-02
Arom-C21-C34 - F3	5.0E+01	2.8E-01	5.7E-03	4.3E-03	8.6E-05	6.4E-03	1.3E-04	---	5.9E-03
F3 - Total									3.5E-02
TPH - Total									
Total TPH HQ =									
PCB									
Aroclor 1254 (Total PCBs)	6.3E-01	1.2E-01	1.9E-01	3.1E-01	4.9E-01	1.5E-01	2.4E-01	---	9.2E-01
Inorganics									
Cadmium	1.0E+00	9.0E-02	9.0E-02	8.2E+00	8.2E+00	5.0E-02	5.0E-02	---	8.4E+00
Chromium (Total)	2.4E+00	1.2E+00	4.8E-01	5.6E+00	2.4E+00	4.0E-02	1.7E-02	---	2.9E+00
Cobalt	1.3E+01	7.1E-02	5.4E-03	8.2E-01	6.2E-02	9.7E-04	7.3E-05	---	6.7E-02
Copper	9.3E+00	4.1E+00	4.1E-01	1.4E+01	1.5E+00	2.4E-02	2.5E-03	---	2.0E+00
Lead	4.1E+01	4.4E+00	1.1E-01	3.8E+01	9.3E-01	1.2E-01	2.8E-03	---	1.0E+00
Molybdenum	2.4E+00	6.1E-01	2.6E-01	1.8E+00	7.8E-01	6.5E-02	2.7E-02	---	1.0E+00
Selenium	3.3E-01	1.5E-02	4.5E-02	2.6E-01	7.8E-01	1.7E-03	5.0E-03	---	8.3E-01
Tin	3.2E+01	1.5E-01	4.7E-03	1.6E-02	5.0E-04	7.5E-03	2.3E-04	---	5.4E-03
Zinc	3.2E+02	4.0E+01	1.3E-01	8.7E+01	2.7E-01	1.2E+00	3.7E-03	---	4.0E-01

Jacques Whitford's Ecological Risk Assessment Model (Version 5.0)

Intake Parameters for the Red Fox		
Receptor Name	Red Fox	
Name of Study Area	Hopedale Area 3	
Entire Local Study Area or Project Alone		
Fraction of organic carbon in the soil	0.01	(unitless)
Fraction organic carbon in freshwater (dry) sediment	0.0706	(unitless, usual range is 0.003 to 0.03)
Fraction organic carbon in marine (dry) sediment	0.01	(unitless, usual range is 0.003 to 0.03)
Fraction lipid in freshwater invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Fraction lipid in marine invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Soil Moisture Content	0.25	(cm ³ /cm ³) or (ml/cm ³)
Soil Bulk Density	1.487	(g/cm ³)
Calculate TU based on	1	(1-top 5% most sensitive species, 2-Rainbow Trout, 3-Daphnia magna)
Receptor Type	2	(1-Bird, 2-Mammal)
Small Mammal Type	1	(1-General, 2-Herbivore, 3-Insectivore) Default value should be 1
Fish based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Benthic invertebrates based on Sediment or Surface Water Uptake	1	(1-Freshwater Sediment, 2-Surface Water) Default value should be 1
Aquatic Plants based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Fish based on Sediment or Seawater Uptake	2	(1-Marine Sediment, 2-Seawater) Default value should be 2
Marine Benthic Invertebrates based on Sediment or Seawater Uptake	1	(1-Marine Sediment, 2-Seawater) Default value should be 1
General Parameters		
Body weight	4.5	kg
Food intake rate	7.6E-01	kg wet-wt/day
Water intake rate	3.8E-01	L/day
Ingestion of Soil		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction diet that is dry solid	3.1E-01	
Fraction of food intake rate	1.3E-02	
Ingestion rate	3.0E-03	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sl)	6.7E-04	kg/kg-day
Ingestion of Terrestrial Plants		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	1.0E-01	
Ingestion rate	7.6E-02	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-lp)	1.7E-02	kg/kg-day
Ingestion of Terrestrial Invertebrates		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	5.0E-02	
Ingestion rate	3.8E-02	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ti)	8.4E-03	kg/kg-day
Ingestion of Terrestrial Mammals/Birds		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	8.5E-01	
Ingestion rate	6.5E-01	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-lm)	1.4E-01	kg/kg-day
Ingestion of Surface Water		
Applicable pathway?	1	(0 = no, 1 = yes)
Ingestion rate	3.8E-01	L/day
Fraction from site	1	
Intake factor (IFing-sw)	8.5E-02	L/kg-day
Ingestion of Freshwater Sediment		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction diet that is dry solid	0.0E+00	
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sed)	0.0E+00	kg/kg-day
Ingestion of Freshwater Aquatic Plants		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ap)	0.0E+00	kg/kg-day
Ingestion of Freshwater Benthic Invertebrates		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-bi)	0.0E+00	kg/kg-day
Ingestion of Freshwater Fish		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-fsh)	0.0E+00	kg/kg-day

Detailed Hazard Quotients for the Red Fox Exposed to COPCs at Hopedale Area 3

Constituent	Reference Toxicity Dose (mg/kg-day)	Average Daily Dose (mg/kg-day)	Surface Soil Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Plant Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Invertebrate Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Mammal Ingestion HQ	Marine Fish Ingestion HQ	Total Hazard Quotient
TPH - CCNE CWS											
Alkyl-C10-C18 - F1	2.6E-01	4.0E-02	1.5E-03	1.1E-01	4.2E-03	1.2E-01	4.4E-03	3.4E-02	1.3E-03	---	1.1E-02
Alkyl-C10-C18 - F1	2.6E-01	2.6E-02	9.9E-04	5.9E-03	2.2E-04	1.2E-01	4.4E-03	3.4E-02	1.4E-04	---	5.9E-03
Alkyl-C10-C18 - F1	5.3E-01	6.5E-03	1.2E-04	6.2E-02	1.2E-03	5.7E-03	1.1E-04	7.2E-03	1.4E-04	---	1.9E-02
F1 - Total											
Alkyl-C10-C18 - F2	1.3E-02	1.0E+00	7.7E-03	9.6E-03	7.3E-05	4.7E+00	3.9E-02	2.4E-02	1.8E-04	---	4.3E-02
Alkyl-C10-C18 - F2	1.3E-02	1.2E+00	9.4E-03	2.8E-03	2.1E-05	5.3E+00	4.0E-02	2.3E-02	1.7E-04	---	5.0E-02
Alkyl-C10-C18 - F2	2.6E-01	2.5E-01	9.6E-03	1.5E+00	1.5E-01	1.5E+00	1.2E-01	5.1E-01	4.5E-03	---	7.7E-02
Alkyl-C10-C18 - F2	2.6E-01	3.1E-01	1.2E-02	8.6E-01	3.2E-02	1.5E-01	6.1E-03	9.7E-02	3.7E-03	---	5.4E-02
F2 - Total											
Alkyl-C18-C21 - F3	5.3E-02	1.5E+00	2.6E-03	3.4E-03	6.4E-06	9.3E-01	1.8E-03	2.7E-02	5.2E-05	---	2.2E-01
Alkyl-C21-C34 - F3	5.3E-02	6.4E-01	1.2E-03	1.4E-03	2.7E-06	2.0E-01	3.8E-04	1.1E-05	1.1E-05	---	4.7E-03
Alkyl-C18-C21 - F3	2.6E-01	3.8E-01	1.4E-02	2.4E-01	9.1E-03	1.5E-01	5.9E-03	3.7E-02	1.4E-03	---	3.1E-02
Alkyl-C21-C34 - F3	2.6E-01	1.6E-01	6.1E-03	1.8E-03	6.9E-05	6.9E-02	2.5E-03	3.8E-03	1.4E-04	---	8.8E-03
F3 - Total											
Polycyclic Aromatic Hydrocarbons											
Low Molecular Weight PAHs											
Acenaphthene	1.7E-02	2.7E-04	1.6E-06	4.5E-04	2.6E-06	1.1E-04	6.5E-07	2.1E-04	1.2E-06	---	6.0E-06
Acenaphthylene	1.7E-02	2.0E-04	1.2E-06	3.9E-04	2.3E-06	8.2E-05	4.9E-07	1.9E-04	1.1E-06	---	5.1E-06
Anthracene	1.7E-02	6.7E-06	3.9E-08	8.3E-05	4.9E-07	2.7E-06	1.8E-08	4.9E-05	2.9E-07	---	8.4E-07
Fluorene	1.7E-02	3.3E-04	2.0E-06	3.9E-04	1.9E-06	5.3E-05	3.2E-07	2.3E-04	1.4E-06	---	4.4E-06
1-Methylnaphthalene	1.7E-02	2.5E-03	1.4E-05	1.2E-03	7.2E-06	1.0E-03	6.0E-06	6.7E-04	4.0E-06	---	3.2E-05
2-Methylnaphthalene	1.7E-02	3.7E-03	2.2E-05	1.5E-03	8.6E-06	1.5E-03	9.0E-06	8.5E-04	5.0E-06	---	4.4E-05
Naphthalene	1.7E-02	8.0E-04	4.7E-06	7.3E-04	4.3E-06	3.4E-04	2.0E-06	2.2E-04	1.3E-05	---	1.2E-05
Phenanthrene	1.7E-02	2.0E-04	1.2E-06	3.9E-04	2.3E-06	8.2E-05	4.8E-07	2.5E-04	1.5E-06	---	5.4E-06
High Molecular Weight PAHs											
Benz(a)anthracene	1.8E-01	1.3E-04	7.4E-06	1.0E-04	5.6E-06	2.7E-05	1.5E-06	8.4E-05	4.7E-06	---	1.9E-04
Benz(b)pyrene	1.8E-01	3.3E-04	1.8E-05	2.4E-04	1.3E-05	3.4E-04	1.9E-05	9.9E-04	5.3E-05	---	1.0E-04
Benz(g,h,i)perylene	1.8E-01	2.0E-04	1.1E-05	1.5E-04	8.2E-06	2.1E-04	1.1E-05	4.8E-04	2.7E-05	---	5.6E-05
Chrysene	1.8E-01	6.0E-04	3.3E-05	4.2E-04	2.3E-05	1.2E-04	6.8E-06	3.8E-04	2.0E-05	---	8.3E-05
Dibenz(a,h)anthracene	1.8E-01	6.7E-06	3.7E-07	5.9E-06	3.3E-07	6.8E-06	3.8E-07	1.9E-05	1.0E-06	---	2.1E-06
Indeno(1,2,3-cd)pyrene	1.8E-01	6.7E-05	3.7E-06	5.2E-05	2.8E-06	6.8E-05	3.8E-06	1.7E-04	9.4E-06	---	2.0E-05
Perylene	1.8E-01	1.3E-04	7.4E-06	1.0E-04	5.6E-06	1.4E-04	7.6E-06	3.7E-04	2.0E-05	---	4.1E-05
Pyrene	1.8E-01	2.7E-04	1.5E-05	1.9E-04	1.1E-05	5.3E-05	3.0E-06	1.8E-04	8.8E-06	---	3.7E-05
PCB											
Aroclor 1254 (Total PCBs)											
Inorganics	1.9E-01	8.0E-03	4.1E-02	1.0E-02	5.4E-02	1.8E-01	8.4E-01	6.3E-02	3.2E-01	---	4.8E-04
Antimony	3.1E-01	5.7E-02	1.8E-01	6.4E-03	2.1E-02	1.1E-01	3.7E-01	5.8E-03	1.9E-02	---	5.9E-01
Chromium (Total)	2.4E+00	4.6E-02	1.9E-02	7.2E-03	3.0E-03	2.9E-02	1.2E-02	2.4E-01	9.9E-02	---	1.3E-01
Copper	9.3E+00	3.5E-01	3.8E-02	5.8E-02	6.3E-03	3.8E-02	4.0E-03	8.8E-01	9.4E-02	---	1.4E-01
Lead	4.1E+01	1.2E+00	2.9E-02	4.4E-02	1.1E-03	4.5E-01	1.1E-02	1.3E+00	3.3E-02	---	7.4E-02
Molybdenum	7.4E+01	8.0E-03	1.1E-02	7.3E-03	9.8E-03	1.9E-02	2.1E-02	2.6E-02	3.6E-02	---	2.7E-02
Nickel	1.0E+01	2.7E-02	2.7E-03	4.4E-03	4.3E-04	5.9E-02	5.7E-03	2.0E-01	2.0E-02	---	2.9E-02
Tin	1.0E+01	2.4E-01	2.4E-02	1.9E-02	1.3E-01	1.3E-01	1.3E-02	2.5E+00	2.5E-01	---	2.9E-01
Zinc	1.7E+02	9.0E-01	5.3E-01	6.7E-01	4.9E-03	1.2E+00	7.3E-03	6.8E+00	4.0E-02	---	5.7E-02
TOTAL PAH HQ =											
TOTAL HP AH HQ =											
TOTAL PAH HQ =											
TOTAL PAH HQ =											

Jacques Whitford's Ecological Risk Assessment Model (Version 5.0)

Intake Parameters for the Masked Shrew		
Receptor Name	Masked Shrew	
Name of Study Area	Hopedale Area 3	
Entire Local Study Area or Project Alone		
Fraction of organic carbon in the soil	0.01	(unitless)
Fraction organic carbon in freshwater (dry) sediment	0.0706	(unitless, usual range is 0.003 to 0.03)
Fraction organic carbon in marine (dry) sediment	0.01	(unitless, usual range is 0.003 to 0.03)
Fraction lipid in freshwater invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Fraction lipid in marine invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Soil Moisture Content	0.25	(cm ³ /cm ³) or (ml/cm ³)
Soil Bulk Density	1.487	(g/cm ³)
Calculate TU based on	1	(1-top 5% most sensitive species, 2-Rainbow Trout, 3-Daphnia magna)
Receptor Type	2	(1-Bird, 2-Mammal)
Small Mammal Type	1	(1-General, 2-Herbivore, 3-Insectivore) Default value should be 1
Fish based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Benthic Invertebrates based on Sediment or Surface Water Uptake	1	(1-Freshwater Sediment, 2-Surface Water) Default value should be 1
Aquatic Plants based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Fish based on Sediment or Seawater Uptake	2	(1-Marine Sediment, 2-Seawater) Default value should be 2
Marine Benthic Invertebrates based on Sediment or Seawater Uptake	1	(1-Marine Sediment, 2-Seawater) Default value should be 1
General Parameters		
Body weight	0.005	kg
Food intake rate	3.0E-03	kg wet-wt/day
Water intake rate	1.0E-03	L/day
Ingestion of Soil		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction diet that is dry solid	3.0E-01	
Fraction of food intake rate	4.9E-02	
Ingestion rate	4.4E-05	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sl)	8.9E-03	kg/kg-day
Ingestion of Terrestrial Plants		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	2.5E-02	
Ingestion rate	7.5E-05	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-lp)	1.5E-02	kg/kg-day
Ingestion of Terrestrial Invertebrates		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	9.8E-01	
Ingestion rate	2.9E-03	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ti)	5.9E-01	kg/kg-day
Ingestion of Terrestrial Mammals/Birds		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-tm)	0.0E+00	kg/kg-day
Ingestion of Surface Water		
Applicable pathway?	1	(0 = no, 1 = yes)
Ingestion rate	1.0E-03	L/day
Fraction from site	1	
Intake factor (IFing-sw)	2.0E-01	L/kg-day
Ingestion of Freshwater Sediment		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction diet that is dry solid	0.0E+00	
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sed)	0.0E+00	kg/kg-day
Ingestion of Freshwater Aquatic Plants		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ap)	0.0E+00	kg/kg-day
Ingestion of Freshwater Benthic Invertebrates		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-bi)	0.0E+00	kg/kg-day
Ingestion of Freshwater Fish		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-fsh)	0.0E+00	kg/kg-day

Detailed Hazard Quotients for the Masked Shrew Exposed to CoPCs at Hopedale Area 3 Receptor Location

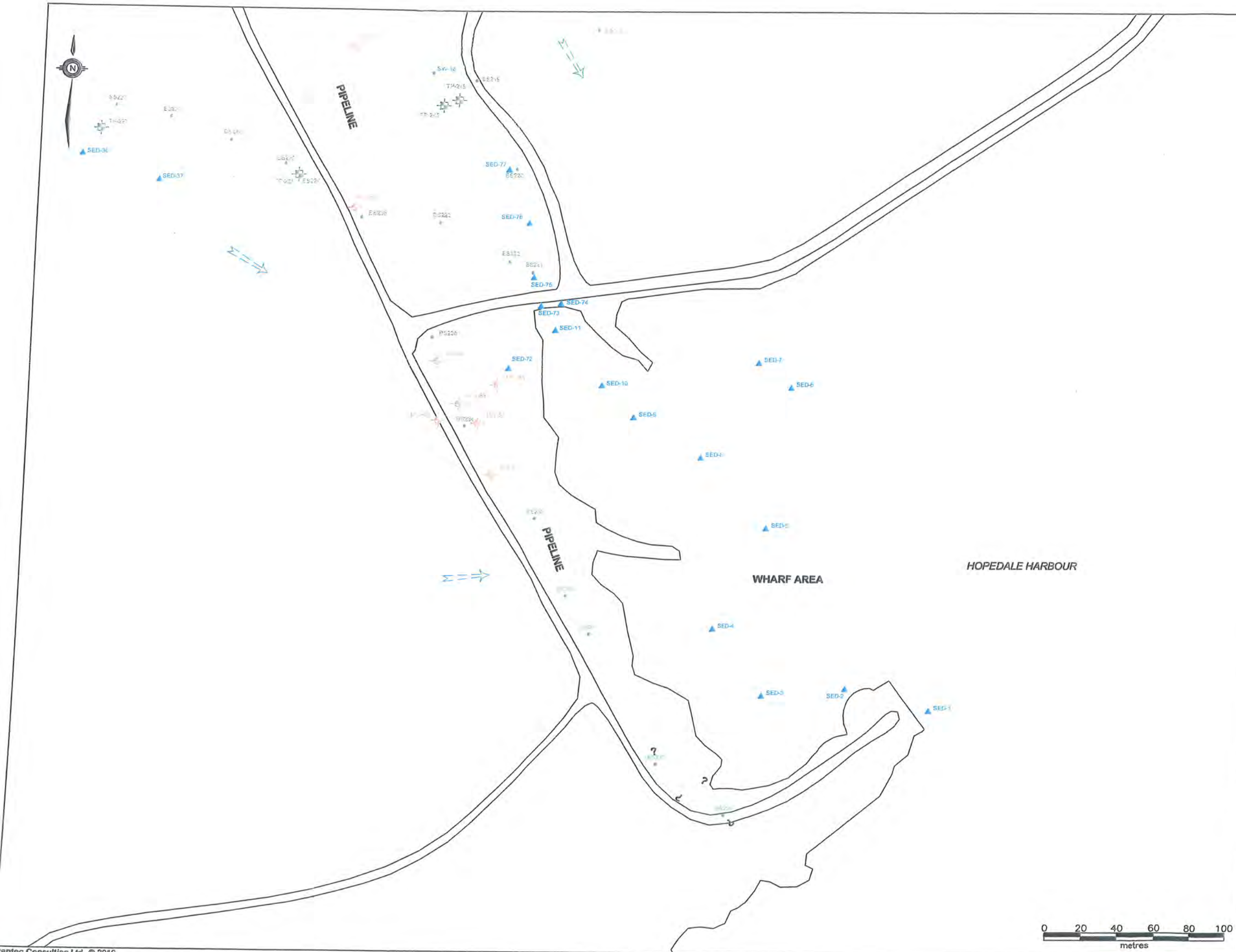
Constituent	Reference Toxicity Dose (mg/kg-day)	Average Daily Dose (mg/kg-day)	Surface Soil Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Plant Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Invertebrate Ingestion HQ	Marine Fish Ingestion HQ	Total Hazard Quotient
TPH - CCME CWS									
Alpha-C08-C08 - F1	5.0E-01	5.3E-01	1.1E-02	9.8E-02	2.0E-03	8.1E+00	1.6E-01	---	1.7E-01
Alpha-C08-C10 - F1	5.0E-01	3.5E-01	7.0E-03	5.3E-03	1.1E-04	8.4E+00	1.7E-01	---	1.8E-01
Alpha-C08-C10 - F1	1.0E+02	8.7E-02	8.7E-04	5.5E-02	5.5E-04	3.9E+01	3.9E-03	---	5.3E-03
F1 - Total									3.5E-01
Alpha-C10-C12 - F2	2.5E-02	1.4E+01	5.4E-02	8.6E-03	3.4E-05	3.2E+02	1.3E+00	---	1.3E+00
Alpha-C12-C16 - F2	2.5E-02	1.7E+01	6.6E-02	2.5E-03	9.8E-06	3.7E+02	1.5E+00	---	1.5E+00
Alpha-C10-C12 - F2	5.0E-01	3.4E+00	6.8E-02	1.4E+00	2.7E-02	9.3E+00	1.9E-01	---	2.8E-01
Alpha-C12-C16 - F2	5.0E+01	4.1E+00	8.3E-02	7.6E-01	1.5E-02	1.1E+01	2.2E-01	---	3.2E-01
F2 - Total									3.5E+00
Alpha-C16-C21 - F3	1.0E-03	2.0E+01	2.0E-02	3.0E-03	3.0E-06	6.4E+01	6.4E-02	---	8.5E-02
Alpha-C21-C34 - F3	1.0E-03	8.8E+00	8.6E-03	1.3E-03	1.3E-06	1.4E+01	1.4E-02	---	2.2E-02
Alpha-C16-C21 - F3	5.0E+01	5.0E+00	1.0E-01	2.1E-01	4.3E-03	1.1E+01	2.1E-01	---	3.2E-01
Alpha-C21-C34 - F3	5.0E+01	2.1E+00	4.3E-02	1.6E-03	3.2E-05	4.6E+00	9.2E-02	---	1.3E-01
F3 - Total									5.6E-01
Polycyclic Aromatic Hydrocarbons									
Low Molecular Weight PAHs									
Acenaphthene	1.7E+02	3.5E-03	2.1E-05	4.0E-04	2.3E-06	7.7E-03	4.5E-05	---	6.8E-05
Acenaphthylene	1.7E+02	2.7E-03	1.6E-05	3.5E-04	2.0E-06	5.7E-03	3.4E-05	---	5.1E-05
Anthracene	1.7E+02	8.9E-05	5.2E-07	7.4E-05	4.4E-07	1.9E-04	1.1E-06	---	2.1E-06
Fluoranthene	1.7E+02	1.8E-03	1.0E-05	2.9E-04	1.7E-06	3.8E-03	2.2E-05	---	3.4E-05
Fluorene	1.7E+02	4.4E-03	2.6E-05	4.4E-04	2.6E-06	9.5E-03	5.6E-05	---	8.5E-05
1-Methylnaphthalene	1.7E+02	3.3E-02	1.9E-04	1.1E-03	6.4E-06	7.1E-02	4.2E-04	---	6.2E-04
2-Methylnaphthalene	1.7E+02	4.9E-02	2.9E-04	1.3E-03	7.7E-06	1.1E-01	6.2E-04	---	9.2E-04
Naphthalene	1.7E+02	1.1E-02	6.3E-05	6.9E-04	3.8E-06	2.4E-02	1.4E-04	---	2.1E-04
Phenanthrene	1.7E+02	2.7E-03	1.6E-05	3.5E-04	2.0E-06	5.7E-03	3.4E-05	---	5.1E-05
High Molecular Weight PAHs									
Benz(a)anthracene	1.8E+01	1.8E-03	9.9E-05	8.9E-05	5.0E-06	1.9E-03	1.1E-04	---	2.1E-04
Benz(a)pyrene	1.8E+01	4.4E-03	2.5E-04	2.1E-04	1.2E-05	2.4E-02	1.3E-03	---	1.6E-03
Benz(b)fluoranthene	1.8E+01	2.7E-03	1.5E-04	1.3E-04	7.3E-06	1.4E-02	7.9E-04	---	9.5E-04
Chrysene	1.8E+01	8.0E-03	4.4E-04	3.7E-04	2.1E-05	8.5E-03	4.7E-04	---	9.4E-04
Dibenz(a,h)anthracene	1.8E+01	8.9E-05	4.9E-06	5.2E-06	2.9E-07	4.7E-04	2.6E-05	---	3.2E-05
Indeno(1,2,3-cd)pyrene	1.8E+01	8.9E-04	4.9E-05	4.6E-05	2.8E-06	4.7E-03	2.6E-04	---	3.2E-04
Perylene	1.8E+01	1.8E-03	9.9E-05	8.9E-05	5.0E-06	9.5E-03	5.3E-04	---	6.3E-04
Pyrene	1.8E+01	3.9E-03	2.0E-04	1.7E-04	9.8E-06	3.8E-03	2.1E-04	---	4.2E-04
PCB									
Aroclor 1254 (Total PCBs)	6.8E-01	1.1E-01	1.6E-01	9.3E-03	1.4E-02	1.1E+01	1.7E-01	---	1.7E+01
Inorganics									
Antimony	5.9E-01	7.5E-01	1.3E+00	5.7E-03	9.7E-03	8.0E+00	1.3E-01	---	1.5E+01
Chromium (Total)	9.3E+00	6.1E-01	2.6E-01	6.4E-03	2.7E-03	2.0E+00	8.2E-01	---	1.1E+00
Copper	4.1E+01	1.5E+01	3.8E-01	5.2E-02	5.6E-03	2.8E+00	2.8E-01	---	7.9E-01
Lead	2.6E+00	1.1E-01	4.1E-02	3.9E-02	9.8E-04	3.1E+01	7.6E-01	---	1.1E+00
Molybdenum	3.6E+01	3.6E-01	3.6E-02	3.9E-03	3.8E-04	1.1E+00	4.0E-01	---	4.6E-01
Nickel	3.5E+01	3.3E+00	9.3E-02	1.7E-02	4.9E-04	8.8E+00	2.5E-01	---	3.9E-01
Tin	3.2E+02	1.2E+01	3.7E-02	5.9E-01	1.9E-03	8.5E+01	2.7E-01	---	3.1E-01

Jacques Whifford's Ecological Risk Assessment Model (Version 5.0)

Intake Parameters for the Meadow Vole		
Receptor Name	Meadow Vole	
Name of Study Area	Hopedale Area 3	
Entire Local Study Area or Project Alone		
Fraction of organic carbon in the soil	0.01	(unitless)
Fraction organic carbon in freshwater (dry) sediment	0.0706	(unitless, usual range is 0.003 to 0.03)
Fraction organic carbon in marine (dry) sediment	0.01	(unitless, usual range is 0.003 to 0.03)
Fraction lipid in freshwater invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Fraction lipid in marine invertebrates (wet weight)	0.017	(unitless, usual range is 0.012 to 0.025)
Soil Moisture Content	0.25	(cm ³ /cm ³) or (m ³ /cm ³)
Soil Bulk Density	1.487	(g/cm ³)
Calculate TU based on	1	(1-top 5% most sensitive species, 2-Rainbow Trout, 3-Daphnia magna)
Receptor Type	2	(1-Bird, 2-Mammal)
Small Mammal Type	1	(1-General, 2-Herbivore, 3-Insectivore) Default value should be 1
Fish based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Benthic Invertebrates based on Sediment or Surface Water Uptake	1	(1-Freshwater Sediment, 2-Surface Water) Default value should be 1
Aquatic Plants based on Sediment or Surface Water Uptake	2	(1-Freshwater Sediment, 2-Surface Water) Default value should be 2
Fish based on Sediment or Seawater Uptake	2	(1-Marine Sediment, 2-Seawater) Default value should be 2
Marine Benthic Invertebrates based on Sediment or Seawater Uptake	1	(1-Marine Sediment, 2-Seawater) Default value should be 1
General Parameters		
Body weight	0.042	kg
Food intake rate	1.1E-02	kg wet-wt/day
Water intake rate	6.0E-03	L/day
Ingestion of Soil		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction diet that is dry solid	4.8E-01	
Fraction of food intake rate	6.0E-02	
Ingestion rate	3.1E-04	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sl)	7.5E-03	kg/kg-day
Ingestion of Terrestrial Plants		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	9.8E-01	
Ingestion rate	1.1E-02	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-lp)	2.6E-01	kg/kg-day
Ingestion of Terrestrial Invertebrates		
Applicable pathway?	1	(0 = no, 1 = yes)
Fraction of food intake rate	2.0E-02	
Ingestion rate	2.2E-04	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-li)	5.2E-03	kg/kg-day
Ingestion of Terrestrial Mammals/Birds		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-tm)	0.0E+00	kg/kg-day
Ingestion of Surface Water		
Applicable pathway?	1	(0 = no, 1 = yes)
Ingestion rate	6.0E-03	L/day
Fraction from site	1	
Intake factor (IFing-sw)	1.4E-01	L/kg-day
Ingestion of Freshwater Sediment		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction diet that is dry solid	0.0E+00	
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg dry-wt/day
Fraction from site	1	
Intake factor (IFing-sed)	0.0E+00	kg/kg-day
Ingestion of Freshwater Aquatic Plants		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-ap)	0.0E+00	kg/kg-day
Ingestion of Freshwater Benthic Invertebrates		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-bi)	0.0E+00	kg/kg-day
Ingestion of Freshwater Fish		
Applicable pathway?	0	(0 = no, 1 = yes)
Fraction of food intake rate	0.0E+00	
Ingestion rate	0.0E+00	kg wet-wt/day
Fraction from site	1	
Intake factor (IFing-fsh)	0.0E+00	kg/kg-day

Detailed Hazard Quotients for the Meadow Vole Exposed to CoPCs at Hopedale Area 3 Receptor Location

Constituent	Reference Toxicity Dose (mg/kg-day)	Average Daily Dose (mg/kg-day)	Surface Soil Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Plant Ingestion HQ	Average Daily Dose (mg/kg-day)	Terrestrial Invertebrate Ingestion HQ	Marine Fish Ingestion HQ	Total Hazard Quotient
TPH - CCMC CWS									
Aliph-C08-C08 - F1	5.0E+01	4.5E-01	9.0E-03	1.7E+00	3.4E-02	7.2E-02	1.4E-03	---	4.4E-02
Aliph-C08-C10 - F1	5.0E+01	2.9E-01	5.9E-03	9.0E-02	1.8E-03	7.5E-02	1.5E-03	---	9.2E-03
Arom-C08-C10 - F1	1.0E+02	7.3E-02	7.3E-04	9.4E-01	9.4E-03	3.5E-03	3.5E-05	---	1.0E-02
F1 - Total									6.3E-02
Aliph-C10-C12 - F2	2.5E+02	1.1E+01	4.6E-02	1.3E+01	5.9E-04	2.9E+00	1.2E-02	---	5.8E-02
Aliph-C12-C16 - F2	2.5E+02	1.4E+01	5.6E-02	4.2E+02	1.7E-04	3.3E+00	1.3E-02	---	6.9E-02
Arom-C10-C12 - F2	5.0E+01	2.9E+00	5.7E-02	2.3E+01	4.7E-01	8.3E-02	1.7E-03	---	5.3E-01
Arom-C12-C16 - F2	5.0E+01	3.5E+00	7.0E-02	1.3E+01	2.6E-01	1.0E+01	2.0E-03	---	3.3E-01
F2 - Total									9.8E-01
Aliph-C16-C21 - F3	1.0E+03	1.7E+01	7.7E-02	5.1E+02	5.1E-05	5.8E-01	5.8E-04	---	1.8E-02
Aliph-C21-C34 - F3	1.0E+03	7.3E+00	7.3E-03	2.2E+02	2.2E-05	1.2E-01	1.2E-04	---	7.4E-03
Arom-C16-C21 - F3	5.0E+01	4.2E+00	8.5E-02	3.6E+00	7.3E-02	9.6E-02	1.9E-03	---	1.6E-01
Arom-C21-C34 - F3	5.0E+01	1.8E+00	3.6E-02	2.8E-02	5.5E-04	4.1E-02	8.2E-04	---	3.8E-02
F3 - Total									2.2E-01
Polycyclic Aromatic Hydrocarbons									
Low Molecular Weight PAHs									
Acenaphthene	1.7E-02	3.0E-03	1.8E-05	6.8E-03	4.0E-05	6.9E-05	4.0E-07	---	5.8E-05
Acenaphthylene	1.7E-02	2.2E-03	1.3E-05	5.9E-03	3.5E-05	5.1E-05	3.0E-07	---	4.9E-05
Anthracene	1.7E-02	1.5E-03	4.4E-07	4.9E-03	7.5E-06	1.7E-06	1.0E-08	---	7.9E-06
Fluoranthene	1.7E-02	1.5E-03	6.8E-06	4.9E-03	2.9E-05	3.4E-05	2.0E-07	---	3.8E-05
Fluorene	1.7E-02	3.7E-03	2.2E-05	7.9E-03	4.4E-05	8.5E-05	5.0E-07	---	6.7E-05
1-Methylanthracene	1.7E-02	2.8E-02	1.9E-04	1.9E-02	1.1E-04	6.4E-04	3.7E-06	---	2.8E-04
2-Methylanthracene	1.7E-02	4.1E-02	2.4E-04	2.2E-02	1.3E-04	9.5E-04	5.6E-06	---	3.8E-04
Naphthalene	1.7E-02	9.0E-03	5.3E-05	1.1E-02	6.8E-05	2.1E-04	1.2E-06	---	1.2E-04
Phenanthrene	1.7E-02	2.2E-03	1.3E-05	5.9E-03	3.5E-05	5.1E-05	3.0E-07	---	4.9E-05
High Molecular Weight PAHs									
Benz(a)anthracene	1.8E-01	1.5E-03	8.3E-05	1.5E-03	8.5E-05	1.7E-05	9.4E-07	---	1.7E-04
Benzo(a)pyrene	1.8E-01	3.7E-03	2.1E-04	3.6E-03	2.0E-04	2.1E-04	1.2E-05	---	4.2E-04
Benzo(g,h,i)perylene	1.8E-01	2.2E-03	1.2E-04	2.2E-03	1.2E-04	1.3E-04	7.1E-06	---	2.6E-04
Chrysene	1.8E-01	6.7E-03	3.7E-04	6.3E-03	3.5E-04	7.6E-05	4.2E-06	---	7.3E-04
Dibenz(a,h)anthracene	1.8E-01	7.5E-05	4.2E-05	9.0E-05	5.0E-06	4.2E-06	2.4E-07	---	9.4E-06
Indeno(1,2,3-cd)pyrene	1.8E-01	7.5E-04	4.2E-05	7.9E-04	4.4E-05	4.2E-05	2.4E-06	---	8.8E-05
Perylene	1.8E-01	1.5E-03	8.3E-05	1.5E-03	8.5E-05	8.5E-05	4.7E-06	---	1.7E-04
Pyrene	1.8E-01	3.0E-03	1.7E-04	2.9E-03	1.6E-04	3.4E-05	1.9E-06	---	3.3E-04
PCB									
Aroclor 1254 (Total PCBs)									
Inorganics									
Antimony	5.9E-01	6.4E-01	1.1E+00	9.8E-02	1.7E-01	7.1E-02	1.2E-01	---	1.4E+00
Chromium (Total)	2.4E+00	5.2E-01	2.2E-01	1.1E-01	9.5E-02	2.3E-02	2.5E-03	---	5.2E-01
Copper	9.3E+00	3.9E+00	4.2E-01	8.9E-01	6.7E-01	9.6E-01	6.8E-03	---	3.4E-01
Lead	4.1E+01	1.3E+01	3.2E-01	6.7E-01	4.6E-02	9.6E-03	4.0E-03	---	8.8E-02
Molybdenum	2.4E+00	9.0E-02	3.0E-02	6.7E-02	6.6E-03	3.6E-02	3.6E-03	---	4.0E-02
Nickel	1.0E+01	3.1E-01	3.0E-02	2.9E-01	9.1E-03	7.9E-02	2.5E-03	---	9.7E-02
Tin	3.2E+01	2.7E+00	3.2E-02	1.0E+01	7.6E-01	7.6E-01	2.4E-03	---	6.8E-02
Zinc	3.2E+02	1.0E+01	3.2E-02	1.0E+01	7.6E-01	7.6E-01	2.4E-03	---	6.8E-02
TOTAL									
TOTAL TPH HQ =									1.3E+00
TOTAL HPAH HQ =									3.2E-03
TOTAL PAH HQ =									5.6E-01



LEGEND

- TEST PIT (STANTEC 2009)
- MONITOR WELL (STANTEC 2009)
- BULK SAMPLE (STANTEC 2009)
- FISH LOCATION (STANTEC 2009)
- WATER SAMPLE (STANTEC 2009)
- BERRY SAMPLE LOCATION (STANTEC 2009)
- VEGETATION SAMPLE (STANTEC 2009)
- BENTHIC SAMPLE (STANTEC 2009)
- SEDIMENT SAMPLE (STANTEC 2009)
- SMALL MAMMALS (STANTEC 2009)

INFERRED GROUNDWATER FLOW DIRECTION

ESTIMATED AREA OF PCB IMPACTED SOIL
REQUIRING REMEDIATION

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

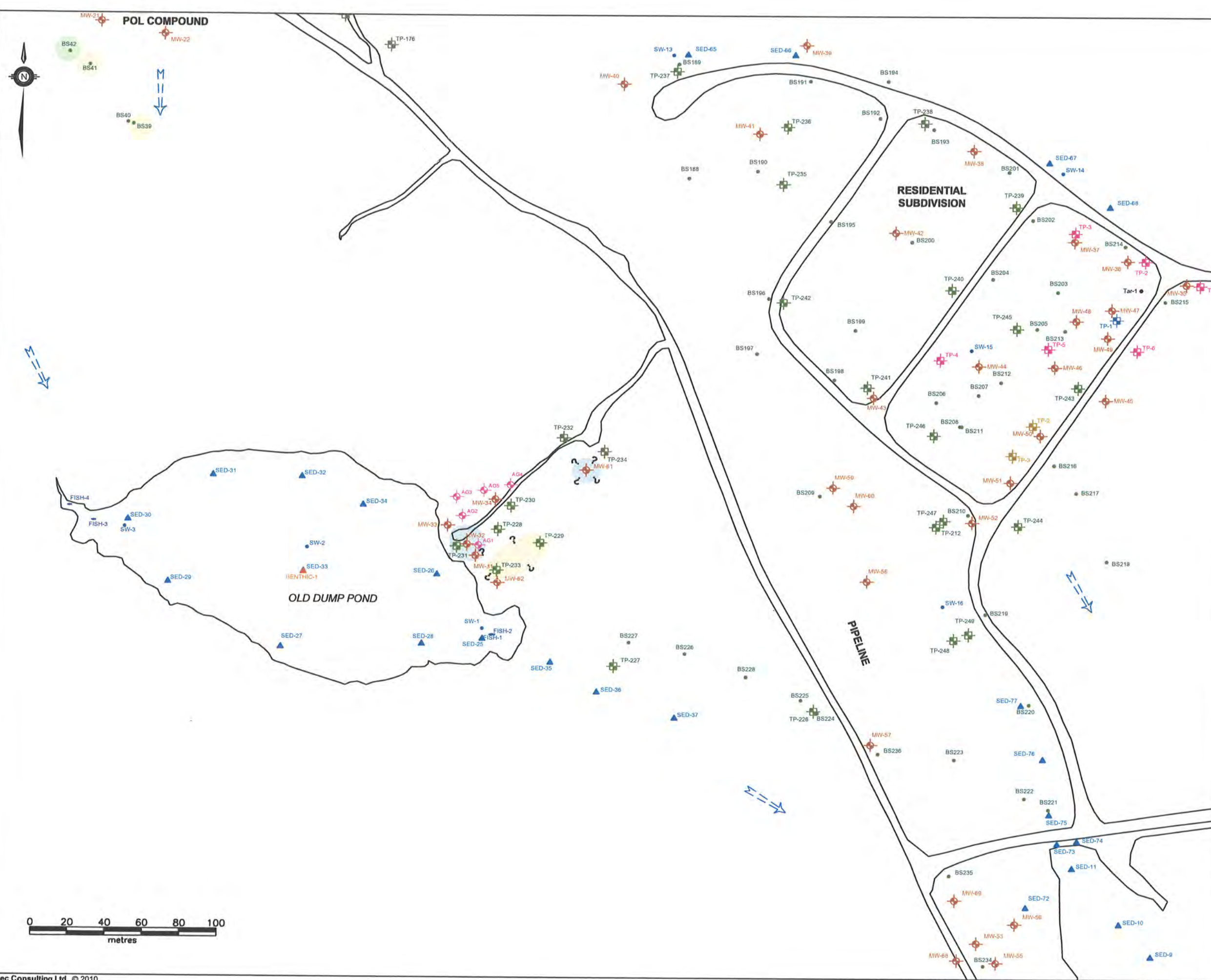
PROJECT TITLE:

PHASE II/III ESA, HHRA AND RAP/RMP
FOR THE FORMER U.S. MILITARY SITE AND
RESIDENTIAL SUBDIVISION, HOPEDALE, NL

DRAWING TITLE:

APPROXIMATE EXTENT OF SURFACE
SOIL REQUIRING REMEDIATION -
WHARF AREA, PIPELINE

SCALE:	1:2000	DATE:	MAY 13, 2010
DRAWN BY:	N.M.	CHECKED BY:	KJ
EDITED BY:	-	REV. No.	0
DRAWING No:	121410103-EE-28a		
CAD FILE:	121410103-EE-07.DWG		



LEGEND

- TEST PIT (STANTEC 2009)
- TEST PIT (2008)
- TEST PIT (2007)
- TEST PIT (2006)
- MONITOR WELL (STANTEC 2009)
- BULK SAMPLE (STANTEC 2009)
- FISH LOCATION (STANTEC 2009)
- WATER SAMPLE (STANTEC 2009)
- BERRY SAMPLE LOCATION (STANTEC 2009)
- VEGETATION SAMPLE (STANTEC 2009)
- BENTHIC SAMPLE (STANTEC 2009)
- SEDIMENT SAMPLE (STANTEC 2009)
- SMALL MAMMALS (STANTEC 2009)

← == → INFERRED GROUNDWATER FLOW DIRECTION

- ESTIMATED AREA OF PCB IMPACTED SOIL REQUIRING REMEDIATION
- ESTIMATED AREA OF METALS IMPACTED SOIL REQUIRING REMEDIATION
- ESTIMATED AREA OF TPH IMPACTED SOIL REQUIRING REMEDIATION
- ESTIMATED AREA OF TPH AND PCB IMPACTED SOIL REQUIRING REMEDIATION

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

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PHASE II/III ESA, HHERA AND RAP/RMP
FOR THE FORMER U.S. MILITARY SITE AND
RESIDENTIAL SUBDIVISION, HOPEDALE, NL

DRAWING TITLE:

APPROXIMATE EXTENT OF SURFACE
SOIL REQUIRING REMEDIATION -
OLD DUMP POND, PIPELINE,
RESIDENTIAL SUBDIVISION

SCALE:	1:2000	DATE:	MAY 13, 2010
DRAWN BY:	N.M.	CHECKED BY:	A.R.
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SED-17
VEG-4



VALLEY
DRAINAGE
PONDS

BS37
VEG-3
SED-16
BERRY

BS35

BS3F

BS34

BS33

BS32

BS21

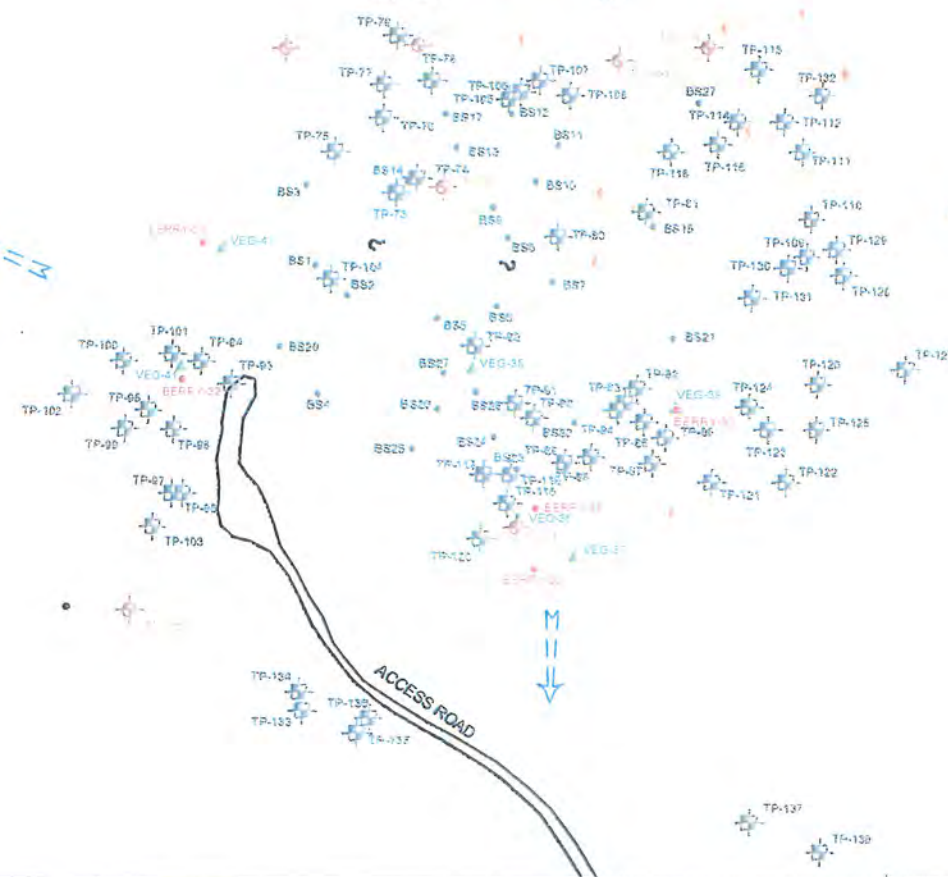
BS30

BMEWS



BS1W
BS16

BS1C
BS20



LEGEND

- TEST PIT (STANTEC 2009)
- MONITOR WELL (STANTEC 2009)
- BULK SAMPLE (STANTEC 2009)
- FISH LOCATION (STANTEC 2009)
- WATER SAMPLE (STANTEC 2009)
- BERRY SAMPLE LOCATION (STANTEC 2009)
- VEGETATION SAMPLE (STANTEC 2009)
- BENTHIC SAMPLE (STANTEC 2009)
- SEDIMENT SAMPLE (STANTEC 2009)
- SMALL MAMMALS (STANTEC 2009)

← = → INFERRED GROUNDWATER FLOW DIRECTION

- CONCRETE FOUNDATION
- ESTIMATED AREA OF PCB IMPACTED SOIL REQUIRING REMEDIATION
- ESTIMATED AREA OF METALS IMPACTED SOIL REQUIRING REMEDIATION
- ESTIMATED AREA OF TPH IMPACTED SOIL REQUIRING REMEDIATION

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

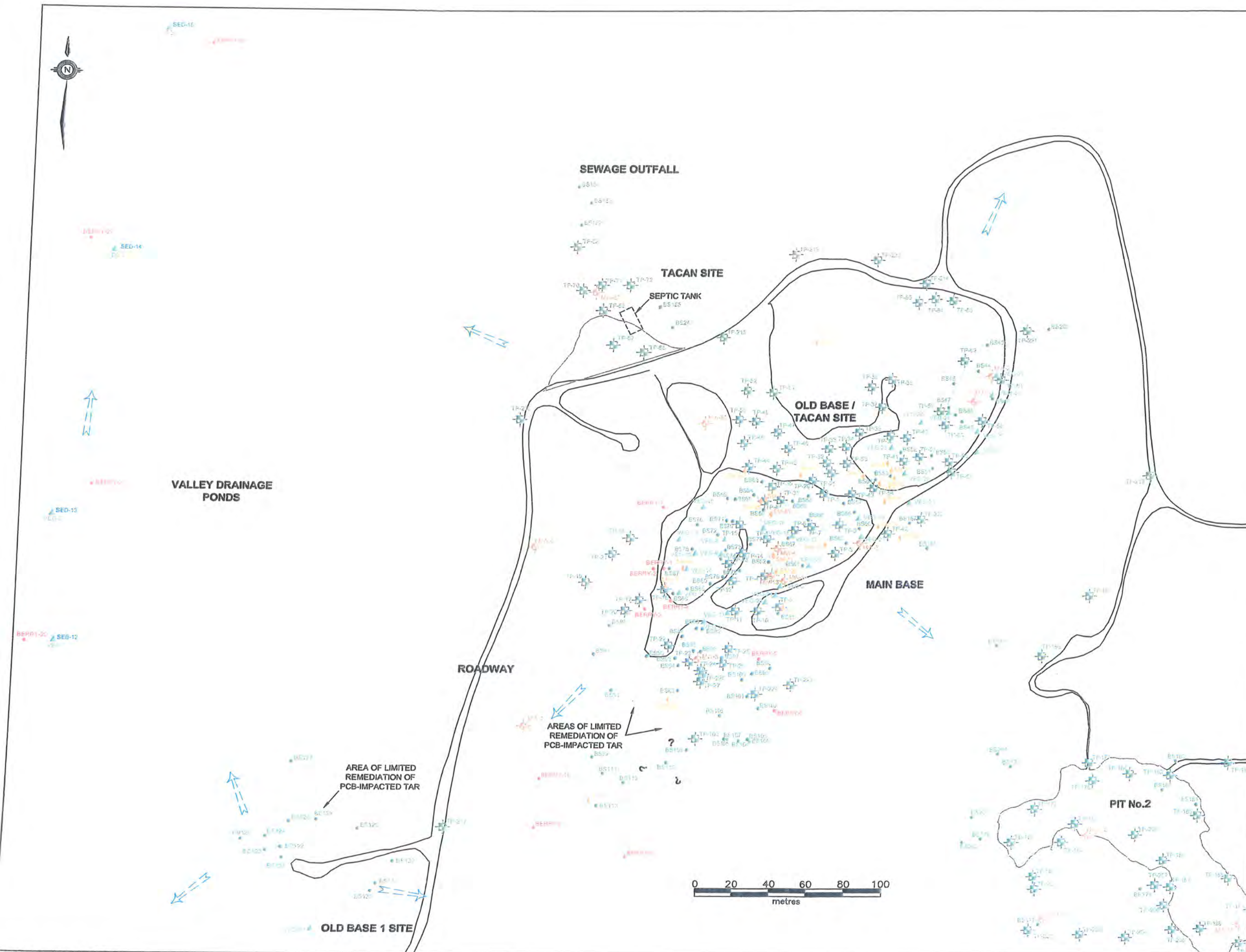
PROJECT TITLE

PHASE II/III ESA, HHERA AND RAP/RMP
FOR THE FORMER U.S. MILITARY SITE AND
RESIDENTIAL SUBDIVISION, HOPEDALE, NL

DRAWING TITLE

APPROXIMATE EXTENT OF SURFACE
SOIL REQUIRING REMEDIATION -
BMEWS, VALLEY DRAINAGE PONDS

SCALE	1:2000	DATE	MAY 13, 2010
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EDITED BY	-	REV No.	0
DRAWING No.	121410103-EE-28c		
CAD FILE	121410103-EE-07.DWG		



LEGEND

- TEST PIT (STANTEC 2009)
- MONITOR WELL (STANTEC 2009)
- BULK SAMPLE (STANTEC 2009)
- FISH LOCATION (STANTEC 2009)
- WATER SAMPLE (STANTEC 2009)
- BERRY SAMPLE LOCATION (STANTEC 2009)
- VEGETATION SAMPLE (STANTEC 2009)
- BENTHIC SAMPLE (STANTEC 2009)
- SEDIMENT SAMPLE (STANTEC 2009)
- SMALL MAMMALS (STANTEC 2009)

INFERRED GROUNDWATER FLOW DIRECTION

- CONCRETE FOUNDATION
- ESTIMATED AREA OF PCB IMPACTED SOIL REQUIRING REMEDIATION
- ESTIMATED AREA OF METALS IMPACTED SOIL REQUIRING REMEDIATION
- ESTIMATED AREA OF TPH IMPACTED SOIL REQUIRING REMEDIATION
- ESTIMATED AREA OF TPH AND PCB IMPACTED SOIL REQUIRING REMEDIATION

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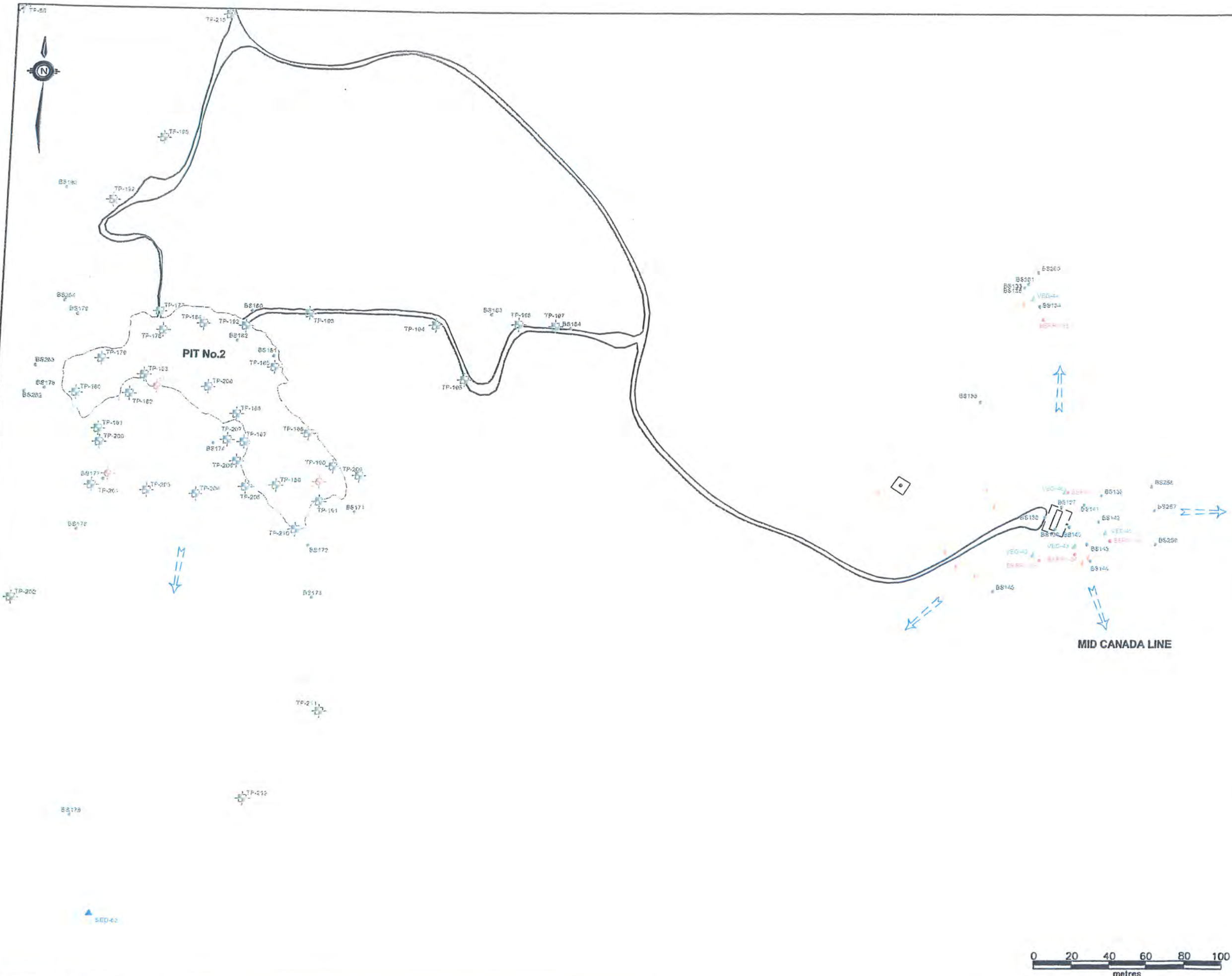
PROJECT TITLE:

PHASE II/III ESA, HHERA AND RAP/RMP
FOR THE FORMER U.S. MILITARY SITE AND
RESIDENTIAL SUBDIVISION, HOPEDALE, NL

DRAWING TITLE:

APPROXIMATE EXTENT OF SURFACE SOIL
REQUIRING REMEDIATION - OLD BASE 1,
MAIN BASE, SEWAGE OUTFALL, ROADWAY
AND VALLEY DRAINAGE PONDS

SCALE:	1:2000	DATE:	MAY 13, 2010
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EDITED BY:	-	REV. No.	0
DRAWING No.	121410103-EE-28d		
CAD FILE:	121410103-EE-07.DWG		



- LEGEND**
- TEST PIT (STANTEC 2009)
 - MONITOR WELL (STANTEC 2009)
 - BULK SAMPLE (STANTEC 2009)
 - FISH LOCATION (STANTEC 2009)
 - WATER SAMPLE (STANTEC 2009)
 - BERRY SAMPLE LOCATION (STANTEC 2009)
 - VEGETATION SAMPLE (STANTEC 2009)
 - BENTHIC SAMPLE (STANTEC 2009)
 - SEDIMENT SAMPLE (STANTEC 2009)
 - SMALL MAMMALS (STANTEC 2009)
 - INFERRED GROUNDWATER FLOW DIRECTION
 - CONCRETE FOUNDATION
 - ESTIMATED AREA OF METALS IMPACTED SOIL REQUIRING REMEDIATION

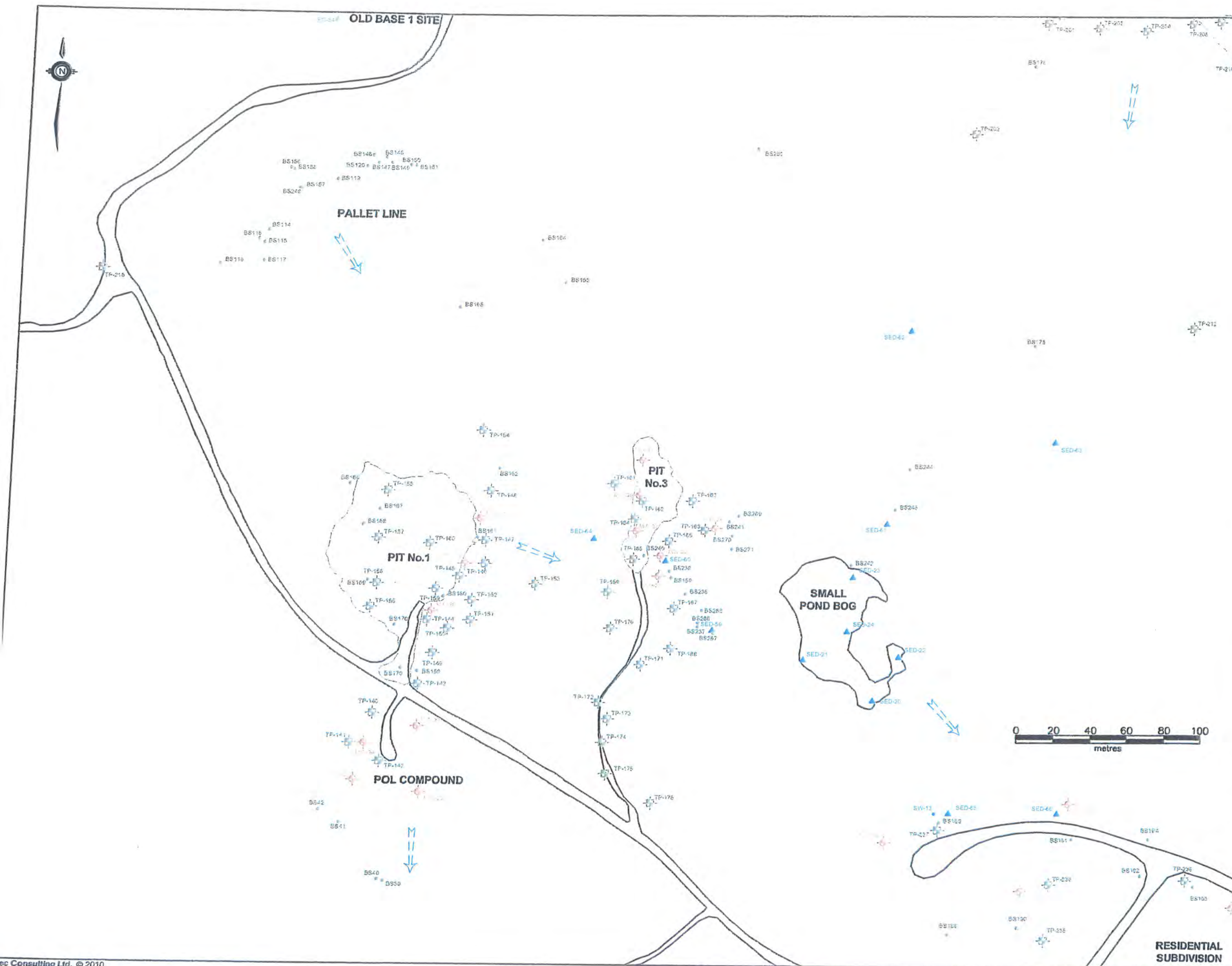
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CLIENT:
**NEWFOUNDLAND AND LABRADOR
DEPARTMENT OF ENVIRONMENT
AND CONSERVATION**

PROJECT TITLE
**PHASE II/III ESA, HHERA AND RAP/RMP
FOR THE FORMER U.S. MILITARY SITE AND
RESIDENTIAL SUBDIVISION, HOPEDALE, NL**

DRAWING TITLE
**APPROXIMATE EXTENT OF SURFACE
SOIL REQUIRING REMEDIATION -
POL COMPOUND, PIT No.1, PIT No.3,
PALLET LINE AND SMALL POND BOG**

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EDITED BY:	-	REV. No	0
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LEGEND

- TEST PIT (STANTEC 2009)
- MONITOR WELL (STANTEC 2009)
- BULK SAMPLE (STANTEC 2009)
- FISH LOCATION (STANTEC 2009)
- WATER SAMPLE (STANTEC 2009)
- BERRY SAMPLE LOCATION (STANTEC 2009)
- VEGETATION SAMPLE (STANTEC 2009)
- BENTHIC SAMPLE (STANTEC 2009)
- SEDIMENT SAMPLE (STANTEC 2009)
- SMALL MAMMALS (STANTEC 2009)
- INFERRED GROUNDWATER FLOW DIRECTION
- ESTIMATED AREA OF PCB IMPACTED SOIL REQUIRING REMEDIATION
- ESTIMATED AREA OF METALS IMPACTED SOIL REQUIRING REMEDIATION
- ESTIMATED AREA OF TPH IMPACTED SOIL REQUIRING REMEDIATION

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CLIENT:

NEWFOUNDLAND AND LABRADOR
DEPARTMENT OF ENVIRONMENT
AND CONSERVATION

PROJECT TITLE

PHASE II/III ESA, HHERA AND RAP/RMP
FOR THE FORMER U.S. MILITARY SITE AND
RESIDENTIAL SUBDIVISION, HOPEDALE, NL

DRAWING TITLE

APPROXIMATE EXTENT OF SURFACE
SOIL REQUIRING REMEDIATION -
POL COMPOUND, PIT No.1, PIT No.3,
PALLET LINE AND SMALL POND BOG

SCALE	1:2000	DATE	MAY 13, 2010
DRAWN BY	N.M.	CHECKED BY	<i>[Signature]</i>
EDITED BY	-	REV. No.	0
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CAD FILE	121410103-EE-07.DWG		