US EPA ARCHIVE DOCUMENT

Superfund Records Center
SITE: Centredale
BREAK: 3-4
OTHER: 212291

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TABLES

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Table 1
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Surface Water

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Surface Water
Exposure Medium: Surface Water

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark		Retain as COPC?	Rationale for Contaminant Deletion or Selection (3)
	Volatile Organics													
75-09-2	Methylene Chloride	0.0003	J	0.0003	J	MG/L	WRC-SW-4004-01	1 / 6	0.001 - 0.001	0.0003	0.21	G	No	S
127-18-4	Tetrachloroethene	0.0005	J	0.0007	J	MG/L	WRC-SW-4003-01	2 / 6	0.001 - 0.001	0.0007	0.0053	G	No	S
	Semivolatile Organics													
92-52-4	1,1'-Biphenyl	0.00000087	J	0.00000087	J	MG/L	WRC-SW-4003-01	1 / 35	0.00000231 - 0.01	0.00000087	0.23	C	No	S
91-57-6	2-Methylnaphthalene	0.00000153	J	0.00000153	J	MG/L	WRC-SW-4003-01	1 / 35	0.00000231 - 0.01	0.00000153	0.15	C	No	S
83-32-9	Acenaphthene	0.00000145	J	0.00000145	J	MG/L	WRC-SW-4003-01	1 / 35	0.00000231 - 0.01	0.00000145	0.0019	G	No	S
208-96-8	Acenaphthylene	0.00000058	J	0.00000132	J	MG/L	WRL-SW-4004-01 WRL-SW-4005-01	3 / 35	0.00000231 - 0.01	0.00000132	0.05	F	No	S
120-12-7	Anthracene	0.00000097	J	0.00000097	J	MG/L	WRC-SW-4003-01	1 / 35	0.00000231 - 0.01	0.00000097	0.00013	C	No	S
100-52-7	Benzaldehyde	0.00001446		0.00001446		MG/L	WRC-SW-4003-01	1 / 35	0.00000892 - 0.01	0.00001446	1.6	F	No	S
56-55-3	Benzo(a)anthracene	0.00000252	J	0.00000252	J	MG/L	WRC-SW-4003-01	1 / 35	0.00000231 - 0.01	0.00000252	0.001	C	No	S
50-32-8	Benzo(a)pyrene	0.00000248	J	0.00000248	J	MG/L	WRC-SW-4003-01	1 / 35	0.00000231 - 0.01	0.00000248	0.005	C	No	S
205-99-2	Benzo(b)fluoranthene	0.00000349	J	0.00000349	J	MG/L	WRC-SW-4003-01	1 / 35	0.00000368 - 0.01	0.00000349	0.00042	C	No	S
191-24-2	Benzo(g,h,i)perylene	0.00000333	J	0.00000333	J	MG/L	WRC-SW-4003-01	1 / 35	0.0000024 - 0.01	0.00000333	0.00002	C	No	S
207-08-9	Benzo(k)fluoranthene	0.00000362	J	0.00000362	J	MG/L	WRC-SW-4003-01	1 / 35	0.00000355 - 0.01	0.00000362	0.00014	C	No	S
117-81-7	bis(2-Ethylhexyl)phthalate	0.001	J	0.16	*	MG/L	WRL-SW-2043-01	2 / 34	0.01 - 0.011	0.16	0.012	G	Yes	A
218-01-9	Chrysene	0.00000514		0.00000514		MG/L	WRC-SW-4003-01	1 / 35	0.00000375 - 0.01	0.00000514	0.00007	C	No	S
53-70-3	Dibenzo(a,h)anthracene	0.00000046	J	0.00000046	J	MG/L	WRC-SW-4003-01	1 / 35	0.00000231 - 0.01	0.00000046	0.00004	C	No	S
132-64-9	Dibenzofuran	0.000001	J	0.000001	J	MG/L	WRC-SW-4003-01	1 / 35	0.00000231 - 0.01	0.000001	1	D	No	S
206-44-0	Fluoranthene	0.00001358		0.00001358		MG/L	WRC-SW-4003-01	1 / 35	0.0000138 - 0.01	0.00001358	0.0044	G	No	S
193-39-5	Indeno(1,2,3-cd)pyrene	0.00000225	J	0.00000225	J	MG/L	WRC-SW-4003-01	1 / 35	0.00000231 - 0.01	0.00000225	0.001	F	No	S
91-20-3	Naphthalene	0.00000766	B	0.00000766	B	MG/L	WRC-SW-4003-01	1 / 35	0.00000323 - 0.01	0.00000766	0.0026	G	No	S
85-01-8	Phenanthrene	0.00000561		0.00000561		MG/L	WRC-SW-4003-01	1 / 35	0.00000672 - 0.01	0.00000561	0.0063	A	No	S
108-95-2	Phenol	0.002	J	0.002	J	MG/L	CMW-SW-2019-01	1 / 34	0.01 - 0.011	0.002	0.0056	G	No	S
129-00-0	Pyrene	0.00000961		0.00000961		MG/L	WRC-SW-4003-01	1 / 35	0.00001077 - 0.01	0.00000961	0.0004	C	No	S
TOTPAH	Total PAH	0.00006613	J	0.00006613	J	MG/L	WRC-SW-4003-01	1 / 35	0.00006744 - 0.01	0.00006613			No	F
	Pesticides/PCBs													
72-55-9	4,4'-DDE	0.0000043	J	0.0000043	J	MG/L	WRL-SW-2042-01	1 / 35	0.00000185 - 0.0001	0.0000043	0.11	A	No	S
50-29-3	4,4'-DDT	0.00001	J	0.00001	J	MG/L	LPX-SW-2050-01	1 / 35	0.00000185 - 0.0001	0.00001	0.000001	A	No	F
309-00-2	Aldrin	0.000003	J	0.000069		MG/L	LPX-SW-2049-01	5 / 35	0.00000185 - 0.00005	0.000069	0.0003	A	No	S
5103-71-9	alpha-Chlordane	0.00000056	J	0.000019	J	MG/L	WRL-SW-2042-01	4 / 35	0.00000195 - 0.00005	0.000019	0.0000043	G	Yes	A
12767-79-2	Aroclor, Total	0.0046		0.0046		MG/L	CMW-SW-2019-01	1 / 35	0.00018462 - 0.002	0.0046	0.000014	A	No	F, M
11097-69-1	Aroclor-1254	0.0046		0.0046		MG/L	CMW-SW-2019-01	1 / 35	0.00002308 - 0.001	0.0046	0.000014	B	No	F, M
319-85-7	beta-BHC	0.00000097	J	0.00000149	J	MG/L	WRL-SW-4005-01	2 / 35	0.00000185 - 0.00005	0.00000149	5	B	No	S
319-86-8	delta-BHC	0.0000017	J	0.0000096	J	MG/L	WRC-SW-2013-01	2 / 35	0.00000185 - 0.00005	0.0000096	0.095	D	No	S
1031-07-8	Endosulfan Sulfate	0.00000121	J	0.00049		MG/L	CMW-SW-2019-01	4 / 35	0.00000185 - 0.0001	0.00049	0.000051	E	Yes	A
72-20-8	Endrin	0.00021		0.00021		MG/L	CMW-SW-2019-01	1 / 35	0.00000185 - 0.0001	0.00021	0.0000023	B	No	F, M
7421-93-4	Endrin Aldehyde	0.0000013	J	0.000005	J	MG/L	WRL-SW-2042-01	4 / 29	0.00000185 - 0.0001	0.000005	0.032	F	No	S
58-89-9	gamma-BHC	0.00000062	J	0.00000083	J	MG/L	WRL-SW-4005-01	2 / 35	0.00000185 - 0.00005	0.00000083	0.00008	B	No	S
5103-74-2	gamma-Chlordane	0.00000055	J	0.00012		MG/L	CMW-SW-2019-01	5 / 35	0.00000195 - 0.00005	0.00012	0.0000043	G	Yes	A
	Total Metals													
7429-90-5	Aluminum	0.0358	J	6.19		MG/L	CMW-SW-2019-01	24 / 33	0.0104 - 0.0905	6.19	0.087	A	Yes	A
7440-36-0	Antimony	0.000183		0.00022	J	MG/L	WRL-SW-4004-01	6 / 33	0.0021 - 0.005	0.00022	0.01	G	No	S
7440-38-2	Arsenic	0.000533		0.0125		MG/L	APB-SW-2029-01	16 / 33	0.0022 - 0.006	0.0125	0.15	A	No	S
7440-39-3	Barium	0.016		0.271		MG/L	WRC-SW-2015-01	32 / 33	0.019 - 0.019	0.271	2.6	C	No	S
7440-41-7	Beryllium	0.0000467	J	0.0002		MG/L	WRL-SW-2042-01	7 / 33	0.0001 - 0.002	0.0002	0.00017	G	Yes	A
7440-43-9	Cadmium	0.0000196	J	0.0000289	J	MG/L	WRL-SW-4005-01	6 / 33	0.0003 - 0.001	0.0000289	0.000097	A	No	S
7440-70-2	Calcium	7.6		36.8		MG/L	CMW-SW-2025-01	27 / 27	-	36.8	120	D	No	S
7440-47-3	Chromium	0.001	J	0.042		MG/L	APB-SW-2029-01	8 / 33	0.0003 - 0.012	0.042	0.028	A	Yes	A
7440-48-4	Cobalt	0.000126		0.0054		MG/L	APB-SW-2029-01	8 / 33	0.0006 - 0.001	0.0054	0.0051	D	Yes	A
7440-50-8	Copper	0.0013		0.0914		MG/L	CMW-SW-2019-01	33 / 33	-	0.0914	0.0029	A	Yes	A
7439-89-6	Iron	0.229		113		MG/L	APB-SW-2029-01	33 / 33	-	113	1	A	Yes	A
7439-92-1	Lead	0.00104		0.223		MG/L	CMW-SW-2019-01	14 / 33	0.0011 - 0.0033	0.223	0.00054	A	Yes	A
7439-95-4	Magnesium	1.24		5.92		MG/L	CMW-SW-2025-01	27 / 27	-	5.92	82	D	No	S
7439-96-5	Manganese	0.0141		2.6		MG/L	APB-SW-2029-01	33 / 33	-	2.6	1.1	D	Yes	A
7439-97-6	Mercury	0.00000211		0.00000394		MG/L	WRL-SW-4004-01	6 / 33	0.0001 - 0.0002	0.00000394	0.000012	G	No	S
7439-98-7	Molybdenum	0.000929	J	0.0011	J	MG/L	WRC-SW-4001-01 WRC-SW-4002-01	6 / 6	-	0.0011	0.88	D	No	S
7440-02-0	Nickel	0.00124	J	0.0343	J	MG/L	APB-SW-2029-01	24 / 33	0.0013 - 0.002	0.0343	0.016	A	Yes	A

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CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark		Retain as COPC?	Rationale for Contaminant Deletion or Selection (3)
7440-09-7	Potassium	1.49	J	5.37	J	MG/L	CMW-SW-2019-01	27 / 27	-	5.37	53	D	No	S
7782-49-2	Selenium	0.0059		0.0108		MG/L	APB-SW-2029-01	3 / 33	0.0004 - 0.005	0.0108	0.005	A	Yes	A
7440-22-4	Silver	0.001	J	0.0018	J	MG/L	CMW-SW-2025-01	7 / 33	0.0004 - 0.00268	0.0018	0.000035	A	Yes	A
7440-23-5	Sodium	15.6		39.7		MG/L	CMW-SW-2019-01	26 / 26	-	39.7	680	D	No	S
7440-28-0	Thallium	0.00000607	J	0.0145		MG/L	CMW-SW-2024-01	12 / 33	0.0021 - 0.0089	0.0145	0.001	G	Yes	A
7440-62-2	Vanadium	0.00000506	J	0.022		MG/L	CMW-SW-2019-01	10 / 33	0.0005 - 0.008	0.022	0.16	C	No	S
7440-66-6	Zinc	0.00592		0.5		MG/L	APB-SW-2029-01	29 / 33	0.0129 - 0.0129	0.5	0.033	G	Yes	A
	Dissolved Metals													
7429-90-5D	Aluminum, Dissolved	0.02	J	0.14		MG/L	WRC-SW-2011-01F	18 / 36	0.014 - 0.0797	0.14	0.087	A	Yes	A
7440-36-0D	Antimony, Dissolved	0.000178		0.00022		MG/L	WRL-SW-4004-01	5 / 36	0.000161 - 0.005	0.00022	0.01	G	No	S
7440-38-2D	Arsenic, Dissolved	0.000416		0.0113		MG/L	CMW-SW-2024-01F	15 / 36	0.0022 - 0.006	0.0113	0.15	A	No	S
7440-39-3D	Barium, Dissolved	0.0136		0.254		MG/L	CMW-SW-2024-01F	24 / 36	0.0083 - 0.177	0.254	2.6	C	No	S
7440-41-7D	Beryllium, Dissolved	0.0000286	J	0.0000435	J	MG/L	WRC-SW-4002-01	6 / 36	0.0001 - 0.0025	0.0000435	0.00017	G	No	S
7440-43-9D	Cadmium, Dissolved	0.0000129	J	0.0000175	J	MG/L	WRC-SW-4003-01	6 / 36	0.0003 - 0.001	0.0000175	0.000094	A	No	S
7440-70-2D	Calcium, Dissolved	5.38		34.9		MG/L	CMW-SW-2025-01F	30 / 30	-	34.9	120	D	No	S
7440-47-3D	Chromium, Dissolved	0.0016		0.0016		MG/L	WRC-SW-2015-01F	1 / 36	0.0003 - 0.012	0.0016	0.024	A	No	S
7440-48-4D	Cobalt, Dissolved	0.0000669		0.001	J	MG/L	WRC-SW-2015-01F	7 / 36	0.0006 - 0.001	0.001	0.0051	D	No	S
7440-50-8D	Copper, Dissolved	0.00131	J	0.016		MG/L	CMW-SW-2019-01F	35 / 36	0.001 - 0.001	0.016	0.0027	A	Yes	A
7439-89-6D	Iron, Dissolved	0.126		7.95		MG/L	CMW-SW-2019-01F	36 / 36	-	7.95	1	A	Yes	A
7439-92-1D	Lead, Dissolved	0.000475		0.0047		MG/L	WRL-SW-2043-01F	7 / 36	0.0011 - 0.0028	0.0047	0.00054	A	Yes	A
7439-95-4D	Magnesium, Dissolved	0.462		5.62		MG/L	CMW-SW-2025-01F	30 / 30	-	5.62	82	D	No	S
7439-96-5D	Manganese, Dissolved	0.0096		1.57		MG/L	APB-SW-2029-01F	36 / 36	-	1.57	1.1	D	Yes	A
7439-97-6D	Mercury, Dissolved	0.00000127		0.00000173		MG/L	WRC-SW-4003-01	6 / 36	0.0001 - 0.0002	0.00000173	0.00077	A	No	S
7439-98-7D	Molybdenum, Dissolved	0.000859	J	0.000897	J	MG/L	WRL-SW-4004-01	6 / 6	-	0.000897	0.88	D	No	S
7440-02-0D	Nickel, Dissolved	0.000989	J	0.0082		MG/L	CMW-SW-2019-01F	20 / 36	0.0013 - 0.002	0.0082	0.016	A	No	S
7440-09-7D	Potassium, Dissolved	0.613	J	4.41	J	MG/L	CMW-SW-2019-01F	30 / 30	-	4.41	53	D	No	S
7782-49-2D	Selenium, Dissolved	0.0039	J	0.0053		MG/L	APB-SW-2029-01F	2 / 36	0.0004 - 0.005	0.0053	0.0046	A	Yes	A
7440-22-4D	Silver, Dissolved	0.0011	J	0.0017	J	MG/L	APB-SW-2029-01F	6 / 36	0.0004 - 0.00268	0.0017	0.00003	A	Yes	A
7440-23-5D	Sodium, Dissolved	20.8		47.5		MG/L	CMW-SW-2019-01F	29 / 30	7.61 - 7.61	47.5	680	D	No	S
7440-28-0D	Thallium, Dissolved	0.00000513	J	0.0106	J	MG/L	CMW-SW-2025-01F	13 / 36	0.0021 - 0.0089	0.0106	0.001	G	Yes	A
7440-62-2D	Vanadium, Dissolved	0.0008	J	0.0008	J	MG/L	WRC-SW-2015-01F	1 / 36	0.0005 - 0.008	0.0008	0.16	C	No	S
7440-66-6D	Zinc, Dissolved	0.00444	J	0.121		MG/L	CMW-SW-2024-01F	34 / 36	0.0118 - 0.0129	0.121	0.032	G	Yes	A
	Inorganics													
BOD	Biochemical Oxygen Demand	2		18.6		MG/L	WRC-SW-4002-01	5 / 5	-	18.6	na		No	E
CONDUCTIVIT	Conductivity	206		250		MS/CM	DAM005-SW	3 / 3	-	250	na		No	E
DOC	Dissolved Organic Carbon	4.78		5.5		MG/L	WRL-SW-4004-01	6 / 6	-	5.5	na		No	E
HARDNESS	Hardness	28.5		29.2		MG/L	WRL-SW-4004-01□WRL-SW-4005-01	6 / 6	-	29.2	na		No	E
NITRATE	Nitrate	0.733		0.773		MG/L	WRC-SW-4002-01	8 / 8	-	0.773	9.8	F	No	S
14797-65-0	Nitrite-N	0.082		0.139		MG/L	WRC-SW-4001-01	6 / 6	-	0.139	1.8	F	No	S
7664-41-7	Nitrogen, Ammonia	0.138	J	0.306	J	MG/L	WRC-SW-4001-01	6 / 6	-	0.306	1.7E-03	D	Yes	A
7727-37-9D	Nitrogen, Dissolved	1.22		1.39		MG/L	WRC-SW-4001-01	6 / 6	-	1.39	0.0012	F	Yes	A
7727-37-9	Nitrogen, Total	1.27		1.44		MG/L	WRC-SW-4001-01	8 / 8	-	1.44	0.0012	F	Yes	A
pH	pH	6.8		8.8		SU	DAM005-SW	3 / 3	-	8.8	na		No	E
14265-44-2	Phosphate	0.0438		0.0617		MG/L	WRC-SW-4004-01	8 / 8	-	0.0617	79	F	No	S
7723-14-0D	Phosphorus, Dissolved	0.0617	J	0.0731	J	MG/L	WRL-SW-4005-01	6 / 6	-	0.0731	12	F	No	S
7723-14-0	Phosphorus, Total	0.0617	J	0.0861		MG/L	WRC-SW-4001-01	8 / 8	-	0.0861	12	F	No	S
TEMPERATURE	Temperature	9		11		C	DAM002-SW DAM003-SW	3 / 3	-	11	na		No	E
7440-44-0	Total Organic Carbon	5.15		5.46		MG/L	WRL-SW-4004-01	8 / 8	-	5.46	na		No	E
00-0-89	Total Suspended Solids	2.4		14.4		MG/L	WRC-SW-4002-01	6 / 6	-	14.4	na		No	E
	Dioxins/Furans										na			
38178-99-3	ECX	0.000000001876	J	0.000000398	J	MG/L	CMW-SW-2019-01	6 / 26	0 - 0	0.000000398	na		No	T
1746-01-6	2,3,7,8-TCDD	0.00000000029	EMPC	0.00001274	J	MG/L	CMW-SW-2019-01	13 / 26	0.0000000037 - 0.0000000092	0.00001274	na		No	T
40321-76-4	1,2,3,7,8-PeCDD	0.000000014	EMPC	0.0000000354	J	MG/L	CMW-SW-2019-01	2 / 26	0.0000000005 - 0.0000000109	0.0000000354	na		No	T
39227-28-6	1,2,3,4,7,8-HxCDD	0.0000000016	J	0.0000000817		MG/L	CMW-SW-2019-01	4 / 26	0.0000000008 - 0.0000000089	0.0000000817	na		No	T
57653-85-7	1,2,3,6,7,8-HxCDD	0.0000000061	J	0.000000232		MG/L	CMW-SW-2019-01	5 / 26	0.0000000007 - 0.0000000084	0.000000232	na		No	T
19408-74-3	1,2,3,7,8,9-HxCDD	0.0000000018	EMPC	0.000000196		MG/L	CMW-SW-2019-01	8 / 26	0.0000000008 - 0.0000000087	0.000000196	na		No	T
35822-46-9	1,2,3,4,6,7,8-HpCDD	0.000000003	EMPC	0.00000478		MG/L	CMW-SW-2019-01	15 / 26	0.0000000034 - 0.0000000109	0.00000478	na		No	T

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3268-87-9	OCDD	0.0000000093	EMPC	0.0000277	J	MG/L	CMW-SW-2019-01	20 / 26	0.0000000097 - 0.0000000445	0.0000277	ns		No	T
51207-31-9	2,3,7,8-TCDF	0.0000000077	J	0.0000000531	J	MG/L	CMW-SW-2019-01	4 / 26	0 - 0.0000000087	0.0000000531	ns		No	T
57117-41-6	1,2,3,7,8-PeCDF	0.0000000141	J	0.0000000364	EMPC	MG/L	APB-SW-2029-01	2 / 26	0.0000000003 - 0.0000000063	0.0000000364	ns		No	T
57117-31-4	2,3,4,7,8-PeCDF	0.0000000183	J	0.0000000282	J	MG/L	CMW-SW-2019-01	2 / 26	0.0000000003 - 0.0000000064	0.0000000282	ns		No	T
70648-26-9	1,2,3,4,7,8-HxCDF	0.0000000024	EMPC	0.000000073		MG/L	CMW-SW-2019-01	5 / 26	0.0000000069 - 0.0000000064	0.000000073	ns		No	T
57117-44-9	1,2,3,6,7,8-HxCDF	0.0000000019	EMPC	0.0000000579		MG/L	CMW-SW-2019-01	5 / 26	0.0000000005 - 0.0000000006	0.0000000579	ns		No	T
60851-34-5	2,3,4,6,7,8-HxCDF	0.0000000059	J	0.0000000782		MG/L	CMW-SW-2019-01	4 / 26	0.0000000005 - 0.0000000063	0.0000000782	ns		No	T
72918-21-9	1,2,3,7,8,9-HxCDF	0.0000000022	J	0.0000000063	J	MG/L	CMW-SW-2019-01	2 / 26	0 - 0.0000000071	0.0000000063	ns		No	T
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.0000000037	J	0.000000991		MG/L	CMW-SW-2019-01	13 / 26	0.0000000007 - 0.0000000075	0.000000991	ns		No	T
55673-89-7	1,2,3,4,7,8,9-HpCDF	0.0000000061	EMPC	0.0000000596	EMPC	MG/L	CMW-SW-2019-01	4 / 26	0 - 0.0000000112	0.0000000596	ns		No	T
39001-02-0	OCDF	0.0000000024	EMPC	0.00000195	J	MG/L	CMW-SW-2019-01	12 / 26	0.000000002 - 0.0000000316	0.00000195	ns		No	T
41903-57-5	Total TCDD	0.0000000029	EMPC	0.00001287	J	MG/L	CMW-SW-2019-01	13 / 26	0.0000000037 - 0.0000000092	0.00001287	ns		No	T
36088-22-9	Total PeCDD	0.0000000084	EMPC	0.000000104	J	MG/L	CMW-SW-2019-01	3 / 26	0.0000000005 - 0.0000000109	0.000000104	ns		No	T
34465-46-8	Total HxCDD	0.0000000031	J	0.00000138	J	MG/L	CMW-SW-2019-01	10 / 26	0.0000000008 - 0.0000000087	0.00000138	ns		No	T
37871-00-4	Total HpCDD	0.0000000053	EMPC	0.00000809	J	MG/L	CMW-SW-2019-01	16 / 26	0.0000000052 - 0.0000000109	0.00000809	ns		No	T
55722-27-5	Total TCDF	0.0000000012	EMPC	0.000000555	J	MG/L	CMW-SW-2019-01	6 / 26	0.0000000007 - 0.0000000087	0.000000555	ns		No	T
30402-15-4	Total PeCDF	0.0000000013	EMPC	0.000000493	J	MG/L	CMW-SW-2019-01	7 / 26	0.0000000009 - 0.0000000064	0.000000493	ns		No	T
55684-94-1	Total HxCDF	0.0000000042	J	0.00000137	J	MG/L	CMW-SW-2019-01	10 / 26	0.0000000069 - 0.0000000164	0.00000137	ns		No	T
38998-75-3	Total HpCDF	0.0000000017	EMPC	0.00000231	J	MG/L	CMW-SW-2019-01	13 / 26	0 - 0.0000000156	0.00000231	ns		No	T
GT1500081	PCDD/Fs	0.0000000093		0.0000568		MG/L	CMW-SW-2019-01	22 / 26	0.0000000063 - 0.0000000109	0.0000568	ns		No	T
38178-99-3M	HCX - Mammals TEQ	0.000000000003752	J	0.0000000000796	J	MG/L	CMW-SW-2019-01	6 / 26	0 - 0	0.0000000000796	ns		No	T
TEM	Toxicity Equivalency - Mammals	0.0000000047		0.0000129		MG/L	CMW-SW-2019-01	26 / 26	-	0.0000129	0.00000001	A	Yes	A
TEB	Toxicity Equivalency - Birds	0.00000000451		0.0000129		MG/L	CMW-SW-2019-01	26 / 26	-	0.0000129	0.00000001	A	Yes	A
TEF	Toxicity Equivalency - Fish	0.00000000465		0.0000129		MG/L	CMW-SW-2019-01	26 / 26	-	0.0000129	0.00000001	A	Yes	A

(1) Minimum or maximum concentration detected in Allendale and Lyman Mill exposure areas. Samples from these exposure areas included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Analyte is selected as a COPC if the concentration used for screening exceeds the benchmark.
S = Concentration used for screening is less than the screening toxicity value; the analyte was not selected as a COPC.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
E = The analyte is an essential nutrient or miscellaneous parameter and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (USEPA, 1995).
T = Dioxin, furan, and PCB congeners were evaluated using Toxic Equivalencies (TEq) and specific congeners were not evaluated individually as COPCs.
F = The analyte has a frequency of detection of less than 5% (USEPA RAGS; 1989); the analyte was not selected as a COPC.
M = Maximum detected concentration of the analyte exceeds the screening benchmark by more than one order of magnitude; the uncertainties associated with not including this analyte in the quantitative risk analysis are discussed in Section 10.

A - NAWQC
B - USEPA Region IV
C - AQUIRE
D - ORNL CVs
E - ORNL Tier II
F - ECOSAR
G - RI State WQC

Qualifier definitions:
J = Value is estimated.
EMPC = Estimated Maximum Possible Concentration

mg/L = milligrams per liter
COPC = chemical of potential concern

Prepared by: KJA
Checked by: RAR

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Table 2
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Groundwater

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Groundwater
Exposure Medium: Groundwater

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark		Retain as COPC?	Rationale for Contaminant Deletion or Selection (3)
	Volatile Organics													
156-59-2	cis-1,2-Dichloroethene	0.018		1.2	J	MG/L	CMS-GW-MW05S-02	2 / 3	0.01 - 0.01	1.2	1.2	A	No	S
79-20-9	Methyl Acetate	0.43	J	0.43	J	MG/L	CMS-GW-MW05S-02	1 / 2	0.01 - 0.01	0.43	1.6	F	No	S
127-18-4	Tetrachloroethene	0.15		61	*	MG/L	CMS-GW-MW05S-02	3 / 3	-	61	0.0053	G	Yes	A
79-01-6	Trichloroethene	2.5		2.5		MG/L	CMS-GW-MW05S-02	1 / 3	0.001 - 0.01	2.5	0.045	G	Yes	A
	Semivolatile Organics													
88-06-2	2,4,6-Trichlorophenol	2.9	*	2.9	*	MG/L	CMS-GW-MW05S-02	1 / 2	0.01 - 0.01	2.9	0.00036	G	Yes	A
120-83-2	2,4-Dichlorophenol	0.06		0.06		MG/L	CMS-GW-MW05S-02	1 / 2	0.01 - 0.01	0.06	0.0022	G	Yes	A
106-44-5	4-Methylphenol	0.001	J	0.001	J	MG/L	CMS-GW-MW05S-02	1 / 2	0.01 - 0.01	0.001	0.14	F	No	S
56-55-3	Benzo(a)anthracene	0.00022		0.00022		MG/L	GEC-6	1 / 3	0.01 - 0.01	0.00022	0.001	C	No	S
205-99-2	Benzo(b)fluoranthene	0.00017		0.00017		MG/L	GEC-6	1 / 3	0.01 - 0.01	0.00017	0.00042	C	No	S
207-08-9	Benzo(k)fluoranthene	0.00018		0.00018		MG/L	GEC-6	1 / 3	0.01 - 0.01	0.00018	0.00014	C	Yes	A
218-01-9	Chrysene	0.00028		0.00028		MG/L	GEC-6	1 / 3	0.01 - 0.01	0.00028	0.00007	C	Yes	A
206-44-0	Fluoranthene	0.00081		0.00081		MG/L	GEC-6	1 / 3	0.01 - 0.01	0.00081	0.0044	G	No	S
91-20-3	Naphthalene	0.011		0.011		MG/L	CMS-GW-MW05S-02	1 / 3	0.00012 - 0.01	0.011	0.0026	G	Yes	A
85-01-8	Phenanthrene	0.00077		0.00077		MG/L	GEC-6	1 / 3	0.01 - 0.01	0.00077	0.0063	A	No	S
129-00-0	Pyrene	0.00061		0.00061		MG/L	GEC-6	1 / 3	0.01 - 0.01	0.00061	0.0004	C	Yes	A

(1) Minimum or maximum concentration detected in Allendale exposure area. Samples from this exposure area included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Analyte is selected as a COPC if the concentration used for screening exceeds the benchmark.
S = Concentration used for screening is less than the screening toxicity value; the analyte was not selected as a COPC.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
E = The analyte is an essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (USEPA, 1995).

A - NAWQC
B - USEPA Region IV
C - AQUIRE
D - ORNL CVs
E - ORNL Tier II
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G - RI State WQC

Qualifier definitions:
J = Value is estimated.
* = Value is either the detection limit (DL) or the Estimated Maximum Possible Concentration (EMPC).

mg/L = milligrams per liter
COPC = chemical of potential concern

Prepared by: KJA
Checked by: RAR

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Table 3
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Sediment

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark		Retain as COPC?	Rationale for Contaminant Deletion or Selection (3)
	Semivolatile Organics													
92-52-4	1,1'-Biphenyl	0.00644	J	0.08503		MG/KG	APB-SD-4010-0000-01	12 / 40	0.4 - 8.8	0.08503	1.1E+00	A	No	S
95-95-4	2,4,5-Trichlorophenol	0.08	J	0.08	J	MG/KG	APB-SD-4010-0000-01	1 / 94	0.91 - 25	0.08	2.3E-02	A	No	F
121-14-2	2,4-Dinitrotoluene	1.2	J	1.2	J	MG/KG	WRM-SD-2055-01	1 / 87	0.36 - 9.9	1.2	3.0E-02	A	No	F, M
95-57-8	2-Chlorophenol	1.8	J	1.8	J	MG/KG	WRM-SD-2055-01	1 / 87	0.36 - 9.9	1.8	3.8E-03	A	No	F, M
91-57-6	**2-Methylnaphthalene**	0.01855		0.13608		MG/KG	APB-SD-4010-0000-01	14 / 99	0.36 - 9.9	0.13608	7.0E-02	A	Yes	A
59-50-7	4-Chloro-3-methylphenol	2.2	J	2.2	J	MG/KG	WRM-SD-2055-01	1 / 87	0.36 - 9.9	2.2	3.3E-02	A	No	F, M
106-44-5	4-Methylphenol	0.47	J	0.83		MG/KG	APB-SD-4010-0000-01	2 / 94	0.36 - 9.9	0.83	1.1E-01	A	No	F
100-02-7	4-Nitrophenol	2.2	J	2.2	J	MG/KG	WRM-SD-2055-01	1 / 85	0.91 - 25	2.2	1.1E-01	A	No	F, M
83-32-9	**Acenaphthene**	0.03411	J	1.8	J	MG/KG	WRM-SD-2055-01	32 / 104	0.36 - 9.9	1.8	1.6E-02	A	Yes	A
208-96-8	**Acenaphthylene**	0.043	J	0.97	J	MG/KG	CMS-192-A	28 / 106	0.36 - 9.9	0.97	4.4E-02	A	Yes	A
120-12-7	**Anthracene**	0.06	J	1.8	J	MG/KG	RES-SS-14-334-01	52 / 107	0.36 - 9.9	1.8	2.7E-02	A	Yes	A
1912-24-9	Atrazine	0.073	J	0.073	J	MG/KG	DYP-SD-2066-01	1 / 28	0.4 - 8.8	0.073	4.4E-02	A	No	F
100-52-7	Benzaldehyde	0.031	JEB	0.37	JEB	MG/KG	LPX-SD-2045B-02	21 / 43	0.4 - 8.8	0.37	4.6E-01	A	No	S
56-55-3	**Benzo(a)anthracene**	0.025	J	8.4		MG/KG	RES-SS-14-334-01	94 / 108	0.36 - 4.9	8.4	2.1E-03	B	Yes	A
50-32-8	**Benzo(a)pyrene**	0.032	J	9.2		MG/KG	RES-SS-14-334-01	97 / 108	0.36 - 4.9	9.2	5.3E-03	B	Yes	A
205-99-2	**Benzo(b)fluoranthene**	0.022	J	13	J*	MG/KG	WRM-SD-2055-01	99 / 108	0.36 - 3.9	13	3.7E-04	B	Yes	A
191-24-2	**Benzo(g,h,i)perylene**	0.023	J	7		MG/KG	RES-SS-14-334-01	78 / 108	0.36 - 4.9	7	6.3E-02	A	Yes	A
207-08-9	**Benzo(k)fluoranthene**	0.008	J	9.2		MG/KG	RES-SS-14-334-01	98 / 108	0.36 - 3.9	9.2	3.7E-04	B	Yes	A
117-81-7	**bis(2-Ethylhexyl)phthalate**	0.043	J	50	J*	MG/KG	WRM-SD-2055-01	68 / 105	0.48 - 13	50	6.8E+00	B	Yes	A
85-68-7	Butylbenzylphthalate	0.064	J	1.2	J	MG/KG	LPX-SD-4012-0000-01	30 / 101	0.36 - 9.9	1.2	1.5E+00	B	No	S
86-74-8	**Carbazole**	0.037	J	1.8	J	MG/KG	RES-SS-14-334-01	42 / 102	0.36 - 9.9	1.8	3.6E-01	A	Yes	A
218-01-9	**Chrysene**	0.042	J	11		MG/KG	RES-SS-14-334-01	101 / 108	0.41 - 3.9	11	5.3E-04	B	Yes	A
53-70-3	**Dibenzo(a,h)anthracene**	0.038	J	2.6	J	MG/KG	RES-SS-14-334-01	54 / 107	0.36 - 9.9	2.6	1.0E-03	B	Yes	A
132-64-9	**Dibenzofuran**	0.027	J	0.64	J	MG/KG	RES-SS-14-366-01	23 / 101	0.36 - 9.9	0.64	4.2E-01	A	Yes	A
131-11-3	Dimethylphthalate	0.18	J	0.18	J	MG/KG	LPX-SD-2045B-02	1 / 88	0.36 - 9.9	0.18	1.1E-03	A	No	F, M
84-74-2	**Di-n-Butylphthalate**	0.034	J	1.8	J	MG/KG	WRM-SD-2055-01	21 / 99	0.36 - 9.9	1.8	4.2E-02	A	Yes	A
117-84-0	Di-n-octylphthalate	0.072	J	0.4	J	MG/KG	LPX-SD-4012-0000-01	6 / 96	0.36 - 9.9	0.4	6.9E-01	B	No	S
206-44-0	**Fluoranthene**	0.023	J	20		MG/KG	RES-SS-14-334-01	105 / 108	1.8 - 2.5	20	6.4E-02	A	Yes	A
86-73-7	**Fluorene**	0.033	J	0.93	J	MG/KG	RES-SS-14-366-01	37 / 105	0.36 - 9.9	0.93	1.9E-02	A	Yes	A
193-39-5	**Indeno(1,2,3-cd)pyrene**	0.028	J	6.8		MG/KG	RES-SS-14-334-01	92 / 108	0.36 - 4.9	6.8	5.2E-04	B	Yes	A
91-20-3	**Naphthalene**	0.01905		0.18514		MG/KG	LPX-SD-4012-0000-01	18 / 102	0.36 - 9.9	0.18514	3.3E-02	A	Yes	A
621-64-7	N-Nitroso-di-n-propylamine	1.4	J	1.4	J	MG/KG	WRM-SD-2055-01	1 / 87	0.36 - 9.9	1.4	1.3E-01	A	No	F, M
87-86-5	Pentachlorophenol	1.4	J	18	J	MG/KG	RES-SS-14-333-01	2 / 95	0.91 - 25	18	3.8E-01	B	No	F, M
85-01-8	**Phenanthrene**	0.023	J	12		MG/KG	RES-SS-14-366-01	93 / 107	0.36 - 8.4	12	2.0E-01	A	Yes	A
108-95-2	Phenol	1.9	JEB	1.9	JEB	MG/KG	WRM-SD-2055-01	1 / 94	0.32 - 9.9	1.9	4.8E-02	A	No	F, M
129-00-0	**Pyrene**	0.049	J	16		MG/KG	RES-SS-14-366-01	100 / 108	0.36 - 4.1	16	2.0E-01	A	Yes	A
TOTPAH	**Total PAH$_{16}$**	0.049		110		MG/KG	RES-SS-14-334-01	90 / 93	1.8 - 2.5	110	2.3E+00	A	Yes	A
	Pesticides/PCBs													
72-54-8	4,4'-DDD	0.00002	J	0.052		MG/KG	WRM-SD-2057-01	40 / 120	0.0031 - 0.011	0.052	2.0E-03	A	Yes	A
72-55-9	4,4'-DDE	0.00031	J	0.2	*	MG/KG	RES-SS-12-551-01	57 / 126	0.0031 - 0.0096	0.2	2.1E-03	B	Yes	A
309-00-2	Aldrin	0.00058	J	0.00058	J	MG/KG	SD-12	1 / 121	0 - 0.0055	0.00058	2.0E-03	A	No	S
5103-71-9	**alpha-Chlordane**	0.00021	J	0.14075		MG/KG	LPX-SD-4004-0000-01	74 / 125	0.0016 - 0.0049	0.14075	5.0E-04	A	Yes	A
12767-79-2	**Aroclor, Total**	0.011	J	27		MG/KG	CMS-606-A	124 / 144	0.073 - 0.15	27	2.3E-02	A	Yes	A
53469-21-9	Aroclor-1242	0.19	J	0.19	J	MG/KG	RES-SS-14-333-01	1 / 150	0 - 7.6	0.19	5.0E-03	A	No	F, M
12672-29-6	**Aroclor-1248**	0.016	J	0.14		MG/KG	WRC-SD-2015-01	13 / 149	0 - 13	0.14	3.0E-02	A	Yes	A
11097-69-1	**Aroclor-1254**	0.011	J	27		MG/KG	CMS-606-A	129 / 158	0.036 - 0.073	27	5.5E-02	B	Yes	A

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Table 3
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Sediment

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark		Retain as COPC?	Rationale for Contaminant Deletion or Selection (3)
11096-82-5	Aroclor-1260	0.029	J	0.27		MG/KG	WRC-SD-2015-01	8 / 149	0 - 7.6	0.27	5.0E-03	A	Yes	A
11100-14-4	Aroclor-1268	0.00455	J	0.31379	J	MG/KG	LPX-SD-4013-0000-01	26 / 26	-	0.31379	5.0E-03	A	Yes	A
319-85-7	beta-BHC	0.0026		0.0026		MG/KG	CMW-SD-2025-000.5-01	1 / 117	0 - 0.0066	0.0026	5.0E-03	A	No	S
319-86-8	delta-BHC	0.0024	J	0.0024	J	MG/KG	SD-20	1 / 120	0 - 0.0055	0.0024	3.0E-03	A	No	S
60-57-1	Dieldrin	0.00062	J	0.11297	J	MG/KG	APB-SD-4010-0000-01	38 / 121	0.0022 - 0.011	0.11297	2.0E-05	A	Yes	A
33213-65-9	Endosulfan II	0.0041	J	0.44	*	MG/KG	RES-SS-12-551-01	24 / 123	0 - 0.011	0.44	5.5E-03	A	Yes	A
1031-07-8	Endosulfan sulfate	0.0017	J	0.011		MG/KG	DAM005-SD	8 / 118	0 - 0.039	0.011	5.5E-03	A	Yes	A
72-20-8	Endrin	0.0014	J	0.028		MG/KG	APB-FP-2032-01	7 / 121	0 - 0.027	0.028	2.0E-05	A	Yes	A
7421-93-4	Endrin aldehyde	0.00077	J	0.011	J	MG/KG	CMS-192-A	4 / 119	0 - 0.01	0.011	2.0E-05	A	No	F, M
53494-70-5	Endrin Ketone	0.00129		0.034		MG/KG	RES-SS-14-334-01	5 / 117	0 - 0.027	0.034	2.0E-05	A	No	F, M
58-89-9	gamma-BHC	0.0003	J	0.006		MG/KG	WRL-SD-2042-02	3 / 120	0 - 0.0055	0.006	1.6E-03	A	No	F
5103-74-2	gamma-Chlordane	0.00065	J	0.074	*	MG/KG	RES-SS-14-398-01	65 / 124	0 - 0.0049	0.074	5.0E-04	A	Yes	A
76-44-8	Heptachlor	0.00043	J	0.0044		MG/KG	RES-SS-12-551-01	6 / 121	0 - 0.0055	0.0044	1.1E-03	A	No	F
1024-57-3	Heptachlor epoxide	0.003		0.006	P	MG/KG	WRL-SD-2042-02	3 / 117	0 - 0.02	0.006	2.5E-03	A	No	F
72-43-5	Methoxychlor	0.0027	J	0.035	J	MG/KG	RES-SS-12-551-01	11 / 124	0 - 0.053	0.035	1.9E-02	A	Yes	A
57-74-9	Technical Chlordane	0.06385	J	2.21273		MG/KG	LPX-SD-4004-0000-01	23 / 27	0 - 0.053	2.21273	5.0E-04	A	Yes	A
	Inorganics													
7429-90-5	Aluminum	1640		27773	J	MG/KG	LPX-SD-4011-0000-01	115 / 115	-	27773	4.4E+01	B	Yes	A
7440-36-0	Antimony	0.0443	J	13.7	J	MG/KG	RES-SS-14-419-01	47 / 114	0.0103 - 11	13.7	6.0E-01	B	Yes	A
7440-38-2	Arsenic	0.6	J	18	J	MG/KG	CMS-192-A	107 / 115	0.48 - 35	18	9.6E-01	B	Yes	A
7440-39-3	Barium	7.6		380	J	MG/KG	LPX-SD-4004-0000-01	112 / 115	15.7 - 41.5	380	5.4E+01	B	Yes	A
7440-43-9	Cadmium	0.17		23.9		MG/KG	WRM-SD-2055-01	69 / 112	0.06 - 3	23.9	5.9E-01	A	Yes	A
7440-70-2	Calcium	158		7620	J	MG/KG	RES-SS-14-333-01	90 / 91	447 - 447	7620			Yes	A
7440-47-3	Chromium	2.8	J	536	J	MG/KG	RES-SS-14-449-01	115 / 115	-	536	4.6E-01	B	Yes	A
7440-48-4	Cobalt	1.5	J	26.6		MG/KG	LPX-SD-4012-0000-01	96 / 115	1.2 - 7.2	26.6	1.7E+00	B	Yes	A
7440-50-8	Copper	4		1110		MG/KG	WRM-SD-2055-01	112 / 115	3.9 - 5.6	1110	1.6E-02	B	Yes	A
7439-89-6	Iron	3370	J	52400	J	MG/KG	RES-SS-14-333-01	115 / 115	-	52400	2.0E+04	A	Yes	A
7439-92-1	Lead	8.5	J	1090		MG/KG	APB-FP-2033-000.5-01	115 / 115	-	1090	1.5E+00	B	Yes	A
7439-95-4	Magnesium	358		4820	J	MG/KG	APB-FP-2033-000.5-01	91 / 91	-	4820			Yes	A
7439-97-6	Mercury	0.00743	J	3.6		MG/KG	CMW-SD-2023-01	86 / 112	0.02 - 0.32	3.6	1.5E-01	A	Yes	A
22967-92-6	Mercury (methyl)	0.000079	J	0.00959	J	MG/KG	WRL-SD-4005-0000-01	23 / 23	-	0.00959	4.8E-07	A	Yes	A
7439-98-7	Molybdenum	1.24	J	29.6		MG/KG	CMS-SD-4003-0000-01	25 / 25	-	29.6	2.8E+00	B	Yes	A
7440-09-7	Potassium	224		2130		MG/KG	RES-SS-12-551-01	81 / 88	252 - 412	2130			Yes	A
7782-49-2	Selenium	0.58	J	3.8	J	MG/KG	RES-SS-14-449-01	35 / 112	0.206 - 10.6	3.8	5.2E-01	B	Yes	A
7440-22-4	Silver	0.258	J	14.6		MG/KG	WRL-SD-2044-000.5-01	67 / 115	0.132 - 5.6	14.6	5.0E-01	A	Yes	A
7440-23-5	Sodium	17.4	J	845	J	MG/KG	RES-SS-14-333-01	43 / 88	13.3 - 480	845			Yes	A
7440-28-0	Thallium	0.0543	J	6.8	J	MG/KG	RES-SS-14-333-01	31 / 112	0.35 - 627	6.8	3.2E+00	B	Yes	A
7440-66-6	Zinc	23		2088	J	MG/KG	CMS-SD-4007-0000-01	112 / 115	22.8 - 30.8	2088	3.7E-01	B	Yes	A
57-12-5	Cyanide	2.4		2.4		MG/KG	CMS-192-A	1 / 1	-	2.4	1.0E-01	A	Yes	A
	AVS/SEM													
7440-43-9	Cadmium	0.000479	J	0.16		UMOL/G	WRM-SD-2055-01	50 / 61	0.00018 - 0.00215	0.16	na		No	U
7440-50-8	Copper	0.0338	J	15.3	J	UMOL/G	WRM-SD-2055-01	63 / 63	-	15.3	na		No	U
7439-92-1	Lead	0.017	J	3.597		UMOL/G	LPX-SD-2052-000.5-01	63 / 63	-	3.597	na		No	U
7439-97-6	Mercury	0.0000141	J	0.0022		UMOL/G	APB-SD-2037-01	27 / 55	0.00003 - 0.00018	0.0022	na		No	U
7440-02-0	Nickel	0.015	J	4.52961	J	UMOL/G	LPX-SD-2051-01	60 / 63	0.029 - 0.051	4.52961	na		No	U
7440-66-6	Zinc	0.25048	J	25	J	UMOL/G	CMS-SD-4007-0000-01	51 / 63	0.0411 - 4.74	25	na		No	U
AVS	Acid Volatile Sulfide	0.048	J	73.03		UMOL/G	LPX-SD-2052-000.5-01	51 / 63	0.04436 - 1	73.03	na		No	E

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Table 3
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Sediment

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark	Retain as COPC?	Rationale for Contaminant Deletion or Selection (3)
SEM	Simultaneously Extracted Metal	0.08706		33.86		UMOL/G	WRM-SD-2055-01	63 / 63	-	33.86		Yes	A
ExcessSEM	Carbon-Normalized Excess SEM	-236		1371		UMOL/G	DYP-SD-2065-01	62 / 62	-	1371		Yes	A
	Dioxins/Furans												
38178-99-3	HCX	0.00000146	J	0.364758	J	MG/KG	SD-23	83 / 108	0 - 0.005036	0.364758	na	No	T
1746-01-6	2,3,7,8-TCDD	0.00000043	J	0.073	J	MG/KG	CMS-022-A	205 / 215	0.0000002 - 0.00000273	0.073	na	No	T
40321-76-4	1,2,3,7,8-PeCDD	0.00000008	EMPC	0.000187		MG/KG	CMS-470-A	99 / 129	0 - 4.6213347458E-06	0.000187	na	No	T
39227-28-6	1,2,3,4,7,8-HxCDD	0.00000014	EMPC	0.0000845		MG/KG	CMS-470-A	105 / 130	0.00000005 - 0.000010387	0.0000845	na	No	T
57653-85-7	1,2,3,6,7,8-HxCDD	0.00000026	J	0.000212		MG/KG	CMS-470-A	115 / 127	0.0000002 - 0.0000028	0.000212	na	No	T
19408-74-3	1,2,3,7,8,9-HxCDD	0.00000027	J	0.000202		MG/KG	CMS-470-A	115 / 130	0 - 0.0000043	0.000202	na	No	T
35822-46-9	1,2,3,4,6,7,8-HpCDD	0.0000017	J	0.00327	J	MG/KG	CMS-470-A	113 / 130	0.00000092 - 0.00022025	0.00327	na	No	T
3268-87-9	OCDD	0.0000188		0.01594	J$EB	MG/KG	RES-SS-14-366-02	114 / 130	0.0000082 - 0.00157588	0.01594	na	No	T
51207-31-9	2,3,7,8-TCDF	0.000000441		0.000184		MG/KG	CMS-470-A	116 / 130	0 - 0.0000031	0.000184	na	No	T
57117-41-6	1,2,3,7,8-PeCDF	0.00000022	EMPC	0.0000585	EMPC	MG/KG	WRC-SD-2015-01	93 / 123	0 - 0.0000051	0.0000585	na	No	T
57117-31-4	2,3,4,7,8-PeCDF	0.00000017	J	0.000111		MG/KG	CMS-470-A	108 / 130	0 - 0.00000491	0.000111	na	No	T
57117-44-9	1,2,3,6,7,8-HxCDF	0.00000033	EMPC	0.000068		MG/KG	CMS-477-A	111 / 125	0 - 0.0000025	0.000068	na	No	T
72918-21-9	1,2,3,7,8,9-HxCDF	0.00000005	EMPC	0.0000463	J	MG/KG	APB-FP-2033-000.5-01	47 / 111	0.00000004 - 0.0000124	0.0000463	na	No	T
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.0000032	EMPC	0.000684	J	MG/KG	RES-SS-14-449-01	118 / 127	0.00000057 - 0.00000813	0.000684	na	No	T
55673-89-7	1,2,3,4,7,8,9-HpCDF	0.00000022	J	0.0000588		MG/KG	CMS-470-A	103 / 129	0 - 0.000012185865922	0.0000588	na	No	T
39001-02-0	OCDF	0.00000074	J	0.00134		MG/KG	MAP-SD-2058-01	107 / 126	0.0000011 - 0.00058198	0.00134	na	No	T
TEM	Toxicity Equivalency - Mammals	8.96E-08		0.073		MG/KG	CMS-022-A	217 / 217	-	0.073	2.6E-06 B	Yes	A
TEB	Toxicity Equivalency - Birds	8.96E-08		0.073		MG/KG	CMS-022-A	217 / 217	-	0.073	2.6E-06 B	Yes	A
TEFish	Toxicity Equivalency - Fish	8.96E-08		0.073		MG/KG	CMS-022-A	217 / 217	-	0.073	2.6E-06 B	Yes	A
PCBCTEM	Toxicity Equivalency (PCB) - Mammals	2.53E-08		0.0000649		MG/KG	LPX-SD-4004-0000-01	8 / 8	-	0.0000649	2.6E-06 B	Yes	A
PCBCTEB	Toxicity Equivalency (PCB) - Birds	0.0000127		0.00021		MG/KG	LPX-SD-4001-0000-01	8 / 8	-	0.00021	2.6E-06 B	Yes	A
PCBCTEFish	Toxicity Equivalency (PCB) - Fish	2.53E-08		0.00000336		MG/KG	LPX-SD-4004-0000-01	8 / 8	-	0.00000336	2.6E-06 B	Yes	A

(1) Minimum or maximum concentration detected in Allendale, Lyman Mill, Manton, and Dyerville exposure areas. Samples from these exposure areas included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Analyte is selected as a COPC if the concentration used for screening exceeds the benchmark.

S = Concentration used for screening is less than the screening toxicity value; the analyte was not selected as a COPC.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
E = The analyte is an essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (USEPA, 1995).
T = Dioxin, furan, and PCB congeners were evaluated using Toxic Equivalencies (TEq) and specific congeners were not evaluated individually as COPCs.
U = Simultaneously Extracted Metals (SEM) were evaluated using AVS/.SEM approach and were not evaluated as COPCs individually.
F = The analyte has a frequency of detection of less than 5% (USEPA RAGS; 1989); the analyte was not selected as a COPC.
M = Maximum detected concentration of the analyte exceeds the screening benchmark by more than one order of magnitude; the uncertainties associated with not including this analyte in the quantitative risk analysis are discussed in Section 10.

A - Aquatic receptor-based
B - Wildlife-based

Qualifier definitions:

J = Value is estimated.
E = Value is estimated due to significant matrix interference.
B = Analyte detected above the detection limit and concentration in associated samples < 10x blank levels.
EMPC = Estimated Maximum Possible Concentration.
P = The difference in concentration between the primary column and confirmation column exceeds 25 percent. The reported centration is considered an estimated value
* = Value is either the detection limit (DL) or the Estimated Maximum Possible Concentration (EMPC).
$ = Result reported from a confirmation analysis.

mg/Kg = milligrams per kilogram
COPC = chemical of potential concern

Prepared by: KJA
Checked by: RAR

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Table 4
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Crayfish

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Crayfish
Exposure Medium: Crayfish

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark (3)	Retain as COPC?	Rationale for Contaminant Deletion or Selection (4)
	Pesticides/PCBs												
72-54-8	4,4'-DDD	0.00023	J	0.00049	J	MG/KG	WRL-CF-4005-0000-01	4 / 7	0.00075 - 0.00076	0.00049	8.0E-03	Yes	S
72-55-9	4,4'-DDE	0.00281		0.00501		MG/KG	LPX-CF-4002-0000-01	7 / 7	-	0.00501	4.2E-02	Yes	S
5103-71-9	alpha-Chlordane	0.00008	J	0.0006	J	MG/KG	LPX-CF-4004-0000-01	6 / 7	0.00076 - 0.00076	0.0006	1.0E-03	Yes	S
12767-79-2	Aroclor, Total	0.03222	J	0.10873	J	MG/KG	LPX-CF-4002-0000-01	7 / 7	-	0.10873	3.6E-02	Yes	A
11097-69-1	Aroclor-1254	0.0297		0.10112		MG/KG	LPX-CF-4002-0000-01	7 / 7	-	0.10112	1.4E+00	Yes	S
11100-14-4	Aroclor-1268	0.00252	J	0.00772	J	MG/KG	LPX-CF-4002-0000-01	7 / 7	-	0.00772	4.5E-02	Yes	S
60-57-1	Dieldrin	0.00063	J	0.00065	J	MG/KG	WRL-CF-4005-0000-01	2 / 7	0.00075 - 0.00076	0.00065	1.0E-02	Yes	S
1031-07-8	Endosulfan Sulfate	0.00105		0.00105		MG/KG	LPX-CF-4002-0000-01	1 / 7	0.00075 - 0.00076	0.00105	1.0E-03	Yes	A
5103-74-2	gamma-Chlordane	0.00015	J	0.00055	J	MG/KG	LPX-CF-4001-0000-01	2 / 7	0.00075 - 0.00076	0.00055	1.0E-03	Yes	S
76-44-8	Heptachlor	0.00022	J	0.00022	J	MG/KG	LPX-CF-4002-0000-01	1 / 7	0.00075 - 0.00076	0.00022	1.0E-02	Yes	S
57-74-9	Technical Chlordane	0.01326	J	0.0275	J	MG/KG	CMS-CF-4003-0000-01	7 / 7	-	0.0275	1.0E-03	Yes	A
	Inorganics												
7429-90-5	Aluminum	1.52	J	2.63	J	MG/KG	CMS-CF-4006-0000-01	2 / 7	1.1 - 1.1	2.63	1.0E+00	Yes	A
7440-36-0	Antimony	0.0108	J	0.0171	J	MG/KG	LPX-CF-4002-0000-01	5 / 7	0.032 - 0.032	0.0171	3.0E+00	Yes	S
7440-39-3	Barium	17.8	J	30.5	J	MG/KG	CMS-CF-4007-0000-01	7 / 7	-	30.5	4.1E-02	Yes	A
7440-43-9	Cadmium	0.0511	J	0.164	J	MG/KG	LPX-CF-4002-0000-01	7 / 7	-	0.164	8.0E-02	Yes	A
7440-47-3	Chromium	0.176	J	0.399	J	MG/KG	CMS-CF-4003-0000-01	6 / 7	0.252 - 0.252	0.399	3.2E+00	Yes	S
7440-48-4	Cobalt	0.147	J	0.35	J	MG/KG	CMS-CF-4006-0000-01	7 / 7	-	0.35		Yes	A
7440-50-8	Copper	22.2		34.7		MG/KG	LPX-CF-4002-0000-01	7 / 7	-	34.7	1.6E-01	Yes	A
7439-89-6	Iron	30.8	J	181	J	MG/KG	CMS-CF-4003-0000-01	7 / 7	-	181		Yes	A
7439-92-1	Lead	0.29	J	1.16	J	MG/KG	CMS-CF-4003-0000-01	7 / 7	-	1.16	2.6E+00	Yes	S
7439-96-5	Manganese	52.7		214		MG/KG	CMS-CF-4006-0000-01	7 / 7	-	214	1.8E+01	Yes	A
7439-97-6	Mercury	0.00976		0.0302		MG/KG	LPX-CF-4002-0000-01	7 / 7	-	0.0302	4.0E-03	Yes	A
22967-92-6	Mercury (methyl)	0.0083		0.0271		MG/KG	LPX-CF-4002-0000-01	7 / 7	-	0.0271	4.3E-03	Yes	A
7439-98-7	Molybdenum	0.0633	J	0.198	J	MG/KG	LPX-CF-4002-0000-01	7 / 7	-	0.198		Yes	A
7440-02-0	Nickel	0.259	J	0.584	J	MG/KG	CMS-CF-4003-0000-01	7 / 7	-	0.584	5.9E-02	Yes	A
7782-49-2	Selenium	0.112	J	0.162	J	MG/KG	CMS-CF-4003-0000-01	7 / 7	-	0.162	1.4E-01	Yes	A
7440-22-4	Silver	0.185		0.252		MG/KG	CMS-CF-4003-0000-01	7 / 7	-	0.252	3.4E+00	Yes	S
7440-28-0	Thallium	0.00717	J	0.0113	J	MG/KG	LPX-CF-4004-0000-01	5 / 7	0.021 - 0.021	0.0113	2.7E+00	Yes	S
7440-62-2	Vanadium	0.182	J	0.361	J	MG/KG	CMS-CF-4003-0000-01	7 / 7	-	0.361	2.0E-02	Yes	A
7440-66-6	Zinc	20		32.5		MG/KG	CMS-CF-4003-0000-01	7 / 7	-	32.5	3.9E+00	Yes	A
	Dioxins/Furans												
38178-99-3	HCX	0.00001342	J	0.00024646	J	MG/KG	LPX-CF-4002-0000-01	6 / 7	0.00008934 - 0.00008934	0.00024646	na	No	T
1746-01-6	2,3,7,8-TCDD	0.00003062		0.00026117		MG/KG	LPX-CF-4002-0000-01	7 / 7	-	0.00026117	na	No	T
39227-28-6	1,2,3,4,7,8-HxCDD	0.00000011	J	0.00000011	J	MG/KG	CMS-CF-4006-0000-01	1 / 7	0.00000247 - 0.000005	0.00000011	na	No	T
57653-85-7	1,2,3,6,7,8-HxCDD	0.00000018	J	0.00000022	J	MG/KG	CMS-CF-4007-0000-01	4 / 7	0.00000247 - 0.00000496	0.00000022	na	No	T
57653-85-7	1,2,3,6,7,8-HxCDD	0.00000018	J	0.00000022	J	MG/KG	LPX-CF-4004-0000-01	4 / 7	0.00000247 - 0.00000496	0.00000022	na	No	T
19408-74-3	1,2,3,7,8,9-HxCDD	0.00000014	J	0.00000023	J	MG/KG	CMS-CF-4007-0000-01	3 / 7	0.00000247 - 0.00000496	0.00000023	na	No	T
35822-46-9	1,2,3,4,6,7,8-HpCDD	0.00000082	J	0.00000286	J	MG/KG	WRL-CF-4005-0000-01	7 / 7	-	0.00000286	na	No	T
3268-87-9	OCDD	0.00000472	J	0.00000472	J	MG/KG	WRL-CF-4005-0000-01	1 / 7	0.00000577 - 0.00001975	0.00000472	na	No	T
51207-31-9	2,3,7,8-TCDF	0.00000043	J	0.00000085	J	MG/KG	CMS-CF-4003-0000-01	6 / 7	0.00000099 - 0.00000099	0.00000085	na	No	T
57117-41-6	1,2,3,7,8-PeCDF	0.00000011	J	0.00000011	J	MG/KG	LPX-CF-4004-0000-01	1 / 7	0.00000247 - 0.000005	0.00000011	na	No	T
57117-31-4	2,3,4,7,8-PeCDF	0.00000015	J	0.00000015	J	MG/KG	LPX-CF-4004-0000-01	1 / 7	0.00000247 - 0.000005	0.00000015	na	No	T
70648-26-9	1,2,3,4,7,8-HxCDF	0.00000012	J	0.00000032	J	MG/KG	CMS-CF-4003-0000-01	5 / 7	0.00000247 - 0.00000249	0.00000032	na	No	T
57117-44-9	1,2,3,6,7,8-HxCDF	0.0000001	J	0.00000021	J	MG/KG	LPX-CF-4004-0000-01	4 / 7	0.00000248 - 0.000005	0.00000021	na	No	T
60851-34-5	2,3,4,6,7,8-HxCDF	0.0000001	J	0.00000016	J	MG/KG	CMS-CF-4007-0000-01	2 / 7	0.00000247 - 0.000005	0.00000016	na	No	T
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.00000031	J	0.00000097	J	MG/KG	CMS-CF-4003-0000-01	7 / 7	-	0.00000097	na	No	T
55673-89-7	1,2,3,4,7,8,9-HpCDF	0.00000006	J	0.00000006	J	MG/KG	CMS-CF-4006-0000-01	1 / 7	0.00000247 - 0.000005	0.00000006	na	No	T
39001-02-0	OCDF	0.00000046	J	0.00000221	J	MG/KG	WRL-CF-4005-0000-01	6 / 7	0.00000999 - 0.00000999	0.00000221	na	No	T
TEM	Toxicity Equivalency - Mammals	0.0000361		0.000264		MG/KG	LPX-CF-4002-0000-01	7 / 7	-	0.000264	1.5E-04	Yes	A
TEB	Toxicity Equivalency - Birds	0.0000375		0.000265		MG/KG	LPX-CF-4002-0000-01	7 / 7	-	0.000265	1.5E-04	Yes	A
TEFish	Toxicity Equivalency - Fish	0.0000366		0.000263		MG/KG	LPX-CF-4002-0000-01	7 / 7	-	0.000263	na	No	V
PCBCTEM	Toxicity Equivalency (PCB) - Mammals	0.00000112		0.00000413		MG/KG	LPX-CF-4002-0000-01	2 / 2	-	0.00000413	1.5E-04	Yes	S
PCBCTEB	Toxicity Equivalency (PCB) - Birds	0.00000411		0.0000121		MG/KG	LPX-CF-4002-0000-01	2 / 2	-	0.0000121	1.5E-04	Yes	S
PCBCTEFish	Toxicity Equivalency (PCB) - Fish	5.34E-08		0.000000171		MG/KG	LPX-CF-4002-0000-01	2 / 2	-	0.000000171	na	No	V

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Table 4
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Crayfish

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Crayfish
Exposure Medium: Crayfish

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark (3)	Retain as COPC?	Rationale for Contaminant Deletion or Selection (4)

(1) Minimum or maximum concentration detected in Allendale and Lyman Mill exposure areas. Samples from these exposure areas included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Screening benchmarks for biota tissue are summarized in Table G-1.
(4) Analyte is selected as a COPC if the concentration used for screening exceeds the benchmark.
S = Concentration used for screening is less than the screening toxicity value; however, the analyte was retained as a COPC for wildlife exposure modeling.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
E = The analyte is an essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (USEPA, 1995).
T = Dioxin, furan, and PCB congeners were evaluated using Toxic Equivalencies (TEq) and specific congeners were not evaluated individually as COPCs.
V = Not relevant for this specific receptor.

Qualifier definitions:
J = Value is estimated.

mg/Kg = milligrams per kilogram
COPC = chemical of potential concern

Prepared by: KJA
Checked by: RAR

Table 5
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Emerging Insect

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Emerging Insect
Exposure Medium: Emerging Insect

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark (3)	Retain as COPC?	Rationale for Contaminant Deletion or Selection (4)
38178-99-3	HCX	0.00016351	J	0.00016351	J	MG/KG	LPX-EI-4006-4010-0000-01	1 / 1	-	0.00016351	na	No	T
1746-01-6	2,3,7,8-TCDD	0.00024557		0.00024557		MG/KG	LPX-EI-4006-4010-0000-01	1 / 1	-	0.00024557	na	No	T
57653-85-7	1,2,3,6,7,8-HxCDD	0.00000252	J	0.00000252	J	MG/KG	LPX-EI-4006-4010-0000-01	1 / 1	-	0.00000252	na	No	T
35822-46-9	1,2,3,4,6,7,8-HpCDD	0.00001246	J	0.00001246	J	MG/KG	LPX-EI-4006-4010-0000-01	1 / 1	-	0.00001246	na	No	T
3268-87-9	OCDD	0.00003134	J	0.00003134	J	MG/KG	LPX-EI-4006-4010-0000-01	1 / 1	-	0.00003134	na	No	T
51207-31-9	2,3,7,8-TCDF	0.00000175	J	0.00000175	J	MG/KG	LPX-EI-4006-4010-0000-01	1 / 1	-	0.00000175	na	No	T
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.00000139	J	0.00000139	J	MG/KG	LPX-EI-4006-4010-0000-01	1 / 1	-	0.00000139	na	No	T
39001-02-0	OCDF	0.00000143	J	0.00000143	J	MG/KG	LPX-EI-4006-4010-0000-01	1 / 1	-	0.00000143	na	No	T
TEM	Toxicity Equivalency - Mammals	0.000297		0.000297		MG/KG	LPX-EI-4006-4010-0000-01	1 / 1	-	0.000297	0.00015	Yes	A
TEB	Toxicity Equivalency - Birds	0.00031		0.00031		MG/KG	LPX-EI-4006-4010-0000-01	1 / 1	-	0.00031	0.00015	Yes	A
TEFish	Toxicity Equivalency - Fish	0.000304		0.000304		MG/KG	LPX-EI-4006-4010-0000-01	1 / 1	-	0.000304	na	No	V
PCBCTEM	Toxicity Equivalency (PCB) - Mammals	0.00000843		0.00000843		MG/KG	LPX-EI-4006-4010-0000-01	1 / 1	-	0.00000843	0.00015	Yes	S
PCBCTEB	Toxicity Equivalency (PCB) - Birds	0.0000262		0.0000262		MG/KG	LPX-EI-4006-4010-0000-01	1 / 1	-	0.0000262	0.00015	Yes	S
PCBCTEFish	Toxicity Equivalency (PCB) - Fish	0.000000362		0.000000362		MG/KG	LPX-EI-4006-4010-0000-01	1 / 1	-	0.000000362	na	No	V

(1) Minimum or maximum concentration detected in Lyman Mill exposure area. Samples from this exposure area included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Screening benchmarks for biota tissue are summarized in Table G-1.
(4) Analyte is selected as a COPC if the concentration used for screening exceeds the benchmark.
S = Concentration used for screening is less than the screening toxicity value; however, the analyte was retained as a COPC for wildlife exposure modeling.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
T = Dioxin, furan, and PCB congeners were evaluated using Toxic Equivalencies (TEq) and specific congeners were not evaluated individually as COPCs.
V = Not relevant for this specific receptor.

Qualifier definitions:
J = Value is estimated.

mg/Kg = milligrams per kilogram
COPC = chemical of potential concern

Prepared by: KJA
Checked by: RAR

Table 6
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Tree Swallow - Stomach Contents

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Tree Swallow
Exposure Medium: Diet

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark (3)	Retain as COPC?	Rationale for Contaminant Deletion or Selection (4)
	Dioxins/Furans												
38178-99-3	HCX	0.00012627	J	0.00020212	J	MG/KG	DIET-LP	2 / 5	0.00000072 - 0.00006949	0.00020212	na	No	T
1746-01-6	2,3,7,8-TCDD	0.00000566	J	0.00021852	J	MG/KG	DIET-AP	5 / 6	0.00000047 - 0.00000047	0.00021852	na	No	T
39227-28-6	1,2,3,4,7,8-HxCDD	0.00000052	J	0.00000141	J	MG/KG	DIET-AP	3 / 6	0.00000038 - 0.00000172	0.00000141	na	No	T
57653-85-7	1,2,3,6,7,8-HxCDD	0.0000008		0.00000734	J	MG/KG	DIET-AP	5 / 6	0.0000017 - 0.0000017	0.00000734	na	No	T
19408-74-3	1,2,3,7,8,9-HxCDD	0.00000036	J	0.00000183	J	MG/KG	DIET-AP	3 / 6	0.00000079 - 0.00000166	0.00000183	na	No	T
35822-46-9	1,2,3,4,6,7,8-HpCDD	0.00002406	J	0.00005506	J	MG/KG	DIET-AP	3 / 6	0.00001021 - 0.00002198	0.00005506	na	No	T
3268-87-9	OCDD	0.00005109	J	0.00018392	J	MG/KG	DIET-AP	3 / 6	0.00002426 - 0.00003896	0.00018392	na	No	T
51207-31-9	2,3,7,8-TCDF	0.00000049	J	0.00000086	J	MG/KG	Allendale Pond Diet	4 / 6	0.00000092 - 0.00000224	0.00000086	na	No	T
57117-41-6	1,2,3,7,8-PeCDF	0.00000182	J	0.00000182	J	MG/KG	DIET-AP	1 / 6	0.00000035 - 0.00000211	0.00000182	na	No	T
57117-31-4	2,3,4,7,8-PeCDF	0.00000013	J	0.0000019	J	MG/KG	DIET-AP	2 / 6	0.00000026 - 0.00000186	0.0000019	na	No	T
70648-26-9	1,2,3,4,7,8-HxCDF	0.00000281	J	0.00000281	J	MG/KG	DIET-AP	1 / 6	0.00000038 - 0.00000122	0.00000281	na	No	T
57117-44-9	1,2,3,6,7,8-HxCDF	0.00000041	J	0.00000254	J	MG/KG	DIET-AP	3 / 6	0.00000027 - 0.00000134	0.00000254	na	No	T
60851-34-5	2,3,4,6,7,8-HxCDF	0.00000017	J	0.00000226	J	MG/KG	DIET-AP	2 / 6	0.00000052 - 0.00000133	0.00000226	na	No	T
72918-21-9	1,2,3,7,8,9-HxCDF	0.00000145	J	0.00000145	J	MG/KG	DIET-AP	1 / 6	0.00000082 - 0.00000153	0.00000145	na	No	T
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.0000032	J	0.00001287	J	MG/KG	DIET-AP	3 / 6	0.00000249 - 0.00000431	0.00001287	na	No	T
TEB	Toxicity Equivalency - Birds	0.00000147		0.000224		MG/KG	DIET-AP	6 / 6	-	0.000224	1.5E-04	Yes	A

(1) Minimum or maximum concentration detected in Allendale and Lyman Mill exposure area. Samples from these exposure areas included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Screening benchmarks for biota tissue are summarized in Table G-1.
(4) Analyte is selected as a COPC if the concentration used for screening exceeds the benchmark.
S = Concentration used for screening is less than the screening toxicity value; the analyte was not selected as a COPC.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
E = The analyte is an essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (USEPA, 1995).
T = Dioxin, furan, and PCB congeners were evaluated using Toxic Equivalencies (TEq) and specific congeners were not evaluated individually as COPCs.
V = Not relevant for this specific receptor.

Qualifier definitions:
J = Value is estimated.

mg/Kg = milligrams per kilogram
COPC = chemical of potential concern

Prepared by: KJA
Checked by: RAR

Table 7
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Floodplain Soil

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Floodplain Soil
Exposure Medium: Floodplain Soil (0-1 ft bgs)

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark		Retain as COPC?	Rationale for Contaminant Deletion or Selection (3)
	Volatile Organics													
95-63-6	1,2,4-Trimethylbenzene	0.0043		0.0043		MG/KG	CMS-408-A	1 / 6	0.0045 - 0.0097	0.0043	1.3E+01	B	No	S
106-46-7	1,4-Dichlorobenzene	0.0041	J	0.0041	J	MG/KG	CMS-098-A	1 / 6	0.0043 - 0.005	0.0041	2.0E+01	A	No	S
71-43-2	Benzene	0.0064	J	0.014		MG/KG	CMS-408-A	2 / 7	0.0045 - 0.0097	0.014	5.0E-02	A	No	S
108-90-7	Chlorobenzene	0.0027	J	0.053	J	MG/KG	CMS-098-A	2 / 6	0.0045 - 0.005	0.053	4.0E+01	A	No	S
91-20-3	Naphthalene	0.0033	J	0.0033	J	MG/KG	CMS-408-A	1 / 6	0.0045 - 0.0097	0.0033	1.0E-01	A	No	S
	Semivolatile Organics													
92-52-4	1,1'-Biphenyl	0.00328	J	0.01552		MG/KG	LPX-FP-4006-0000-01	3 / 3	-	0.01552	6.0E+01	A	No	S
91-57-6	2-Methylnaphthalene	0.00782	J	0.03566		MG/KG	LPX-FP-4007-0000-01	3 / 12	0.33 - 4.2	0.03566	4.7E+01	A	No	S
83-32-9	Acenaphthene	0.01054	J	0.22	J	MG/KG	CMS-405-A	8 / 12	0.34 - 4.2	0.22	2.0E+01	A	No	S
208-96-8	*Acenaphthylene*	0.01934		*0.83*	*J*	MG/KG	CMS-418-A	5 / 12	0.34 - 4.2	*0.83*	4.7E+01	A	No	S
120-12-7	Anthracene	0.04475	J	0.9	J	MG/KG	CMS-418-A	10 / 12	0.34 - 4.2	0.9	1.0E-01	A	Yes	A
100-52-7	Benzaldehyde	0.05566		0.07051		MG/KG	LPX-FP-4007-0000-01	2 / 3	0.02951 - 0.02951	0.07051	4.6E+00	A	No	S
56-55-3	Benzo(a)anthracene	0.082	J	2.2		MG/KG	CMS-089-A	12 / 12	-	2.2	8.2E-03	B	Yes	A
50-32-8	Benzo(a)pyrene	0.085	J	2.4		MG/KG	CMS-089-A	12 / 12	-	2.4	2.1E-02	B	Yes	A
205-99-2	Benzo(b)fluoranthene	0.19	J	5.2		MG/KG	CMS-089-A	11 / 12	0.33 - 0.33	5.2	1.5E-03	B	Yes	A
191-24-2	Benzo(g,h,i)perylene	0.22254		1.97047		MG/KG	LPX-FP-4007-0000-01	10 / 12	0.34 - 0.6	1.97047	1.3E+00	B	Yes	A
207-08-9	Benzo(k)fluoranthene	0.18	J	3.1	J	MG/KG	CMS-418-A	6 / 12	0.34 - 0.67	3.1	1.5E-03	B	Yes	A
117-81-7	bis(2-Ethylhexyl)phthalate	0.074	J	1.6		MG/KG	LPX-FP-4007-0000-01	9 / 12	0.34 - 4.2	1.6	6.8E+00	B	No	S
85-68-7	Butylbenzylphthalate	0.07	J	0.21	J	MG/KG	LPX-FP-4007-0000-01	3 / 12	0.33 - 4.2	0.21	5.8E+00	B	No	S
86-74-8	Carbazole	0.068	J	0.65		MG/KG	CMS-405-A	8 / 12	0.34 - 4.2	0.65	6.1E+01	A	No	S
218-01-9	Chrysene	0.12	J	2.83046		MG/KG	LPX-FP-4007-0000-01	12 / 12	-	2.83046	2.1E-03	B	Yes	A
53-70-3	Dibenzo(a,h)anthracene	0.05503		0.46627		MG/KG	LPX-FP-4007-0000-01	7 / 12	0.33 - 4.2	0.46627	4.1E-03	B	Yes	A
132-64-9	Dibenzofuran	0.01111	J	0.2	J	MG/KG	CMS-418-A□CMS-456-A	7 / 12	0.34 - 4.2	0.2	4.3E+01	B	No	S
84-66-2	Diethylphthalate	0.057	J	0.057	J	MG/KG	CMS-118-A	1 / 9	0.33 - 4.2	0.057	5.8E+00	B	No	S
84-74-2	Di-*n*-Butylphthalate	0.089	J	0.85	J	MG/KG	LPX-FP-4006-0000-01	2 / 12	0.33 - 4.2	0.85	5.8E+00	B	No	S
117-84-0	Di-n-octylphthalate	0.097	J	0.097	J	MG/KG	LPX-FP-4007-0000-01	1 / 12	0.33 - 4.2	0.097	5.8E+00	B	No	S
206-44-0	Fluoranthene	0.25	J	4.87119		MG/KG	LPX-FP-4007-0000-01	12 / 12	-	4.87119	1.0E-01	A	Yes	A
86-73-7	Fluorene	0.01638	J	0.5	J	MG/KG	CMS-418-A	8 / 12	0.34 - 4.2	0.5	3.0E+01	A	No	S
193-39-5	Indeno(1,2,3-cd)pyrene	0.23708		2.1227		MG/KG	LPX-FP-4007-0000-01	10 / 12	0.34 - 0.6	2.1227	2.1E-03	B	Yes	A
91-20-3	Naphthalene	0.01275	J	0.0634		MG/KG	LPX-FP-4007-0000-01	3 / 12	0.33 - 4.2	0.0634	1.0E-01	A	No	S
85-01-8	Phenanthrene	0.23	J	3.5		MG/KG	CMS-405-A	12 / 12	-	3.5	1.0E-01	A	Yes	A
129-00-0	Pyrene	0.25	J	5.2	J	MG/KG	CMS-405-A	12 / 12	-	5.2	1.0E-01	A	Yes	A
	Pesticides/PCBs													
72-54-8	4,4'-DDD	0.00144		0.015	J	MG/KG	CMS-089-A	5 / 12	0.0017 - 0.062	0.015	2.5E-03	A	Yes	A
72-55-9	4,4'-DDE	0.002	J	0.049	J	MG/KG	CMS-118-A	7 / 12	0.0036 - 0.062	0.049	2.5E-03	A	Yes	A
50-29-3	4,4'-DDT	0.00304		0.14	J	MG/KG	CMS-405-A	7 / 12	0.0017 - 0.062	0.14	2.5E-03	A	Yes	A
5103-71-9	alpha-Chlordane	0.00123	J	0.02223		MG/KG	LPX-FP-4007-0000-01	5 / 10	0.0018 - 0.031	0.02223	1.0E-01	A	No	S
12767-79-2	Aroclor, Total	0.041	J	27		MG/KG	CMS-419-A	40 / 42	0.035 - 0.035	27	1.4E+02	A	No	S
53469-21-9	Aroclor-1242	3.1		3.1		MG/KG	CMS-425-A	1 / 42	0.01423 - 16	3.1	9.8E-02	B	No	F, M
12672-29-6	Aroclor-1248	2		2.3	J	MG/KG	CMS-433-A	3 / 42	0.01423 - 13	2.3	1.0E-01	B	Yes	A
11097-69-1	Aroclor-1254	0.041	J	27		MG/KG	CMS-419-A	40 / 42	0.035 - 0.035	27	9.2E-02	B	Yes	A
11100-14-4	Aroclor-1268	0.02249		0.02507	J	MG/KG	LPX-FP-4006-0000-01	3 / 3	-	0.02507	3.3E-05	A	Yes	A
319-85-7	beta-BHC	0.0031	J	0.0031	J	MG/KG	CMS-118-A	1 / 12	0.00114 - 0.031	0.0031	1.0E-03	A	Yes	A
60-57-1	Dieldrin	0.0022		0.027	J	MG/KG	CMS-089-A	5 / 12	0.00149 - 0.035	0.027	5.0E-04	A	Yes	A
1031-07-8	Endosulfan sulfate	0.00137		0.017	J	MG/KG	SS-01	3 / 12	0.00149 - 0.062	0.017	1.0E-01	A	No	S
72-20-8	Endrin	0.0072	J	0.011	J	MG/KG	CMS-405-A	2 / 12	0.00114 - 0.062	0.011	1.0E-03	A	Yes	A
7421-93-4	Endrin aldehyde	0.0012	J	0.0092	J	MG/KG	CMS-118-A	2 / 12	0.00114 - 0.062	0.0092	5.4E-02	B	No	S
5103-74-2	gamma-Chlordane	0.0031		0.0061	J	MG/KG	CMS-089-A	2 / 10	0.00114 - 0.031	0.0061	1.0E-01	A	No	S
1024-57-3	Heptachlor epoxide	0.00036	J	0.00207		MG/KG	LPX-FP-4007-0000-01	3 / 12	0.00149 - 0.031	0.00207	4.3E-02	B	No	S
57-74-9	Technical Chlordane	0.0061	J	0.45584		MG/KG	LPX-FP-4007-0000-01	4 / 10	0.0018 - 0.092	0.45584	1.0E-01	A	Yes	A
	Inorganics													
7429-90-5	Aluminum	2490		20313	J	MG/KG	LPX-FP-4006-0000-01	11 / 11	-	20313	3.3E+00	B	Yes	A
7440-36-0	Antimony	0.213	J	0.704	J	MG/KG	LPX-FP-4006-0000-01	3 / 9	0.112 - 6.4	0.704	4.5E-02	B	Yes	A

Table 7
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Floodplain Soil

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Floodplain Soil
Exposure Medium: Floodplain Soil (0-1 ft bgs)

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark		Retain as COPC?	Rationale for Contaminant Deletion or Selection (3)
7440-38-2	Arsenic	1.2	J	7.42		MG/KG	LPX-FP-4006-0000-01	11 / 11	-	7.42	2.2E-01	B	Yes	A
7440-39-3	Barium	16.6	J	842		MG/KG	LPX-FP-4006-0000-01	11 / 11	-	842	1.3E+02	B	Yes	A
7440-41-7	Beryllium	0.21	J	1.06		MG/KG	LPX-FP-4004-0000-01	11 / 11	-	1.06	7.7E-01	B	Yes	A
7440-43-9	Cadmium	0.16	J	3.18		MG/KG	LPX-FP-4006-0000-01	5 / 11	0.06 - 0.53	3.18	1.7E+00	B	Yes	A
7440-70-2	Calcium	504	J	2710		MG/KG	CMS-407-A	8 / 8	-	2710			Yes	A
7440-47-3	Chromium	3.5	J	107		MG/KG	LPX-FP-4006-0000-01	10 / 11	27.2 - 27.2	107	4.0E-01	A	Yes	A
7440-48-4	Cobalt	1.8	J	13.8	J	MG/KG	CMS-407-A	11 / 11	-	13.8	1.3E-01	B	Yes	A
7440-50-8	Copper	10.7	J	400		MG/KG	LPX-FP-4006-0000-01	11 / 11	-	400	7.1E-01	B	Yes	A
7439-89-6	Iron	8080		25516		MG/KG	LPX-FP-4006-0000-01	11 / 11	-	25516	2.0E+02	A	Yes	A
7439-92-1	Lead	2.8	J	901		MG/KG	LPX-FP-4006-0000-01	11 / 11	-	901	2.0E+01	B	Yes	A
7439-95-4	Magnesium	741	J	5690	J	MG/KG	CMS-407-A	8 / 8	-	5690			Yes	A
7439-96-5	Manganese	132		1130		MG/KG	WRL-SD-2038-01	11 / 11	-	1130	1.0E+02	A	Yes	A
7439-97-6	Mercury	0.082	J	0.245		MG/KG	LPX-FP-4006-0000-01	7 / 11	0.041 - 0.043	0.245	1.0E-01	A	Yes	A
22967-92-6	Mercury (methyl)	0.000159	J	0.000767	J	MG/KG	LPX-FP-4004-0000-01	3 / 3	-	0.000767	3.3E-02	B	No	S
7439-98-7	Molybdenum	0.34	J	6.7		MG/KG	CMS-118-A	9 / 10	4.1 - 4.1	6.7	3.2E-01	B	Yes	A
7440-02-0	Nickel	5	J	29.5	J	MG/KG	CMS-407-A	11 / 11	-	29.5	5.3E+01	B	No	S
7440-09-7	Potassium	374	J	1700		MG/KG	CMS-405-A	8 / 8	-	1700			Yes	A
7782-49-2	Selenium	0.48	J	1.4	J	MG/KG	CMS-098-A	6 / 11	0.438 - 26.6	1.4	3.4E-01	B	Yes	A
7440-22-4	Silver	0.407		3.88		MG/KG	LPX-FP-4007-0000-01	3 / 11	1 - 2.7	3.88	3.8E+01	B	No	S
7440-23-5	Sodium	48.2		338	J	MG/KG	CMS-407-A	7 / 8	507 - 507	338			Yes	A
7440-28-0	Thallium	0.279		0.575		MG/KG	LPX-FP-4006-0000-01	3 / 11	0.38 - 362	0.575	2.4E-01	B	Yes	A
7440-62-2	Vanadium	8.6		42.6		MG/KG	LPX-FP-4006-0000-01	11 / 11	-	42.6	7.3E-01	B	Yes	A
7440-66-6	Zinc	39.1		1150		MG/KG	LPX-FP-4006-0000-01	11 / 11	-	1150	7.6E+01	B	Yes	A
	Dioxins/Furans													
38178-99-3	HCX	0.00011784	J	0.0036542	J$	MG/KG	WRL-SD-2038-01	4 / 4	-	0.0036542	na		No	T
1746-01-6	2,3,7,8-TCDD	0.00000214		0.0281		MG/KG	3428-CMS-098	93 / 111	0.0000017 - 0.00034	0.0281	na		No	T
40321-76-4	1,2,3,7,8-PeCDD	0.00000061	J	0.00001264	J	MG/KG	LPX-FP-4007-0000-01	4 / 4	-	0.00001264	na		No	T
39227-28-6	1,2,3,4,7,8-HxCDD	0.0000009	J	0.00002712	J	MG/KG	LPX-FP-4007-0000-01	4 / 4	-	0.00002712	na		No	T
57653-85-7	1,2,3,6,7,8-HxCDD	0.00000253	J	0.00007439	J	MG/KG	LPX-FP-4007-0000-01	4 / 4	-	0.00007439	na		No	T
19408-74-3	1,2,3,7,8,9-HxCDD	0.00000233	J	0.0000722	J	MG/KG	LPX-FP-4007-0000-01	4 / 4	-	0.0000722	na		No	T
35822-46-9	1,2,3,4,6,7,8-HpCDD	0.00005714		0.00173931	J	MG/KG	LPX-FP-4007-0000-01	4 / 4	-	0.00173931	na		No	T
3268-87-9	OCDD	0.00043255		0.01118023	J	MG/KG	LPX-FP-4007-0000-01	4 / 4	-	0.01118023	na		No	T
51207-31-9	2,3,7,8-TCDF	0.00000226	J	0.00003551		MG/KG	LPX-FP-4006-0000-01	4 / 4	-	0.00003551	na		No	T
57117-41-6	1,2,3,7,8-PeCDF	0.00000088	J	0.00000894	J	MG/KG	LPX-FP-4006-0000-01	4 / 4	-	0.00000894	na		No	T
57117-31-4	2,3,4,7,8-PeCDF	0.00000134	J	0.00001294	J	MG/KG	LPX-FP-4006-0000-01	4 / 4	-	0.00001294	na		No	T
70648-26-9	1,2,3,4,7,8-HxCDF	0.00000267	J	0.00003622	J	MG/KG	LPX-FP-4007-0000-01	4 / 4	-	0.00003622	na		No	T
57117-44-9	1,2,3,6,7,8-HxCDF	0.00000166	J	0.00002904	J	MG/KG	LPX-FP-4007-0000-01	4 / 4	-	0.00002904	na		No	T
60851-34-5	2,3,4,6,7,8-HxCDF	0.00000131	J	0.00002515	J	MG/KG	LPX-FP-4007-0000-01	4 / 4	-	0.00002515	na		No	T
72918-21-9	1,2,3,7,8,9-HxCDF	0.00000049	J	0.00000066	J	MG/KG	LPX-FP-4006-0000-01	2 / 4	0.0000002 - 0.000001116	0.00000066	na		No	T
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.00001822		0.00084393	J	MG/KG	LPX-FP-4007-0000-01	4 / 4	-	0.00084393	na		No	T
55673-89-7	1,2,3,4,7,8,9-HpCDF	0.00000118	J	0.00003893	J	MG/KG	LPX-FP-4007-0000-01	4 / 4	-	0.00003893	na		No	T
39001-02-0	OCDF	0.00003719		0.00199234	J	MG/KG	LPX-FP-4007-0000-01	4 / 4	-	0.00199234	na		No	T
TEM	Toxicity Equivalency - Mammals	0.00000085		0.0281		MG/KG	3428-CMS-098	111 / 111	-	0.0281	8.9E-07	B	Yes	A
TEB	Toxicity Equivalency - Birds	0.00000085		0.0281		MG/KG	3428-CMS-098	111 / 111	-	0.0281	8.9E-07	B	Yes	A
TEFish	Toxicity Equivalency - Fish	0.00000085		0.0281		MG/KG	3428-CMS-098	111 / 111	-	0.0281	na		No	V
PCBCTEM	Toxicity Equivalency (PCB) - Mammals	0.00000598		0.0000062		MG/KG	LPX-FP-4004-0000-01	2 / 2	-	0.0000062	8.9E-07	B	Yes	A
PCBCTEB	Toxicity Equivalency (PCB) - Birds	0.0000162		0.0000293		MG/KG	LPX-FP-4004-0000-01	2 / 2	-	0.0000293	8.9E-07	B	Yes	A
PCBCTEFish	Toxicity Equivalency (PCB) - Fish	0.000000306		0.000000341		MG/KG	LPX-FP-4004-0000-01	2 / 2	-	0.000000341	na		No	V

Table 7
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Floodplain Soil

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Floodplain Soil
Exposure Medium: Floodplain Soil (0-1 ft bgs)

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark	Retain as COPC?	Rationale for Contaminant Deletion or Selection (3)

(1) Minimum or maximum concentration detected in Allendale and Lyman Mill exposure areas. Samples from these exposure areas included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Analyte is selected as a COPC if the concentration used for screening exceeds the benchmark.
S = Concentration used for screening is less than the screening toxicity value; the analyte was not selected as a COPC.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
E = The analyte is an essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (USEPA, 1995).
T = Dioxin, furan, and PCB congeners were evaluated using Toxic Equivalencies (TEq) and specific congeners were not evaluated individually as COPCs.
V = Not relevant for this specific receptor.
F = The analyte has a frequency of detection of less than 5% (USEPA RAGS; 1989); the analyte was not selected as a COPC. Analytes whose maximum concentration exceeds
M = Maximum detected concentration of the analyte exceeds the screening benchmark by more than one order of magnitude; the uncertainties associated with not including this analyte in the quantitative risk analysis are discussed in Section 10.

A - Soil invertebrate-based
B - Wildlife-based

Qualifier definitions:
J = Value is estimated.
$ = Result reported from a confirmation analysis.

mg/Kg = milligrams per kilogram
COPC = chemical of potential concern

Prepared by: KJA
Checked by: RAR

Table 8
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Earthworm

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Earthworm
Exposure Medium: Earthworm

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark (3)	Retain as COPC?	Rationale for Contaminant Deletion or Selection (4)
	Pesticides/PCBs												
72-54-8	4,4'-DDD	0.00104	J	0.00371		MG/KG	CMS-EW-4001-0000-01	6 / 7	0.0009 - 0.0009	0.00371	0.008	Yes	A
72-55-9	4,4'-DDE	0.00181		0.00524		MG/KG	LPX-EW-4007-0000-01	7 / 7	-	0.00524	0.042	Yes	S
50-29-3	4,4'-DDT	0.00011	J	0.00717		MG/KG	LPX-EW-4007-0000-01	3 / 7	0.00061 - 0.0009	0.00717	0.13	Yes	S
5103-71-9	alpha-Chlordane	0.00106		0.00318		MG/KG	CMS-EW-4001-0000-01	7 / 7	-	0.00318	0.001	Yes	A
12767-79-2	Aroclor, Total	0.02658	J	0.12173		MG/KG	CMS-EW-4001-0000-01	7 / 7	-	0.12173	0.036	Yes	A
11097-69-1	Aroclor-1254	0.02444		0.11584		MG/KG	CMS-EW-4001-0000-01	7 / 7	-	0.11584	1.4	Yes	S
11100-14-4	Aroclor-1268	0.00213	J	0.0129		MG/KG	LPX-EW-4007-0000-01	7 / 7	-	0.0129	0.045	Yes	S
319-86-8	delta-BHC	0.00066	J	0.00066	J	MG/KG	CMS-EW-4005-0000-01	1 / 7	0.00073 - 0.0009	0.00066	0.0028	Yes	S
60-57-1	Dieldrin	0.00041	J	0.00297		MG/KG	CMS-EW-4002-0000-01	7 / 7	-	0.00297	0.01	Yes	S
1031-07-8	Endosulfan Sulfate	0.00087		0.00426		MG/KG	CMS-EW-4002-0000-01	7 / 7	-	0.00426	0.001	Yes	A
5103-74-2	gamma-Chlordane	0.00006	J	0.00518		MG/KG	CMS-EW-4005-0000-01	7 / 7	-	0.00518	0.001	Yes	A
1024-57-3	Heptachlor Epoxide	0.00013	J	0.00127		MG/KG	CMS-EW-4002-0000-01	6 / 7	0.0009 - 0.0009	0.00127	0.001	Yes	A
72-43-5	Methoxychlor	0.00037	J	0.004		MG/KG	CMS-EW-4003-0000-01	4 / 7	0.00075 - 0.0008	0.004	0.01	Yes	S
57-74-9	Technical Chlordane	0.02286	J	0.11924		MG/KG	CMS-EW-4005-0000-01	7 / 7	-	0.11924	0.001	Yes	A
	Inorganics												
7429-90-5	Aluminum	1306	J	5581	J	MG/KG	LPX-EW-4005-0000-01	7 / 7	-	5581	1	Yes	A
7440-36-0	Antimony	0.103		0.241		MG/KG	CMS-EW-4003-0000-01	7 / 7	-	0.241	5	Yes	S
7440-38-2	Arsenic	0.465		1.17		MG/KG	LPX-EW-4006-0000-01	7 / 7	-	1.17	0.53	Yes	A
7440-39-3	Barium	22.1		51.5		MG/KG	CMS-EW-4003-0000-01	7 / 7	-	51.5	0.041	Yes	A
7440-41-7	Beryllium	0.0481	J	0.297	J	MG/KG	CMS-EW-4003-0000-01	7 / 7	-	0.297	5.13	Yes	S
7440-43-9	Cadmium	1.72		7.78		MG/KG	LPX-EW-4004-0000-01	7 / 7	-	7.78	0.08	Yes	A
7440-47-3	Chromium	3.03		9.63		MG/KG	CMS-EW-4003-0000-01	7 / 7	-	9.63	3.2	Yes	A
7440-48-4	Cobalt	0.386		1.12		MG/KG	CMS-EW-4003-0000-01	7 / 7	-	1.12		Yes	A
7440-50-8	Copper	4.3		11.7		MG/KG	CMS-EW-4003-0000-01	7 / 7	-	11.7	0.16	Yes	A
7439-89-6	Iron	1066		2583		MG/KG	CMS-EW-4003-0000-01	7 / 7	-	2583		Yes	A
7439-92-1	Lead	17	J	99.5	J	MG/KG	LPX-EW-4004-0000-01	7 / 7	-	99.5	2.55	Yes	A
7439-96-5	Manganese	23.5		256		MG/KG	CMS-EW-4003-0000-01	7 / 7	-	256	18.4	Yes	A
7439-97-6	Mercury	0.0302		0.151		MG/KG	LPX-EW-4004-0000-01	7 / 7	-	0.151	0.004	Yes	A
22967-92-6	Mercury (methyl)	0.00084	J	0.00436		MG/KG	CMS-EW-4001-0000-01	7 / 7	-	0.00436	0.0043	Yes	A
7439-98-7	Molybdenum	0.158		1.37		MG/KG	CMS-EW-4003-0000-01	7 / 7	-	1.37		Yes	A
7440-02-0	Nickel	0.946		3.01		MG/KG	CMS-EW-4003-0000-01	7 / 7	-	3.01	0.059	Yes	A
7782-49-2	Selenium	0.251	J	5.22	J	MG/KG	LPX-EW-4004-0000-01	7 / 7	-	5.22	0.14	Yes	A
7440-22-4	Silver	0.0477		0.182		MG/KG	LPX-EW-4007-0000-01	7 / 7	-	0.182	5.36	Yes	S
7440-28-0	Thallium	0.0338		0.0757		MG/KG	LPX-EW-4005-0000-01	7 / 7	-	0.0757	2.72	Yes	S
7440-62-2	Vanadium	1.91		5.76		MG/KG	LPX-EW-4005-0000-01	7 / 7	-	5.76	0.02	Yes	A
7440-66-6	Zinc	83.8		214		MG/KG	LPX-EW-4004-0000-01	7 / 7	-	214	3.9	Yes	A
	Dioxins/Furans												
38178-99-3	HCX	0.00040506	J	0.00868996	J	MG/KG	CMS-EW-4002-0000-01	5 / 7	0.00001993 - 0.00001998	0.00868996	na	No	T
1746-01-6	2,3,7,8-TCDD	0.00000304	J	0.0002155	J	MG/KG	CMS-EW-4002-0000-01	7 / 7	-	0.0002155	na	No	T
40321-76-4	1,2,3,7,8-PeCDD	0.00000018	J	0.0000013	J	MG/KG	LPX-EW-4007-0000-01	6 / 7	0.00000498 - 0.00000498	0.0000013	na	No	T
39227-28-6	1,2,3,4,7,8-HxCDD	0.00000016	J	0.0000037	J	MG/KG	LPX-EW-4007-0000-01	6 / 7	0.00000498 - 0.00000498	0.0000037	na	No	T
57653-85-7	1,2,3,6,7,8-HxCDD	0.00000052	J	0.00000906	J	MG/KG	LPX-EW-4007-0000-01	7 / 7	-	0.00000906	na	No	T
19408-74-3	1,2,3,7,8,9-HxCDD	0.0000004	J	0.00000956	J	MG/KG	LPX-EW-4007-0000-01	7 / 7	-	0.00000956	na	No	T
35822-46-9	1,2,3,4,6,7,8-HpCDD	0.00000883	J	0.00024013	J	MG/KG	LPX-EW-4007-0000-01	7 / 7	-	0.00024013	na	No	T
3268-87-9	OCDD	0.00005121	J	0.00164885	J	MG/KG	LPX-EW-4007-0000-01	7 / 7	-	0.00164885	na	No	T
51207-31-9	2,3,7,8-TCDF	0.00000016	J#	0.00000067	#	MG/KG	CMS-EW-4002-0000-01	3 / 7	0.0000005 - 0.00000338	0.00000067	na	No	T
57117-41-6	1,2,3,7,8-PeCDF	0.00000023	J	0.00000023	J	MG/KG	CMS-EW-4001-0000-01	1 / 7	0.00000047 - 0.00000498	0.00000023	na	No	T
57117-31-4	2,3,4,7,8-PeCDF	0.00000028	J	0.00000034	J	MG/KG	CMS-EW-4003-0000-01	2 / 7	0.00000055 - 0.0000025	0.00000034	na	No	T
70648-26-9	1,2,3,4,7,8-HxCDF	0.00000044	J	0.0000036	J	MG/KG	LPX-EW-4007-0000-01	7 / 7	-	0.0000036	na	No	T
57117-44-9	1,2,3,6,7,8-HxCDF	0.00000029	J	0.00000379	J	MG/KG	LPX-EW-4007-0000-01	6 / 7	0.00000498 - 0.00000498	0.00000379	na	No	T
60851-34-5	2,3,4,6,7,8-HxCDF	0.00000035	J	0.00000255	J	MG/KG	LPX-EW-4007-0000-01	6 / 7	0.00000498 - 0.00000498	0.00000255	na	No	T
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.00000265	J	0.00011506	J	MG/KG	LPX-EW-4007-0000-01	7 / 7	-	0.00011506	na	No	T
55673-89-7	1,2,3,4,7,8,9-HpCDF	0.00000015	J	0.00000536	J	MG/KG	LPX-EW-4007-0000-01	7 / 7	-	0.00000536	na	No	T

Table 8
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Earthworm

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Earthworm
Exposure Medium: Earthworm

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark (3)	Retain as COPC?	Rationale for Contaminant Deletion or Selection (4)
39001-02-0	OCDF	0.00000438	J	0.00026543	J	MG/KG	LPX-EW-4007-0000-01	7 / 7	-	0.00026543	na	No	T
TEM	Toxicity Equivalency - Mammals	0.00000627		0.000221		MG/KG	CMS-EW-4002-0000-01	7 / 7	-	0.000221	0.00015	Yes	A
TEB	Toxicity Equivalency - Birds	0.00000697		0.000221		MG/KG	CMS-EW-4002-0000-01	7 / 7	-	0.000221	0.00015	Yes	A
TEFish	Toxicity Equivalency - Fish	0.00000615		0.00022		MG/KG	CMS-EW-4002-0000-01	7 / 7	-	0.00022	na	No	V
PCBCTEM	Toxicity Equivalency (PCB) - Mammals	0.00000246		0.00000246		MG/KG	LPX-EW-4004-0000-01	1 / 1	-	0.00000246	0.00015	Yes	S
PCBCTEB	Toxicity Equivalency (PCB) - Birds	0.0000104		0.0000104		MG/KG	LPX-EW-4004-0000-01	1 / 1	-	0.0000104	0.00015	Yes	S
PCBCTEFish	Toxicity Equivalency (PCB) - Fish	0.000000124		0.000000124		MG/KG	LPX-EW-4004-0000-01	1 / 1	-	0.000000124	na	No	V

(1) Minimum or maximum concentration detected in Allendale and Lyman Mill exposure areas. Samples from these exposure ares included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Screening benchmarks for biota tissue are summarized in Table G-1.
(4) Analyte is selected as a COPC if the concentration used for screening exceeds the benchmark.
S = Concentration used for screening is less than the screening toxicity value; however, the analyte was retained as a COPC for wildlife exposure modeling.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
E = The analyte is an essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (USEPA, 1995).
T = Dioxin, furan, and PCB congeners were evaluated using Toxic Equivalencies (TEq) and specific congeners were not evaluated individually as COPCs.
V = Not relevant for this specific receptor.

Qualifier definitions:
J = Value is estimated.
# = Value is result from second column confirmation analysis.

mg/Kg = milligrams per kilogram
COPC = chemical of potential concern

Prepared by: KJA
Checked by: RAR

Table 9
Occurrence, Distribution and Selection of Chemicals of Potential Concern
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Benchmark (3)	Retain as COPC?	Rationale for Contaminant Deletion or Selection (4)
	Semivolatile Organics													
92-52-4	1,1'-Biphenyl	0.00075		0.00162		MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	0.00162			Yes	A
91-57-6	2-Methylnaphthalene	0.00288		0.00553		MG/KG	LPX-WS-4007-0000-01-W	20 / 20	-	0.00553		1.79	Yes	S
83-32-9	Acenaphthene	0.00258		0.00361		MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	0.00361		3.5	Yes	S
208-96-8	Acenaphthylene	0.00136		0.00458		MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	0.00458		0.022	Yes	S
120-12-7	Anthracene	0.00154		0.00541		MG/KG	LPX-WS-4007-0000-01-W	20 / 20	-	0.00541		3.4	Yes	S
56-55-3	Benzo(a)anthracene	0.00037	J	0.01173		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.01173		17.5	Yes	S
50-32-8	Benzo(a)pyrene	0.00013	J	0.01469		MG/KG	LPX-WS-4009-0000-01-W	19 / 20	0.00068 - 0.00068	0.01469		0.03	Yes	S
205-99-2	Benzo(b)fluoranthene	0.00025	J	0.02077		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.02077		0.022	Yes	S
191-24-2	Benzo(g,h,i)perylene	0.00115		0.01143		MG/KG	LPX-WS-4009-0000-01-W	10 / 20	0.00066 - 0.00075	0.01143		0.022	Yes	S
207-08-9	Benzo(k)fluoranthene	0.00027	J	0.01739		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.01739		0.022	Yes	S
218-01-9	Chrysene	0.00072		0.02304		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.02304		2.6	Yes	S
53-70-3	Dibenzo(a,h)anthracene	0.00012	J	0.00273		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.00273		0.022	Yes	S
132-64-9	Dibenzofuran	0.00186		0.00461		MG/KG	LPX-WS-4002-0000-01-W	20 / 20	-	0.00461			Yes	A
206-44-0	Fluoranthene	0.00517		0.04906		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.04906		0.022	Yes	A
86-73-7	Fluorene	0.00274		0.00814		MG/KG	LPX-WS-4002-0000-01-W	20 / 20	-	0.00814		189	Yes	S
193-39-5	Indeno(1,2,3-cd)pyrene	0.00018	J	0.01347		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.01347		0.022	Yes	S
91-20-3	Naphthalene	0.00215		0.00492		MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	0.00492		1.7	Yes	S
85-01-8	Phenanthrene	0.00569		0.02954		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.02954		0.078	Yes	S
129-00-0	Pyrene	0.00118		0.02235		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.02235		1.08	Yes	S
TOTPAH	Total PAH	0.03402		0.251		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.251		0.022	Yes	A
	Pesticides/PCBs													
72-54-8	4,4'-DDD	0.00618	J	0.0668	J	MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	0.0668		0.008	Yes	A
72-55-9	4,4'-DDE	0.01089	J	0.28651	J	MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	0.28651		0.042	Yes	A
50-29-3	4,4'-DDT	0.00031	J	0.02462	J	MG/KG	APC-WS-4001-0000-01-W	20 / 20	-	0.02462		0.13	Yes	S
5103-71-9	alpha-Chlordane	0.00837	J	0.05956	J	MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	0.05956		0.001	Yes	A
12767-79-2	Aroclor, Total	0.44466	J	7.14443	J	MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	7.14443		0.036	Yes	A
11097-69-1	Aroclor-1254	0.42643	J	7.09977	J	MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	7.09977		1.4	Yes	A
11100-14-4	Aroclor-1268	0.01823	J	0.05274	J	MG/KG	APC-WS-4007-0000-01-W	20 / 20	-	0.05274		0.045	Yes	A
60-57-1	Dieldrin	0.00166	J	0.0099	J	MG/KG	APC-WS-4005-0000-01-W	20 / 20	-	0.0099		0.01	Yes	S
58-89-9	gamma-BHC	0.00007	J	0.00047	J	MG/KG	LPX-WS-4005-0000-01-W	19 / 20	0.00123 - 0.00123	0.00047		0.0072	Yes	S
5103-74-2	gamma-Chlordane	0.0051	J	0.0408	J	MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	0.0408		0.001	Yes	A
1024-57-3	Heptachlor Epoxide	0.00032	J	0.002	J	MG/KG	LPX-WS-4002-0000-01-W	20 / 20	-	0.002		0.001	Yes	A
57-74-9	Technical Chlordane	0.0999	J	2.61185	J	MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	2.61185		0.001	Yes	A
	Inorganics													
7429-90-5	Aluminum	1.06	J	117		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	117		1	Yes	A
7440-36-0	Antimony	0.00481	J	0.01	J	MG/KG	LPX-WS-4009-0000-01-W	6 / 20	0.034 - 0.034	0.01		3	Yes	S
7440-38-2	Arsenic	0.0715		0.0715		MG/KG	LPX-WS-4009-0000-01-W	1 / 20	0.0295 - 0.08	0.0715		0.53	Yes	S
7440-39-3	Barium	0.4	J	2.06		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	2.06		0.041	Yes	A
7440-41-7	Beryllium	0.00642		0.0137		MG/KG	LPX-WS-4009-0000-01-W	5 / 20	0.004 - 0.00332	0.0137		5.13	Yes	S
7440-43-9	Cadmium	0.0113	J	0.0484	J	MG/KG	APC-WS-4008-0000-01-W	20 / 20	-	0.0484		0.08	Yes	S
7440-47-3	Chromium	0.0669	J	0.513		MG/KG	LPX-WS-4009-0000-01-W	16 / 20	0.139 - 0.269	0.513		3.2	Yes	S
7440-48-4	Cobalt	0.051	J	0.127	J	MG/KG	APC-WS-4005-0000-01-W	19 / 20	0.0745 - 0.0745	0.127			Yes	A
7440-50-8	Copper	0.551		2.23		MG/KG	APC-WS-4010-0000-01-W	20 / 20	-	2.23		0.16	Yes	A
7439-89-6	Iron	14.1		174		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	174			Yes	A
7439-92-1	Lead	0.0976	J	1.01	J	MG/KG	LPX-WS-4009-0000-01-W	16 / 20	0.0513 - 0.133	1.01		2.55	Yes	S
7439-96-5	Manganese	3.83	J	12.3	J	MG/KG	APC-WS-4008-0000-01-W	20 / 20	-	12.3		18.4	Yes	S
7439-97-6	Mercury	0.0648		0.216		MG/KG	APC-WS-4007-0000-01-W	20 / 20	-	0.216		0.004	Yes	A
22967-92-6	Mercury (methyl)	0.0642		0.223		MG/KG	APC-WS-4007-0000-01-W	20 / 20	-	0.223		0.0043	Yes	A
7439-98-7	Molybdenum	0.0252	J	0.0939	J	MG/KG	APC-WS-4008-0000-01-W	12 / 20	0.0394 - 0.32	0.0939			Yes	A
7440-02-0	Nickel	0.0963	J	0.232	J	MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.232		0.059	Yes	A
7782-49-2	Selenium	0.199	J	0.349	J	MG/KG	APC-WS-4008-0000-01-W	19 / 20	0.306 - 0.306	0.349		0.14	Yes	A
7440-22-4	Silver	0.00283	J	0.0167	J	MG/KG	LPX-WS-4008-0000-01-W	4 / 20	0.06 - 0.06	0.0167		5.36	Yes	S
7440-62-2	Vanadium	0.071	J	0.254		MG/KG	LPX-WS-4009-0000-01-W	12 / 20	0.179 - 0.179	0.254		0.02	Yes	A
7440-66-6	Zinc	14.6	J	26.3	J	MG/KG	APC-WS-4005-0000-01-W	20 / 20	-	26.3		3.9	Yes	A

Table 9
Occurrence, Distribution and Selection of Chemicals of Potential Concern
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Benchmark (3)	Retain as COPC?	Rationale for Contaminant Deletion or Selection (4)
	Dioxins/Furans													
38178-99-3	HCX	0.00001474	J	0.00008931	J	MG/KG	APC-WS-4003-0000-01-W	18 / 25	0.00000042 - 0.00001994	0.00008931		na	No	T
1746-01-6	2,3,7,8-TCDD	0.00007943	J	0.00136549	J	MG/KG	LPX-WS-4005-0000-01-W	25 / 25	-	0.00136549		na	No	T
40321-76-4	1,2,3,7,8-PeCDD	0.00000039	J	0.00000169	J	MG/KG	LPX-WS-4005-0000-01-W	8 / 25	0.00000021 - 0.00000082	0.00000169		na	No	T
39227-28-6	1,2,3,4,7,8-HxCDD	0.00000007	J	0.00000044	J	MG/KG	LPX-WS-4006-0000-01-W	10 / 25	0.00000013 - 0.00000122	0.00000044		na	No	T
57653-85-7	1,2,3,6,7,8-HxCDD	0.00000014	J	0.00000099	J	MG/KG	LPX-WS-4005-0000-01-W	14 / 25	0.00000029 - 0.00000128	0.00000099		na	No	T
19408-74-3	1,2,3,7,8,9-HxCDD	0.00000021	J	0.00000041	J	MG/KG	LPX-WS-4006-0000-01-W	4 / 25	0.00000013 - 0.0000012	0.00000041		na	No	T
35822-46-9	1,2,3,4,6,7,8-HpCDD	0.00000053		0.00000488		MG/KG	AP-SC-04, AP-SC-05	14 / 25	0.00000016 - 0.00000136	0.00000488		na	No	T
3268-87-9	OCDD	0.00001184	J	0.0000243	J	MG/KG	LPX-WS-4009-0000-01-W	3 / 25	0.00000073 - 0.00000856	0.0000243		na	No	T
51207-31-9	2,3,7,8-TCDF	0.00000054	J	0.00000809	J#	MG/KG	LPX-WS-4005-0000-01-W	23 / 25	0.00000044 - 0.00000048	0.00000809		na	No	T
57117-41-6	1,2,3,7,8-PeCDF	0.00000012	J	0.00000038	J	MG/KG	LPX-WS-4005-0000-01-W	10 / 25	0.00000023 - 0.00000129	0.00000038		na	No	T
57117-31-4	2,3,4,7,8-PeCDF	0.00000021	J	0.00000128	J	MG/KG	LPX-WS-4005-0000-01-W	12 / 25	0.00000018 - 0.00000838	0.00000128		na	No	T
70648-26-9	1,2,3,4,7,8-HxCDF	0.00000017	J	0.00000017	J	MG/KG	LPX-WS-4010-0000-01-W	1 / 25	0.0000001 - 0.00000158	0.00000017		na	No	T
57117-44-9	1,2,3,6,7,8-HxCDF	0.0000001	J	0.0000001	J	MG/KG	LPX-WS-4010-0000-01-W	1 / 25	0.00000006 - 0.00000159	0.0000001		na	No	T
60851-34-5	2,3,4,6,7,8-HxCDF	0.00000002	J	0.00000021	J	MG/KG	LPX-WS-4006-0000-01-W	8 / 25	0.00000014 - 0.00000129	0.00000021		na	No	T
72918-21-9	1,2,3,7,8,9-HxCDF	0.00000012	J	0.00000012	J	MG/KG	LPX-WS-4003-0000-01-W	1 / 25	0.0000001 - 0.00000115	0.00000012		na	No	T
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.00000099	J	0.00000114	J	MG/KG	LPX-WS-4009-0000-01-W	3 / 25	0.0000001 - 0.00000146	0.00000114		na	No	T
39001-02-0	OCDF	0.00000308		0.00000308		MG/KG	AP-SC-04, AP-SC-05	1 / 25	0.0000001 - 0.0000022	0.00000308		na	No	T
TEM	**Toxicity Equivalency - Mammals**	0.00008		0.00137		MG/KG	LPX-WS-4005-0000-01-W	25 / 25	-	0.00137		0.00015	Yes	A
TEB	**Toxicity Equivalency - Birds**	0.0000816		0.00138		MG/KG	LPX-WS-4005-0000-01-W	25 / 25	-	0.00138		0.00015	Yes	A
TEFish	**Toxicity Equivalency - Fish**	0.0000799		0.00137		MG/KG	LPX-WS-4005-0000-01-W	25 / 25	-	0.00137		0.00015	Yes	A
PCBCTEM	**Toxicity Equivalency (PCB) - Mammals**	0.0000182		0.000977		MG/KG	LP-CC-08	11 / 11	-	0.000977		0.00015	Yes	A
PCBCTEB	**Toxicity Equivalency (PCB) - Birds**	0.0000287		0.00147		MG/KG	LP-CC-08	11 / 11	-	0.00147		0.00015	Yes	A
PCBCTEFish	**Toxicity Equivalency (PCB) - Fish**	0.000000844		0.0000488		MG/KG	LP-CC-08	11 / 11	-	0.0000488		0.00015	Yes	S

(1) Minimum or maximum concentration detected in Allendale and Lyman Mill exposure areas. Samples from these exposure areas included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Screening benchmarks for biota tissue are summarized in Table G-1.
(4) Analyte is selected as a COPC if the concentration used for screening exceeds the benchmark.
S = Concentration used for screening is less than the screening toxicity value; however, the analyte was retained as a COPC for wildlife exposure modeling.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
E = The analyte is an essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (USEPA, 1995).
T = Dioxin, furan, and PCB congeners were evaluated using Toxic Equivalencies (TEq) and specific congeners were not evaluated individually as COPCs.

Qualifier definitions:
J = Value is estimated.
# = Value is result from second column confirmation analysis.

mg/Kg = milligrams per kilogram
COPC = chemical of potential concern

Prepared by: KJA
Checked by: RAR

US EPA ARCHIVE DOCUMENT

Table 10
Occurrence, Distribution and Selection of Chemicals of Potential Concern
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark (3)	Retain as COPC?	Rationale for Contaminant Deletion or Selection (4)
	Semivolatile Organics												
92-52-4	1,1'-Biphenyl	0.00039	J	0.00128	J	MG/KG	LPX-AE-4006-0000-01-W	20 / 23	0.00126 - 0.00134	0.00128		Yes	A
91-57-6	2-Methylnaphthalene	0.00243		0.00534		MG/KG	LPX-AE-4006-0000-01-W	20 / 23	0.00187 - 0.00189	0.00534	1.79	Yes	S
83-32-9	Acenaphthene	0.00179	J	0.0082		MG/KG	LPX-AE-4002-0000-01-W	23 / 23	-	0.0082	3.5	Yes	S
208-96-8	Acenaphthylene	0.00054	J	0.00294		MG/KG	LPX-AE-4009-0000-01-W	23 / 23	-	0.00294	0.022	Yes	S
120-12-7	Anthracene	0.00063	J	0.00379		MG/KG	LPX-AE-4009-0000-01-W	23 / 23	-	0.00379	3.4	Yes	S
56-55-3	Benzo(a)anthracene	0.00345		0.00345		MG/KG	LPX-AE-4004-0000-01-W	1 / 23	0.00126 - 0.00189	0.00345	17.5	No	F, S
50-32-8	Benzo(a)pyrene	0.00382		0.00382		MG/KG	LPX-AE-4004-0000-01-W	1 / 23	0.00126 - 0.00189	0.00382	0.03	No	F, S
205-99-2	Benzo(b)fluoranthene	0.00577		0.00577		MG/KG	LPX-AE-4004-0000-01-W	1 / 23	0.00126 - 0.00286	0.00577	0.022	No	F, S
207-08-9	Benzo(k)fluoranthene	0.00511		0.00511		MG/KG	LPX-AE-4004-0000-01-W	1 / 23	0.00126 - 0.00258	0.00511	0.022	No	F, S
218-01-9	Chrysene	0.00738		0.00738		MG/KG	LPX-AE-4004-0000-01-W	1 / 23	0.00126 - 0.00381	0.00738	2.6	No	F, S
53-70-3	Dibenzo(a,h)anthracene	0.00017	J	0.00075	J	MG/KG	LPX-AE-4004-0000-01-W	3 / 23	0.00126 - 0.00189	0.00075	0.022	Yes	S
132-64-9	Dibenzofuran	0.0006	J	0.00231		MG/KG	LPX-AE-4003-0000-01-W	23 / 23	-	0.00231		Yes	A
206-44-0	Fluoranthene	0.00515		0.02309		MG/KG	LPX-AE-4004-0000-01-W	22 / 23	0.00476 - 0.00476	0.02309	0.022	Yes	A
86-73-7	Fluorene	0.00106	J	0.00511		MG/KG	LPX-AE-4003-0000-01-W	23 / 23	-	0.00511	189	Yes	S
193-39-5	Indeno(1,2,3-cd)pyrene	0.00338		0.00338		MG/KG	LPX-AE-4004-0000-01-W	1 / 23	0.00126 - 0.00189	0.00338	0.022	No	F, S
91-20-3	Naphthalene	0.00332		0.00666		MG/KG	LPX-AE-4009-0000-01-W	20 / 23	0.00224 - 0.00314	0.00666	1.7	Yes	S
85-01-8	Phenanthrene	0.00404		0.02717		MG/KG	LPX-AE-4002-0000-01-W	23 / 23	-	0.02717	0.078	Yes	S
129-00-0	Pyrene	0.00596		0.01165		MG/KG	LPX-AE-4004-0000-01-W	4 / 23	0.00229 - 0.00502	0.01165	1.08	Yes	S
TOTPAH	Total PAH	0.0143	J	0.1109		MG/KG	LPX-AE-4004-0000-01-W	23 / 23	-	0.1109	0.022	Yes	A
	Pesticides/PCBs												
72-54-8	4,4'-DDD	0.00606	J	0.04205		MG/KG	APC-AE-4006-0000-01-W	23 / 23	-	0.04205	8.0E-03	Yes	A
72-55-9	4,4'-DDE	0.00352		0.07891	J	MG/KG	LPX-AE-4009-0000-01-W	23 / 23	-	0.07891	4.2E-02	Yes	A
50-29-3	4,4'-DDT	0.00137		0.01467		MG/KG	DYP-AE-5001-0000-01-W	18 / 23	0.00127 - 0.00132	0.01467	1.3E-01	Yes	S
5103-71-9	alpha-Chlordane	0.0075	J	0.06327		MG/KG	APC-AE-4007-0000-01-W	23 / 23	-	0.06327	1.0E-03	Yes	A
12767-79-2	Aroclor, Total	0.28877		1.23323	J	MG/KG	APC-AE-4006-0000-01-W	21 / 23	0.12857 - 0.13063	1.23323	3.6E-02	Yes	A
11097-69-1	Aroclor-1254	0.28877		1.17773	J	MG/KG	LPX-AE-4009-0000-01-W	21 / 23	0.01607 - 0.01633	1.17773	1.4E+00	Yes	S
11100-14-4	Aroclor-1268	0.07747	J	0.07747	J	MG/KG	APC-AE-4006-0000-01-W	1 / 23	0.01581 - 0.01891	0.07747	4.5E-02	No	F
319-85-7	beta-BHC	0.00061	J	0.00255	J	MG/KG	LPX-AE-4005-0000-01-W	10 / 23	0.00059 - 0.00152	0.00255		Yes	A
60-57-1	Dieldrin	0.00313		0.01448		MG/KG	APC-AE-4009-0000-01-W	22 / 23	0.00059 - 0.00059	0.01448	1.0E-02	Yes	A
1031-07-8	Endosulfan Sulfate	0.00999		0.00999		MG/KG	APC-AE-4006-0000-01-W	1 / 23	0.00127 - 0.00152	0.00999	1.0E-03	No	F
7421-93-4	Endrin Aldehyde	0.0008		0.0008		MG/KG	APC-AE-4006-0000-01-W	1 / 23	0.00127 - 0.00152	0.0008	1.0E-03	No	F, S
58-89-9	gamma-BHC	0.00026	J	0.0014	J	MG/KG	LPX-AE-4005-0000-01-W	16 / 23	0.00059 - 0.00152	0.0014	7.2E-03	Yes	S
5103-74-2	gamma-Chlordane	0.0026	J	0.02296		MG/KG	APC-AE-4007-0000-01-W	23 / 23	-	0.02296	1.0E-03	Yes	A
76-44-8	Heptachlor	0.00129		0.00129		MG/KG	APC-AE-4007-0000-01-W	1 / 23	0.00059 - 0.00152	0.00129	1.0E-02	No	F, S
1024-57-3	Heptachlor Epoxide	0.00067	J	0.00559		MG/KG	LPX-AE-4003-0000-01-W	22 / 23	0.00059 - 0.00059	0.00559	1.0E-03	Yes	A
57-74-9	Technical Chlordane	0.10259	J	0.76577		MG/KG	LPX-AE-4003-0000-01-W	23 / 23	-	0.76577	1.0E-03	Yes	A
	Inorganics												
7429-90-5	Aluminum	1.16	J	41.6		MG/KG	LPX-AE-4004-0000-01-W	21 / 23	1.12 - 2.11	41.6	1.0E+00	Yes	A
7440-36-0	Antimony	0.00643	J	0.00643	J	MG/KG	LPX-AE-4004-0000-01-W	1 / 23	0.034 - 0.034	0.00643	5.0E+00	No	F, S
7440-39-3	Barium	0.2		0.781		MG/KG	LPX-AE-4004-0000-01-W	23 / 23	-	0.781	4.1E-02	Yes	A
7440-43-9	Cadmium	0.011	J	0.261		MG/KG	DYP-AE-5001-0000-01-W	23 / 23	-	0.261	8.0E-02	Yes	A
7440-47-3	Chromium	0.0281	J	0.187	J	MG/KG	LPX-AE-4004-0000-01-W	15 / 23	0.269 - 0.269	0.187	3.2E+00	Yes	S
7440-48-4	Cobalt	0.0369	J	0.138	J	MG/KG	APC-AE-4007-0000-01-W	23 / 23	-	0.138		Yes	A
7440-50-8	Copper	0.519	J	1.03	J	MG/KG	APC-AE-4007-0000-01-W	23 / 23	-	1.03	1.6E-01	Yes	A
7439-89-6	Iron	11.7		53.2		MG/KG	LPX-AE-4004-0000-01-W	23 / 23	-	53.2		Yes	A
7439-92-1	Lead	0.11	J	0.952	J	MG/KG	APC-AE-4007-0000-01-W	22 / 23	0.12 - 0.12	0.952	2.6E+00	Yes	S
7439-96-5	Manganese	1.62	J	23	J	MG/KG	DYP-AE-5003-0000-01-W	23 / 23	-	23	1.8E+01	Yes	A
7439-97-6	Mercury	0.0297		0.24		MG/KG	APC-AE-4007-0000-01-W	19 / 23	0.0202 - 0.0646	0.24	4.0E-03	Yes	A
22967-92-6	Mercury (methyl)	0.0164		0.471		MG/KG	APC-AE-4008-0000-01-W	23 / 23	-	0.471	4.3E-03	Yes	A
7439-98-7	Molybdenum	0.0135	J	0.115	J	MG/KG	APC-AE-4004-0000-01-W	3 / 23	0.32 - 0.32	0.115		Yes	A
7440-02-0	Nickel	0.0372	J	0.214	J	MG/KG	APC-AE-4007-0000-01-W	23 / 23	-	0.214	5.9E-02	Yes	A
7782-49-2	Selenium	0.273	J	0.523		MG/KG	APC-AE-4003-0000-01-W	19 / 23	0.448 - 0.448	0.523	1.4E-01	Yes	A
7440-22-4	Silver	0.000324	J	0.0238	J	MG/KG	LPX-AE-4002-0000-01-W	3 / 23	0.06 - 0.06	0.0238	5.4E+00	Yes	S

Table 10
Occurrence, Distribution and Selection of Chemicals of Potential Concern
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark (3)	Retain as COPC?	Rationale for Contaminant Deletion or Selection (4)
7440-28-0	Thallium	0.00444	J	0.00815	J	MG/KG	LPX-AE-4007-0000-01-W	4 / 23	0.022 - 0.022	0.00815	2.7E+00	Yes	S
7440-62-2	Vanadium	0.00195	J	0.109	J	MG/KG	APC-AE-4005-0000-01-W	6 / 23	0.179 - 0.179	0.109	2.0E-02	Yes	A
7440-66-6	Zinc	18.2	J	34.6	J	MG/KG	APC-AE-4004-0000-01-W	20 / 23	20.2 - 24.9	34.6	3.9E+00	Yes	A
	Dioxins/Furans												
38178-99-3	HCX	0.00000774	J	0.00010904	J	MG/KG	APC-AE-4005-0000-01-W	22 / 23	0.00001998 - 0.00001998	0.00010904	na	No	T
1746-01-6	2,3,7,8-TCDD	0.00000928	J	0.00030691	J	MG/KG	APC-AE-4006-0000-01-W	23 / 23	-	0.00030691	na	No	T
40321-76-4	1,2,3,7,8-PeCDD	0.00000087	J	0.00000087	J	MG/KG	LPX-AE-4010-0000-01-W	1 / 23	0.00000019 - 0.00000146	0.00000087	na	No	T
39227-28-6	1,2,3,4,7,8-HxCDD	0.00000016	J	0.00000093	J	MG/KG	LPX-AE-4002-0000-01-W	17 / 23	0.00000009 - 0.00000058	0.00000093	na	No	T
57653-85-7	1,2,3,6,7,8-HxCDD	0.00000047	J	0.00000432	J	MG/KG	LPX-AE-4002-0000-01-W	22 / 23	0.00000057 - 0.00000057	0.00000432	na	No	T
19408-74-3	1,2,3,7,8,9-HxCDD	0.00000014	J	0.00000047	J	MG/KG	LPX-AE-4004-0000-01-W	17 / 23	0.00000018 - 0.00000054	0.00000047	na	No	T
35822-46-9	1,2,3,4,6,7,8-HpCDD	0.00000088	J	0.00000486	J	MG/KG	LPX-AE-4002-0000-01-W	15 / 23	0.00000058 - 0.00000281	0.00000486	na	No	T
51207-31-9	2,3,7,8-TCDF	0.00000006	J	0.00000008	J	MG/KG	APC-AE-4008-0000-01-W	3 / 23	0.00000003 - 0.00000049	0.00000008	na	No	T
57117-41-6	1,2,3,7,8-PeCDF	0.00000008	J	0.00000008	J	MG/KG	APC-AE-4008-0000-01-W	1 / 23	0.00000009 - 0.0000007	0.00000008	na	No	T
57117-31-4	2,3,4,7,8-PeCDF	0.00000012	J	0.00000031	J	MG/KG	APC-AE-4008-0000-01-W	7 / 23	0.00000008 - 0.00000064	0.00000031	na	No	T
57117-44-9	1,2,3,6,7,8-HxCDF	0.00000011	J	0.00000033	J	MG/KG	APC-AE-4002-0000-01-W	15 / 23	0.00000009 - 0.00000028	0.00000033	na	No	T
57117-44-9	1,2,3,6,7,8-HxCDF	0.00000011	J	0.00000033	J	MG/KG	APC-AE-4008-0000-01-W	15 / 23	0.00000009 - 0.00000028	0.00000033	na	No	T
72918-21-9	1,2,3,7,8,9-HxCDF	0.00000002	J	0.00000002	J	MG/KG	APC-AE-4007-0000-01-W	1 / 23	0.00000008 - 0.00000054	0.00000002	na	No	T
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.00000035	J	0.0000016	J	MG/KG	LPX-AE-4004-0000-01-W	9 / 23	0.00000022 - 0.00000113	0.0000016	na	No	T
TEM	Toxicity Equivalency - Mammals	0.00000957		0.000308		MG/KG	APC-AE-4006-0000-01-W	23 / 23	-	0.000308	1.5E-04	Yes	A
TEB	Toxicity Equivalency - Birds	0.00000969		0.000308		MG/KG	APC-AE-4006-0000-01-W	23 / 23	-	0.000308	1.5E-04	Yes	A
TEFish	Toxicity Equivalency - Fish	0.00000952		0.000307		MG/KG	APC-AE-4006-0000-01-W	23 / 23	-	0.000307		Yes	A
PCBCTEM	Toxicity Equivalency (PCB) - Mammals	0.0000154		0.0000604		MG/KG	LPX-AE-4001-0000-01-W	7 / 7	-	0.0000604	1.5E-04	Yes	S
PCBCTEB	Toxicity Equivalency (PCB) - Birds	0.0000158		0.000039		MG/KG	LPX-AE-4001-0000-01-W	7 / 7	-	0.000039	1.5E-04	Yes	S
PCBCTEFish	Toxicity Equivalency (PCB) - Fish	0.000000677		0.00000253		MG/KG	LPX-AE-4001-0000-01-W	7 / 7	-	0.00000253		Yes	A

(1) Minimum or maximum concentration detected in Allendale, Lyman Mill, and Dyerville exposure areas. Samples from these exposure areas included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Screening benchmarks for biota tissue are summarized in Table G-1.
(4) Analyte is selected as a COPC if the concentration used for screening exceeds the benchmark.
S = Concentration used for screening is less than the screening toxicity value; the analyte was retained as a COPC for wildlife exposure modeling if it was detected at a frequency ≥ 5%.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
B = The analyte is an essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (USEPA, 1995).
T = Dioxin, furan, and PCB congeners were evaluated using Toxic Equivalencies (TEq) and specific congeners were not evaluated individually as COPCs.
F = The analyte has a frequency of detection of less than 5% (USEPA RAGS; 1989), and the maximum detected concentration exceeds the screening toxicity value by less than one order of magnitude; the analyte was not selected as a COPC.

Qualifier definitions:
J = Value is estimated.
# = Value is result from second column confirmation analysis.
mg/Kg = milligrams per kilogram
COPC = chemical of potential concern

Prepared by: KJA
Checked by: NAR

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Table 11
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Largemouth Bass

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Largemouth Bass
Exposure Medium: Whole Body

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark (3)	Retain as COPC?	Rationale for Contaminant Deletion or Selection (4)
	Semivolatile Organics												
92-52-4	1,1'-Biphenyl	0.00023	J	0.00059		MG/KG	LPX-LB-4007-0000-01-W	13 / 13	-	0.00059		Yes	A
91-57-6	2-Methylnaphthalene	0.00108		0.00582		MG/KG	MAP-LB-4003-0000-01-W	13 / 13	-	0.00582	1.8E+00	Yes	S
83-32-9	Acenaphthene	0.0004	J	0.00158		MG/KG	LPX-LB-4003-0000-01-W	12 / 13	0.00057 - 0.00057	0.00158	3.5E+00	Yes	S
208-96-8	Acenaphthylene	0.00016	J	0.00098		MG/KG	MAP-LB-4003-0000-01-W	13 / 13	-	0.00098	2.2E-02	Yes	S
120-12-7	Anthracene	0.00032	J	0.00171		MG/KG	MAP-LB-4003-0000-01-W	13 / 13	-	0.00171	3.4E+00	Yes	S
56-55-3	Benzo(a)anthracene	0.00007	J	0.00348		MG/KG	LPX-LB-4003-0000-01-W	12 / 13	0.00065 - 0.00065	0.00348	1.8E+01	Yes	S
50-32-8	Benzo(a)pyrene	0.00014	J	0.00513		MG/KG	LPX-LB-4003-0000-01-W	10 / 13	0.00058 - 0.00066	0.00513	3.0E-02	Yes	S
205-99-2	Benzo(b)fluoranthene	0.00014	J	0.0067		MG/KG	LPX-LB-4003-0000-01-W	11 / 13	0.00065 - 0.00066	0.0067	2.2E-02	Yes	S
191-24-2	Benzo(g,h,i)perylene	0.00035	J	0.00524		MG/KG	LPX-LB-4003-0000-01-W	9 / 13	0.00066 - 0.0022	0.00524	2.2E-02	Yes	S
207-08-9	Benzo(k)fluoranthene	0.00018	J	0.00605		MG/KG	LPX-LB-4003-0000-01-W	10 / 13	0.00058 - 0.00066	0.00605	2.2E-02	Yes	S
218-01-9	Chrysene	0.00023	J	0.0067		MG/KG	LPX-LB-4003-0000-01-W	12 / 13	0.00065 - 0.00065	0.0067	2.6E+00	Yes	S
53-70-3	Dibenzo(a,h)anthracene	0.00002	J	0.00139		MG/KG	LPX-LB-4003-0000-01-W	8 / 13	0.00057 - 0.00083	0.00139	2.2E-02	Yes	S
132-64-9	Dibenzofuran	0.00042	J	0.00143		MG/KG	LPX-LB-4007-0000-01-W	13 / 13	-	0.00143		Yes	A
206-44-0	Fluoranthene	0.00118		0.01618		MG/KG	MAP-LB-4003-0000-01-W	13 / 13	-	0.01618	2.2E-02	Yes	S
86-73-7	Fluorene	0.00064		0.00471		MG/KG	LPX-LB-4007-0000-01-W	13 / 13	-	0.00471	1.9E+02	Yes	S
193-39-5	Indeno(1,2,3-cd)pyrene	0.00013	J	0.00596		MG/KG	LPX-LB-4003-0000-01-W	12 / 13	0.00065 - 0.00065	0.00596	2.2E-02	Yes	S
91-20-3	Naphthalene	0.00103		0.00492		MG/KG	MAP-LB-4003-0000-01-W	13 / 13	-	0.00492	1.7E+00	Yes	S
85-01-8	Phenanthrene	0.00193		0.01609		MG/KG	MAP-LB-4003-0000-01-W	13 / 13	-	0.01609	7.8E-02	Yes	S
129-00-0	Pyrene	0.00048		0.00834		MG/KG	MAP-LB-4003-0000-01-W	13 / 13	-	0.00834	1.1E+00	Yes	S
TOTPAH	Total PAH	0.01055	J	0.07838	J	MG/KG	MAP-LB-4003-0000-01-W	13 / 13	-	0.07838	2.2E-02	Yes	S
	Pesticides/PCBs												
72-54-8	4,4'-DDD	0.00322		0.00873		MG/KG	MAP-LB-4003-0000-01-W	13 / 13	-	0.00873	8.0E-03	Yes	A
72-55-9	4,4'-DDE	0.02045		0.12507	D	MG/KG	LPX-LB-4007-0000-01-W	13 / 13	-	0.12507	4.2E-02	Yes	A
50-29-3	4,4'-DDT	0.00114		0.00354		MG/KG	MAP-LB-4003-0000-01-W	13 / 13	-	0.00354	1.3E-01	Yes	S
5103-71-9	alpha-Chlordane	0.00243		0.0101		MG/KG	LPX-LB-4009-0000-01-W	13 / 13	-	0.0101	1.0E-03	Yes	A
12767-79-2	Aroclor, Total	0.44237		2.36514		MG/KG	LPX-LB-4007-0000-01-W	13 / 13	-	2.36514	3.6E-02	Yes	A
11097-69-1	Aroclor-1254	0.16082		2.35105	D	MG/KG	LPX-LB-4007-0000-01-W	13 / 13	-	2.35105	1.4E+00	Yes	A
11100-14-4	Aroclor-1268	0.00652	J	0.29687	D	MG/KG	MAP-LB-4002-0000-01-W	13 / 13	-	0.29687	4.5E-02	Yes	A
60-57-1	Dieldrin	0.00064		0.00261		MG/KG	LPX-LB-4009-0000-01-W	13 / 13	-	0.00261	1.0E-02	Yes	S
5103-74-2	gamma-Chlordane	0.00088		0.00415		MG/KG	LPX-LB-4009-0000-01-W	13 / 13	-	0.00415	1.0E-03	Yes	A
1024-57-3	Heptachlor Epoxide	0.0001	J	0.00045	J	MG/KG	MAP-LB-4003-0000-01-W	3 / 12	0.00046 - 0.00098	0.00045	1.0E-03	Yes	S
57-74-9	Technical Chlordane	0.06854		0.23542		MG/KG	MAP-LB-4003-0000-01-W	13 / 13	-	0.23542	1.0E-03	Yes	A
	Inorganics												
7429-90-5	Aluminum	1.05		67		MG/KG	LPX-LB-4003-0000-01-W	13 / 13	-	67	1.0E+00	Yes	A
7440-39-3	Barium	0.363	J	5.53		MG/KG	MAP-LB-4002-0000-01-W	13 / 13	-	5.53	4.1E-02	Yes	A
7440-41-7	Beryllium	0.00125	J	0.0108		MG/KG	LPX-LB-4003-0000-01-W	4 / 13	0.004 - 0.00603	0.0108	5.1E+00	Yes	S
7440-43-9	Cadmium	0.004	J	0.0188	J	MG/KG	LPX-LB-4004-0000-01-W	13 / 13	-	0.0188	8.0E-02	Yes	S
7440-47-3	Chromium	0.123	J	0.288		MG/KG	LPX-LB-4003-0000-01-W	7 / 13	0.0303 - 0.269	0.288	3.2E+00	Yes	S
7440-48-4	Cobalt	0.0242	J	0.1	J	MG/KG	LPX-LB-4003-0000-01-W	12 / 13	0.00163 - 0.00163	0.1		Yes	A
7440-50-8	Copper	0.4	J	1.26	J	MG/KG	LPX-LB-4007-0000-01-W	13 / 13	-	1.26	1.6E-01	Yes	A
7439-89-6	Iron	12.5	J	93.7		MG/KG	LPX-LB-4003-0000-01-W	13 / 13	-	93.7		Yes	A
7439-92-1	Lead	0.0356	J	0.369	J	MG/KG	LPX-LB-4003-0000-01-W	13 / 13	-	0.369	2.6E+00	Yes	S
7439-96-5	Manganese	1.51		14.7		MG/KG	LPX-LB-4003-0000-01-W	13 / 13	-	14.7	1.8E+01	Yes	S
7439-97-6	Mercury	0.0706		0.338		MG/KG	LPX-LB-4008-0000-01-W	6 / 13	0.0768 - 0.292	0.338	4.0E-03	Yes	A
22967-92-6	Mercury (methyl)	0.0516		0.308		MG/KG	LPX-LB-4006-0000-01-W	13 / 13	-	0.308	4.3E-03	Yes	A
7439-98-7	Molybdenum	0.0179	J	0.0445	J	MG/KG	LPX-LB-4003-0000-01-W	9 / 13	0.00956 - 0.32	0.0445		Yes	A
7440-02-0	Nickel	0.0343	J	0.177	J	MG/KG	LPX-LB-4003-0000-01-W	13 / 13	-	0.177	5.9E-02	Yes	A
7782-49-2	Selenium	0.141	J	0.232	J	MG/KG	LPX-LB-4006-0000-01-W	9 / 13	0.0431 - 0.448	0.232	1.4E-01	Yes	A
7440-22-4	Silver	0.0207	J	0.0214	J	MG/KG	LPX-LB-4009-0000-01-W	2 / 13	0.06 - 0.06	0.0214	5.4E+00	Yes	S
7440-28-0	Thallium	0.00339	J	0.00577	J	MG/KG	MAP-LB-4001-0000-01-W	13 / 13	-	0.00577	2.7E+00	Yes	S
7440-62-2	Vanadium	0.0207	J	0.11	J	MG/KG	LPX-LB-4003-0000-01-W	9 / 13	0.179 - 0.179	0.11	2.0E-02	Yes	A
7440-66-6	Zinc	12.6	J	21	J	MG/KG	LPX-LB-4003-0000-01-W	10 / 13	14.5 - 17	21	3.9E+00	Yes	A

Table 11
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Largemouth Bass

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Largemouth Bass
Exposure Medium: Whole Body

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark (3)	Retain as COPC?	Rationale for Contaminant Deletion or Selection (4)
	Dioxins/Furans												
38178-99-3	HCX	0.00001341	J	0.00003074	J	MG/KG	LPX-LB-4006-0000-01-W	11 / 13	0.00003993 - 0.00003998	0.00003074	na	No	T
1746-01-6	2,3,7,8-TCDD	0.00002094		0.0002888	J	MG/KG	LPX-LB-4009-0000-01-W	13 / 13	-	0.0002888	na	No	T
40321-76-4	1,2,3,7,8-PeCDD	0.00000013	J	0.00000047	J	MG/KG	LPX-LB-4002-0000-01-W	12 / 13	0.0000008 - 0.0000008	0.00000047	na	No	T
40321-76-4	1,2,3,7,8-PeCDD	0.00000013	J	0.00000047	J	MG/KG	LPX-LB-4007-0000-01-W	12 / 13	0.0000008 - 0.0000008	0.00000047	na	No	T
39227-28-6	1,2,3,4,7,8-HxCDD	0.00000005	J	0.00000009	J	MG/KG	LPX-LB-4005-0000-01-W	3 / 13	0.00000013 - 0.00000035	0.00000009	na	No	T
57653-85-7	1,2,3,6,7,8-HxCDD	0.00000013	J	0.0000003	J	MG/KG	LPX-LB-4001-0000-01-W	8 / 13	0.00000028 - 0.00000036	0.0000003	na	No	T
19408-74-3	1,2,3,7,8,9-HxCDD	0.00000003	J	0.00000007	J	MG/KG	LPX-LB-4009-0000-01-W	3 / 13	0.00000023 - 0.00000033	0.00000007	na	No	T
35822-46-9	1,2,3,4,6,7,8-HpCDD	0.0000002	J	0.00000038	J	MG/KG	LPX-LB-4003-0000-01-W	4 / 13	0.0000002 - 0.00000103	0.00000038	na	No	T
51207-31-9	2,3,7,8-TCDF	0.00000009	J	0.00000099	J#	MG/KG	LPX-LB-4001-0000-01-W	11 / 13	0.00000018 - 0.00000056	0.00000099	na	No	T
57117-41-6	1,2,3,7,8-PeCDF	0.0000004	J	0.0000004	J	MG/KG	LPX-LB-4005-0000-01-W	1 / 13	0.00000015 - 0.00000055	0.0000004	na	No	T
57117-31-4	2,3,4,7,8-PeCDF	0.00000014	J	0.00000035	J	MG/KG	LPX-LB-4005-0000-01-W	7 / 13	0.00000014 - 0.00000031	0.00000035	na	No	T
57117-44-9	1,2,3,6,7,8-HxCDF	0.0000001	J	0.00000024	J	MG/KG	LPX-LB-4005-0000-01-W	2 / 13	0.00000007 - 0.00000033	0.00000024	na	No	T
60851-34-5	2,3,4,6,7,8-HxCDF	0.00000012	J	0.00000012	J	MG/KG	LPX-LB-4005-0000-01-W	1 / 13	0.0000001 - 0.00000035	0.00000012	na	No	T
72918-21-9	1,2,3,7,8,9-HxCDF	0.00000012	J	0.00000012	J	MG/KG	LPX-LB-4005-0000-01-W	1 / 13	0.00000011 - 0.00000038	0.00000012	na	No	T
55673-89-7	1,2,3,4,7,8,9-HpCDF	0.00000006	J	0.00000045	J	MG/KG	MAP-LB-4001-0000-01-W	2 / 13	0.00000009 - 0.00000061	0.00000045	na	No	T
TEM	Toxicity Equivalency - Mammals	0.0000215		0.000289		MG/KG	LPX-LB-4009-0000-01-W	13 / 13	-	0.000289	1.5E-04	Yes	A
TEB	Toxicity Equivalency - Birds	0.0000218		0.00029		MG/KG	LPX-LB-4009-0000-01-W	13 / 13	-	0.00029	1.5E-04	Yes	A
TEFish	Toxicity Equivalency - Fish	0.0000215		0.000289		MG/KG	LPX-LB-4009-0000-01-W	13 / 13	-	0.000289	1.5E-04	Yes	A
PCBCTEM	Toxicity Equivalency (PCB) - Mammals	0.00000742		0.0000372		MG/KG	LPX-LB-4001-0000-01-W	5 / 5	-	0.0000372	1.5E-04	Yes	S
PCBCTEB	Toxicity Equivalency (PCB) - Birds	0.0000149		0.0000546		MG/KG	LPX-LB-4001-0000-01-W	5 / 5	-	0.0000546	1.5E-04	Yes	S
PCBCTEFish	Toxicity Equivalency (PCB) - Fish	0.000000339		0.00000177		MG/KG	LPX-LB-4001-0000-01-W	5 / 5	-	0.00000177	1.5E-04	Yes	S

(1) Minimum or maximum concentration detected in Lyman Mill and Manton exposure areas. Samples from these exposure areas included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Screening benchmarks for biota tissue are summarized in Table G-1.
(4) Analyte is selected as a COPC if the concentration used for screening exceeds the benchmark.
S = Concentration used for screening is less than the screening toxicity value; however, the analyte was retained as a COPC for wildlife exposure modeling.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
E = The analyte is an essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (USEPA, 1995).
T = Dioxin, furan, and PCB congeners were evaluated using Toxic Equivalencies (TEq) and specific congeners were not evaluated individually as COPCs.

Qualifier definitions:
J = Value is estimated.
D = Results from analytical dilution
# = Value is result from second column confirmation analysis.

mg/Kg = milligrams per kilogram
COPC = chemical of potential concern

Prepared by: KJA
Checked by: RAR

US EPA ARCHIVE DOCUMENT

Table 12
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Tree Swallow - Egg

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Tree Swallow
Exposure Medium: Egg

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits *Min-Max*	Concentration Used for Screening (2)	Benchmark (3)	Retain as COPC?	Rationale for Contaminant Deletion or *Selection (4)*
	Pesticides/PCBs												
57-74-9	Technical Chlordane	0.18741	J	0.91843	J	MG/KG	G-TS-06-P	8 / 8	-	0.91843	1.0E-03	Yes	A
1024-57-3	Heptachlor Epoxide	0.00742	J	0.04076	J	MG/KG	G-TS-06-P	8 / 8	-	0.04076	1.0E-03	Yes	A
60-57-1	Dieldrin	0.00955	J	0.02859		MG/KG	G-TS-19-P	8 / 8	-	0.02859	1.0E-02	Yes	A
72-55-9	4,4'-DDE	0.15176		0.65313		MG/KG	G-TS-06-P	8 / 8	-	0.65313	4.2E-02	Yes	A
72-54-8	4,4'-DDD	0.0036	J	0.01268		MG/KG	A-TS-39-P	8 / 8	-	0.01268	8.0E-03	Yes	A
50-29-3	4,4'-DDT	0.00261	J	0.00693	J	MG/KG	L-TS-65-P	7 / 8	0.00816 - 0.00816	0.00693	1.3E-01	Yes	A
5103-71-9	alpha-Chlordane	0.00118	J	0.03292		MG/KG	A-TS-39-P	8 / 8	-	0.03292	1.0E-03	Yes	A
11097-69-1	Aroclor-1254	0.39422		1.51226		MG/KG	G-TS-06-P	8 / 8	-	1.51226	1.4E+00	Yes	A
11100-14-4	Aroclor-1268	0.0923	J	0.373		MG/KG	A-TS-33-P	8 / 8	-	0.373	4.5E-02	Yes	A
12767-79-2	Aroclor, Total	0.50234	J	1.87218		MG/KG	G-TS-06-P	8 / 8	-	1.87218	3.6E-02	Yes	A
	Dioxins/Furans												
38178-99-3	HCX	0.00001186	J	0.00008858	J	MG/KG	L-TS-83-P	10 / 48	0.0000001 - 0.00016221	0.00008858	na	No	T
TCX	TCX	0.00000306	J	0.00000306	J	MG/KG	A-TS-48-P	1 / 18	0.00056 - 0.0032	0.00000306	na	No	T
1746-01-6	2,3,7,8-TCDD	0.00000307		0.00300354	J	MG/KG	A-TS-54-P	75 / 75	-	0.00300354	na	No	T
40321-76-4	1,2,3,7,8-PeCDD	0.00000209	J	0.00003249		MG/KG	AP-TS-16-E	63 / 75	0.00000092 - 0.00001393	0.00003249	na	No	T
39227-28-6	1,2,3,4,7,8-HxCDD	0.00000271	J	0.0000535		MG/KG	RF13-P	67 / 75	0.00000535 - 0.00001265	0.0000535	na	No	T
57653-85-7	1,2,3,6,7,8-HxCDD	0.00001178		0.00028853		MG/KG	RF13-P	68 / 75	0.00001948 - 0.00006349	0.00028853	na	No	T
19408-74-3	1,2,3,7,8,9-HxCDD	0.00000223	J	0.00007359		MG/KG	RF13-P	67 / 75	0.00000255 - 0.00000613	0.00007359	na	No	T
35822-46-9	1,2,3,4,6,7,8-HpCDD	0.00002853	J	0.00179364		MG/KG	RF13-P	67 / 75	0.00003391 - 0.00017253	0.00179364	na	No	T
3268-87-9	OCDD	0.00005488		0.00357178	J	MG/KG	L-TS-84-P	43 / 75	0.00002062 - 0.0002156	0.00357178	na	No	T
51207-31-9	2,3,7,8-TCDF	0.00000554	J	0.00004273	#	MG/KG	RF06-P	63 / 75	0.00000194 - 0.0000298	0.00004273	na	No	T
57117-41-6	1,2,3,7,8-PeCDF	0.00000139		0.00001375		MG/KG	RF13-P	64 / 75	0.00000087 - 0.00000363	0.00001375	na	No	T
57117-31-4	2,3,4,7,8-PeCDF	0.00000222	*	0.00001893		MG/KG	RF13-P	62 / 75	0.00000081 - 0.0000102	0.00001893	na	No	T
70648-26-9	1,2,3,4,7,8-HxCDF	0.0000022	J	0.00004921		MG/KG	RF13-P	62 / 75	0.00000181 - 0.00002537	0.00004921	na	No	T
57117-44-9	1,2,3,6,7,8-HxCDF	0.00000233	J	0.00003506		MG/KG	RF13-P	63 / 75	0.00000175 - 0.00000961	0.00003506	na	No	T
60851-34-5	2,3,4,6,7,8-HxCDF	0.00000101		0.00002308		MG/KG	RF13-P	61 / 75	0.00000126 - 0.0000103	0.00002308	na	No	T
72918-21-9	1,2,3,7,8,9-HxCDF	0.00000009	J	0.0000015	J	MG/KG	RF11-P	15 / 75	0.00000004 - 0.00001157	0.0000015	na	No	T
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.00000271	J	0.00022997	J	MG/KG	L-TS-84-P	53 / 75	0.00000259 - 0.00002419	0.00022997	na	No	T
55673-89-7	1,2,3,4,7,8,9-HpCDF	0.00000024	J	0.00001644	J	MG/KG	L-TS-84-P	24 / 75	0.00000041 - 0.00002097	0.00001644	na	No	T
39001-02-0	OCDF	0.00000827	J	0.00011623	J	MG/KG	L-TS-84-P	20 / 75	0.00000058 - 0.00003113	0.00011623	na	No	T
TEB	Toxicity Equivalency - Birds	0.0000143		0.00303		MG/KG	A-TS-54-P	75 / 75	-	0.00303	1.5E-04	Yes	A
PCBCTEB	Toxicity Equivalency (PCB) - Birds	0.000138		0.000329		MG/KG	A-TS-47-P	6 / 6	-	0.000329	1.5E-04	Yes	A

(1) Minimum or maximum concentration detected in Allendale and Lyman Mill exposure areas. Samples from these exposure areas included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Screening benchmarks for biota tissue are summarized in Table G-1.
(4) Analyte is selected as a COPC if the concentration used for screening exceeds the benchmark.
S = Concentration used for screening is less than the screening toxicity value; however, the analyte was retained as a COPC for wildlife exposure modeling.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
E = The analyte is an essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (USEPA, 1995).
T = Dioxin, furan, and PCB congeners were evaluated using Toxic Equivalencies (TEq) and specific congeners were not evaluated individually as COPCs.
V = Not relevant for this specific receptor.

Qualifier definitions:
J = Value is estimated.
* = Value is either the detection limit (DL) or the Estimated Maximum Possible Concentration (EMPC).
# = Value is result from second column confirmation analysis.

mg/Kg = milligrams per kilogram
COPC = chemical of potential concern

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Table 13
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Tree Swallow - Nestling

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Tree Swallow
Exposure Medium: Nestling

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Benchmark (3)	Retain as COPC?	Rationale for Contaminant Deletion or Selection (4)
	Pesticides/PCBs												
57-74-9	Technical Chlordane	0.18068		0.83588	J	MG/KG	A-TS-57-N	18 / 18	-	0.83588	1.0E-03	Yes	A
1024-57-3	Heptachlor Epoxide	0.00454	J	0.04218		MG/KG	A-TS-57-N	16 / 18	0.00201 - 0.00241	0.04218	1.0E-03	Yes	A
60-57-1	Dieldrin	0.00282	J	0.01642		MG/KG	A-TS-57-N	18 / 18	-	0.01642	1.0E-02	Yes	A
72-55-9	4,4'-DDE	0.00334		0.06728	J	MG/KG	L-TS-70-N	16 / 18	0.00201 - 0.00241	0.06728	4.2E-02	Yes	A
72-54-8	4,4'-DDD	0.00205	J	0.06395		MG/KG	A-TS-35-N	18 / 18	-	0.06395	8.0E-03	Yes	A
1031-07-8	Endosulfan Sulfate	0.01022		0.01312		MG/KG	A-TS-57-N	2 / 18	0.00153 - 0.00699	0.01312	1.0E-03	Yes	A
50-29-3	4,4'-DDT	0.00043	J	0.00607		MG/KG	A-TS-57-N	16 / 18	0.00201 - 0.00241	0.00607	1.3E-01	Yes	A
5103-71-9	alpha-Chlordane	0.00265	J	0.0706		MG/KG	A-TS-57-N	18 / 18	-	0.0706	1.0E-03	Yes	A
5103-74-2	gamma-Chlordane	0.00068	J	0.0186		MG/KG	A-TS-57-N	6 / 18	0.00201 - 0.00699	0.0186	1.0E-03	Yes	A
11097-69-1	Aroclor-1254	0.10826		0.98496		MG/KG	A-TS-57-N	18 / 18	-	0.98496	1.4E+00	Yes	A
11100-14-4	Aroclor-1268	0.02104	J	0.06412	J	MG/KG	L-TS-89-N	18 / 18	-	0.06412	4.5E-02	Yes	A
12767-79-2	Aroclor, Total	0.1334	J	1.02141		MG/KG	A-TS-57-N	18 / 18	-	1.02141	3.6E-02	Yes	A
	Dioxins/Furans												
38178-99-3	HCX	0.00000832	J	0.00005961	J	MG/KG	A-TS-57-N	10 / 25	0.00000008 - 0.00003657	0.00005961	na	No	T
1746-01-6	2,3,7,8-TCDD	0.00000464		0.00170268	J	MG/KG	A-TS-57-N	30 / 30	-	0.00170268	na	No	T
40321-76-4	1,2,3,7,8-PeCDD	0.00000098		0.00000489	J	MG/KG	L-TS-84-N	24 / 30	0.00000076 - 0.00000581	0.00000489	na	No	T
39227-28-6	1,2,3,4,7,8-HxCDD	0.00000095		0.00000458	J	MG/KG	L-TS-84-N	26 / 30	0.00000351 - 0.00000743	0.00000458	na	No	T
57653-85-7	1,2,3,6,7,8-HxCDD	0.00000175	*	0.0000173	J	MG/KG	L-TS-84-N	26 / 30	0.00000679 - 0.00002625	0.0000173	na	No	T
19408-74-3	1,2,3,7,8,9-HxCDD	0.00000047	J	0.00000415	J	MG/KG	A-TS-48-N	24 / 30	0.00000057 - 0.00000995	0.00000415	na	No	T
35822-46-9	1,2,3,4,6,7,8-HpCDD	0.00000615	J	0.00020056		MG/KG	RMP 120-N	25 / 30	0.00000613 - 0.00008438	0.00020056	na	No	T
3268-87-9	OCDD	0.00001938	J	0.00013441	J	MG/KG	A-TS-49-N	9 / 30	0.00000445 - 0.00025682	0.00013441	na	No	T
51207-31-9	2,3,7,8-TCDF	0.00000136	J	0.00000928	J	MG/KG	A-TS-57-N	30 / 30	-	0.00000928	na	No	T
57117-41-6	1,2,3,7,8-PeCDF	0.00000049		0.00000235	J	MG/KG	L-TS-70-N	28 / 30	0.00000063 - 0.00000163	0.00000235	na	No	T
57117-31-4	2,3,4,7,8-PeCDF	0.00000078	J	0.00000625	J	MG/KG	A-TS-48-N	22 / 30	0.00000064 - 0.00001107	0.00000625	na	No	T
70648-26-9	1,2,3,4,7,8-HxCDF	0.00000073	J	0.00000306	J	MG/KG	A-TS-48-N	17 / 30	0.00000057 - 0.00000439	0.00000306	na	No	T
57117-44-9	1,2,3,6,7,8-HxCDF	0.00000052	J	0.00000296	J	MG/KG	L-TS-62-N	22 / 30	0.0000006 - 0.00000546	0.00000296	na	No	T
60851-34-5	2,3,4,6,7,8-HxCDF	0.00000024	*	0.00000131	J	MG/KG	A-TS-35-N	22 / 30	0.00000012 - 0.00000328	0.00000131	na	No	T
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.0000009	J	0.00000949	J	MG/KG	A-TS-49-N	15 / 30	0.00000073 - 0.0000273	0.00000949	na	No	T
55673-89-7	1,2,3,4,7,8,9-HpCDF	0.00000017	J	0.00000056	J	MG/KG	A-TS-48-N	8 / 30	0.00000013 - 0.00000287	0.00000056	na	No	T
39001-02-0	OCDF	0.00001101	J	0.00001101	J	MG/KG	A-TS-48-N	1 / 30	0.00000021 - 0.00001051	0.00001101	na	No	T
TEB	Toxicity Equivalency - Birds	0.00000933		0.00172		MG/KG	A-TS-57-N	30 / 30	-	0.00172	1.5E-04	Yes	A
PCBCTEB	Toxicity Equivalency (PCB) - Birds	0.0000228		0.000268		MG/KG	AP-TS-15-N	13 / 13	-	0.000268	1.5E-04	Yes	A

(1) Minimum or maximum concentration detected in Allendale and Lyman Mill exposure areas. Samples from these exposure areas included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Screening benchmarks for biota tissue are summarized in Table G-1.
(4) Analyte is selected as a COPC if the concentration used for screening exceeds the benchmark.
S = Concentration used for screening is less than the screening toxicity value; however, the analyte was retained as a COPC for wildlife exposure modeling.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
E = The analyte is an essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (USEPA, 1995).
T = Dioxin, furan, and PCB congeners were evaluated using Toxic Equivalencies (TEq) and specific congeners were not evaluated individually as COPCs.
V = Not relevant for this specific receptor.

Qualifier definitions:
J = Value is estimated.
* = Value is either the detection limit (DL) or the Estimated Maximum Possible Concentration (EMPC).

mg/Kg = milligrams per kilogram
COPC = chemical of potential concern

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Table 14
Toxicity Equivalency Factors (TEFs[1]) for Mammals, Fish, and Bird Receptors

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

	Toxicity Equivalency Factor		
Congener	**Human/Mammal**	**Fish**	**Bird**
Dibenzo-p-dioxins			
2,3,7,8-TCDD	1	1	1
1,2,3,7,8-PnCDD	1	1	1
1,2,3,4,7,8-HxCDD	0.1	0.5	0.05
1,2,3,6,7,8-HxCDD	0.1	0.01	0.01
1,2,3,7,8,9-HxCDD	0.1	0.01	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.001	0.001
OCDD	0.0001	0.0001	0.0001
Dibenzofurans			
2,3,7,8-TCDF	0.1	0.05	1
1,2,3,7,8-PnCDF	0.05	0.05	0.1
2,3,4,7,8-PnCDF	0.5	0.5	1
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01
OCDF	0.0001	0.0001	0.0001
Non-ortho PCBs			
PCB 77	0.0001	0.0001	0.05
PCB 81	0.0001	0.0005	0.1
PCB 126	0.1	0.005	0.1
PCB 169	0.01	0.00005	0.001
Mono-ortho PCBs			
PCB 105	0.0001	0.000005	0.0001
PCB 114	0.0005	0.000005	0.0001
PCB 118	0.0001	0.000005	0.00001
PCB 123	0.0001	0.000005	0.00001
PCB 156	0.0005	0.000005	0.0001
PCB 157	0.0005	0.000005	0.0001
PCB 167	0.00001	0.000005	0.00001
PCB 189	0.0001	0.000005	0.00001
Hexachloroxanthene[2]			
HCX	0.0002	0.0002	0.0002

Notes:

[1] TEFs are based on the conclusions of the World Health Organization meeting in Stockholm, Sweden, June 15-18 1997 (Van den Berg et al., 1998).

[2] Interim value based on results from Hahn (2001); letter report included in Appendix H. See Section 2.4.1.3 for discussion on derivation of TEFs for HCX.

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TABLE 15
BERA ENDPOINTS AND WEIGHT-OF-EVIDENCE DOCUMENTATION

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Assessment Endpoint	Measures of Effect	Overall Score[b]	Attribute[a]									
			Biological Linkage	Correlation of Stressor/Response	Utility of Measure	Quality of Data	Site-specificity	Sensitivity	Spatial Representativeness	Temporal Representativeness	Quantitativeness	Standard Measure
1a. Protection and maintenance (i.e., survival, growth, reproduction) of aquatic invertebrate communities which are a forage base for fish and wildlife populations	A. Comparison of surface water COC concentrations to criteria/guidelines	Low - Medium	L	L-M	L-M	M	M	L-M	L-M	L-M	M	M
	B. Comparison of sediment COC concentrations to benchmarks/guidelines	Medium	L-M	M	M	M	M	L-M	M	M-H	M	M-H
	C. Whole sediment laboratory bioassays	Medium - High	L-M	M-H	M-H	M-H	M-H	M	M-H	M	H	H
	D. Comparison of measured COC concentrations in aquatic macroinvertebrates to CBRs	Low - Medium	L-M	L-M	L-M	L	L-M	L-M	L-M	M	M	M
	E_1. Aquatic macroinvertebrate community structure/function	Medium - High	H	M-H	M	H	H	L-M	H	M	M	H
	E_2. Emerging aquatic macroinvertebrate productivity	Low - Medium	H	L	L	L	M	L-M	M	L-M	L	M
1b. Protection and maintenance (i.e., survival, growth, reproduction) of floodplain invertebrate communities which are a forage base for wildlife populations	A. Comparison of soil COC concentrations to benchmarks/guidelines	Low - Medium	L	L-M	L-M	M	M	L-M	L-M	L-M	M	M
	B. Comparison of measured COC concentrations in floodplain invertebrates to CBRs	Low - Medium	L-M	L-M	L-M	L	L-M	L-M	L-M	M	M	M
	C. Floodplain macroinvertebrate community integrity	Medium	H	M-H	M	M	L-M	L-M	M-H	M	M	M

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TABLE 15
BERA ENDPOINTS AND WEIGHT-OF-EVIDENCE DOCUMENTATION

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Assessment Endpoint	Measures of Effect	Overall Score[b]	Attribute[a]									
			Biological Linkage	Correlation of Stressor/Response	Utility of Measure	Quality of Data	Site-specificity	Sensitivity	Spatial Representativeness	Temporal Representativeness	Quantitativeness	Standard Measure
2. Protection and maintenance of demersal, omnivorous fish populations as a forage base or sports fishery.	A_1. Fish length-weight relationships and condition indices relative to habitat characterization	Low - Medium	L	L	M	L-M	M	L	M	M	M	M
	A_2. Percent gross lesions in individual fish	Medium	M	M	M	M	H	L-M	H	L-M	M	M
	A_3. Demographic structure analysis of dominant species (based on fish scales)	Medium	H	L	M	L-M	M-H	L-M	M	M	M	M
	A_4. Species richness and relative abundance of ichthyoplankton	Medium	H	M	M	L-M	M-H	L-M	M	M	M	M
	B_1. Comparison of measured concentrations or toxic equivalencies in fish tissue to literature derived CBRs	Medium - High	M	M-H	H	H	M	M	H	L-M	M	M-H
	B_2. Comparison of modeled concentrations or toxic equivalencies (using BSAFs) in eggs and fish tissue to literature derived CBRs	Medium	M	M-H	M	M	M	M	H	L-M	M	M-H
	B_3. Partial life cycle laboratory water exposure of fish eggs dosed with synthetic mixture emulating DLC composition of Allendale Pond fish tissue.	Medium - High	H	H	H	H	M	H	H	L-M	H	M

TABLE 15
BERA ENDPOINTS AND WEIGHT-OF-EVIDENCE DOCUMENTATION

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Assessment Endpoint	Measures of Effect	Overall Score[b]	Attribute[a]									
			Biological Linkage	Correlation of Stressor/Response	Utility of Measure	Quality of Data	Site-specificity	Sensitivity	Spatial Representativeness	Temporal Representativeness	Quantitativeness	Standard Measure
3. Protection and maintenance of pelagic, piscivorous, or semi-piscivorous fish populations as a forage base or sports fishery	A_1. Fish length-weight relationships and condition indices relative to habitat characterization	Low - Medium	L	L	M	L-M	M	L	M	M	M	M
	A_2. Percent gross lesions in individual fish	Medium	M	M	M	M	H	L-M	H	L-M	M	M
	A_3. Demographic structure analysis of dominant species (based on fish scales)	Medium	H	L	M	L-M	M-H	L-M	M	M	M	M
	A_4. Species richness and relative abundance of ichthyoplankton	Medium	H	M	M	L-M	M-H	L-M	M	M	M	M
	B_1. Comparison of measured concentrations or toxic equivalencies in fish tissue to literature derived CBRs	Medium - High	M	M-H	H	H	M	M	H	L-M	M	M-H
	B_2. Comparison of modeled concentrations or toxic equivalencies (using BSAFs) in eggs and fish tissue to literature derived CBRs	Medium	M	M-H	M	M	M	M	H	L-M	M	M-H
4. Protection and maintenance of piscivorous mammal and bird populations	A. Comparison of estimated ingestion doses in piscivorous wildlife with TRVs and toxic equivalencies	Medium	M	M-H	M-H	M	L-M	M	M	M-H	M	M-H
	B. Comparison of estimated piscivorous wildlife residues with CBRs	Low - Medium	M	M-H	M	L	L	M	L	L-M	M	M

TABLE 15
BERA ENDPOINTS AND WEIGHT-OF-EVIDENCE DOCUMENTATION

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Assessment Endpoint	Measures of Effect	Overall Score[b]	Attribute[a]									
			Biological Linkage	Correlation of Stressor/Response	Utility of Measure	Quality of Data	Site-specificity	Sensitivity	Spatial Representativeness	Temporal Representativeness	Quantitativeness	Standard Measure
5. Protection and maintenance of insectivorous mammal and bird populations	A. Comparison of estimated ingestion doses in insectivorous wildlife with TRVs and toxic equivalencies	Medium	M	M-H	M-H	M	M	M	M	M-H	M	M-H
	B_1. Comparison of measured insectivorous wildlife tissue and/or egg residues with CBR data	Medium - High	M	M-H	M	M-H	M-H	M	M-H	M-H	H	H
	B_2. Comparison of estimated insectivorous wildlife tissue and/or egg residues with CBR data	Medium	M	M-H	M	L	L-M	M	L-M	L-M	M	M
	C_1. Measurement of reproductive effects in local tree swallow populations	Medium - High	H	H	M-H	M-H	H	M	H	H	M-H	M-H
	C_2. Survey of calling amphibians	Low - Medium	M-H	L	L	M	M-H	L	M-H	M	L	L-M
	D. Measurement of MFO activity in tree swallow nestling tissue	Medium	L	M-H	M	L-M	H	M	H	H	L-M	M-H
6. Protection and maintenance of omnivorous mammal and bird populations	A. Comparison of estimated ingestion doses in omnivorous wildlife with TRVs and toxic equivalencies	Medium	M	M-H	M-H	M	L-M	M	M	M-H	M	M-H

TABLE 15
BERA ENDPOINTS AND WEIGHT-OF-EVIDENCE DOCUMENTATION

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Assessment Endpoint	Measures of Effect	Overall Score[b]	Attribute[a]									
			Biological Linkage	Correlation of Stressor/Response	Utility of Measure	Quality of Data	Site-specificity	Sensitivity	Spatial Representativeness	Temporal Representativeness	Quantitativeness	Standard Measure

Notes:
The full expression of the assessment endpoints include the risk questions and associated measures of effect; see discussion in Section 2.6.

a. Attributes as discussed in MWOEW, 1995, which provides the following guidance for attribute scoring:

Biological Linkage: Correlation and/or applicability of measurement endpoint with respect to assessment endpoint; linkage based on known biological processes; similarity of effect; target organ, mechanism of action, and level of ecological organization

Correlation of Stressor/Response: Ability of endpoint to demonstrate effects from chronic exposure to stressor and to correlate effects with degree of exposure; susceptibility and magnitude of effects

Utility of Measure: Applicability, certainty, and scientific basis of measure that is used to judge environmental harm; sensitivity of benchmark in detecting environmental harm

Quality of Data: Extent to which DQOs are met

Site-Specificity: Representativeness of chemical or biological data, environmental media, species, environmental conditions, benchmark (or reference) and habitat types that are used in the measurement endpoint relative to those present at the site

Sensitivity: The percentage of the total possible variability that the endpoint is able to detect; ability of measurement endpoint to detect effects from stressor, rather than from natural or design variability or uncertainty

Spatial Representativeness: Spatial overlap of study area, measurement or sampling locations, locations of stressors, locations of receptors, and points of potential exposure to those receptors

Temporal Representativeness: Temporal overlap between the measurement period and the period during which chronic effects would likely to be detected (daily, weekly, seasonally, annually)

Quantitativeness: Results are quantitative/qualitative, subjective/objective, sufficient to test for statistical significance, and extent to which biological significance

TABLE 15
BERA ENDPOINTS AND WEIGHT-OF-EVIDENCE DOCUMENTATION

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Assessment Endpoint	Measures of Effect	Overall Score[b]	Attribute[a]									
			Biological Linkage	Correlation of Stressor/Response	Utility of Measure	Quality of Data	Site-specificity	Sensitivity	Spatial Representativeness	Temporal Representativeness	Quantitativeness	Standard Measure

can be evaluated.

Standard Measure: Method availability; ASTM approval, suitability and applicability to endpoint and site; need for modification of method; relationship to impact assessment, field survey, toxicity test, benchmark, toxicity quotient, or tissue residue analysis methodologies

b. The overall score derived for each measurement endpoint is a quatitative measure of its relative importance in characterizing risk at a given assessment endpoint using multiple lines of evidence. The overall score is determined by the *a priori* assignments for the 10 attributes..

TABLE 16
SUMMARY OF ENDPOINT RECEPTORS BY EXPOSURE AREA

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Assessment Endpoint[a]	Receptors of Concern[b]	Exposure Habitat	Exposure Area[c]					
			Allendale	Lyman Mill	Manton	Dyerville	Assapumpset	Greystone
Aquatic/Floodplain Invertebrate Communities	Invertebrate Community	Aquatic	*	*	*	*	*	*
	Invertebrate Community	Floodplain Soil	*	*				*
Demersal/Omnivorous Fish Populations	White Sucker/Brown Bullhead/Eel	Aquatic	*	*	*	*	*	*
Pelagic/Piscivorous Fish Populations	Largemouth Bass	Aquatic		*	*		*	*
Piscivorous Mammal and Bird Populations	River Otter	Aquatic	*	*	*	*	*	*
	Belted Kingfisher	Aquatic	*	*	*	*	*	*
	Great Blue Heron	Aquatic	*	*	*	*	*	*
Insectivorous Mammal and Bird Populations	Short-tailed Shrew	Floodplain Soil	*	*				*
	Little Brown Bat	Aquatic	*	*	*	*	*	*
	Woodcock	Floodplain Soil	*	*				*
	Tree Swallow	Aquatic	*	*	*	*	*	*
Omnivorous Mammal and Bird Populations	Raccoon	Aquatic/Floodplain Soil	*	*	*	*	*	*
	Mallard	Aquatic	*	*	*	*	*	*

Notes:
a. Assessment endpoints described in Section 2.6.
b. Receptors of Concern are described in Section 2.2.3.
c. Exposure Areas as defined in Section 2.1; the upriver background area (Greystone Mill Pond) and reference area (Assapumpset Pond) are shaded.

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TABLE 17
SUMMARY OF WILDLIFE ENDPOINT RECEPTORS AND EVALUATED EXPOSURE PATHWAYS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Receptor[c]	Trophic Status[b]	Exposure Pathway[a]							
					Consumption of Contaminated Food				
		Water Ingestion	Incidental Sediment Ingestion	Incidental Soil Ingestion	Aquatic Plants	Aquatic Invertebrates	Fish	Floodplain Plants	Floodplain Invertebrates
Belted Kingfisher	P	Yes	No	No	No	Yes	Yes	No	No
Great Blue Heron	P	Yes	Yes	No	No	Yes	Yes	No	No
River Otter	P	Yes	Yes	No	No	Yes	Yes	No	No
Tree Swallow	I	Yes	No	No	No	Yes	No	No	No
Tree Swallow (nestling)	I	Yes	No	No	No	Yes	No	No	No
Little Brown Bat	I	Yes	No	No	No	Yes	No	No	No
Woodcock	V	Yes	No	Yes	No	No	No	No	Yes
Short-tailed Shrew	V	Yes	No	Yes	No	No	No	Yes	Yes
Mallard	O	Yes	Yes	No	Yes	Yes	No	No	No
Raccoon (aquatic)	O	Yes	Yes	No	No	Yes	Yes	No	No
Raccoon (floodplain)	O	Yes	No	Yes	No	No	No	Yes	Yes

Notes:

a. Exposure pathways are discussed in Section 2.2.4.

b. Wildlife species representing three broad categories of foraging strategy were evaluated in the BERA; the insectivore category includes species that feed primarily on earthworms (i.e., vermivores).
   P - piscivores
   I - insectivores
   V - vermivores
   O - omnivores

c. Receptors of concern selected to evaluate each of the three wildlife population assessment endpoints are described in Section 2.2.3.

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TABLE 18
SUMMARY OF MISCELLANEOUS FOOD WEB MODELING INPUTS - PISCIVOROUS WILDLIFE RECEPTORS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Parameter/Receptor/Medium	Exposure Area				Reference	Background
	Allendale	Lyman Mill	Manton	Dyerville	Assapumpset	Greystone
Exposure Area (ha)	5.22	8.77	2.18	6.73	1000	1000
Site Foraging Frequency[a]						
Kingfisher	1	1	1	1	1	1
Heron	1	1	1	1	1	1
Otter	0.08	0.08	0.08	0.08	1	1
Exposure Media Available?						
Surface Water	Yes	Yes	No	No	Yes	Yes
Sediment	Yes[d]	Yes[d]	Yes[d]	Yes[d]	Yes[d]	Yes[d]
Aquatic Invertebrate	Yes	Yes	No	No	Yes	Yes
Fish	Yes	Yes	Yes	Yes	Yes	Yes
EPC Basis[b]						
Surface Water	data	data	not derived	not derived	data	data
Sediment	data	data	data	data	data	data
Aquatic Invertebrate	data (cf)	data (cf)	estimated	estimated	data (cf)	data (cf)
Fish	data (ws)	data (ws)	data (lmb)	estimated	data (bb)	data (ws)
Miscellaneous Parameters[c]						
Sediment Organic Carbon	6.53%	7.10%	2.70%	2.26%	3.20%	7.36%
Fish Lipid	5.07%	6.84%	7.95%	7.95%	7.95%	10.36%
Invertebrate Lipid	2.79%	2.58%	2.56%	2.56%	2.91%	2.30%

Notes:
a. The Site Foraging Frequency (SFF) is the ratio of a receptor's typical foraging range relative the available contaminated Site Area. SFFs were calculated using the foraging range data presented in Appendix I and the total Site Area (i.e., 22.9 hectares).
b. EPCs were developed using available data for a specific EA or (in the case of prey tissue concentrations) were estimated using site-specific uptake factors (e.g., BSAFs). The specific biological tissue used is indicated: cf - crayfish, ws - white sucker, lmb - largemouth bass, bb - brown bullhead.
c. Miscellaneous parameters were estimated from downloads from the project database and were used to adjust BSAFs to estimate prey tissue concentrations for those EAs lacking analytical data. Shaded cells represent average values for the entire Site.
d. Exposure medium available to the heron and otter only.

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TABLE 19
SUMMARY OF MISCELLANEOUS FOOD WEB MODELING INPUTS - INSECTIVOROUS/VERMIVOROUS WILDLIFE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Insectivorous Wildlife - Aquatic Exposures

Parameter/Receptor/Medium	Exposure Area				Reference	Background
	Allendale	Lyman Mill	Manton	Dyerville	Assapumpset	Greystone
Exposure Area (ha)	5.22	8.77	2.18	6.73	1000	1000
Site Foraging Frequency[a]						
Tree Swallow	1	1	1	1	not evaluated	1
Tree Swallow Nestling	1	1	1	1	not evaluated	1
Little Brown Bat	1	1	1	1	not evaluated	1
Exposure Media Available?						
Surface Water	Yes	Yes	No	No	Yes	Yes
Emerging Invertebrate	Yes	Yes	No	No	No	Yes
EPC Basis[b]						
Surface Water	data	data	not derived	not derived	-	data
Aquatic Invertebrate	estimated	estimated	estimated	estimated	-	estimated
Miscellaneous Parameters[c]						
Sediment Organic Carbon	6.53%	7.10%	2.70%	2.26%	-	7.36%
Emerging Insect Lipid	2.66%	2.49%	2.66%	2.66%	-	2.82%

Vermivorous Wildlife - Floodplain Exposures

Parameter/Receptor/Medium	Exposure Area				Reference	Background
	Allendale	Lyman Mill	Manton	Dyerville	Assapumpset	Greystone
Exposure Area (ha)	1.74	2.08	not evaluated	not evaluated	not evaluated	1000
Site Foraging Frequency[a]						
Woodcock	0.76	0.76	not evaluated	not evaluated	not evaluated	1
Short-tailed Shrew	1	1	not evaluated	not evaluated	not evaluated	1
Exposure Media Available?						
Surface Water	Yes	Yes	No	No	Yes	Yes
Soil	Yes	Yes	No	No	No	Yes
Floodplain Plants	Yes[d]	Yes[d]	No	No	No	Yes[d]
Soil Invertebrates	Yes	Yes	No	No	No	Yes

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TABLE 19
SUMMARY OF MISCELLANEOUS FOOD WEB MODELING INPUTS - INSECTIVOROUS/VERMIVOROUS WILDLIFE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Vermivorous Wildlife - Floodplain Exposures (continued)

Parameter/Receptor/Medium	Exposure Area				Reference	Background
	Allendale	Lyman Mill	Manton	Dyerville	Assapumpset	Greystone
EPC Basis[b]						
Surface Water	data	data	-	-	-	data
Soil	data	data	-	-	-	data
Floodplain Plants	estimated	estimated	-	-	-	estimated
Soil Invertebrates	data (ew)	data (ew)	-	-	-	data (ew)
Miscellaneous Parameters[c]						
Soil Organic Carbon	6.75%	6.25%	-	-	-	7.63%
Earthworm Lipid	2.83%	2.66%	-	-	-	2.82%

Notes:

a. The Site Foraging Frequency (SFF) is the ratio of a receptor's typical foraging range relative the available contaminated Site Area. SFFs were calculated using the foraging range data presented in Appendix I and the total Site Area (i.e., 21.9 and 3.81 hectares for aquatic and floodplain exposures, respectively).

b. EPCs were developed using available data for a specific EA or (in the case of prey tissue concentrations) were estimated using site-specific uptake factors (e.g., BSAFs or BAFs). The specific biological tissue used is indicated: ew - earthworm. Floodplain plant tissue were estimated using literature-derived BAFs and an average BSAF for emerging insect and tree swallow stomach contents was used to estimate insect concentrations.

c. Miscellaneous parameters were estimated from downloads from the project database and were used to adjust BSAFs to estimate prey tissue concentrations for those EAs lacking analytical data. Shaded cells represent average values for the entire Site.

d. Exposure medium available to the short-tailed shrew only.

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TABLE 20
SUMMARY OF MISCELLANEOUS FOOD WEB MODELING INPUTS - OMNIVOROUS WILDLIFE RECEPTORS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Omnivorous Wildlife - Aquatic Exposures

Parameter/Receptor/Medium	Exposure Area				Reference	Background
	Allendale	Lyman Mill	Manton	Dyerville	Assapumpset	Greystone
Exposure Area (ha)	5.22	8.77	2.18	6.73	1000	1000
Site Foraging Frequency[a]						
Mallard	0.04	0.04	0.04	0.04	1	1
Raccoon	0.21	0.21	0.21	0.21	1	1
Exposure Media Available?						
Surface Water	Yes	Yes	No	No	Yes	Yes
Sediment	Yes	Yes	Yes	Yes	Yes	Yes
Aquatic Plants	No	No	No	No	No	No
Aquatic Invertebrate	Yes	Yes	No	No	Yes	Yes
Fish	Yes	Yes	Yes	Yes	Yes	Yes
EPC Basis[b]						
Surface Water	data	data	not derived	not derived	data	data
Sediment	data	data	data	data	data	data
Aquatic Plants	estimated	estimated	estimated	estimated	estimated	estimated
Aquatic Invertebrate	data (cf)	data (cf)	estimated	estimated	data (cf)	data (cf)
Fish	data (ws)	data (ws)	data (lmb)	estimated	data (bb)	data (ws)
Miscellaneous Parameters[c]						
Sediment Organic Carbon	6.53%	7.10%	2.70%	2.26%	7.36%	7.36%
Fish Lipid	5.07%	6.84%	7.95%	7.95%	7.95%	10.36%
Invertebrate Lipid	2.79%	2.58%	2.56%	2.56%	2.91%	2.30%

Omnivorous Wildlife - Floodplain Exposures

Parameter/Receptor/Medium	Exposure Area				Reference	Background
	Allendale	Lyman Mill	Manton	Dyerville	Assapumpset	Greystone
Exposure Area (ha)	1.74	2.08	not evaluated	not evaluated	not evaluated	1000
Site Foraging Frequency[a]						
Raccoon	0.04	0.04	not evaluated	not evaluated	not evaluated	1

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TABLE 20
SUMMARY OF MISCELLANEOUS FOOD WEB MODELING INPUTS - OMNIVOROUS WILDLIFE RECEPTORS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Omnivorous Wildlife - Floodplain Exposures (continued)

Parameter/Receptor/Medium	Exposure Area				Reference	Background
	Allendale	Lyman Mill	Manton	Dyerville	Assapumpset	Greystone
Exposure Media Available?						
Surface Water	Yes	Yes	No	No	not evaluated	Yes
Soil	Yes	Yes	No	No	not evaluated	Yes
Floodplain Plants	No	No	No	No	not evaluated	No
Soil Invertebrates	Yes	Yes	No	No	not evaluated	Yes
EPC Basis[b]						
Surface Water	data	data	-	-	-	data
Soil	data	data	-	-	-	data
Floodplain Plants	estimated	estimated	-	-	-	estimated
Soil Invertebrates	data (ew)	data (ew)	-	-	-	data (ew)
Miscellaneous Parameters[c]						
Soil Organic Carbon	6.75%	6.25%	-	-	-	7.63%
Earthworm Lipid	2.83%	2.66%	-	-	-	2.82%

Notes:

a. The Site Foraging Frequency (SFF) is the ratio of a receptor's typical foraging range relative the available contaminated Site Area. SFFs were calculated using the foraging range data presented in Appendix I and the total Site Area (i.e., 22.9 and 3.81 hectares for aquatic and floodplain exposures, respectively).

b. EPCs were developed using available data for a specific EA or (in the case of prey tissue concentrations) were estimated using site-specific uptake factors (e.g., BSAFs or BAFs). The specific biological tissue used is indicated: ew - earthworm, cf - crayfish, ws - white sucker, lmb - largemouth bass, bb - brown bullhead. Floodplain plant tissue concentrations were estimated using literature-derived BAFs.

c. Miscellaneous parameters were estimated from downloads from the project database and were used to adjust BSAFs to estimate prey tissue concentrations for those EAs lacking analytical data. Shaded cells represent average values for the entire Site.

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TABLE 21
EXPOSURE EQUATIONS USED TO ESTIMATE DAILY WILDLIFE CONTAMINANT INTAKE – AQUATIC EXPOSURES

Baseline Ecological Risk Assessment – Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Estimated Daily Intake

$$EDI_{total} = EDI_{water} + EDI_{sed} + EDI_{diet}$$

Surface Water Ingestion

$$EDI_{water} = \frac{C_{water} * IR_{water} * SFF * EF}{BW}$$

Incidental Sediment Ingestion

$$EDI_{sed} = \frac{C_{sed} * IR_{sed} * SFF * EF}{BW}$$

Dietary Intake

$$EDI_{diet} = EDI_{plant} + EDI_{invert} + EDI_{fish}$$

Aquatic Plant Intake

$$EDI_{plant} = \frac{C_{plant} * IR_{food} * P_{plant} * SFF * EF}{BW}$$

Aquatic Invertebrate Intake

$$EDI_{invert} = \frac{C_{invert} * IR_{food} * P_{invert} * SFF * EF}{BW}$$

Fish Intake

$$EDI_{fish} = \frac{C_{fish} * IR_{food} * P_{fish} * SFF * EF}{BW}$$

Parameter	Definition	Units	Value
EDI_{total}	Total estimated daily intake of a chemical for a receptor species	mg/kg-day	calculated
EDI_{water}	Total estimated daily intake of a chemical for a receptor	mg/kg-day	calculated
EDI_{sed}	Total estimated daily intake of a chemical via the incidental sediment ingestion pathway for a receptor	mg/kg-day	calculated
EDI_{diet}	Total estimated daily intake of a chemical via the consumption of contaminated prey pathway for a	mg/kg-day	calculated

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TABLE 21
EXPOSURE EQUATIONS USED TO ESTIMATE DAILY WILDLIFE CONTAMINANT INTAKE – AQUATIC EXPOSURES

Baseline Ecological Risk Assessment – Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Parameter	Definition	Units	Value
	receptor		
C_{water}	Chemical concentration in surface water	mg/L	chemical-specific[a]
IR_{water}	Drinking water ingestion rate	L/day	receptor-specific[b]
SFF	Site Foraging Frequency (ratio of foraging or home range to Site area)	unitless	receptor-specific[b]
EF	Exposure Frequency (number of days present at Site/year)	unitless	receptor-specific[b]
BW	Body weight	kg	receptor-specific[b]
C_{sed}	Chemical concentration in sediment	mg/kg (dw)	chemical-specific[a]
IR_{sed}	Ingestion rate of sediment	kg/day	receptor-specific[b]
EDI_{plant}	Total estimated daily intake of a chemical via consumption of contaminated plants in the diet of a receptor	mg/kg-day	calculated
C_{plant}[c]	Chemical concentration in aquatic plant forage	mg/kg (ww)	chemical-specific[a]
IR_{food}	Food ingestion rate	kg/day	receptor-specific[b]
P_{plant}	Percentage of plant mass in the diet of a receptor	unitless	receptor-specific[b]
EDI_{invert}	Total estimated daily intake of a chemical via consumption of contaminated invertebrate prey in the diet of a receptor	mg/kg-day	calculated
C_{invert}[d]	Chemical concentration in aquatic invertebrate prey	mg/kg (ww)	chemical-specific[a]
P_{invert}	Percentage of invertebrate mass in the diet of a receptor	unitless	receptor-specific[b]
EDI_{fish}	Total estimated daily intake of a chemical via consumption of contaminated fish prey in the diet of a receptor	mg/kg-day	calculated
C_{fish}[e]	Chemical concentration in fish prey	mg/kg (ww)	chemical-specific[a]
P_{fish}	Percentage of fish mass in the diet of a receptor	unitless	receptor-specific[b]

TABLE 21
EXPOSURE EQUATIONS USED TO ESTIMATE DAILY WILDLIFE CONTAMINANT INTAKE – AQUATIC EXPOSURES

Baseline Ecological Risk Assessment – Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Notes:

a. Abiotic media exposure point concentrations were estimated as the CT EPC.
b. Receptor-specific exposure parameters for aquatic and semi-aquatic wildlife endpoint receptor species are documented in Appendix I.
c. COPC concentrations in plant forage were estimated by multiplying the CT EPC sediment concentration (Table 27) by aquatic plant BAFs; plant BAFs are summarized in Table J-1.
d. COPC concentrations in aquatic invertebrate prey were estimated using CT EPCs for crayfish tissue (Table 29) collected during the 2001 field sampling program, or site-specific BSAFs for crayfish as presented in Tables J-2 and J-3 in Appendix J. COPC concentrations in aerial insect prey were estimated using the CT EPCs for emerging insects (Table 31) or site-specific BSAFs for emerging insects and swallow stomach contents as presented in Tables J-6 and J-7. BSAFs were adjusted by the average sediment organic carbon concentration in a particular exposure area and by the average lipid content of the analyzed insect tissue samples.
e. COPC concentrations in fish prey were estimated using the CT EPCs for white sucker tissue (Table 80) collected during the 2001 field sampling program, or site-specific BSAFs for white sucker as presented in Tables J-4 and J-5 in Appendix J. BSAFs were adjusted by the average sediment organic carbon concentration in a particular exposure area and by the average lipid content of the white sucker tissue samples.

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TABLE 22
EXPOSURE EQUATIONS USED TO ESTIMATE WILDLIFE DAILY CONTAMINANT INTAKE – FLOODPLAIN EXPOSURES

Baseline Ecological Risk Assessment – Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Estimated Daily Intake
$$EDI_{total} = EDI_{water} + EDI_{soil} + EDI_{diet}$$
Surface Water Ingestion
$$EDI_{water} = \frac{C_{water} * IR_{water} * SFF * EF}{BW}$$
Incidental Soil Ingestion
$$EDI_{soil} = \frac{C_{soil} * IR_{soil} * SFF * EF}{BW}$$
Dietary Intake
$$EDI_{diet} = EDI_{plant} + EDI_{invert} + EDI_{fish}$$
Terrestrial Plant Intake
$$EDI_{plant} = \frac{C_{plant} * IR_{food} * P_{plant} * SFF * EF}{BW}$$
Soil Invertebrate Intake
$$EDI_{invert} = \frac{C_{invert} * IR_{food} * P_{invert} * SFF * EF}{BW}$$

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TABLE 22
EXPOSURE EQUATIONS USED TO ESTIMATE WILDLIFE DAILY CONTAMINANT INTAKE – FLOODPLAIN EXPOSURES

Baseline Ecological Risk Assessment – Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Parameter	Definition	Units	Value
EDI_{total}	Total estimated daily intake of a chemical for a receptor species	mg/kg-day	calculated
EDI_{water}	Total estimated daily intake of a chemical for a receptor	mg/kg-day	calculated
EDI_{soil}	Total estimated daily intake of a chemical via the incidental soil ingestion pathway for a receptor	mg/kg-day	calculated
EDI_{diet}	Total estimated daily intake of a chemical via the consumption of contaminated prey pathway for a receptor	mg/kg-day	calculated
C_{water}	Chemical concentration in surface water	mg/L	chemical-specific[a]
IR_{water}	Drinking water ingestion rate	L/day	receptor-specific[b]
SFF	Site Foraging Frequency (ratio of foraging or home range to Site area)	unitless	receptor-specific[b]
EF	Exposure Frequency (number of days present at Site/year)	unitless	receptor-specific[b]
BW	Body weight	kg	receptor-specific[b]
C_{soil}	Chemical concentration in soil	mg/kg (dw)	chemical-specific[a]
IR_{soil}	Ingestion rate of soil	kg/day	receptor-specific[b]
EDI_{plant}	Total estimated daily intake of a chemical via consumption of contaminated plants in the diet of a receptor	mg/kg-day	calculated
C_{plant}[c]	Chemical concentration in aquatic plant forage	mg/kg (ww)	chemical-specific[a]
IR_{food}	Food ingestion rate	kg/day	receptor-specific[b]
P_{plant}	Percentage of plant mass in the diet of a receptor	unitless	receptor-specific[b]
EDI_{invert}	Total estimated daily intake of a chemical via consumption of contaminated invertebrate prey in the diet of a receptor	mg/kg-day	calculated
C_{invert}[d]	Chemical concentration in aquatic invertebrate prey	mg/kg (ww)	chemical-specific[a]
P_{invert}	Percentage of invertebrate mass in the diet of a receptor	unitless	receptor-specific[b]

TABLE 22
EXPOSURE EQUATIONS USED TO ESTIMATE WILDLIFE DAILY CONTAMINANT INTAKE – FLOODPLAIN EXPOSURES

Baseline Ecological Risk Assessment – Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Notes:

a. Abiotic media exposure point concentrations were estimated as the CT EPC concentrations.
b. Receptor-specific exposure parameters for terrestrial wildlife endpoint receptor are documented in Appendix I.
c. COPC concentrations of plant forage were estimated by multiplying the CT EPC floodplain soil concentration (Table 67) by the terrestrial plant BAFs; plant BAFs are summarized in Table J-1.
d. COPC concentrations in soil invertebrate prey (i.e., earthworms) were estimated using CT EPCs for field caught earthworm tissue (Table 69) or site-specific BSAFs (calculated as the average organic carbon/lipid normalized ratios from individual collocated earthworm tissue/floodplain soil analytical data sets) and multiplying by the CT EPC soil concentration. BSAFs were adjusted to the average floodplain soil organic carbon concentration in a particular exposure area and by the average lipid content of the analyzed earthworms. Earthworm BSAFs are presented in Appendix J-8.

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Table 23
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Surface Water

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
ASSAPUMPSET	**Semivolatile Organics**								
(Reference area)	bis(2-Ethylhexyl)phthalate	MG/L	0.0033	NC	0.001 J	0.001	MG/L	Max	(3)
	Total Metals								
	Aluminum	MG/L	0.16	NC	0.263	0.16	MG/L	Mean	(2)
	Beryllium	MG/L	0.00027	NC	0.0000487 J	0.0000487	MG/L	Max	(3)
	Cobalt	MG/L	0.00031	NC	0.000114	0.000114	MG/L	Max	(3)
	Copper	MG/L	0.0021	NC	0.0035	0.0021	MG/L	Mean	(2)
	Iron	MG/L	0.97	NC	1.11	0.97	MG/L	Mean	(2)
	Lead	MG/L	0.00068	NC	0.000366	0.000366	MG/L	Max	(3)
	Manganese	MG/L	0.14	NC	0.166	0.14	MG/L	Mean	(2)
	Nickel	MG/L	0.0017	NC	0.0021 J	0.0017	MG/L	Mean	(2)
	Selenium	MG/L	0.0013	NC	0.0000815 J	0.0000815	MG/L	Max	(3)
	Thallium	MG/L	0.0018	NC	0.00000511 J	0.00000511	MG/L	Max	(3)
	Zinc	MG/L	0.034	NC	0.0665	0.034	MG/L	Mean	(2)
	Dissolved Metals								
	Aluminum, Dissolved	MG/L	0.027	NC	0.019 J	0.019	MG/L	Max	(3)
	Copper, Dissolved	MG/L	0.0025	NC	0.0034	0.0025	MG/L	Mean	(2)
	Iron, Dissolved	MG/L	0.52	NC	0.551	0.52	MG/L	Mean	(2)
	Lead, Dissolved	MG/L	0.00062	NC	0.000232	0.000232	MG/L	Max	(3)
	Manganese, Dissolved	MG/L	0.075	NC	0.127	0.075	MG/L	Mean	(2)
	Thallium, Dissolved	MG/L	0.0018	NC	0.00000806 J	0.00000806	MG/L	Max	(3)
	Zinc, Dissolved	MG/L	0.012	NC	0.0206	0.012	MG/L	Mean	(2)
	Inorganics								
	Dissolved Organic Carbon	MG/L	6.06	NC	6.06	6.06	MG/L	Mean	(2)
	Total Organic Carbon	MG/L	6.18	NC	6.18	6.18	MG/L	Mean	(2)
	Biochemical Oxygen Demand	MG/L	2.4	NC	2.4	2.4	MG/L	Mean	(2)
	Nitrogen, Ammonia	MG/L	0.011	NC	0.011 J	0.011	MG/L	Mean	(2)
	Total Suspended Solids	MG/L	3.6	NC	3.6	3.6	MG/L	Mean	(2)
	Dioxins/Furans								
	Toxicity Equivalency - Mammals	MG/L	0.0000000053	NC	0.0000000053	0.0000000053	MG/L	Mean	(2)
	Toxicity Equivalency - Birds	MG/L	0.0000000070	NC	0.0000000070	0.0000000070	MG/L	Mean	(2)
	Toxicity Equivalency - Fish	MG/L	0.0000000057	NC	0.0000000057	0.0000000057	MG/L	Mean	(2)

Table 23
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Surface Water

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
GREYSTONE	**Total Metals**								
(Background area)	Aluminum	MG/L	0.089	NC	0.166	0.089	MG/L	Mean	(2)
	Beryllium	MG/L	0.00020	NC	0.0000551 J	0.0000551	MG/L	Max	(3)
	Chromium	MG/L	0.0048	NC	0.0025	0.0025	MG/L	Max	(3)
	Cobalt	MG/L	0.00025	NC	0.00012	0.00012	MG/L	Max	(3)
	Copper	MG/L	0.0054	NC	0.0126	0.0054	MG/L	Mean	(2)
	Iron	MG/L	0.68	NC	0.716	0.68	MG/L	Mean	(2)
	Lead	MG/L	0.0029	NC	0.0068	0.0029	MG/L	Mean	(2)
	Manganese	MG/L	0.13	NC	0.144	0.13	MG/L	Mean	(2)
	Nickel	MG/L	0.0019	NC	0.0035 J	0.0019	MG/L	Mean	(2)
	Selenium	MG/L	0.00093	NC	0.0000868 J	0.0000868	MG/L	Max	(3)
	Thallium	MG/L	0.0012	NC	0.00000741 J	0.00000741	MG/L	Max	(3)
	Zinc	MG/L	0.020	NC	0.0482	0.020	MG/L	Mean	(2)
	Dissolved Metals								
	Aluminum, Dissolved	MG/L	0.016	NC	0.0251 J	0.016	MG/L	Mean	(2)
	Cadmium, Dissolved	MG/L	0.0011	NC	0.004	0.0011	MG/L	Mean	(2)
	Copper, Dissolved	MG/L	0.0028	NC	0.0055	0.0028	MG/L	Mean	(2)
	Iron, Dissolved	MG/L	0.34	NC	0.51	0.34	MG/L	Mean	(2)
	Lead, Dissolved	MG/L	0.00074	NC	0.000542	0.000542	MG/L	Max	(3)
	Manganese, Dissolved	MG/L	0.088	NC	0.112	0.088	MG/L	Mean	(2)
	Nickel, Dissolved	MG/L	0.0072	NC	0.0232	0.0072	MG/L	Mean	(2)
	Thallium, Dissolved	MG/L	0.0018	NC	0.00000908 J	0.00000908	MG/L	Max	(3)
	Zinc, Dissolved	MG/L	0.018	NC	0.0343	0.018	MG/L	Mean	(2)
	Inorganics								
	Dissolved Organic Carbon	MG/L	5.6	NC	5.64	5.6	MG/L	Mean	(2)
	Total Organic Carbon	MG/L	5.4	NC	5.52	5.4	MG/L	Mean	(2)
	Biochemical Oxygen Demand	MG/L	2.6	NC	2.8	2.6	MG/L	Mean	(2)
	Nitrogen, Ammonia	MG/L	0.39	NC	0.447 J	0.39	MG/L	Mean	(2)
	Total Suspended Solids	MG/L	2.4	NC	2.4	2.4	MG/L	Mean	(2)
	Dioxins/Furans								
	Toxicity Equivalency - Mammals	MG/L	0.0000000056	NC	0.0000000056	0.0000000056	MG/L	Mean	(2)
	Toxicity Equivalency - Birds	MG/L	0.0000000072	NC	0.0000000072	0.0000000072	MG/L	Mean	(2)
	Toxicity Equivalency - Fish	MG/L	0.0000000059	NC	0.0000000059	0.0000000059	MG/L	Mean	(2)

Table 23
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Surface Water

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ALLENDALE	**Semivolatile Organics**										
	bis(2-Ethylhexyl)phthalate	MG/L	0.0048	0.0048	NP	0.001	J	0.001	MG/L	Max	(3)
	Pesticides/PCBs										
	alpha-Chlordane	MG/L	0.000020	0.000020	NP	0.00000069	J	0.00000069	MG/L	Max	(3)
	Endosulfan Sulfate	MG/L	0.000059	0.00043	T	0.00049		0.000059	MG/L	Mean	(2)
	gamma-Chlordane	MG/L	0.000025	0.000025	NP	0.00012		0.000025	MG/L	Mean	(2)
	Total Metals										
	Aluminum	MG/L	0.65	0.65	NP	6.19		0.65	MG/L	Mean	(2)
	Beryllium	MG/L	0.00031	0.00042	N	0.00005	J	0.00005	MG/L	Max	(3)
	Chromium	MG/L	0.0051	0.018	T	0.042		0.0051	MG/L	Mean	(2)
	Cobalt	MG/L	0.00060	0.00060	NP	0.0054		0.00060	MG/L	Mean	(2)
	Copper	MG/L	0.013	0.013	NP	0.0914		0.013	MG/L	Mean	(2)
	Iron	MG/L	7.8	7.8	NP	113		7.8	MG/L	Mean	(2)
	Lead	MG/L	0.021	0.021	NP	0.223		0.021	MG/L	Mean	(2)
	Manganese	MG/L	0.40	0.98	T	2.6		0.40	MG/L	Mean	(2)
	Nickel	MG/L	0.0049	0.0092	T	0.0343	J	0.0049	MG/L	Mean	(2)
	Selenium	MG/L	0.0024	0.0058	T	0.0108		0.0024	MG/L	Mean	(2)
	Silver	MG/L	0.00083	0.00083	NP	0.0018	J	0.00083	MG/L	Mean	(2)
	Thallium	MG/L	0.0037	0.0037	NP	0.0145		0.0037	MG/L	Mean	(2)
	Zinc	MG/L	0.065	0.16	T	0.5		0.065	MG/L	Mean	(2)
	Dissolved Metals										
	Aluminum, Dissolved	MG/L	0.034	0.049	T	0.14		0.034	MG/L	Mean	(2)
	Copper, Dissolved	MG/L	0.0042	0.0065	T	0.016		0.0042	MG/L	Mean	(2)
	Iron, Dissolved	MG/L	0.84	0.84	NP	7.95		0.84	MG/L	Mean	(2)
	Lead, Dissolved	MG/L	0.00078	0.00078	NP	0.000501		0.000501	MG/L	Max	(3)
	Manganese, Dissolved	MG/L	0.29	0.77	T	1.57		0.29	MG/L	Mean	(2)
	Selenium, Dissolved	MG/L	0.0018	0.0039	T	0.0053		0.0018	MG/L	Mean	(2)
	Silver, Dissolved	MG/L	0.00078	0.00078	NP	0.0017	J	0.00078	MG/L	Mean	(2)
	Thallium, Dissolved	MG/L	0.0029	0.0029	NP	0.0106	J	0.0029	MG/L	Mean	(2)
	Zinc, Dissolved	MG/L	0.058	0.06	NP	0.121		0.058	MG/L	Mean	(2)

Table 23
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Surface Water

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ALLENDALE (continued)	**Inorganics**										
	Dissolved Organic Carbon	MG/L	5.053	NC		5.23		5.053	MG/L	Mean	(2)
	Total Organic Carbon	MG/L	5.2	NC		5.33		5.2	MG/L	Mean	(2)
	Biochemical Oxygen Demand	MG/L	6.5	NC		18.6		6.5	MG/L	Mean	(2)
	Conductivity	MS/CM	206	NC		206		206	MG/L	Mean	(2)
	Nitrogen, Ammonia	MG/L	0.24	NC		0.306	J	0.24	MG/L	Mean	(2)
	pH	SU	6.8	NC		6.8		6.8	MG/L	Mean	(2)
	Total Suspended Solids	MG/L	5.4	NC		14.4		5.4	MG/L	Mean	(2)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/L	0.0000011	0.0000011	NP	0.00001274	J	0.0000011	MG/L	Mean	(2)
	2,3,7,8-TCDF	MG/L	0.0000000085	0.0000000085	NP	0.0000000531	J	0.0000000085	MG/L	Mean	(2)
	Toxicity Equivalency - Mammals	MG/L	0.0000011	0.0000011	NP	0.0000129		0.0000011	MG/L	Mean	(2)
	Toxicity Equivalency - Birds	MG/L	0.0000011	0.0000011	NP	0.0000129		0.0000011	MG/L	Mean	(2)
	Toxicity Equivalency - Fish	MG/L	0.0000011	0.0000011	NP	0.0000129		0.0000011	MG/L	Mean	(2)
LYMAN MILL	**Semivolatile Organics**										
	bis(2-Ethylhexyl)phthalate	MG/L	0.017	0.017	NP	0.16	*	0.017	MG/L	Mean	(2)
	Pesticides/PCBs										
	alpha-Chlordane	MG/L	0.000021	0.000021	NP	0.000019	J	0.000019	MG/L	Max	(3)
	Endosulfan Sulfate	MG/L	0.000039	0.000039	NP	0.0000032	J	0.0000032	MG/L	Max	(3)
	gamma-Chlordane	MG/L	0.000021	0.000021	NP	0.000021	J	0.000021	MG/L	Mean	(2)
	Total Metals										
	Aluminum	MG/L	0.18	0.58	T	0.917		0.18	MG/L	Mean	(2)
	Beryllium	MG/L	0.00027	0.00027	NP	0.0002		0.0002	MG/L	Max	(3)
	Chromium	MG/L	0.0023	0.0023	NP	0.0063		0.0023	MG/L	Mean	(2)
	Cobalt	MG/L	0.00042	0.00061	T	0.001	J	0.00042	MG/L	Mean	(2)
	Copper	MG/L	0.0087	0.0087	NP	0.0294		0.0087	MG/L	Mean	(2)
	Iron	MG/L	0.63	0.95	T	1.56		0.63	MG/L	Mean	(2)
	Lead	MG/L	0.0044	0.0044	NP	0.0218		0.0044	MG/L	Mean	(2)
	Manganese	MG/L	0.13	0.13	NP	0.436		0.13	MG/L	Mean	(2)
	Nickel	MG/L	0.0019	0.0025	N	0.0041		0.0019	MG/L	Mean	(2)
	Silver	MG/L	0.00059	0.00059	NP	0.0014	J	0.00059	MG/L	Mean	(2)
	Thallium	MG/L	0.0022	0.0022	NP	0.0077	J	0.0022	MG/L	Mean	(2)
	Zinc	MG/L	0.02785	0.045	T	0.0757		0.02785	MG/L	Mean	(2)

Table 23
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Surface Water

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
LYMAN MILL (continued)	**Dissolved Metals**										
	Aluminum, Dissolved	MG/L	0.03	0.03	NP	0.1		0.03	MG/L	Mean	(2)
	Copper, Dissolved	MG/L	0.0044	0.0058	N	0.01		0.0044	MG/L	Mean	(2)
	Iron, Dissolved	MG/L	0.27	0.32	N	0.474		0.27	MG/L	Mean	(2)
	Lead, Dissolved	MG/L	0.0012	0.0012	NP	0.0047		0.0012	MG/L	Mean	(2)
	Manganese, Dissolved	MG/L	0.096	0.096	NP	0.436		0.096	MG/L	Mean	(2)
	Silver, Dissolved	MG/L	0.00054	0.00054	NP	0.0012	J	0.00054	MG/L	Mean	(2)
	Thallium, Dissolved	MG/L	0.0029	0.0029	NP	0.009		0.0029	MG/L	Mean	(2)
	Zinc, Dissolved	MG/L	0.048	0.048	NP	0.0956		0.048	MG/L	Mean	(2)
	Inorganics										
	Dissolved Organic Carbon	MG/L	5.3	NC		5.5		5.3	MG/L	Mean	(2)
	Total Organic Carbon	MG/L	5.4	NC		5.46		5.4	MG/L	Mean	(2)
	Biochemical Oxygen Demand	MG/L	2.1	NC		2.1		2.1	MG/L	Mean	(2)
	Conductivity	MS/CM	242	NC		242		242	MG/L	Mean	(2)
	Nitrogen, Ammonia	MG/L	0.14	NC		0.142	J	0.14	MG/L	Mean	(2)
	pH	SU	6.8	NC		6.8		6.8	MG/L	Mean	(2)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/L	0.00000013	0.00000013	NP	0.000000853		0.00000013	MG/L	Mean	(2)
	2,3,7,8-TCDF	MG/L	0.0000000019	NC		0.0000000077	J	0.0000000019	MG/L	Mean	(2)
	Toxicity Equivalency - Mammals	MG/L	0.00000013	0.0000037	T	0.000000861		0.00000013	MG/L	Mean	(2)
	Toxicity Equivalency - Birds	MG/L	0.00000013	0.0000035	T	0.000000867		0.00000013	MG/L	Mean	(2)
	Toxicity Equivalency - Fish	MG/L	0.00000013	0.0000037	T	0.000000859		0.00000013	MG/L	Mean	(2)

(1) Chemicals of potential concern are identified in Table 1 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(2) Mean: Arithmetic Mean
(3) Max: Maximum, applied in the special case where the arithmetic mean has been selected, but because of elevated detection limits in non-detects, it is greater than the maximum detected concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Table 23
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Surface Water

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

Qualifier Definitions:

J = Value is estimated.

* = Value is either the detection limit (DL) or the Estimated Maximum Possible Concentration (EMPC).

mg/L = milligrams per liter
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

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Table 24
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Surface Water

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
ASSAPUMPSET	**Semivolatile Organics**								
(Reference area)	bis(2-Ethylhexyl)phthalate	MG/L	0.0033	NC	0.001 J	0.001	MG/L	Max	(5)
	Total Metals								
	Aluminum	MG/L	0.16	NC	0.263	0.263	MG/L	Max	(5)
	Beryllium	MG/L	0.00027	NC	0.0000487 J	0.0000487	MG/L	Max	(5)
	Cobalt	MG/L	0.00031	NC	0.000114	0.000114	MG/L	Max	(5)
	Copper	MG/L	0.0021	NC	0.0035	0.0035	MG/L	Max	(5)
	Iron	MG/L	0.97	NC	1.11	1.11	MG/L	Max	(5)
	Lead	MG/L	0.00068	NC	0.000366	0.000366	MG/L	Max	(5)
	Manganese	MG/L	0.14	NC	0.166	0.166	MG/L	Max	(5)
	Nickel	MG/L	0.0017	NC	0.0021 J	0.0021	MG/L	Max	(5)
	Selenium	MG/L	0.0013	NC	0.0000815 J	0.0000815	MG/L	Max	(5)
	Thallium	MG/L	0.0018	NC	0.00000511 J	0.00000511	MG/L	Max	(5)
	Zinc	MG/L	0.034	NC	0.0665	0.0665	MG/L	Max	(5)
	Dissolved Metals								
	Aluminum, Dissolved	MG/L	0.027	NC	0.019 J	0.019	MG/L	Max	(5)
	Copper, Dissolved	MG/L	0.0025	NC	0.0034	0.0034	MG/L	Max	(5)
	Iron, Dissolved	MG/L	0.52	NC	0.551	0.551	MG/L	Max	(5)
	Lead, Dissolved	MG/L	0.00062	NC	0.000232	0.000232	MG/L	Max	(5)
	Manganese, Dissolved	MG/L	0.075	NC	0.127	0.127	MG/L	Max	(5)
	Thallium, Dissolved	MG/L	0.0018	NC	0.00000806 J	0.00000806	MG/L	Max	(5)
	Zinc, Dissolved	MG/L	0.012	NC	0.0206	0.0206	MG/L	Max	(5)
	Inorganics								
	Dissolved Organic Carbon	MG/L	6.06	NC	6.06	6.06	MG/L	Max	(5)
	Total Organic Carbon	MG/L	6.18	NC	6.18	6.18	MG/L	Max	(5)
	Biochemical Oxygen Demand	MG/L	2.4	NC	2.4	2.4	MG/L	Max	(5)
	Nitrogen, Ammonia	MG/L	0.011	NC	0.011 J	0.011	MG/L	Max	(5)
	Total Suspended Solids	MG/L	3.6	NC	3.6	3.6	MG/L	Max	(5)
	Dioxins/Furans								
	Toxicity Equivalency - Mammals	MG/L	0.0000000053	NC	0.0000000053	0.0000000053	MG/L	Max	(5)
	Toxicity Equivalency - Birds	MG/L	0.0000000070	NC	0.0000000070	0.0000000070	MG/L	Max	(5)
	Toxicity Equivalency - Fish	MG/L	0.0000000057	NC	0.0000000057	0.0000000057	MG/L	Max	(5)

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Table 24
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Surface Water

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
GREYSTONE	**Total Metals**								
(Background area)	Aluminum	MG/L	0.089	NC	0.166	0.166	MG/L	Max	(5)
	Beryllium	MG/L	0.00020	NC	0.0000551 J	0.0000551	MG/L	Max	(5)
	Chromium	MG/L	0.0048	NC	0.0025	0.0025	MG/L	Max	(5)
	Cobalt	MG/L	0.00025	NC	0.00012	0.00012	MG/L	Max	(5)
	Copper	MG/L	0.0054	NC	0.0126	0.0126	MG/L	Max	(5)
	Iron	MG/L	0.68	NC	0.716	0.716	MG/L	Max	(5)
	Lead	MG/L	0.0029	NC	0.0068	0.0068	MG/L	Max	(5)
	Manganese	MG/L	0.13	NC	0.144	0.144	MG/L	Max	(5)
	Nickel	MG/L	0.0019	NC	0.0035 J	0.0035	MG/L	Max	(5)
	Selenium	MG/L	0.00093	NC	0.0000868 J	0.0000868	MG/L	Max	(5)
	Thallium	MG/L	0.0012	NC	0.00000741 J	0.00000741	MG/L	Max	(5)
	Zinc	MG/L	0.020	NC	0.0482	0.0482	MG/L	Max	(5)
	Dissolved Metals								
	Aluminum, Dissolved	MG/L	0.016	NC	0.0251 J	0.0251	MG/L	Max	(5)
	Cadmium, Dissolved	MG/L	0.0011	NC	0.004	0.004	MG/L	Max	(5)
	Copper, Dissolved	MG/L	0.0028	NC	0.0055	0.0055	MG/L	Max	(5)
	Iron, Dissolved	MG/L	0.34	NC	0.51	0.51	MG/L	Max	(5)
	Lead, Dissolved	MG/L	0.00074	NC	0.000542	0.000542	MG/L	Max	(5)
	Manganese, Dissolved	MG/L	0.088	NC	0.112	0.112	MG/L	Max	(5)
	Nickel, Dissolved	MG/L	0.0072	NC	0.0232	0.0232	MG/L	Max	(5)
	Thallium, Dissolved	MG/L	0.0018	NC	0.00000908 J	0.00000908	MG/L	Max	(5)
	Zinc, Dissolved	MG/L	0.018	NC	0.0343	0.0343	MG/L	Max	(5)
	Inorganics								
	Dissolved Organic Carbon	MG/L	5.6	NC	5.64	5.64	MG/L	Max	(5)
	Total Organic Carbon	MG/L	5.4	NC	5.52	5.52	MG/L	Max	(5)
	Biochemical Oxygen Demand	MG/L	2.6	NC	2.8	2.8	MG/L	Max	(5)
	Nitrogen, Ammonia	MG/L	0.39	NC	0.447 J	0.447	MG/L	Max	(5)
	Total Suspended Solids	MG/L	2.4	NC	2.4	2.4	MG/L	Max	(5)
	Dioxins/Furans								
	Toxicity Equivalency - Mammals	MG/L	0.0000000056	NC	0.0000000056	0.0000000056	MG/L	Max	(5)
	Toxicity Equivalency - Birds	MG/L	0.0000000072	NC	0.0000000072	0.0000000072	MG/L	Max	(5)
	Toxicity Equivalency - Fish	MG/L	0.0000000059	NC	0.0000000059	0.0000000059	MG/L	Max	(5)

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Table 24
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Surface Water

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ALLENDALE	**Semivolatile Organics**										
	bis(2-Ethylhexyl)phthalate	MG/L	0.0048	0.0048	NP	0.001	J	0.001	MG/L	Max	(5)
	Pesticides/PCBs										
	alpha-Chlordane	MG/L	0.000020	0.000020	NP	0.00000069	J	0.00000069	MG/L	Max	(5)
	Endosulfan Sulfate	MG/L	0.000059	0.00043	T	0.00049		0.00043	MG/L	95% UCL-T	(3)
	gamma-Chlordane	MG/L	0.000025	0.000025	NP	0.00012		0.000025	MG/L	95% UCL-NP	(4)
	Total Metals										
	Aluminum	MG/L	0.65	0.65	NP	6.19		0.65	MG/L	95% UCL-NP	(4)
	Beryllium	MG/L	0.00031	0.00042	N	0.00005	J	0.00005	MG/L	Max	(5)
	Chromium	MG/L	0.0051	0.018	T	0.042		0.018	MG/L	95% UCL-T	(3)
	Cobalt	MG/L	0.00060	0.00060	NP	0.0054		0.00060	MG/L	95% UCL-NP	(4)
	Copper	MG/L	0.013	0.013	NP	0.0914		0.013	MG/L	95% UCL-NP	(4)
	Iron	MG/L	7.8	7.8	NP	113		7.8	MG/L	95% UCL-NP	(4)
	Lead	MG/L	0.021	0.021	NP	0.223		0.021	MG/L	95% UCL-NP	(4)
	Manganese	MG/L	0.40	0.98	T	2.6		0.98	MG/L	95% UCL-T	(3)
	Nickel	MG/L	0.0049	0.0092	T	0.0343	J	0.0092	MG/L	95% UCL-T	(3)
	Selenium	MG/L	0.0024	0.0058	T	0.0108		0.0058	MG/L	95% UCL-T	(3)
	Silver	MG/L	0.00083	0.00083	NP	0.0018	J	0.00083	MG/L	95% UCL-NP	(4)
	Thallium	MG/L	0.0037	0.0037	NP	0.0145		0.0037	MG/L	95% UCL-NP	(4)
	Zinc	MG/L	0.065	0.16	T	0.5		0.16	MG/L	95% UCL-T	(3)
	Dissolved Metals										
	Aluminum, Dissolved	MG/L	0.034	0.049	T	0.14		0.049	MG/L	95% UCL-T	(3)
	Copper, Dissolved	MG/L	0.0042	0.0065	T	0.016		0.0065	MG/L	95% UCL-T	(3)
	Iron, Dissolved	MG/L	0.84	0.84	NP	7.95		0.84	MG/L	95% UCL-NP	(4)
	Lead, Dissolved	MG/L	0.00078	0.00078	NP	0.000501		0.000501	MG/L	Max	(5)
	Manganese, Dissolved	MG/L	0.29	0.77	T	1.57		0.77	MG/L	95% UCL-T	(3)
	Selenium, Dissolved	MG/L	0.0018	0.0039	T	0.0053		0.0039	MG/L	95% UCL-T	(3)
	Silver, Dissolved	MG/L	0.00078	0.00078	NP	0.0017	J	0.00078	MG/L	95% UCL-NP	(4)
	Thallium, Dissolved	MG/L	0.0029	0.0029	NP	0.0106	J	0.0029	MG/L	95% UCL-NP	(4)
	Zinc, Dissolved	MG/L	0.058	0.06	NP	0.121		0.06	MG/L	95% UCL-NP	(4)

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Table 24
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Surface Water

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ALLENDALE (continued)	**Inorganics**										
	Dissolved Organic Carbon	MG/L	5.053	NC		5.23		5.23	MG/L	Max	(5)
	Total Organic Carbon	MG/L	5.2	NC		5.33		5.33	MG/L	Max	(5)
	Biochemical Oxygen Demand	MG/L	6.5	NC		18.6		18.6	MG/L	Max	(5)
	Conductivity	MS/CM	206	NC		206		206	MS/CM	Max	(5)
	Nitrogen, Ammonia	MG/L	0.24	NC		0.306	J	0.306	MG/L	Max	(5)
	pH	SU	6.8	NC		6.8		6.8	SU	Max	(5)
	Total Suspended Solids	MG/L	5.4	NC		14.4		14.4	MG/L	Max	(5)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/L	0.0000011	0.0000011	NP	0.00001274	J	0.0000011	MG/L	95% UCL-NP	(4)
	2,3,7,8-TCDF	MG/L	0.0000000085	0.0000000085	NP	5.31E-08	J	0.0000000085	MG/L	95% UCL-NP	(4)
	Toxicity Equivalency - Mammals	MG/L	0.0000011	0.0000011	NP	0.0000129		0.0000011	MG/L	95% UCL-NP	(4)
	Toxicity Equivalency - Birds	MG/L	0.0000011	0.0000011	NP	0.0000129		0.0000011	MG/L	95% UCL-NP	(4)
	Toxicity Equivalency - Fish	MG/L	0.0000011	0.0000011	NP	0.0000129		0.0000011	MG/L	95% UCL-NP	(4)
LYMAN MILL	**Semivolatile Organics**										
	bis(2-Ethylhexyl)phthalate	MG/L	0.017	0.017	NP	0.16	*	0.017	MG/L	95% UCL-NP	(4)
	Pesticides/PCBs										
	alpha-Chlordane	MG/L	0.000021	0.000021	NP	0.000019	J	0.000019	MG/L	Max	(5)
	Endosulfan Sulfate	MG/L	0.000039	0.000039	NP	0.0000032	J	0.0000032	MG/L	Max	(5)
	gamma-Chlordane	MG/L	0.000021	0.000021	NP	0.000021	J	0.000021	MG/L	95% UCL-NP	(4)
	Total Metals										
	Aluminum	MG/L	0.18	0.58	T	0.917		0.58	MG/L	95% UCL-T	(3)
	Beryllium	MG/L	0.00027	0.00027	NP	0.0002		0.0002	MG/L	Max	(5)
	Chromium	MG/L	0.0023	0.0023	NP	0.0063		0.0023	MG/L	95% UCL-NP	(4)
	Cobalt	MG/L	0.00042	0.00061	T	0.001	J	0.00061	MG/L	95% UCL-T	(3)
	Copper	MG/L	0.0087	0.0087	NP	0.0294		0.0087	MG/L	95% UCL-NP	(4)
	Iron	MG/L	0.63	0.95	T	1.56		0.95	MG/L	95% UCL-T	(3)
	Lead	MG/L	0.0044	0.0044	NP	0.0218		0.0044	MG/L	95% UCL-NP	(4)
	Manganese	MG/L	0.13	0.13	NP	0.436		0.13	MG/L	95% UCL-NP	(4)
	Nickel	MG/L	0.0019	0.0025	N	0.0041		0.0025	MG/L	95% UCL-N	(2)
	Silver	MG/L	0.00059	0.00059	NP	0.0014	J	0.00059	MG/L	95% UCL-NP	(4)
	Thallium	MG/L	0.0022	0.0022	NP	0.0077	J	0.0022	MG/L	95% UCL-NP	(4)
	Zinc	MG/L	0.027850	0.044533	T	0.0757		0.044533	MG/L	95% UCL-T	(3)

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Table 24
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Surface Water

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
LYMAN MILL (continued)	**Dissolved Metals**										
	Aluminum, Dissolved	MG/L	0.03	0.03	NP	0.1		0.03	MG/L	95% UCL-NP	(4)
	Copper, Dissolved	MG/L	0.0044	0.0058	N	0.01		0.0058	MG/L	95% UCL-N	(2)
	Iron, Dissolved	MG/L	0.27	0.32	N	0.474		0.32	MG/L	95% UCL-N	(2)
	Lead, Dissolved	MG/L	0.0012	0.0012	NP	0.0047		0.0012	MG/L	95% UCL-NP	(4)
	Manganese, Dissolved	MG/L	0.096	0.096	NP	0.436		0.096	MG/L	95% UCL-NP	(4)
	Silver, Dissolved	MG/L	0.00054	0.00054	NP	0.0012	J	0.00054	MG/L	95% UCL-NP	(4)
	Thallium, Dissolved	MG/L	0.0029	0.0029	NP	0.009		0.0029	MG/L	95% UCL-NP	(4)
	Zinc, Dissolved	MG/L	0.048	0.048	NP	0.0956		0.048	MG/L	95% UCL-NP	(4)
	Inorganics										
	Dissolved Organic Carbon	MG/L	5.3	NC		5.5		5.5	MG/L	Max	(5)
	Total Organic Carbon	MG/L	5.4	NC		5.46		5.46	MG/L	Max	(5)
	Biochemical Oxygen Demand	MG/L	2.1	NC		2.1		2.1	MG/L	Max	(5)
	Conductivity	MS/CM	242	NC		242		242	MS/CM	Max	(5)
	Nitrogen, Ammonia	MG/L	0.14	NC		0.142	J	0.142	MG/L	Max	(5)
	pH	SU	6.8	NC		6.8		6.8	SU	Max	(5)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/L	0.00000013	0.00000013	NP	0.000000853		0.00000013	MG/L	95% UCL-NP	(4)
	2,3,7,8-TCDF	MG/L	0.0000000019	NC		0.0000000077	J	0.0000000077	MG/L	Max	(5)
	Toxicity Equivalency - Mammals	MG/L	0.00000013	0.0000037	T	0.000000861		0.000000861	MG/L	Max	(5)
	Toxicity Equivalency - Birds	MG/L	0.00000013	0.0000035	T	0.000000867		0.000000867	MG/L	Max	(5)
	Toxicity Equivalency - Fish	MG/L	0.00000013	0.0000037	T	0.000000859		0.000000859	MG/L	Max	(5)

(1) Chemicals of potential concern are identified in Table 1 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(2) 95% UCL-N: 95% Upper Concentration Limit on the mean, normal distribution
(3) 95% UCL-T: 95% Upper Concentration Limit on the mean, lognormal distribution
(4) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(5) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.

LN - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

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Table 24
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Surface Water

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

Qualifier Definitions:

J = Value is estimated.

* = Value is either the detection limit (DL) or the Estimated Maximum Possible Concentration (EMPC).

mg/L = milligrams per liter

EPC = Exposure Point Concentration

UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

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Table 25
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Groundwater

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
ALLENDALE	**Volatile Organics**								
	Tetrachloroethene	MG/L	20.5	NC	61 *	20.5	MG/KG	Mean	(2)
	Trichloroethene	MG/L	0.84	NC	2.5	0.84	MG/KG	Mean	(2)
	Semivolatile Organics								
	2,4,6-Trichlorophenol	MG/L	1.5	NC	2.9 *	1.5	MG/KG	Mean	(2)
	2,4-Dichlorophenol	MG/L	0.033	NC	0.06	0.033	MG/KG	Mean	(2)
	Benzo(k)fluoranthene	MG/L	0.0034	NC	0.00018	0.00018	MG/KG	Max	(3)
	Chrysene	MG/L	0.0034	NC	0.00028	0.00028	MG/KG	Max	(3)
	Naphthalene	MG/L	0.0054	NC	0.011	0.0054	MG/KG	Mean	(2)
	Pyrene	MG/L	0.0035	NC	0.00061	0.00061	MG/KG	Max	(3)

(1) Chemicals of potential concern are identified in Table 2.

(2) Mean: Arithmetic Mean

(3) Max: Maximum, applied in the special case where the arithmetic mean has been selected, but because of elevated detection limits in non-detects, it is greater than the maximum detected concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.

NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.

N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:

* = Value is either the detection limit (DL) or the Estimated Maximum Possible Concentration (EMPC).

mg/L = milligrams per liter

EPC = Exposure Point Concentration

UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

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Table 26
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Groundwater

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
ALLENDALE	**Volatile Organics**								
	Tetrachloroethene	MG/L	20.5	NC	61 *	61	MG/L	Max	(5)
	Trichloroethene	MG/L	0.84	NC	2.5	2.5	MG/L	Max	(5)
	Semivolatile Organics								
	2,4,6-Trichlorophenol	MG/L	1.5	NC	2.9 *	2.9	MG/L	Max	(5)
	2,4-Dichlorophenol	MG/L	0.033	NC	0.06	0.06	MG/L	Max	(5)
	Benzo(k)fluoranthene	MG/L	0.0034	NC	0.00018	0.00018	MG/L	Max	(5)
	Chrysene	MG/L	0.0034	NC	0.00028	0.00028	MG/L	Max	(5)
	Naphthalene	MG/L	0.0054	NC	0.011	0.011	MG/L	Max	(5)
	Pyrene	MG/L	0.0035	NC	0.00061	0.00061	MG/L	Max	(5)

(1) Chemicals of potential concern are identified in Table 2.
(5) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.

LN - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:

* = Value is either the detection limit (DL) or the Estimated Maximum Possible Concentration (EMPC).

mg/L = milligrams per liter
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

Table 27
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Sediment

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
ASSAPUMPSET	**Semivolatile Organics**									
(Reference area)	2-Methylnaphthalene	MG/KG	0.22	NC	0.01855		0.01855	MG/KG	Max	(3)
	Acenaphthene	MG/KG	0.22	NC	0.03411	J	0.03411	MG/KG	Max	(3)
	Acenaphthylene	MG/KG	0.19	NC	0.0589		0.0589	MG/KG	Max	(3)
	Anthracene	MG/KG	0.21	NC	0.14754		0.14754	MG/KG	Max	(3)
	Benzo(a)anthracene	MG/KG	0.52	NC	1		0.52	MG/KG	Mean	(2)
	Benzo(a)pyrene	MG/KG	0.53	NC	0.84		0.53	MG/KG	Mean	(2)
	Benzo(b)fluoranthene	MG/KG	0.63	NC	1.4		0.63	MG/KG	Mean	(2)
	Benzo(g,h,i)perylene	MG/KG	0.40	NC	0.59468		0.40	MG/KG	Mean	(2)
	Benzo(k)fluoranthene	MG/KG	0.41	NC	0.80433		0.41	MG/KG	Mean	(2)
	bis(2-Ethylhexyl)phthalate	MG/KG	0.47	NC	1	J	0.47	MG/KG	Mean	(2)
	Carbazole	MG/KG	0.16	NC	0.089	J	0.089	MG/KG	Max	(3)
	Chrysene	MG/KG	0.68	NC	1.1		0.68	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.15	NC	0.17898		0.15	MG/KG	Mean	(2)
	Dibenzofuran	MG/KG	0.22	NC	0.03586		0.03586	MG/KG	Max	(3)
	Di-n-Butylphthalate	MG/KG	0.11	NC	0.08	JEB	0.08	MG/KG	Max	(3)
	Fluoranthene	MG/KG	1.09	NC	1.7		1.09	MG/KG	Mean	(2)
	Fluorene	MG/KG	0.19	NC	0.08068		0.08068	MG/KG	Max	(3)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.43	NC	0.65		0.43	MG/KG	Mean	(2)
	Naphthalene	MG/KG	0.22	NC	0.01905		0.01905	MG/KG	Max	(3)
	Phenanthrene	MG/KG	0.54	NC	0.79474		0.54	MG/KG	Mean	(2)
	Pyrene	MG/KG	0.94	NC	1.6		0.94	MG/KG	Mean	(2)
	Total PAH	MG/KG	6.7	NC	9.6		6.7	MG/KG	Mean	(2)
	PAH ESG	-	0.79	NC	2.2		0.79	MG/KG	Mean	
	Pesticides/PCBs									
	4,4'-DDD	MG/KG	0.0026	NC	0.00317	J	0.0026	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.0033	NC	0.00547	J	0.0033	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.00133	NC	0.00133	J	0.00133	MG/KG	Max	(3)
	Aroclor, Total	MG/KG	0.058	NC	0.09922	J	0.058	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.032	NC	0.05755		0.032	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.023	NC	0.04166		0.023	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.002	NC	0.00191	J	0.002	MG/KG	Max	(3)

Table 27
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Sediment

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
ASSAPUMPSET (continued)	gamma-Chlordane	MG/KG	0.001	NC	0.00065	J	0.001	MG/KG	Max	(3)
(Reference area)	Technical Chlordane	MG/KG	0.11	NC	0.15253	J	0.11	MG/KG	Mean	(2)
	Inorganics									
	Aluminum	MG/KG	9841	NC	21774	J	9841	MG/KG	Mean	(2)
	Arsenic	MG/KG	2.7	NC	5.21	J	2.7	MG/KG	Mean	(2)
	Barium	MG/KG	93.6	NC	204	J	93.6	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.37	NC	0.858		0.37	MG/KG	Mean	(2)
	Chromium	MG/KG	10	NC	17.5	J	10	MG/KG	Mean	(2)
	Cobalt	MG/KG	6.2	NC	10.1		6.2	MG/KG	Mean	(2)
	Copper	MG/KG	11.8	NC	18.3	J	11.8	MG/KG	Mean	(2)
	Iron	MG/KG	14362.8	NC	23357		14362.8	MG/KG	Mean	(2)
	Lead	MG/KG	41	NC	88.6	J	41	MG/KG	Mean	(2)
	Mercury	MG/KG	0.051	NC	0.114		0.051	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.00056	NC	0.000863	J	0.00056	MG/KG	Mean	(2)
	Molybdenum	MG/KG	1.575	NC	1.59	J	1.575	MG/KG	Mean	(2)
	Selenium	MG/KG	0.62	NC	2.2	J	0.62	MG/KG	Mean	(2)
	Silver	MG/KG	1.6	NC	6.5		1.6	MG/KG	Mean	(2)
	Thallium	MG/KG	0.43	NC	0.354	J	0.354	MG/KG	Max	(3)
	Zinc	MG/KG	101	NC	227	J	101	MG/KG	Mean	(2)
	AVS/SEM									
	Cadmium	UMOL/G	0.0029	NC	0.012	J	0.0029	UMOL/G	Mean	(2)
	Copper	UMOL/G	0.17	NC	0.286	J	0.17	UMOL/G	Mean	(2)
	Lead	UMOL/G	0.22	NC	0.428	J	0.22	UMOL/G	Mean	(2)
	Nickel	UMOL/G	0.26	NC	0.51	J	0.26	UMOL/G	Mean	(2)
	Zinc	UMOL/G	1.0	NC	1.07	J	1.0	UMOL/G	Mean	(2)
	Acid Volatile Sulfide	UMOL/G	2.3	NC	7.3	J	2.3	UMOL/G	Mean	(2)
	Simultaneously Extracted Metal	UMOL/G	1.7	NC	2.788		1.7	UMOL/G	Mean	(2)
	Carbon-Normalized Excess SEM	UMOL/G	79.2	NC	133		79.2	UMOL/G	Mean	(2)
	SEM/AVS		3.1	NC	12.9		3.14		Mean	(2)

Table 27
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Sediment

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
ASSAPUMPSET (continued)	**Dioxins/Furans**									
(Reference area)	2,3,7,8-TCDD	MG/KG	0.0000019	NC	0.0000045	EMPC	0.0000019	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.0000015	NC	0.0000034		0.0000015	MG/KG	Mean	(2)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.0000038	NC	0.00000773		0.0000038	MG/KG	Mean	(2)
	Toxicity Equivalency (Dioxins/Furans) - Birds	MG/KG	0.0000051	NC	0.0000113		0.0000051	MG/KG	Mean	(2)
	Toxicity Equivalency (Dioxins/Furans) - Fish	MG/KG	0.0000034	NC	0.00000723		0.0000034	MG/KG	Mean	(2)
GREYSTONE	**Semivolatile Organics**									
(Background area)	2-Methylnaphthalene	MG/KG	1.1	NC	0.07478	J	0.07478	MG/KG	Max	(3)
	Acenaphthene	MG/KG	0.81	NC	0.48	J	0.48	MG/KG	Max	(3)
	Acenaphthylene	MG/KG	1.1	NC	0.19279	J	0.19279	MG/KG	Max	(3)
	Anthracene	MG/KG	0.99	NC	0.93	J	0.93	MG/KG	Max	(3)
	Benzo(a)anthracene	MG/KG	1.5	NC	3.5		1.5	MG/KG	Mean	(2)
	Benzo(a)pyrene	MG/KG	1.4	NC	3.1		1.4	MG/KG	Mean	(2)
	Benzo(b)fluoranthene	MG/KG	1.5	NC	3.1		1.5	MG/KG	Mean	(2)
	Benzo(g,h,i)perylene	MG/KG	0.9	NC	2.07671	J	0.9	MG/KG	Mean	(2)
	Benzo(k)fluoranthene	MG/KG	1.4	NC	3.6		1.4	MG/KG	Mean	(2)
	bis(2-Ethylhexyl)phthalate	MG/KG	1.2	NC	0.95	J	0.95	MG/KG	Max	(3)
	Carbazole	MG/KG	0.88	NC	0.66	J	0.66	MG/KG	Max	(3)
	Chrysene	MG/KG	1.8	NC	4.1		1.8	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.97	NC	0.77	J	0.77	MG/KG	Max	(3)
	Dibenzofuran	MG/KG	1.1	NC	0.29	J	0.29	MG/KG	Max	(3)
	Di-n-Butylphthalate	MG/KG	1.0	NC	0.47	JEB	0.47	MG/KG	Max	(3)
	Fluoranthene	MG/KG	3.3	NC	7		3.3	MG/KG	Mean	(2)
	Fluorene	MG/KG	0.85	NC	0.47	J	0.47	MG/KG	Max	(3)
	Indeno(1,2,3-cd)pyrene	MG/KG	1.0	NC	2.18335	J	1.0	MG/KG	Mean	(2)
	Naphthalene	MG/KG	1.1	NC	0.09382	J	0.09382	MG/KG	Max	(3)
	Phenanthrene	MG/KG	2.1	NC	4.8		2.1	MG/KG	Mean	(2)
	Pyrene	MG/KG	2.8	NC	6.5		2.8	MG/KG	Mean	(2)
	Total PAH	MG/KG	18.4	NC	40		18.4	MG/KG	Mean	(2)
	PAH ESG		0.5	NC	0.84		0.5		Mean	

Table 27
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Sediment

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
GREYSTONE (continued)	**Pesticides/PCBs**										
(Background area)	4,4'-DDD	MG/KG	0.0049	0.0049	NP	0.0193	J	0.0049	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.0060	0.0060	NP	0.03128		0.0060	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.0061	0.0061	NP	0.01746	J	0.0061	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.2	0.2089	NP	0.48		0.2	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.15	0.53	T	0.38		0.15	MG/KG	Mean	(2)
	Aroclor-1260	MG/KG	0.025	0.025	NP	0.1		0.025	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.14	NC		0.2467		0.14	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.0026	0.0026	NP	0.0051	J	0.0026	MG/KG	Mean	(2)
	Endrin	MG/KG	0.0019	0.0019	NP	0.00296		0.0019	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.0048	0.0048	NP	0.01016		0.0048	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.40	NC		0.62618		0.40	MG/KG	Mean	(2)
	Inorganics										
	Aluminum	MG/KG	8210	15554	T	24690	J	8210	MG/KG	Mean	(2)
	Antimony	MG/KG	0.73	4.3	T	4.3	J	0.73	MG/KG	Mean	(2)
	Arsenic	MG/KG	3.9	9.6	T	13.5		3.9	MG/KG	Mean	(2)
	Barium	MG/KG	134	671	T	374	J	134	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.81	10.4	T	4.35		0.81	MG/KG	Mean	(2)
	Chromium	MG/KG	99.3	601	T	271		99.3	MG/KG	Mean	(2)
	Cobalt	MG/KG	8.1	27.6	T	23.8		8.1	MG/KG	Mean	(2)
	Copper	MG/KG	72.8	650	T	436		72.8	MG/KG	Mean	(2)
	Iron	MG/KG	13426	13426	NP	28339		13426	MG/KG	Mean	(2)
	Lead	MG/KG	179	179	NP	570		179	MG/KG	Mean	(2)
	Mercury	MG/KG	0.21	1.0	T	0.757		0.21	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.00026	NC		0.000658	J	0.00026	MG/KG	Mean	(2)
	Molybdenum	MG/KG	12.6	NC		17.2		12.6	MG/KG	Mean	(2)
	Selenium	MG/KG	1.1	3.7	T	3.6	J	1.1	MG/KG	Mean	(2)
	Silver	MG/KG	2.6	18	T	9.2		2.6	MG/KG	Mean	(2)
	Thallium	MG/KG	0.37	0.37	NP	0.71	J	0.37	MG/KG	Mean	(2)
	Zinc	MG/KG	221	780	T	854	J	221	MG/KG	Mean	(2)

Table 27
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Sediment

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
GREYSTONE (continued)	**AVS/SEM**								
(Background area)	Cadmium	UMOL/G	0.012	NC	0.027 J	0.012	UMOL/G	Mean	(2)
	Copper	UMOL/G	1.5	NC	5.92 J	1.5	UMOL/G	Mean	(2)
	Lead	UMOL/G	1.2	NC	2.88 J	1.2	UMOL/G	Mean	(2)
	Nickel	UMOL/G	0.9	NC	4.41 J	0.9	UMOL/G	Mean	(2)
	Zinc	UMOL/G	4.7	NC	12.2 J	4.7	UMOL/G	Mean	(2)
	Acid Volatile Sulfide	UMOL/G	3.6	NC	9.5 J	3.6	UMOL/G	Mean	(2)
	Simultaneously Extracted Metal	UMOL/G	8.3	NC	18.367	8.3	UMOL/G	Mean	(2)
	Carbon-Normalized Excess SEM	UMOL/G	106	NC	303	106	UMOL/G	Mean	(2)
	SEM/AVS		53.0	NC	306	53.0		Mean	(2)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.000015	0.00038 T	0.0000866	0.000015	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.000013	0.000099 T	0.0000693	0.000013	MG/KG	Mean	(2)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000035	0.00012 T	0.000179	0.000035	MG/KG	Mean	(2)
	Toxicity Equivalency (Dioxins/Furans) - Birds	MG/KG	0.000045	0.00015 T	0.000233	0.000045	MG/KG	Mean	(2)
	Toxicity Equivalency (Dioxins/Furans) - Fish	MG/KG	0.000030	0.00011 T	0.000159	0.000030	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.000025	NC	0.0000249	0.000025	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.000034	NC	0.0000337	0.000034	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.0000012	NC	0.00000122	0.0000012	MG/KG	Mean	(2)
ALLENDALE	**Semivolatile Organics**								
	2-Methylnaphthalene	MG/KG	1.6	3.7 T	0.13608	0.13608	MG/KG	Max	(3)
	Acenaphthene	MG/KG	1.5	1.8 N	1.2 J	1.2	MG/KG	Max	(3)
	Acenaphthylene	MG/KG	1.6	1.9 N	0.97 J	0.97	MG/KG	Max	(3)
	Anthracene	MG/KG	1.2	1.8 T	1.8 J	1.2	MG/KG	Mean	(2)
	Benzo(a)anthracene	MG/KG	2.2	3.4 T	8.4	2.2	MG/KG	Mean	(2)
	Benzo(a)pyrene	MG/KG	2.3	4.0 T	9.2	2.3	MG/KG	Mean	(2)
	Benzo(b)fluoranthene	MG/KG	2.8	4.4 T	9.5	2.8	MG/KG	Mean	(2)
	Benzo(g,h,i)perylene	MG/KG	2.0	2.0 NP	7	2.0	MG/KG	Mean	(2)
	Benzo(k)fluoranthene	MG/KG	2.6	3.9 T	9.2	2.6	MG/KG	Mean	(2)
	bis(2-Ethylhexyl)phthalate	MG/KG	2.3	3.2 T	12	2.3	MG/KG	Mean	(2)

Table 27
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Sediment

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ALLENDALE (continued)	Carbazole	MG/KG	1.5	2.7	T	1.8	J	1.5	MG/KG	Mean	(2)
	Chrysene	MG/KG	3.0	5.1	T	11		3.0	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	1.4	2.0	T	2.6	J	1.4	MG/KG	Mean	(2)
	Dibenzofuran	MG/KG	1.6	1.9	N	0.64	J	0.64	MG/KG	Max	(3)
	Di-n-Butylphthalate	MG/KG	1.6	3.7	T	0.61	EB	0.61	MG/KG	Max	(3)
	Fluoranthene	MG/KG	5.2	9.6	T	20		5.2	MG/KG	Mean	(2)
	Fluorene	MG/KG	1.4	1.8	N	0.93	J	0.93	MG/KG	Max	(3)
	Indeno(1,2,3-cd)pyrene	MG/KG	1.9	3.2	T	6.8		1.9	MG/KG	Mean	(2)
	Naphthalene	MG/KG	1.6	1.9	N	0.18126		0.18126	MG/KG	Max	(3)
	Phenanthrene	MG/KG	2.9	4.8	T	12		2.9	MG/KG	Mean	(2)
	Pyrene	MG/KG	4.4	7.7	T	16		4.4	MG/KG	Mean	(2)
	Total PAH	MG/KG	28.9	63.3	T	110		28.9	MG/KG	Mean	(2)
	PAH ESG		1.5	NC		8.4		1.5		Mean	
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0060	0.0060	NP	0.023	J	0.0060	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.016	0.016	NP	0.2	*	0.016	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.011	0.011	NP	0.062		0.011	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	1.53	2.30	T	27		1.53	MG/KG	Mean	(2)
	Aroclor-1248	MG/KG	0.25	0.25	NP	0.14		0.14	MG/KG	Max	(3)
	Aroclor-1254	MG/KG	1.5	2.4	T	27		1.5	MG/KG	Mean	(2)
	Aroclor-1260	MG/KG	0.20	0.20	NP	0.27		0.20	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.079	0.08	NP	0.15642		0.079	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.0090	0.0090	NP	0.11297	J	0.0090	MG/KG	Mean	(2)
	Endosulfan II	MG/KG	0.037	0.037	NP	0.44	*	0.037	MG/KG	Mean	(2)
	Endosulfan sulfate	MG/KG	0.0027	0.0027	NP	0.00902		0.0027	MG/KG	Mean	(2)
	Endrin	MG/KG	0.0032	0.0032	NP	0.028		0.0032	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.0097	0.017	T	0.074	*	0.0097	MG/KG	Mean	(2)

Table 27
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Sediment

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Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ALLENDALE (continued)	Methoxychlor	MG/KG	0.011	0.011	NP	0.035	J	0.011	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.515	0.651	N	0.85181		0.515	MG/KG	Mean	(2)
	Inorganics										
	Aluminum	MG/KG	10038	12475	T	22168	J	10038	MG/KG	Mean	(2)
	Antimony	MG/KG	2.3	4.8	T	13.7	J	2.3	MG/KG	Mean	(2)
	Arsenic	MG/KG	5.8	5.8	NP	18	J	5.8	MG/KG	Mean	(2)
	Barium	MG/KG	138	158	N	320	J	138	MG/KG	Mean	(2)
	Cadmium	MG/KG	1.2	1.2	NP	5.2	J	1.2	MG/KG	Mean	(2)
	Chromium	MG/KG	142	238	T	536	J	142	MG/KG	Mean	(2)
	Cobalt	MG/KG	7.1	8.7	T	23.4	J	7.1	MG/KG	Mean	(2)
	Copper	MG/KG	119	192	T	419	J	119	MG/KG	Mean	(2)
	Iron	MG/KG	17994	21005	T	52400	J	17994	MG/KG	Mean	(2)
	Lead	MG/KG	329	488	T	1090		329	MG/KG	Mean	(2)
	Mercury	MG/KG	0.47	0.97	T	3.6		0.47	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.00080	0.0019	T	0.00285	J	0.00080	MG/KG	Mean	(2)
	Molybdenum	MG/KG	13.2	13.2	NP	29.6		13.2	MG/KG	Mean	(2)
	Selenium	MG/KG	1.1	1.4	T	3.8	J	1.1	MG/KG	Mean	(2)
	Silver	MG/KG	2.8	4.4	T	14.6		2.8	MG/KG	Mean	(2)
	Thallium	MG/KG	7.3	7.3	NP	6.8	J	6.8	MG/KG	Max	(3)
	Zinc	MG/KG	354	482	T	2088	J	354	MG/KG	Mean	(2)
	Cyanide	MG/KG	2	NC		2.4		2	MG/KG	Mean	(2)
	AVS/SEM										
	Cadmium	UMOL/G	0.014	0.014	NP	0.0439	J	0.014	UMOL/G	Mean	(2)
	Copper	UMOL/G	1.6	1.6	NP	5.61336	J	1.6	UMOL/G	Mean	(2)
	Lead	UMOL/G	1.4	1.4	NP	3.29	J	1.4	UMOL/G	Mean	(2)
	Nickel	UMOL/G	1.0	1.0	NP	2.92605	J	1.0	UMOL/G	Mean	(2)
	Zinc	UMOL/G	6.6	6.6	NP	25	J	6.6	UMOL/G	Mean	(2)
	Acid Volatile Sulfide	UMOL/G	7.9	7.9	NP	44.8	J	7.9	UMOL/G	Mean	(2)
	Simultaneously Extracted Metal	UMOL/G	10.6	13.6	N	30.1725		10.6	UMOL/G	Mean	(2)
	Carbon-Normalized Excess SEM	UMOL/G	26.0	166.7	NP	253		26.0	UMOL/G	Mean	(2)

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North Providence, Rhode Island

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Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ALLENDALE (continued)	SEM/AVS		73.0	NC		530		73.0		Mean	(2)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.0058	0.0058	NP	0.073	J	0.0058	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.000030	0.000074	T	0.000184		0.000030	MG/KG	Mean	(2)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.0058	0.029	T	0.073		0.0058	MG/KG	Mean	(2)
	Toxicity Equivalency (Dioxins/Furans) - Birds	MG/KG	0.0058	0.027	T	0.073		0.0058	MG/KG	Mean	(2)
	Toxicity Equivalency (Dioxins/Furans) - Fish	MG/KG	0.0058	0.0058	NP	0.073		0.0058	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.000056	NC		0.000056		0.000056	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.000000112	NC		0.000000112		0.000000112	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.000000112	NC		0.000000112		0.000000112	MG/KG	Mean	(2)
LYMAN MILL	**Semivolatile Organics**										
	2-Methylnaphthalene	MG/KG	0.9	0.9	NP	0.1	J	0.1	MG/KG	Max	(3)
	Acenaphthene	MG/KG	0.93	0.93	NP	1.8	J	0.93	MG/KG	Mean	(2)
	Acenaphthylene	MG/KG	0.88	0.88	NP	0.42856		0.42856	MG/KG	Max	(3)
	Anthracene	MG/KG	0.79	0.79	NP	1.4		0.79	MG/KG	Mean	(2)
	Benzo(a)anthracene	MG/KG	1.4	2.8	T	5.5	J	1.4	MG/KG	Mean	(2)
	Benzo(a)pyrene	MG/KG	1.4	2.9	T	6.17711		1.4	MG/KG	Mean	(2)
	Benzo(b)fluoranthene	MG/KG	2.1	4.5	T	13	J*	2.1	MG/KG	Mean	(2)
	Benzo(g,h,i)perylene	MG/KG	1.3	3.0	T	4.85176		1.3	MG/KG	Mean	(2)
	Benzo(k)fluoranthene	MG/KG	1.1	2.1	T	7.30225		1.1	MG/KG	Mean	(2)
	bis(2-Ethylhexyl)phthalate	MG/KG	2.6	5.2	T	50	J*	2.6	MG/KG	Mean	(2)
	Carbazole	MG/KG	0.80	0.80	NP	0.85	J	0.80	MG/KG	Mean	(2)
	Chrysene	MG/KG	1.66	3.58	T	8.9397		1.66	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.77	1.1	T	1.0694		0.77	MG/KG	Mean	(2)
	Dibenzofuran	MG/KG	0.89	2.00	T	0.31	J	0.31	MG/KG	Max	(3)
	Di-n-Butylphthalate	MG/KG	0.99	1.79	T	1.8	J	0.99	MG/KG	Mean	(2)
	Fluoranthene	MG/KG	2.7	6.8	T	16.763		2.7	MG/KG	Mean	(2)

Table 27
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Sediment

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
LYMAN MILL (continued)	Fluorene	MG/KG	0.89	0.89	NP	0.67084		0.67084	MG/KG	Max	(3)
	Indeno(1,2,3-cd)pyrene	MG/KG	1.28	2.7	T	5.25309		1.28	MG/KG	Mean	(2)
	Naphthalene	MG/KG	0.92	0.92	NP	0.18514		0.18514	MG/KG	Max	(3)
	Phenanthrene	MG/KG	1.5	2.8	T	8.37861		1.5	MG/KG	Mean	(2)
	Pyrene	MG/KG	2.4	5.1	T	13.14306		2.4	MG/KG	Mean	(2)
	Total PAH	MG/KG	11.1	47.2	T	87.9		11.1	MG/KG	Mean	(2)
	PAH ESG		1.0	NC		8.2		1.0		Mean	
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0093	0.0093	NP	0.052		0.0093	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.0083	0.011	T	0.048		0.0083	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.016	0.032	T	0.14075		0.016	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.2629	0.390	T	2.21205		0.2629	MG/KG	Mean	(2)
	Aroclor-1248	MG/KG	0.02	0.028	T	0.052		0.02	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.27	0.49	T	2.2	*	0.27	MG/KG	Mean	(2)
	Aroclor-1260	MG/KG	0.024	0.027	T	0.043	J	0.024	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.12	NC		0.31379	J	0.12	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.0038	0.0044	T	0.017	P	0.0038	MG/KG	Mean	(2)
	Endosulfan II	MG/KG	0.0038	0.0047	T	0.017		0.0038	MG/KG	Mean	(2)
	Endosulfan sulfate	MG/KG	0.0029	0.0029	NP	0.01055		0.0029	MG/KG	Mean	(2)
	Endrin	MG/KG	0.0026	0.0026	NP	0.0056	P	0.0026	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.0089	0.015	T	0.06988		0.0089	MG/KG	Mean	(2)
	Methoxychlor	MG/KG	0.0105	0.0120	N	0.0053	J	0.0053	MG/KG	Max	(3)
	Technical Chlordane	MG/KG	1.3	NC		2.21273		1.3	MG/KG	Mean	(2)

Table 27
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Sediment

Baseline Ecological Risk Assessment - Interim Final
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North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
LYMAN MILL (continued)	**Inorganics**										
	Aluminum	MG/KG	10181	13069	T	27773	J	10181	MG/KG	Mean	(2)
	Antimony	MG/KG	1.3	3.1	T	5.3	J	1.3	MG/KG	Mean	(2)
	Arsenic	MG/KG	5.2	6.4	T	13.2	J	5.2	MG/KG	Mean	(2)
	Barium	MG/KG	130	207	T	380	J	130	MG/KG	Mean	(2)
	Cadmium	MG/KG	2.1	2.1	NP	23.9		2.1	MG/KG	Mean	(2)
	Chromium	MG/KG	98.9	200	T	310	J	98.9	MG/KG	Mean	(2)
	Cobalt	MG/KG	7.8	12	T	26.6		7.8	MG/KG	Mean	(2)
	Copper	MG/KG	112.2	199	T	1110		112.2	MG/KG	Mean	(2)
	Iron	MG/KG	16468	20068	T	41293		16468	MG/KG	Mean	(2)
	Lead	MG/KG	236	375	T	721	J	236	MG/KG	Mean	(2)
	Mercury	MG/KG	0.29	0.62	T	0.946		0.29	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.0021	NC		0.00959	J	0.0021	MG/KG	Mean	(2)
	Molybdenum	MG/KG	6.5	NC		13.4		6.5	MG/KG	Mean	(2)
	Selenium	MG/KG	0.96	1.2	T	2.9	J	0.96	MG/KG	Mean	(2)
	Silver	MG/KG	2.9	4.3	T	12.7		2.9	MG/KG	Mean	(2)
	Thallium	MG/KG	0.58	0.58	NP	0.883	J	0.58	MG/KG	Mean	(2)
	Zinc	MG/KG	391	758	T	1662	J	391	MG/KG	Mean	(2)
	AVS/SEM										
	Cadmium	UMOL/G	0.025	0.025	NP	0.16		0.025	UMOL/G	Mean	(2)
	Copper	UMOL/G	2.1	2.1	NP	15.3	J	2.1	UMOL/G	Mean	(2)
	Lead	UMOL/G	1.5	1.5	NP	3.597		1.5	UMOL/G	Mean	(2)
	Nickel	UMOL/G	1.0	1.0	NP	4.52961	J	1.0	UMOL/G	Mean	(2)
	Zinc	UMOL/G	8.1	8.1	NP	19.8	J	8.1	UMOL/G	Mean	(2)
	Acid Volatile Sulfide	UMOL/G	12.8	12.8	NP	73.03		12.8	UMOL/G	Mean	(2)
	Simultaneously Extracted Metal	UMOL/G	12.7	16.0	N	33.86		12.7	UMOL/G	Mean	(2)
	Carbon-Normalized Excess SEM	UMOL/G	16.3	1665.9	T	375		16.3	UMOL/G	Mean	(2)
	SEM/AVS		5.1	NC		44.9		5.1		Mean	(2)

Table 27
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Sediment

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North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
LYMAN MILL (continued)	**Dioxins/Furans**								
	2,3,7,8-TCDD	MG/KG	0.0018	0.0018 NP	0.00798702 J	0.0018	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.000017	0.000052 T	0.0000713 J	0.000017	MG/KG	Mean	(2)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.0018	0.035 T	0.00806	0.0018	MG/KG	Mean	(2)
	Toxicity Equivalency (Dioxins/Furans) - Birds	MG/KG	0.0018	0.028 T	0.00808	0.0018	MG/KG	Mean	(2)
	Toxicity Equivalency (Dioxins/Furans) - Fish	MG/KG	0.00179	0.03613 T	0.00805	0.00179	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.000033	NC	0.0000649	0.000033	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.00015	NC	0.00021	0.00015	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.0000018	NC	0.00000336	0.0000018	MG/KG	Mean	(2)
MANTON	**Semivolatile Organics**								
	Benzo(a)anthracene	MG/KG	0.15	NC	0.3 J	0.15	MG/KG	Mean	(2)
	Benzo(a)pyrene	MG/KG	0.18	NC	0.37 J	0.18	MG/KG	Mean	(2)
	Benzo(b)fluoranthene	MG/KG	0.31	NC	0.64 J	0.31	MG/KG	Mean	(2)
	Benzo(g,h,i)perylene	MG/KG	0.11	NC	0.22 J	0.11	MG/KG	Mean	(2)
	Benzo(k)fluoranthene	MG/KG	0.18	NC	0.2 J	0.18	MG/KG	Mean	(2)
	bis(2-Ethylhexyl)phthalate	MG/KG	0.31	NC	0.43 J	0.31	MG/KG	Mean	(2)
	Carbazole	MG/KG	0.25	NC	0.052 J	0.052	MG/KG	Max	(3)
	Chrysene	MG/KG	0.23	NC	0.46 J	0.23	MG/KG	Mean	(2)
	Fluoranthene	MG/KG	0.39	NC	0.81 J	0.39	MG/KG	Mean	(2)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.15	NC	0.29 J	0.15	MG/KG	Mean	(2)
	Phenanthrene	MG/KG	0.14	NC	0.3 J	0.14	MG/KG	Mean	(2)
	Pyrene	MG/KG	0.30	NC	0.6 J	0.30	MG/KG	Mean	(2)
	Total PAH	MG/KG	3.1	NC	5.0	3.1	MG/KG	Mean	(2)
	PAH ESG		0.65	NC	0.93	0.65		Mean	
	Pesticides/PCBs								
	alpha-Chlordane	MG/KG	0.0022	NC	0.004	0.0022	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.0025	NC	0.005	0.0025	MG/KG	Mean	(2)
	Inorganics								
	Aluminum	MG/KG	2220	NC	2470	2220	MG/KG	Mean	(2)
	Arsenic	MG/KG	0.77	NC	0.97 J	0.77	MG/KG	Mean	(2)
	Barium	MG/KG	24.4	NC	38.1	24.4	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.68	NC	0.96 J	0.68	MG/KG	Mean	(2)
	Chromium	MG/KG	13.4	NC	18.6 J	13.4	MG/KG	Mean	(2)

Table 27
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Sediment

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
MANTON (continued)	Cobalt	MG/KG	2.3	NC	3.5		2.3	MG/KG	Mean	(2)
	Copper	MG/KG	29.5	NC	63.5		29.5	MG/KG	Mean	(2)
	Iron	MG/KG	4013	NC	4770	J	4013	MG/KG	Mean	(2)
	Lead	MG/KG	46	NC	91	J	46	MG/KG	Mean	(2)
	Zinc	MG/KG	78.5	NC	161		78.5	MG/KG	Mean	(2)
	AVS/SEM									
	Cadmium	UMOL/G	0.0046	NC	0.0075	J	0.0046	UMOL/G	Mean	(2)
	Copper	UMOL/G	0.20	NC	0.41	J	0.20	UMOL/G	Mean	(2)
	Lead	UMOL/G	0.3	NC	0.67	J	0.3	UMOL/G	Mean	(2)
	Nickel	UMOL/G	0.088	NC	0.15	J	0.088	UMOL/G	Mean	(2)
	Zinc	UMOL/G	0.93	NC	2.4		0.93	UMOL/G	Mean	(2)
	Acid Volatile Sulfide	UMOL/G	1.7	NC	4	J	1.7	UMOL/G	Mean	(2)
	Simultaneously Extracted Metal	UMOL/G	1.5	NC	3.6375		1.5	UMOL/G	Mean	(2)
	Carbon-Normalized Excess SEM	UMOL/G	-22.9	NC	7.9		-22.9	UMOL/G	Mean	(2)
	SEM/AVS		0.9	NC	1.2		0.9		Mean	(2)
	Dioxins/Furans									
	2,3,7,8-TCDD	MG/KG	0.00043	NC	0.000982	$	0.00043	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.0000045	NC	0.0000112		0.0000045	MG/KG	Mean	(2)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.00043	NC	0.000999		0.00043	MG/KG	Mean	(2)
	Toxicity Equivalency (Dioxins/Furans) - Birds	MG/KG	0.00043	NC	0.001		0.00043	MG/KG	Mean	(2)
	Toxicity Equivalency (Dioxins/Furans) - Fish	MG/KG	0.00043	NC	0.000992		0.00043	MG/KG	Mean	(2)
DYERVILLE	**Semivolatile Organics**									
	2-Methylnaphthalene	MG/KG	0.12	NC	0.031	J	0.031	MG/KG	Max	(3)
	Acenaphthene	MG/KG	0.14	NC	0.14	J	0.14	MG/KG	Mean	(2)
	Acenaphthylene	MG/KG	0.16	NC	0.27		0.16	MG/KG	Mean	(2)
	Anthracene	MG/KG	0.30	NC	0.55		0.30	MG/KG	Mean	(2)
	Benzo(a)anthracene	MG/KG	1.4	NC	2.6		1.4	MG/KG	Mean	(2)
	Benzo(a)pyrene	MG/KG	1.4	NC	2.2		1.4	MG/KG	Mean	(2)
	Benzo(b)fluoranthene	MG/KG	2.5	NC	4	*	2.5	MG/KG	Mean	(2)
	Benzo(g,h,i)perylene	MG/KG	1.1	NC	1.6		1.1	MG/KG	Mean	(2)
	Benzo(k)fluoranthene	MG/KG	0.7	NC	1.1		0.7	MG/KG	Mean	(2)

Table 27
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Sediment

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Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
DYERVILLE (continued)	bis(2-Ethylhexyl)phthalate	MG/KG	1.10	NC	1.6	J*	1.10	MG/KG	Mean	(2)
	Carbazole	MG/KG	0.22	NC	0.41	J	0.22	MG/KG	Mean	(2)
	Chrysene	MG/KG	1.5	NC	2.4		1.5	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.20	NC	0.32	J	0.20	MG/KG	Mean	(2)
	Dibenzofuran	MG/KG	0.15	NC	0.1	J	0.1	MG/KG	Max	(3)
	Di-n-Butylphthalate	MG/KG	0.13	NC	0.051	J	0.051	MG/KG	Max	(3)
	Fluoranthene	MG/KG	2.80	NC	5.4	*	2.80	MG/KG	Mean	(2)
	Fluorene	MG/KG	0.12	NC	0.22	J	0.12	MG/KG	Mean	(2)
	Indeno(1,2,3-cd)pyrene	MG/KG	1.4	NC	2		1.4	MG/KG	Mean	(2)
	Naphthalene	MG/KG	0.10	NC	0.064		0.064	MG/KG	Max	(3)
	Phenanthrene	MG/KG	1.4	NC	2.9		1.4	MG/KG	Mean	(2)
	Pyrene	MG/KG	2.4	NC	4.2	*	2.4	MG/KG	Mean	(2)
	Total PAH	MG/KG	19.0	NC	19		19.0	MG/KG	Mean	(2)
	PAH ESG		2.4	NC	4.7		2.4		Mean	
	Pesticides/PCBs									
	4,4'-DDD	MG/KG	0.0058	NC	0.013		0.0058	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.0039	NC	0.007		0.0039	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.0043	NC	0.011		0.0043	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	1.4	NC	1.42		1.4	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.49	NC	1.3		0.49	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.120	NC	0.12		0.120	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.01	NC	0.03		0.01	MG/KG	Mean	(2)
	Endosulfan sulfate	MG/KG	0.0052	NC	0.011		0.0052	MG/KG	Mean	(2)
	Inorganics									
	Aluminum	MG/KG	5630	NC	10700		5630	MG/KG	Mean	(2)
	Arsenic	MG/KG	4.4	NC	2.1	J	2.1	MG/KG	Max	(3)
	Barium	MG/KG	67.8	NC	116		67.8	MG/KG	Mean	(2)
	Cadmium	MG/KG	1.7	NC	4	J	1.7	MG/KG	Mean	(2)
	Chromium	MG/KG	156	NC	385		156	MG/KG	Mean	(2)
	Cobalt	MG/KG	5.8	NC	9.1		5.8	MG/KG	Mean	(2)
	Copper	MG/KG	90.5	NC	210		90.5	MG/KG	Mean	(2)
	Iron	MG/KG	10443	NC	15300		10443	MG/KG	Mean	(2)

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Sediment

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North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
DYERVILLE (continued)	Lead	MG/KG	160	NC	307		160	MG/KG	Mean	(2)
	Mercury	MG/KG	0.40	NC	1.06		0.40	MG/KG	Mean	(2)
	Zinc	MG/KG	719.30	NC	1930		719.30	MG/KG	Mean	(2)
	AVS/SEM									
	Cadmium	UMOL/G	0.0043	NC	0.0074	J	0.0043	UMOL/G	Mean	(2)
	Copper	UMOL/G	0.54	NC	0.61	J	0.54	UMOL/G	Mean	(2)
	Lead	UMOL/G	0.41	NC	0.59	J	0.41	UMOL/G	Mean	(2)
	Nickel	UMOL/G	0.25	NC	0.27		0.25	UMOL/G	Mean	(2)
	Zinc	UMOL/G	2.0	NC	2.5		2.0	UMOL/G	Mean	(2)
	Acid Volatile Sulfide	UMOL/G	1.3	NC	2	J	1.3	UMOL/G	Mean	(2)
	Simultaneously Extracted Metal	UMOL/G	3.1	NC	3.9274		3.1	UMOL/G	Mean	(2)
	Carbon-Normalized Excess SEM	UMOL/G	733	NC	1371		733	UMOL/G	Mean	(2)
	SEM/AVS		3.4	NC	4.7		3.4		Mean	(2)
	Dioxins/Furans									
	2,3,7,8-TCDD	MG/KG	0.000091	NC	0.000144	J	0.000091	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.000022	NC	0.0000536		0.000022	MG/KG	Mean	(2)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000083	NC	0.000152		0.000083	MG/KG	Mean	(2)
	Toxicity Equivalency (Dioxins/Furans) - Birds	MG/KG	0.000098	NC	0.000157		0.000098	MG/KG	Mean	(2)
	Toxicity Equivalency (Dioxins/Furans) - Fish	MG/KG	0.000079	NC	0.00015		0.000079	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.000000025	NC	2.53E-08		0.000000025	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.000013	NC	0.0000127		0.000013	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.000000025	NC	2.53E-08		0.000000025	MG/KG	Mean	(2)

Table 27
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Sediment

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North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

(1) Chemicals of potential concern are identified in Table 3 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(2) Mean: *Arithmetic Mean*
(3) Max: Maximum, applied in the special case where the arithmetic mean has been selected, but because of elevated detection limits in non-detects, it is greater than the maximum detected concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:

J = Value is estimated.
E = Value is estimated due to significant matrix interference.
B = Analyte detected above the detection limit and concentration in associated samples < 10x blank levels.
EMPC = Estimated Maximum Possible Concentration.
P = The difference in concentration between the primary column and confirmation column exceeds 25 percent. The reported concentration is considered an estimated value
* = Value is either the detection limit (DL) or the Estimated Maximum Possible Concentration (EMPC).
$ = Result reported from a confirmation analysis.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

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Table 28
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Sediment

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
ASSAPUMPSET	**Semivolatile Organics**									
(Reference area)	2-Methylnaphthalene	MG/KG	0.22	NC	0.01855		0.01855	MG/KG	Max	(5)
	Acenaphthene	MG/KG	0.22	NC	0.03411	J	0.03411	MG/KG	Max	(5)
	Acenaphthylene	MG/KG	0.19	NC	0.0589		0.0589	MG/KG	Max	(5)
	Anthracene	MG/KG	0.21	NC	0.14754		0.14754	MG/KG	Max	(5)
	Benzo(a)anthracene	MG/KG	0.52	NC	1		1	MG/KG	Max	(5)
	Benzo(a)pyrene	MG/KG	0.53	NC	0.84		0.84	MG/KG	Max	(5)
	Benzo(b)fluoranthene	MG/KG	0.63	NC	1.4		1.4	MG/KG	Max	(5)
	Benzo(g,h,i)perylene	MG/KG	0.40	NC	0.59468		0.59468	MG/KG	Max	(5)
	Benzo(k)fluoranthene	MG/KG	0.41	NC	0.80433		0.80433	MG/KG	Max	(5)
	bis(2-Ethylhexyl)phthalate	MG/KG	0.47	NC	1	J	1	MG/KG	Max	(5)
	Carbazole	MG/KG	0.16	NC	0.089	J	0.089	MG/KG	Max	(5)
	Chrysene	MG/KG	0.68	NC	1.1		1.1	MG/KG	Max	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.15	NC	0.17898		0.17898	MG/KG	Max	(5)
	Dibenzofuran	MG/KG	0.22	NC	0.03586		0.03586	MG/KG	Max	(5)
	Di-n-Butylphthalate	MG/KG	0.11	NC	0.08	JEB	0.08	MG/KG	Max	(5)
	Fluoranthene	MG/KG	1.09	NC	1.7		1.7	MG/KG	Max	(5)
	Fluorene	MG/KG	0.19	NC	0.08068		0.08068	MG/KG	Max	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.43	NC	0.65		0.65	MG/KG	Max	(5)
	Naphthalene	MG/KG	0.22	NC	0.01905		0.01905	MG/KG	Max	(5)
	Phenanthrene	MG/KG	0.54	NC	0.79474		0.79474	MG/KG	Max	(5)
	Pyrene	MG/KG	0.94	NC	1.6		1.6	MG/KG	Max	(5)
	Total PAH	MG/KG	6.7	NC	9.6		9.6	MG/KG	Max	(5)
	PAH ESG		0.79	NC	2.2		2.2	MG/KG	Max	(5)
	Pesticides/PCBs									
	4,4'-DDD	MG/KG	0.0026	NC	0.00317	J	0.00317	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.0033	NC	0.00547	J	0.00547	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.0013	NC	0.00133	J	0.00133	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	0.058	NC	0.09922	J	0.09922	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.032	NC	0.05755		0.05755	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.023	NC	0.04166		0.04166	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.0022	NC	0.00191	J	0.00191	MG/KG	Max	(5)

Table 28
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Sediment

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
ASSAPUMPSET (continued)	gamma-Chlordane	MG/KG	0.0012	NC	0.00065	J	0.00065	MG/KG	Max	(5)
(Reference area)	Technical Chlordane	MG/KG	0.11	NC	0.15253	J	0.15253	MG/KG	Max	(5)
	Inorganics									
	Aluminum	MG/KG	9841	NC	21774	J	21774	MG/KG	Max	(5)
	Arsenic	MG/KG	2.67	NC	5.21	J	5.21	MG/KG	Max	(5)
	Barium	MG/KG	93.6	NC	204	J	204	MG/KG	Max	(5)
	Cadmium	MG/KG	0.37	NC	0.858		0.858	MG/KG	Max	(5)
	Chromium	MG/KG	10.4	NC	17.5	J	17.5	MG/KG	Max	(5)
	Cobalt	MG/KG	6.2	NC	10.1		10.1	MG/KG	Max	(5)
	Copper	MG/KG	11.8	NC	18.3	J	18.3	MG/KG	Max	(5)
	Iron	MG/KG	14363	NC	23357		23357	MG/KG	Max	(5)
	Lead	MG/KG	40.5	NC	88.6	J	88.6	MG/KG	Max	(5)
	Mercury	MG/KG	0.0512	NC	0.114		0.114	MG/KG	Max	(5)
	Mercury (methyl)	MG/KG	0.000561	NC	0.000863	J	0.000863	MG/KG	Max	(5)
	Molybdenum	MG/KG	1.58	NC	1.59	J	1.59	MG/KG	Max	(5)
	Selenium	MG/KG	0.62	NC	2.2	J	2.2	MG/KG	Max	(5)
	Silver	MG/KG	1.56	NC	6.5		6.5	MG/KG	Max	(5)
	Thallium	MG/KG	0.43	NC	0.354	J	0.354	MG/KG	Max	(5)
	Zinc	MG/KG	101	NC	227	J	227	MG/KG	Max	(5)
	AVS/SEM									
	Cadmium	UMOL/G	0.0029	NC	0.012	J	0.012	UMOL/G	Max	(5)
	Copper	UMOL/G	0.17	NC	0.286	J	0.286	UMOL/G	Max	(5)
	Lead	UMOL/G	0.22	NC	0.428	J	0.428	UMOL/G	Max	(5)
	Nickel	UMOL/G	0.26	NC	0.51	J	0.51	UMOL/G	Max	(5)
	Zinc	UMOL/G	1.0	NC	1.07	J	1.07	UMOL/G	Max	(5)
	Acid Volatile Sulfide	UMOL/G	2.3	NC	7.3	J	7.3	UMOL/G	Max	(5)
	Simultaneously Extracted Metal	UMOL/G	1.7	NC	2.788		2.788	UMOL/G	Max	(5)
	Carbon-Normalized Excess SEM	UMOL/G	79.2	NC	133		133	UMOL/G	Max	(5)
	Dioxins/Furans									
	2,3,7,8-TCDD	MG/KG	0.0000019	NC	0.0000045	EMPC	0.0000045	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.0000015	NC	0.0000034		0.0000034	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.0000038	NC	0.00000773		0.00000773	MG/KG	Max	(5)

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North Providence, Rhode Island

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Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
ASSAPUMPSET (continued)	Toxicity Equivalency (Dioxins/Furans) - Birds	MG/KG	0.0000051	NC	0.0000113	0.0000113	MG/KG	Max	(5)
(Reference area)	Toxicity Equivalency (Dioxins/Furans) - Fish	MG/KG	0.0000034	NC	0.00000723	0.00000723	MG/KG	Max	(5)
GREYSTONE	**Semivolatile Organics**								
(Background area)	2-Methylnaphthalene	MG/KG	1.1	NC	0.07478 J	0.07478	MG/KG	Max	(5)
	Acenaphthene	MG/KG	0.8134589	NC	0.48 J	0.48	MG/KG	Max	(5)
	Acenaphthylene	MG/KG	1.1369767	NC	0.19279 J	0.19279	MG/KG	Max	(5)
	Anthracene	MG/KG	0.9937056	NC	0.93 J	0.93	MG/KG	Max	(5)
	Benzo(a)anthracene	MG/KG	1.4751389	NC	3.5	3.5	MG/KG	Max	(5)
	Benzo(a)pyrene	MG/KG	1.3930344	NC	3.1	3.1	MG/KG	Max	(5)
	Benzo(b)fluoranthene	MG/KG	1.5102811	NC	3.1	3.1	MG/KG	Max	(5)
	Benzo(g,h,i)perylene	MG/KG	0.8557456	NC	2.07671 J	2.07671	MG/KG	Max	(5)
	Benzo(k)fluoranthene	MG/KG	1.3982967	NC	3.6	3.6	MG/KG	Max	(5)
	bis(2-Ethylhexyl)phthalate	MG/KG	1.1532222	NC	0.95 J	0.95	MG/KG	Max	(5)
	Carbazole	MG/KG	0.8811111	NC	0.66 J	0.66	MG/KG	Max	(5)
	Chrysene	MG/KG	1.8113211	NC	4.1	4.1	MG/KG	Max	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.9747467	NC	0.77 J	0.77	MG/KG	Max	(5)
	Dibenzofuran	MG/KG	1.0526544	NC	0.29 J	0.29	MG/KG	Max	(5)
	Di-n-Butylphthalate	MG/KG	1.0070000	NC	0.47 JEB	0.47	MG/KG	Max	(5)
	Fluoranthene	MG/KG	3.3049122	NC	7	7	MG/KG	Max	(5)
	Fluorene	MG/KG	0.8485556	NC	0.47 J	0.47	MG/KG	Max	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	1.0217056	NC	2.18335 J	2.18335	MG/KG	Max	(5)
	Naphthalene	MG/KG	1.1259800	NC	0.09382 J	0.09382	MG/KG	Max	(5)
	Phenanthrene	MG/KG	2.0610878	NC	4.8	4.8	MG/KG	Max	(5)
	Pyrene	MG/KG	2.7900644	NC	6.5	6.5	MG/KG	Max	(5)
	Total PAH	MG/KG	18.4	NC	40	40	MG/KG	Max	(5)
	PAH ESG		0.5	NC	0.84	0.84		Max	(5)
	Pesticides/PCBs								
	4,4'-DDD	MG/KG	0.0048525	0.00485 NP	0.0193 J	0.00485	MG/KG	95% UCL-NP	(4)
	4,4'-DDE	MG/KG	0.0060167	0.00602 NP	0.03128	0.00602	MG/KG	95% UCL-NP	(4)
	alpha-Chlordane	MG/KG	0.0060542	0.00605 NP	0.01746 J	0.00605	MG/KG	95% UCL-NP	(4)
	Aroclor, Total	MG/KG	0.2089167	0.2089167 NP	0.48	0.2089167	MG/KG	95% UCL-NP	(4)
	Aroclor-1254	MG/KG	0.1494142	0.52835 T	0.38	0.38	MG/KG	Max	(5)

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Table 28
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Sediment

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North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
GREYSTONE (continued)	Aroclor-1260	MG/KG	0.025	0.025	NP	0.1		0.025	MG/KG	95% UCL-NP	(4)
(Background area)	Aroclor-1268	MG/KG	0.1372600	NC		0.24667		0.24667	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.0025525	0.00255	NP	0.0051	J	0.0025525	MG/KG	95% UCL-NP	(4)
	Endrin	MG/KG	0.0019104	0.00191	NP	0.00296		0.0019104	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.00478	0.00478	NP	0.01016		0.00478	MG/KG	95% UCL-NP	(4)
	Technical Chlordane	MG/KG	0.40	NC		0.62618		0.62618	MG/KG	Max	(5)
	Inorganics										
	Aluminum	MG/KG	8209.62	15554.1499	T	24690	J	15554.1499	MG/KG	95% UCL-T	(3)
	Antimony	MG/KG	0.73	4.3	T	4.3	J	4.3	MG/KG	Max	(5)
	Arsenic	MG/KG	3.9	9.6	T	13.5		9.6	MG/KG	95% UCL-T	(3)
	Barium	MG/KG	134	671	T	374	J	374	MG/KG	Max	(5)
	Cadmium	MG/KG	0.81	10.4	T	4.35		4.35	MG/KG	Max	(5)
	Chromium	MG/KG	99.3	601	T	271		271	MG/KG	Max	(5)
	Cobalt	MG/KG	8.1	28	T	23.8		23.8	MG/KG	Max	(5)
	Copper	MG/KG	72.8	650	T	436		436	MG/KG	Max	(5)
	Iron	MG/KG	13426	13426	NP	28339		13426	MG/KG	95% UCL-NP	(4)
	Lead	MG/KG	179	179	NP	570		179	MG/KG	95% UCL-NP	(4)
	Mercury	MG/KG	0.21	1.0	T	0.757		0.757	MG/KG	Max	(5)
	Mercury (methyl)	MG/KG	0.00026	NC		0.000658	J	0.000658	MG/KG	Max	(5)
	Molybdenum	MG/KG	12.6	NC		17.2		17.2	MG/KG	Max	(5)
	Selenium	MG/KG	1.1	3.7	T	3.6	J	3.6	MG/KG	Max	(5)
	Silver	MG/KG	2.6	18	T	9.2		9.2	MG/KG	Max	(5)
	Thallium	MG/KG	0.37	0.37	NP	0.71	J	0.37	MG/KG	95% UCL-NP	(4)
	Zinc	MG/KG	221	780	T	854	J	780	MG/KG	95% UCL-T	(3)
	AVS/SEM										
	Cadmium	UMOL/G	0.012	NC		0.027	J	0.027	UMOL/G	Max	(5)
	Copper	UMOL/G	1.5	NC		5.92	J	5.92	UMOL/G	Max	(5)
	Lead	UMOL/G	1.2	NC		2.88	J	2.88	UMOL/G	Max	(5)
	Nickel	UMOL/G	0.92	NC		4.41	J	4.41	UMOL/G	Max	(5)
	Zinc	UMOL/G	4.7	NC		12.2	J	12.2	UMOL/G	Max	(5)
	Acid Volatile Sulfide	UMOL/G	3.6	NC		9.5	J	9.5	UMOL/G	Max	(5)
	Simultaneously Extracted Metal	UMOL/G	8.3	NC		18.367		18.367	UMOL/G	Max	(5)

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Table 28
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Sediment

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North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
GREYSTONE (continued)	Carbon-Normalized Excess SEM	UMOL/G	106	NC		303		303	UMOL/G	Max	(5)
(Background area)	**Dioxins/Furans**										
	2,3,7,8-TCDD	MG/KG	0.000015	0.00038	T	0.0000866		0.0000866	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.000013	0.000099	T	0.0000693		0.0000693	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000035	0.00012	T	0.000179		0.00012	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency (Dioxins/Furans) - Birds	MG/KG	0.000045	0.00015	T	0.000233		0.00015	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency (Dioxins/Furans) - Fish	MG/KG	0.000030	0.00011	T	0.000159		0.00011	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.000025	NC		0.0000249		0.0000249	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.000034	NC		0.0000337		0.0000337	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.0000012	NC		0.00000122		0.00000122	MG/KG	Max	(5)
ALLENDALE	**Semivolatile Organics**										
	2-Methylnaphthalene	MG/KG	1.6	3.7	T	0.13608		0.13608	MG/KG	Max	(5)
	Acenaphthene	MG/KG	1.5	1.8	N	1.2	J	1.2	MG/KG	Max	(5)
	Acenaphthylene	MG/KG	1.6	1.9	N	0.97	J	0.97	MG/KG	Max	(5)
	Anthracene	MG/KG	1.2	1.8	T	1.8	J	1.8	MG/KG	Max	(5)
	Benzo(a)anthracene	MG/KG	2.2	3.4	T	8.4		3.4	MG/KG	95% UCL-T	(3)
	Benzo(a)pyrene	MG/KG	2.3	4.0	T	9.2		4.0	MG/KG	95% UCL-T	(3)
	Benzo(b)fluoranthene	MG/KG	2.8	4.4	T	9.5		4.4	MG/KG	95% UCL-T	(3)
	Benzo(g,h,i)perylene	MG/KG	2	2	NP	7		2	MG/KG	95% UCL-NP	(4)
	Benzo(k)fluoranthene	MG/KG	2.6	3.9	T	9.2		3.9	MG/KG	95% UCL-T	(3)
	bis(2-Ethylhexyl)phthalate	MG/KG	2.3	3.2	T	12		3.2	MG/KG	95% UCL-T	(3)
	Carbazole	MG/KG	1.5	2.7	T	1.8	J	1.8	MG/KG	Max	(5)
	Chrysene	MG/KG	3.0	5.1	T	11		5.1	MG/KG	95% UCL-T	(3)
	Dibenzo(a,h)anthracene	MG/KG	1.4	2.0	T	2.6	J	2.0	MG/KG	95% UCL-T	(3)
	Dibenzofuran	MG/KG	1.6	1.9	N	0.64	J	0.64	MG/KG	Max	(5)
	Di-n-Butylphthalate	MG/KG	1.6	3.7	T	0.61	EB	0.61	MG/KG	Max	(5)
	Fluoranthene	MG/KG	5.2	9.6	T	20		9.6	MG/KG	95% UCL-T	(3)
	Fluorene	MG/KG	1.4	1.8	N	0.93	J	0.93	MG/KG	Max	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	1.9	3.2	T	6.8		3.2	MG/KG	95% UCL-T	(3)
	Naphthalene	MG/KG	1.6	1.9	N	0.18126		0.18126	MG/KG	Max	(5)

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Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ALLENDALE (continued)	Phenanthrene	MG/KG	2.9	4.8	T	12		4.8	MG/KG	95% UCL-T	(3)
	Pyrene	MG/KG	4.4	7.7	T	16		7.7	MG/KG	95% UCL-T	(3)
	Total PAH	MG/KG	28.9	63.3	T	110		63.3	MG/KG	95% UCL-T	(3)
	PAH ESG		1.5	NC		8.4		8.4		Max	(5)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0060	0.0060	NP	0.023	J	0.0060	MG/KG	95% UCL-NP	(4)
	4,4'-DDE	MG/KG	0.016	0.016	NP	0.2	*	0.016	MG/KG	95% UCL-NP	(4)
	alpha-Chlordane	MG/KG	0.011	0.011	NP	0.062		0.011	MG/KG	95% UCL-NP	(4)
	Aroclor, Total	MG/KG	1.5	2.3	T	27		2.3	MG/KG	95% UCL-T	(3)
	Aroclor-1248	MG/KG	0.254	0.254	NP	0.14		0.14	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	1.5	2.4	T	27		2.4	MG/KG	95% UCL-T	(3)
	Aroclor-1260	MG/KG	0.20	0.20	NP	0.27		0.20	MG/KG	95% UCL-NP	(4)
	Aroclor-1268	MG/KG	0.08	0.08	NP	0.15642		0.08	MG/KG	95% UCL-NP	(4)
	Dieldrin	MG/KG	0.0090	0.0090	NP	0.11297	J	0.0090	MG/KG	95% UCL-NP	(4)
	Endosulfan II	MG/KG	0.037	0.037	NP	0.44	*	0.037	MG/KG	95% UCL-NP	(4)
	Endosulfan sulfate	MG/KG	0.0027	0.0027	NP	0.00902		0.0027	MG/KG	95% UCL-NP	(4)
	Endrin	MG/KG	0.0032	0.0032	NP	0.028		0.0032	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.0097	0.0170	T	0.074	*	0.0170	MG/KG	95% UCL-T	(3)
	Methoxychlor	MG/KG	0.011	0.011	NP	0.035	J	0.011	MG/KG	95% UCL-NP	(4)
	Technical Chlordane	MG/KG	0.515	0.651	N	0.85181		0.651	MG/KG	95% UCL-N	(2)
	Inorganics										
	Aluminum	MG/KG	10038	12475	T	22168	J	12475	MG/KG	95% UCL-T	(3)
	Antimony	MG/KG	2.3	4.8	T	13.7	J	4.8	MG/KG	95% UCL-T	(3)
	Arsenic	MG/KG	5.8	5.8	NP	18	J	5.8	MG/KG	95% UCL-NP	(4)
	Barium	MG/KG	137.6	157.6	N	320	J	157.6	MG/KG	95% UCL-N	(2)

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Table 28
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Sediment

Baseline Ecological Risk Assessment - Interim Final
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North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ALLENDALE (continued)	Cadmium	MG/KG	1.2	1.2	NP	5.2	J	1.2	MG/KG	95% UCL-NP	(4)
	Chromium	MG/KG	142	238	T	536	J	238	MG/KG	95% UCL-T	(3)
	Cobalt	MG/KG	7.1	8.7	T	23.4	J	8.7	MG/KG	95% UCL-T	(3)
	Copper	MG/KG	119	192	T	419	J	192	MG/KG	95% UCL-T	(3)
	Iron	MG/KG	17994	21005	T	52400	J	21005	MG/KG	95% UCL-T	(3)
	Lead	MG/KG	329	488	T	1090		488	MG/KG	95% UCL-T	(3)
	Mercury	MG/KG	0.47	0.97	T	3.6		0.97	MG/KG	95% UCL-T	(3)
	Mercury (methyl)	MG/KG	0.0008	0.00186	T	0.00285	J	0.00186	MG/KG	95% UCL-T	(3)
	Molybdenum	MG/KG	13.2	13.2	NP	29.6		13.2	MG/KG	95% UCL-NP	(4)
	Selenium	MG/KG	1.1	1.4	T	3.8	J	1.4	MG/KG	95% UCL-T	(3)
	Silver	MG/KG	2.8	4.4	T	14.6		4.4	MG/KG	95% UCL-T	(3)
	Thallium	MG/KG	7.28	7.28	NP	6.8	J	6.8	MG/KG	Max	(5)
	Zinc	MG/KG	353.8	482.4	T	2088	J	482.4	MG/KG	95% UCL-T	(3)
	Cyanide	MG/KG	2.4	NC		2.4		2.4	MG/KG	Max	(5)
	AVS/SEM										
	Cadmium	UMOL/G	0.014	0.014	NP	0.0439	J	0.014	UMOL/G	95% UCL-NP	(4)
	Copper	UMOL/G	1.6	1.6	NP	5.61336	J	1.6	UMOL/G	95% UCL-NP	(4)
	Lead	UMOL/G	1.4	1.4	NP	3.29	J	1.4	UMOL/G	95% UCL-NP	(4)
	Nickel	UMOL/G	1.0	1.0	NP	2.92605	J	1.0	UMOL/G	95% UCL-NP	(4)
	Zinc	UMOL/G	6.6	6.6	NP	25	J	6.6	UMOL/G	95% UCL-NP	(4)
	Acid Volatile Sulfide	UMOL/G	7.9	7.9	NP	44.8	J	7.9	UMOL/G	95% UCL-NP	(4)
	Simultaneously Extracted Metal	UMOL/G	10.6	13.6	N	30.1725		13.6	UMOL/G	95% UCL-N	(2)
	Carbon-Normalized Excess SEM	UMOL/G	73.0	73.0	NP	530		530	UMOL/G	Max	(4)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.0058	0.0058	NP	0.073	J	0.0058	MG/KG	95% UCL-NP	(4)
	2,3,7,8-TCDF	MG/KG	0.000030	0.000074	T	0.000184		0.000074	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.0058	0.029	T	0.073		0.029	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency (Dioxins/Furans) - Birds	MG/KG	0.0058	0.027	T	0.073		0.027	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency (Dioxins/Furans) - Fish	MG/KG	0.0058	0.006	NP	0.073		0.006	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0001	NC		0.000056		0.000056	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.0000	NC		0.000000112		0.000000112	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0000	NC		0.000000112		0.000000112	MG/KG	Max	(5)

Table 28
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Sediment

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
LYMAN MILL	**Semivolatile Organics**										
	2-Methylnaphthalene	MG/KG	0.95	0.95	NP	0.1	J	0.1	MG/KG	Max	(5)
	Acenaphthene	MG/KG	0.93	0.93	NP	1.8	J	0.93	MG/KG	95% UCL-NP	(4)
	Acenaphthylene	MG/KG	0.88	0.88	NP	0.42856		0.42856	MG/KG	Max	(5)
	Anthracene	MG/KG	0.79	0.79	NP	1.4		0.79	MG/KG	95% UCL-NP	(4)
	Benzo(a)anthracene	MG/KG	1.4	2.8	T	5.5	J	2.8	MG/KG	95% UCL-T	(3)
	Benzo(a)pyrene	MG/KG	1.4	2.9	T	6.17711		2.9	MG/KG	95% UCL-T	(3)
	Benzo(b)fluoranthene	MG/KG	2.1	4.5	T	13	J*	4.5	MG/KG	95% UCL-T	(3)
	Benzo(g,h,i)perylene	MG/KG	1.26	2.99	T	4.85176		2.99	MG/KG	95% UCL-T	(3)
	Benzo(k)fluoranthene	MG/KG	1.1	2.1	T	7.30225		2.1	MG/KG	95% UCL-T	(3)
	bis(2-Ethylhexyl)phthalate	MG/KG	2.6	5.2	T	50	J*	5.2	MG/KG	95% UCL-T	(3)
	Carbazole	MG/KG	0.8	0.8	NP	0.85	J	0.8	MG/KG	95% UCL-NP	(4)
	Chrysene	MG/KG	1.7	3.6	T	8.9397		3.6	MG/KG	95% UCL-T	(3)
	Dibenzo(a,h)anthracene	MG/KG	0.77	1.1	T	1.0694		1.0694	MG/KG	Max	(5)
	Dibenzofuran	MG/KG	0.89	2.0	T	0.31	J	0.31	MG/KG	Max	(5)
	Di-n-Butylphthalate	MG/KG	0.99	1.8	T	1.8	J	1.8	MG/KG	95% UCL-T	(3)
	Fluoranthene	MG/KG	2.7	6.8	T	16.763		6.8	MG/KG	95% UCL-T	(3)
	Fluorene	MG/KG	0.89	0.89	NP	0.67084		0.67084	MG/KG	Max	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	1.28	2.71	T	5.25309		2.71	MG/KG	95% UCL-T	(3)
	Naphthalene	MG/KG	0.92	0.92	NP	0.18514		0.18514	MG/KG	Max	(5)
	Phenanthrene	MG/KG	1.5	2.8	T	8.37861		2.8	MG/KG	95% UCL-T	(3)
	Pyrene	MG/KG	2.4	5.1	T	13.14306		5.1	MG/KG	95% UCL-T	(3)
	Total PAH	MG/KG	11.1	47.2	T	87.93009		47.2	MG/KG	95% UCL-T	(3)
	PAH ESG		1.0	NC		8.2		8.2		Max	(5)

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Table 28
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Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
LYMAN MILL (continued)	**Pesticides/PCBs**										
	4,4'-DDD	MG/KG	0.0093	0.0093	NP	0.052		0.0093	MG/KG	95% UCL-NP	(4)
	4,4'-DDE	MG/KG	0.0083	0.011	T	0.048		0.011	MG/KG	95% UCL-T	(3)
	alpha-Chlordane	MG/KG	0.016	0.032	T	0.14075		0.032	MG/KG	95% UCL-T	(3)
	Aroclor, Total	MG/KG	0.26	0.39	T	2.21205		0.39	MG/KG	95% UCL-T	(3)
	Aroclor-1248	MG/KG	0.025	0.028	T	0.052		0.028	MG/KG	95% UCL-T	(3)
	Aroclor-1254	MG/KG	0.27	0.49	T	2.2	*	0.49	MG/KG	95% UCL-T	(3)
	Aroclor-1260	MG/KG	0.024	0.027	T	0.043	J	0.027	MG/KG	95% UCL-T	(3)
	Aroclor-1268	MG/KG	0.116	NC		0.31379	J	0.31379	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.0038	0.0044	T	0.017	P	0.0044	MG/KG	95% UCL-T	(3)
	Endosulfan II	MG/KG	0.0038	0.0047	T	0.017		0.0047	MG/KG	95% UCL-T	(3)
	Endosulfan sulfate	MG/KG	0.0029	0.0029	NP	0.01055		0.0029	MG/KG	95% UCL-NP	(4)
	Endrin	MG/KG	0.0026	0.0026	NP	0.0056	P	0.0026	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.0089	0.015	T	0.06988		0.015	MG/KG	95% UCL-T	(3)
	Methoxychlor	MG/KG	0.010	0.012	N	0.0053	J	0.0053	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	1.294	NC		2.21273		2.21273	MG/KG	Max	(5)
	Inorganics										
	Aluminum	MG/KG	10181	13069	T	27773	J	13069	MG/KG	95% UCL-T	(3)
	Antimony	MG/KG	1.3	3.1	T	5.3	J	3.1	MG/KG	95% UCL-T	(3)
	Arsenic	MG/KG	5.2	6.4	T	13.2	J	6.4	MG/KG	95% UCL-T	(3)
	Barium	MG/KG	130	207	T	380	J	207	MG/KG	95% UCL-T	(3)
	Cadmium	MG/KG	2.1	2.1	NP	23.9		2.1	MG/KG	95% UCL-NP	(4)
	Chromium	MG/KG	98.9	200	T	310	J	200	MG/KG	95% UCL-T	(3)
	Cobalt	MG/KG	7.8	12	T	26.6		12	MG/KG	95% UCL-T	(3)
	Copper	MG/KG	112	199	T	1110		199	MG/KG	95% UCL-T	(3)
	Iron	MG/KG	16468	20068	T	41293		20068	MG/KG	95% UCL-T	(3)
	Lead	MG/KG	235.6	375	T	721	J	375	MG/KG	95% UCL-T	(3)
	Mercury	MG/KG	0.3	1	T	0.946		1	MG/KG	95% UCL-T	(3)

Table 28
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Sediment

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
LYMAN MILL (continued)	Mercury (methyl)	MG/KG	0.0021	NC		0.00959	J	0.00959	MG/KG	Max	(5)
	Molybdenum	MG/KG	6.5	NC		13.4		13.4	MG/KG	Max	(5)
	Selenium	MG/KG	0.96	1.2	T	2.9	J	1.2	MG/KG	95% UCL-T	(3)
	Silver	MG/KG	2.9	4.3	T	12.7		4.3	MG/KG	95% UCL-T	(3)
	Thallium	MG/KG	0.58	0.58	NP	0.883	J	0.58	MG/KG	95% UCL-NP	(4)
	Zinc	MG/KG	391	758	T	1662	J	758	MG/KG	95% UCL-T	(3)
	AVS/SEM										
	Cadmium	UMOL/G	0.025	0.025	NP	0.16		0.025	UMOL/G	95% UCL-NP	(4)
	Copper	UMOL/G	2.1	2.1	NP	15.3	J	2.1	UMOL/G	95% UCL-NP	(4)
	Lead	UMOL/G	1.5	1.5	NP	3.597		1.5	UMOL/G	95% UCL-NP	(4)
	Nickel	UMOL/G	1.0	1.0	NP	4.52961	J	1.0	UMOL/G	95% UCL-NP	(4)
	Zinc	UMOL/G	8.1	8.1	NP	19.8	J	8.1	UMOL/G	95% UCL-NP	(4)
	Acid Volatile Sulfide	UMOL/G	12.8	12.8	NP	73.03		12.8	UMOL/G	95% UCL-NP	(4)
	Simultaneously Extracted Metal	UMOL/G	12.7	16.0	N	33.86		16.0	UMOL/G	95% UCL-N	(2)
	Carbon-Normalized Excess SEM	UMOL/G	16.3	16.3	NP	375		375	UMOL/G	Max	(5)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.0018	0.0018	NP	0.00798702	J	0.0018	MG/KG	95% UCL-NP	(4)
	2,3,7,8-TCDF	MG/KG	0.00	0.000052	T	0.0000713	J	0.000052	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.0018	0.035	T	0.00806		0.00806	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Birds	MG/KG	0.0018	0.028	T	0.00808		0.00808	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Fish	MG/KG	0.0018	0.036	T	0.00805		0.00805	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.000033	NC		0.0000649		0.0000649	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.00015	NC		0.00021		0.00021	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.0000018	NC		0.00000336		0.00000336	MG/KG	Max	(5)
MANTON	**Semivolatile Organics**										
	Benzo(a)anthracene	MG/KG	0.15	NC		0.3	J	0.3	MG/KG	Max	(5)
	Benzo(a)pyrene	MG/KG	0.18	NC		0.37	J	0.37	MG/KG	Max	(5)
	Benzo(b)fluoranthene	MG/KG	0.31	NC		0.64	J	0.64	MG/KG	Max	(5)
	Benzo(g,h,i)perylene	MG/KG	0.11	NC		0.22	J	0.22	MG/KG	Max	(5)
	Benzo(k)fluoranthene	MG/KG	0.18	NC		0.2	J	0.2	MG/KG	Max	(5)
	bis(2-Ethylhexyl)phthalate	MG/KG	0.31	NC		0.43	J	0.43	MG/KG	Max	(5)

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Table 28
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Sediment

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North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
MANTON (continued)	Carbazole	MG/KG	0.25	NC	0.052	J	0.052	MG/KG	Max	(5)
	Chrysene	MG/KG	0.23	NC	0.46	J	0.46	MG/KG	Max	(5)
	Fluoranthene	MG/KG	0.39	NC	0.81	J	0.81	MG/KG	Max	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.15	NC	0.29	J	0.29	MG/KG	Max	(5)
	Phenanthrene	MG/KG	0.14	NC	0.3	J	0.3	MG/KG	Max	(5)
	Pyrene	MG/KG	0.30	NC	0.6	J	0.6	MG/KG	Max	(5)
	Total PAH	MG/KG	3.1	NC	5.0		5.0	MG/KG	Max	(5)
	PAH ESG		0.65	NC	0.93		0.93		Max	(5)
	Pesticides/PCBs									
	alpha-Chlordane	MG/KG	0.0022	NC	0.004		0.004	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.0025	NC	0.005		0.005	MG/KG	Max	(5)
	Inorganics									
	Aluminum	MG/KG	2220	NC	2470		2470	MG/KG	Max	(5)
	Arsenic	MG/KG	0.77	NC	0.97	J	0.97	MG/KG	Max	(5)
	Barium	MG/KG	24.4	NC	38.1		38.1	MG/KG	Max	(5)
	Cadmium	MG/KG	0.68	NC	0.96	J	0.96	MG/KG	Max	(5)
	Chromium	MG/KG	13.4	NC	18.6	J	18.6	MG/KG	Max	(5)
	Cobalt	MG/KG	2.3	NC	3.5		3.5	MG/KG	Max	(5)
	Copper	MG/KG	29.5	NC	63.5		63.5	MG/KG	Max	(5)
	Iron	MG/KG	4013	NC	4770	J	4770	MG/KG	Max	(5)
	Lead	MG/KG	46	NC	91	J	91	MG/KG	Max	(5)
	Zinc	MG/KG	78.5	NC	161		161	MG/KG	Max	(5)
	AVS/SEM									
	Cadmium	UMOL/G	0.0046	NC	0.0075	J	0.0075	UMOL/G	Max	(5)
	Copper	UMOL/G	0.20	NC	0.41	J	0.41	UMOL/G	Max	(5)
	Lead	UMOL/G	0.27	NC	0.67	J	0.67	UMOL/G	Max	(5)
	Nickel	UMOL/G	0.088	NC	0.15	J	0.15	UMOL/G	Max	(5)
	Zinc	UMOL/G	0.93	NC	2.4		2.4	UMOL/G	Max	(5)
	Acid Volatile Sulfide	UMOL/G	1.7	NC	4	J	4	UMOL/G	Max	(5)
	Simultaneously Extracted Metal	UMOL/G	1.5	NC	3.6375		3.6375	UMOL/G	Max	(5)
	Carbon-Normalized Excess SEM	UMOL/G	-22.9	NC	7.9		7.9	UMOL/G	Max	(5)

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Sediment

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Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
MANTON (continued)	**Dioxins/Furans**									
	2,3,7,8-TCDD	MG/KG	0.00043	NC	0.000982	$	0.000982	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.00000	NC	0.0000112		0.0000112	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.00043	NC	0.000999		0.000999	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Birds	MG/KG	0.00043	NC	0.001		0.001	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Fish	MG/KG	0.00043	NC	0.000992		0.000992	MG/KG	Max	(5)
DYERVILLE	**Semivolatile Organics**									
	2-Methylnaphthalene	MG/KG	0.12	NC	0.031	J	0.031	MG/KG	Max	(5)
	Acenaphthene	MG/KG	0.14	NC	0.14	J	0.14	MG/KG	Max	(5)
	Acenaphthylene	MG/KG	0.16	NC	0.27		0.27	MG/KG	Max	(5)
	Anthracene	MG/KG	0.30	NC	0.55		0.55	MG/KG	Max	(5)
	Benzo(a)anthracene	MG/KG	1.4	NC	2.6		2.6	MG/KG	Max	(5)
	Benzo(a)pyrene	MG/KG	1.4	NC	2.2		2.2	MG/KG	Max	(5)
	Benzo(b)fluoranthene	MG/KG	2.5	NC	4	*	4	MG/KG	Max	(5)
	Benzo(g,h,i)perylene	MG/KG	1.1	NC	1.6		1.6	MG/KG	Max	(5)
	Benzo(k)fluoranthene	MG/KG	0.71	NC	1.1		1.1	MG/KG	Max	(5)
	bis(2-Ethylhexyl)phthalate	MG/KG	1.1	NC	1.6	J*	1.6	MG/KG	Max	(5)
	Carbazole	MG/KG	0.22	NC	0.41	J	0.41	MG/KG	Max	(5)
	Chrysene	MG/KG	1.5	NC	2.4		2.4	MG/KG	Max	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.20	NC	0.32	J	0.32	MG/KG	Max	(5)
	Dibenzofuran	MG/KG	0.15	NC	0.1	J	0.1	MG/KG	Max	(5)
	Di-n-Butylphthalate	MG/KG	0.13	NC	0.051	J	0.051	MG/KG	Max	(5)
	Fluoranthene	MG/KG	2.8	NC	5.4	*	5.4	MG/KG	Max	(5)
	Fluorene	MG/KG	0.12	NC	0.22	J	0.22	MG/KG	Max	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	1.4	NC	2		2	MG/KG	Max	(5)
	Naphthalene	MG/KG	0.10	NC	0.064		0.064	MG/KG	Max	(5)
	Phenanthrene	MG/KG	1.4	NC	2.9		2.9	MG/KG	Max	(5)
	Pyrene	MG/KG	2.4	NC	4.2	*	4.2	MG/KG	Max	(5)
	Total PAH	MG/KG	19.0	NC	19		19.0	MG/KG	Max	(5)
	PAH ESG		2.4	NC	4.7		4.7	MG/KG	Max	(5)

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Table 28
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Sediment

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
DYERVILLE (continued)	**Pesticides/PCBs**									
	4,4'-DDD	MG/KG	0.0058	NC	0.013		0.013	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.0039	NC	0.007		0.007	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.0043	NC	0.011		0.011	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	1.4	NC	1.42		1.42	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.5	NC	1.3		1.3	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.12	NC	0.12		0.12	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.01	NC	0.03		0.03	MG/KG	Max	(5)
	Endosulfan sulfate	MG/KG	0.0	NC	0.011		0.011	MG/KG	Max	(5)
	Inorganics									
	Aluminum	MG/KG	5630	NC	10700		10700	MG/KG	Max	(5)
	Arsenic	MG/KG	4.4	NC	2.1	J	2.1	MG/KG	Max	(5)
	Barium	MG/KG	67.8	NC	116		116	MG/KG	Max	(5)
	Cadmium	MG/KG	1.7	NC	4	J	4	MG/KG	Max	(5)
	Chromium	MG/KG	156	NC	385		385	MG/KG	Max	(5)
	Cobalt	MG/KG	5.8	NC	9.1		9.1	MG/KG	Max	(5)
	Copper	MG/KG	90.5	NC	210		210	MG/KG	Max	(5)
	Iron	MG/KG	10443	NC	15300		15300	MG/KG	Max	(5)
	Lead	MG/KG	160	NC	307		307	MG/KG	Max	(5)
	Mercury	MG/KG	0.40	NC	1.06		1.06	MG/KG	Max	(5)
	Zinc	MG/KG	719	NC	1930		1930	MG/KG	Max	(5)
	AVS/SEM									
	Cadmium	UMOL/G	0.0043	NC	0.0074	J	0.0074	UMOL/G	Max	(5)
	Copper	UMOL/G	0.54	NC	0.61	J	0.61	UMOL/G	Max	(5)
	Lead	UMOL/G	0.41	NC	0.59	J	0.59	UMOL/G	Max	(5)
	Nickel	UMOL/G	0.245	NC	0.27		0.27	UMOL/G	Max	(5)
	Zinc	UMOL/G	1.95	NC	2.5		2.5	UMOL/G	Max	(5)
	Acid Volatile Sulfide	UMOL/G	1.250000	NC	2	J	2	UMOL/G	Max	(5)
	Simultaneously Extracted Metal	UMOL/G	3.14	NC	3.9274		3.9274	UMOL/G	Max	(5)
	Carbon-Normalized Excess SEM	UMOL/G	732.75	NC	1371		1371	UMOL/G	Max	(5)

Table 28
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Sediment

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
DYERVILLE (continued)	**Dioxins/Furans**								
	2,3,7,8-TCDD	MG/KG	0.000091	NC	0.000144 J	0.000144	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.000022	NC	0.0000536	0.0000536	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000083	NC	0.000152	0.000152	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Birds	MG/KG	0.000098	NC	0.000157	0.000157	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Fish	MG/KG	0.000079	NC	0.00015	0.00015	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.000000025	NC	2.53E-08	0.0000000253	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.000013	NC	0.0000127	0.0000127	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.000000025	NC	2.53E-08	0.0000000253	MG/KG	Max	(5)

(1) Chemicals of potential concern are identified in Table 3 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(2) 95% UCL-N: 95% *Upper Concentration Limit on the mean, normal distribution*
(3) 95% UCL-T: 95% Upper Concentration Limit on the mean, lognormal distribution
(4) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(5) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

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Table 28
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Sediment

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Sediment
Exposure Medium: Sediment (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

Qualifier Definitions:

J = Value is estimated.

E = Value is estimated due to significant matrix interference.

B = Analyte detected above the detection limit and concentration in associated samples < 10x blank levels.

EMPC = Estimated Maximum Possible Concentration.

P = The difference in concentration between the primary column and confirmation column exceeds 25 percent. The reported centration is considered an estimated value

* = Value is either the detection limit (DL) or the Estimated Maximum Possible Concentration (EMPC).

$ = Result reported from a confirmation analysis.

mg/Kg = milligrams per kilogram

EPC = Exposure Point Concentration

UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

Table 29
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Crayfish

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Crayfish
Exposure Medium: Crayfish

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
GREYSTONE	**Pesticides/PCBs**									
(Background area)	4,4'-DDE	MG/KG	0.00433	NC	0.00705		0.00433	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.0003	NC	0.00028	J	0.0003	MG/KG	Max	(3)
	Aroclor, Total	MG/KG	0.04395	NC	0.05647	J	0.04395	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.03774	NC	0.05142		0.03774	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.00621	NC	0.00899	J	0.00621	MG/KG	Mean	(2)
	Endosulfan Sulfate	MG/KG	0.00051	NC	0.00053	J	0.00051	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.0004	NC	0.00009	J	0.00009	MG/KG	Max	(3)
	Technical Chlordane	MG/KG	0.0183	NC	0.02241	J	0.0183	MG/KG	Mean	(2)
	Inorganics									
	Aluminum	MG/KG	0.900	NC	1.95	J	0.900	MG/KG	Mean	(2)
	Antimony	MG/KG	0.0139	NC	0.0155	J	0.0139	MG/KG	Mean	(2)
	Barium	MG/KG	25.5	NC	28.9	J	25.5	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.086	NC	0.117	J	0.086	MG/KG	Mean	(2)
	Chromium	MG/KG	0.224	NC	0.368	J	0.224	MG/KG	Mean	(2)
	Cobalt	MG/KG	0.240	NC	0.308	J	0.240	MG/KG	Mean	(2)
	Copper	MG/KG	26.8	NC	29.7		26.8	MG/KG	Mean	(2)
	Iron	MG/KG	79.6	NC	158	J	79.6	MG/KG	Mean	(2)
	Lead	MG/KG	0.519	NC	0.673	J	0.519	MG/KG	Mean	(2)
	Manganese	MG/KG	116	NC	146		116	MG/KG	Mean	(2)
	Mercury	MG/KG	0.0224	NC	0.027		0.0224	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.0223	NC	0.0286		0.0223	MG/KG	Mean	(2)
	Molybdenum	MG/KG	0.141	NC	0.247	J	0.141	MG/KG	Mean	(2)
	Nickel	MG/KG	0.282	NC	0.374		0.282	MG/KG	Mean	(2)
	Selenium	MG/KG	0.125	NC	0.139	J	0.125	MG/KG	Mean	(2)
	Silver	MG/KG	0.215	NC	0.31		0.215	MG/KG	Mean	(2)
	Thallium	MG/KG	0.00988	NC	0.0138	J	0.00988	MG/KG	Mean	(2)
	Vanadium	MG/KG	0.166	NC	0.278	J	0.166	MG/KG	Mean	(2)
	Zinc	MG/KG	22.6	NC	28.1		22.6	MG/KG	Mean	(2)

Table 29
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Crayfish

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Crayfish
Exposure Medium: Crayfish

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
ASSAPUMPSET	**Pesticides/PCBs**									
(Reference area)	4,4'-DDE	MG/KG	0.00361	NC	0.00361		0.00361	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.01102	NC	0.01102	J	0.01102	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.01034	NC	0.01034		0.01034	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.00069	NC	0.00069	J	0.00069	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.00009	NC	0.00009	J	0.00009	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.00883	NC	0.00883	J	0.00883	MG/KG	Mean	(2)
	Inorganics									
	Barium	MG/KG	39.7	NC	39.7	J	39.7	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.0819	NC	0.0819	J	0.0819	MG/KG	Mean	(2)
	Cobalt	MG/KG	0.0829	NC	0.0829	J	0.0829	MG/KG	Mean	(2)
	Copper	MG/KG	15	NC	15		15	MG/KG	Mean	(2)
	Iron	MG/KG	29.4	NC	29.4	J	29.4	MG/KG	Mean	(2)
	Lead	MG/KG	0.14	NC	0.14	J	0.14	MG/KG	Mean	(2)
	Manganese	MG/KG	112	NC	112		112	MG/KG	Mean	(2)
	Mercury	MG/KG	0.0389	NC	0.0389		0.0389	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.0389	NC	0.0389		0.0389	MG/KG	Mean	(2)
	Molybdenum	MG/KG	0.0425	NC	0.0425	J	0.0425	MG/KG	Mean	(2)
	Nickel	MG/KG	0.25	NC	0.25	J	0.25	MG/KG	Mean	(2)
	Selenium	MG/KG	0.125	NC	0.125	J	0.125	MG/KG	Mean	(2)
	Silver	MG/KG	0.215	NC	0.215		0.215	MG/KG	Mean	(2)
	Thallium	MG/KG	0.00712	NC	0.00712	J	0.00712	MG/KG	Mean	(2)
	Zinc	MG/KG	22.9	NC	22.9		22.9	MG/KG	Mean	(2)
	Dioxins/Furans									
	2,3,7,8-TCDD	MG/KG	0.00000039	NC	0.00000039	J	0.00000039	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.00000028	NC	0.00000028	J	0.00000028	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.000003	NC	0.000003		0.000003	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.00000374	NC	0.00000374		0.00000374	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.00000324	NC	0.00000324		0.00000324	MG/KG	Mean	(2)

Table 29
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Crayfish

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Crayfish
Exposure Medium: Crayfish

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
GREYSTONE	**Pesticides/PCBs**									
(Background area)	4,4'-DDE	MG/KG	0.00433	NC	0.00705		0.00433	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.0003	NC	0.00028	J	0.0003	MG/KG	Max	(3)
	Aroclor, Total	MG/KG	0.04395	NC	0.05647	J	0.04395	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.03774	NC	0.05142		0.03774	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.00621	NC	0.00899	J	0.00621	MG/KG	Mean	(2)
	Endosulfan Sulfate	MG/KG	0.00051	NC	0.00053	J	0.00051	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.0004	NC	0.00009	J	0.00009	MG/KG	Max	(3)
	Technical Chlordane	MG/KG	0.0183	NC	0.02241	J	0.0183	MG/KG	Mean	(2)
	Inorganics									
	Aluminum	MG/KG	0.900	NC	1.95	J	0.900	MG/KG	Mean	(2)
	Antimony	MG/KG	0.0139	NC	0.0155	J	0.0139	MG/KG	Mean	(2)
	Barium	MG/KG	25.5	NC	28.9	J	25.5	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.086	NC	0.117	J	0.086	MG/KG	Mean	(2)
	Chromium	MG/KG	0.224	NC	0.368	J	0.224	MG/KG	Mean	(2)
	Cobalt	MG/KG	0.240	NC	0.308	J	0.240	MG/KG	Mean	(2)
	Copper	MG/KG	26.8	NC	29.7		26.8	MG/KG	Mean	(2)
	Iron	MG/KG	79.6	NC	158	J	79.6	MG/KG	Mean	(2)
	Lead	MG/KG	0.519	NC	0.673	J	0.519	MG/KG	Mean	(2)
	Manganese	MG/KG	116	NC	146		116	MG/KG	Mean	(2)
	Mercury	MG/KG	0.0224	NC	0.027		0.0224	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.0223	NC	0.0286		0.0223	MG/KG	Mean	(2)
	Molybdenum	MG/KG	0.141	NC	0.247	J	0.141	MG/KG	Mean	(2)
	Nickel	MG/KG	0.282	NC	0.374		0.282	MG/KG	Mean	(2)
	Selenium	MG/KG	0.125	NC	0.139	J	0.125	MG/KG	Mean	(2)
	Silver	MG/KG	0.215	NC	0.31		0.215	MG/KG	Mean	(2)
	Thallium	MG/KG	0.00988	NC	0.0138	J	0.00988	MG/KG	Mean	(2)
	Vanadium	MG/KG	0.166	NC	0.278	J	0.166	MG/KG	Mean	(2)
	Zinc	MG/KG	22.6	NC	28.1		22.6	MG/KG	Mean	(2)

Table 29
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Crayfish

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Crayfish
Exposure Medium: Crayfish

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
GREYSTONE (continued)	**Dioxins/Furans**									
(Background area)	2,3,7,8-TCDD	MG/KG	0.00000045	NC	0.00000041	J	0.00000041	MG/KG	Max	(3)
	2,3,7,8-TCDF	MG/KG	0.00000065	NC	0.00000077	#	0.00000065	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.00000314	NC	0.00000586		0.00000314	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.00000427	NC	0.00000799		0.00000427	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	3.4725E-06	NC	0.00000665		0.00000347	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.00000122	NC	0.00000122		0.00000122	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000023	NC	0.0000023		0.0000023	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.0000000382	NC	0.0000000382		0.0000000382	MG/KG	Mean	(2)
ALLENDALE	**Pesticides/PCBs**									
	4,4'-DDD	MG/KG	0.00037	NC	0.00049	J	0.00037	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.00321	NC	0.00342		0.00321	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.0003	NC	0.00043	J	0.0003	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.07589	NC	0.10873		0.07589	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.06991	NC	0.10112		0.06991	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.00597	NC	0.00761	J	0.00597	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.00047	NC	0.00065	J	0.00047	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.016463333	NC	0.01968	J	0.016463333	MG/KG	Mean	(2)
	Inorganics									
	Aluminum	MG/KG	1.57	NC	2.63	J	1.57	MG/KG	Mean	(2)
	Antimony	MG/KG	0.017	NC	0.0171	J	0.017	MG/KG	Mean	(2)
	Barium	MG/KG	20.9	NC	24.2	J	20.9	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.0915	NC	0.101	J	0.0915	MG/KG	Mean	(2)
	Chromium	MG/KG	0.282	NC	0.399	J	0.282	MG/KG	Mean	(2)
	Cobalt	MG/KG	0.174	NC	0.194	J	0.174	MG/KG	Mean	(2)
	Copper	MG/KG	30.3	NC	34.7		30.3	MG/KG	Mean	(2)
	Iron	MG/KG	62.7	NC	90.4	J	62.7	MG/KG	Mean	(2)
	Lead	MG/KG	0.59	NC	0.814	J	0.59	MG/KG	Mean	(2)
	Manganese	MG/KG	71.7	NC	90.8		71.7	MG/KG	Mean	(2)
	Mercury	MG/KG	0.0246	NC	0.0302		0.0246	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.0225	NC	0.0271		0.0225	MG/KG	Mean	(2)
	Molybdenum	MG/KG	0.128	NC	0.142	J	0.128	MG/KG	Mean	(2)

Table 29
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Crayfish

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Crayfish
Exposure Medium: Crayfish

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
ALLENDALE (continued)	Nickel	MG/KG	0.317	NC	0.366		0.317	MG/KG	Mean	(2)
	Selenium	MG/KG	0.126	NC	0.141	J	0.126	MG/KG	Mean	(2)
	Silver	MG/KG	0.209	NC	0.246		0.209	MG/KG	Mean	(2)
	Thallium	MG/KG	0.00889	NC	0.00885	J	0.00885	MG/KG	Max	(3)
	Vanadium	MG/KG	0.219	NC	0.257	J	0.219	MG/KG	Mean	(2)
	Zinc	MG/KG	21	NC	22.2		21	MG/KG	Mean	(2)
	Dioxins/Furans									
	2,3,7,8-TCDD	MG/KG	0.0001773	NC	0.00026117		0.0001773	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.00000061	NC	0.00000083	E	0.00000061	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.000180	NC	0.000264		0.000180	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000181	NC	0.000265		0.000181	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.000180	NC	0.000263		0.000180	MG/KG	Mean	(2)
LYMAN MILL	**Pesticides/PCBs**									
	4,4'-DDD	MG/KG	0.00031	NC	0.00027	J	0.00027	MG/KG	Max	(3)
	4,4'-DDE	MG/KG	0.00404	NC	0.00501		0.00404	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.0003	NC	0.0006	J	0.0003	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.07651	NC	0.10842		0.07651	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.0713	NC	0.1007		0.0713	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.00521	NC	0.00772	J	0.00521	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.00044	NC	0.00063	J	0.00044	MG/KG	Mean	(2)
	Endosulfan Sulfate	MG/KG	0.000545	NC	0.00105		0.000545	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.00036	NC	0.00055	J	0.00036	MG/KG	Mean	(2)
	Heptachlor	MG/KG	0.00034	NC	0.00022	J	0.00022	MG/KG	Max	(3)
	Technical Chlordane	MG/KG	0.02251	NC	0.0275	J	0.02251	MG/KG	Mean	(2)
	Inorganics									
	Antimony	MG/KG	0.0146	NC	0.0166	J	0.0146	MG/KG	Mean	(2)
	Barium	MG/KG	28.1	NC	30.5	J	28.1	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.0888	NC	0.164	J	0.0888	MG/KG	Mean	(2)
	Chromium	MG/KG	0.24	NC	0.346	J	0.24	MG/KG	Mean	(2)
	Cobalt	MG/KG	0.3	NC	0.35	J	0.3	MG/KG	Mean	(2)
	Copper	MG/KG	30.0	NC	33.2		30.0	MG/KG	Mean	(2)
	Iron	MG/KG	122	NC	181	J	122	MG/KG	Mean	(2)

Table 29
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Crayfish

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Crayfish
Exposure Medium: Crayfish

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
LYMAN MILL (continued)	Lead	MG/KG	0.859	NC	1.16 J	0.859	MG/KG	Mean	(2)
	Manganese	MG/KG	125	NC	214	125	MG/KG	Mean	(2)
	Mercury	MG/KG	0.0203	NC	0.0259	0.0203	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.015	NC	0.0215	0.015	MG/KG	Mean	(2)
	Molybdenum	MG/KG	0.124	NC	0.198 J	0.124	MG/KG	Mean	(2)
	Nickel	MG/KG	0.485	NC	0.584	0.485	MG/KG	Mean	(2)
	Selenium	MG/KG	0.14	NC	0.162 J	0.14	MG/KG	Mean	(2)
	Silver	MG/KG	0.24	NC	0.252	0.24	MG/KG	Mean	(2)
	Thallium	MG/KG	0.00961	NC	0.0113 J	0.00961	MG/KG	Mean	(2)
	Vanadium	MG/KG	0.27	NC	0.361 J	0.27	MG/KG	Mean	(2)
	Zinc	MG/KG	26.2	NC	32.5	26.2	MG/KG	Mean	(2)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.00009950	NC	0.00015603	0.00009950	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.00000067	NC	0.00000085 J#	0.00000067	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.000103	NC	0.000161	0.000103	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000105	NC	0.000163	0.000105	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.000104	NC	0.000162	0.000104	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.00000263	NC	0.00000413	0.00000263	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.00000811	NC	0.0000121	0.00000811	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.000000112	NC	0.000000171	0.000000112	MG/KG	Mean	(2)

Table 29
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Crayfish

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Crayfish
Exposure Medium: Crayfish

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

(1) Chemicals of potential concern are identified in Table 4 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(2) Mean: Arithmetic Mean
(3) Max: Maximum, applied in the special case where the arithmetic mean has been selected, but because of elevated detection limits in non-detects, it is greater than the maximum detected concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:
J = Value is estimated.
E = Value is estimated due to significant matrix interference.
# = Value is result from second column confirmation analysis.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

Table 30
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Crayfish

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Crayfish
Exposure Medium: Crayfish

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic (1)	Rationale
ASSAPUMPSET	**Pesticides/PCBs**									
(Reference area)	4,4'-DDE	MG/KG	0.00361	NC	0.00361		0.00361	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	0.01102	NC	0.01102	J	0.01102	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.01034	NC	0.01034		0.01034	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.00069	NC	0.00069	J	0.00069	MG/KG	Max	(5)
	Heptachlor Epoxide	MG/KG	0.00009	NC	0.00009	J	0.00009	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.00883	NC	0.00883	J	0.00883	MG/KG	Max	(5)
	Inorganics									
	Barium	MG/KG	39.7	NC	39.7	J	39.7	MG/KG	Max	(5)
	Cadmium	MG/KG	0.0819	NC	0.0819	J	0.0819	MG/KG	Max	(5)
	Cobalt	MG/KG	0.0829	NC	0.0829	J	0.0829	MG/KG	Max	(5)
	Copper	MG/KG	15	NC	15		15	MG/KG	Max	(5)
	Iron	MG/KG	29.4	NC	29.4	J	29.4	MG/KG	Max	(5)
	Lead	MG/KG	0.14	NC	0.14	J	0.14	MG/KG	Max	(5)
	Manganese	MG/KG	112	NC	112		112	MG/KG	Max	(5)
	Mercury	MG/KG	0.0389	NC	0.0389		0.0389	MG/KG	Max	(5)
	Mercury (methyl)	MG/KG	0.0389	NC	0.0389		0.0389	MG/KG	Max	(5)
	Molybdenum	MG/KG	0.0425	NC	0.0425	J	0.0425	MG/KG	Max	(5)
	Nickel	MG/KG	0.25	NC	0.25	J	0.25	MG/KG	Max	(5)
	Selenium	MG/KG	0.125	NC	0.125	J	0.125	MG/KG	Max	(5)
	Silver	MG/KG	0.215	NC	0.215		0.215	MG/KG	Max	(5)
	Thallium	MG/KG	0.00712	NC	0.00712	J	0.00712	MG/KG	Max	(5)
	Zinc	MG/KG	22.9	NC	22.9		22.9	MG/KG	Max	(5)
	Dioxins/Furans									
	2,3,7,8-TCDD	MG/KG	0.00000039	NC	0.00000039	J	0.00000039	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.00000028	NC	0.00000028	J	0.00000028	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.000003	NC	0.000003		0.000003	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.00000374	NC	0.00000374		0.00000374	MG/KG	Max	(5)
	Toxicity Equivalency - Fish	MG/KG	0.00000324	NC	0.00000324		0.00000324	MG/KG	Max	(5)

Table 30
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Crayfish

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Crayfish
Exposure Medium: Crayfish

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic (1)	Rationale
GREYSTONE	**Pesticides/PCBs**									
(Background area)	4,4'-DDE	MG/KG	0.00433	NC	0.00705		0.00705	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.0003	NC	0.00028	J	0.00028	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	0.0440	NC	0.05647	J	0.05647	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.03774	NC	0.05142		0.05142	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.00621	NC	0.00899	J	0.00899	MG/KG	Max	(5)
	Endosulfan Sulfate	MG/KG	0.00051	NC	0.00053	J	0.00053	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.0004	NC	0.00009	J	0.00009	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.0183	NC	0.02241	J	0.02241	MG/KG	Max	(5)
	Inorganics									
	Aluminum	MG/KG	0.900	NC	1.95	J	1.95	MG/KG	Max	(5)
	Antimony	MG/KG	0.0139	NC	0.0155	J	0.0155	MG/KG	Max	(5)
	Barium	MG/KG	25.5	NC	28.9	J	28.9	MG/KG	Max	(5)
	Cadmium	MG/KG	0.086	NC	0.117	J	0.117	MG/KG	Max	(5)
	Chromium	MG/KG	0.224	NC	0.368	J	0.368	MG/KG	Max	(5)
	Cobalt	MG/KG	0.240	NC	0.308	J	0.308	MG/KG	Max	(5)
	Copper	MG/KG	26.8	NC	29.7		29.7	MG/KG	Max	(5)
	Iron	MG/KG	79.6	NC	158	J	158	MG/KG	Max	(5)
	Lead	MG/KG	0.519	NC	0.673	J	0.673	MG/KG	Max	(5)
	Manganese	MG/KG	116	NC	146		146	MG/KG	Max	(5)
	Mercury	MG/KG	0.0224	NC	0.027		0.027	MG/KG	Max	(5)
	Mercury (methyl)	MG/KG	0.0223	NC	0.0286		0.0286	MG/KG	Max	(5)
	Molybdenum	MG/KG	0.141	NC	0.247	J	0.247	MG/KG	Max	(5)
	Nickel	MG/KG	0.282	NC	0.374		0.374	MG/KG	Max	(5)
	Selenium	MG/KG	0.125	NC	0.139	J	0.139	MG/KG	Max	(5)
	Silver	MG/KG	0.215	NC	0.31		0.31	MG/KG	Max	(5)
	Thallium	MG/KG	0.00988	NC	0.0138	J	0.0138	MG/KG	Max	(5)
	Vanadium	MG/KG	0.166	NC	0.278	J	0.278	MG/KG	Max	(5)
	Zinc	MG/KG	22.6	NC	28.1		28.1	MG/KG	Max	(5)

Table 30
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Crayfish

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Crayfish
Exposure Medium: Crayfish

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic (1)	Rationale
GREYSTONE (continued)	**Dioxins/Furans**									
(Background area)	2,3,7,8-TCDD	MG/KG	0.00000045	NC	0.00000041	J	0.00000041	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.00000065	NC	0.00000077	#	0.00000077	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.00000314	NC	0.00000586		0.00000586	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.00000427	NC	0.00000799		0.00000799	MG/KG	Max	(5)
	Toxicity Equivalency - Fish	MG/KG	0.00000347	NC	0.00000665		0.00000665	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.00000122	NC	0.00000122		0.00000122	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.00000230	NC	0.0000023		0.0000023	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.0000000382	NC	0.0000000382		0.0000000382	MG/KG	Max	(5)
ALLENDALE	**Pesticides/PCBs**									
	4,4'-DDD	MG/KG	0.00037	NC	0.00049	J	0.00049	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.00321	NC	0.00342		0.00342	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.0003	NC	0.00043	J	0.00043	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	0.07589	NC	0.10873		0.10873	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.06991	NC	0.10112		0.10112	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.00597	NC	0.00761	J	0.00761	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.00047	NC	0.00065	J	0.00065	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.016463333	NC	0.01968	J	0.01968	MG/KG	Max	(5)
	Inorganics									
	Aluminum	MG/KG	1.57	NC	2.63	J	2.63	MG/KG	Max	(5)
	Antimony	MG/KG	0.017	NC	0.0171	J	0.0171	MG/KG	Max	(5)
	Barium	MG/KG	20.9	NC	24.2	J	24.2	MG/KG	Max	(5)
	Cadmium	MG/KG	0.0915	NC	0.101	J	0.101	MG/KG	Max	(5)
	Chromium	MG/KG	0.282	NC	0.399	J	0.399	MG/KG	Max	(5)
	Cobalt	MG/KG	0.174	NC	0.194	J	0.194	MG/KG	Max	(5)
	Copper	MG/KG	30.3	NC	34.7		34.7	MG/KG	Max	(5)
	Iron	MG/KG	62.7	NC	90.4	J	90.4	MG/KG	Max	(5)
	Lead	MG/KG	0.59	NC	0.814	J	0.814	MG/KG	Max	(5)
	Manganese	MG/KG	71.7	NC	90.8		90.8	MG/KG	Max	(5)
	Mercury	MG/KG	0.0246	NC	0.0302		0.0302	MG/KG	Max	(5)
	Mercury (methyl)	MG/KG	0.0225	NC	0.0271		0.0271	MG/KG	Max	(5)
	Molybdenum	MG/KG	0.128	NC	0.142	J	0.142	MG/KG	Max	(5)

Table 30
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Crayfish

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Crayfish
Exposure Medium: Crayfish

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic (1)	Rationale
ALLENDALE (continued)	Nickel	MG/KG	0.317	NC	0.366		0.366	MG/KG	Max	(5)
	Selenium	MG/KG	0.126	NC	0.141	J	0.141	MG/KG	Max	(5)
	Silver	MG/KG	0.209	NC	0.246		0.246	MG/KG	Max	(5)
	Thallium	MG/KG	0.00889	NC	0.00885	J	0.00885	MG/KG	Max	(5)
	Vanadium	MG/KG	0.219	NC	0.257	J	0.257	MG/KG	Max	(5)
	Zinc	MG/KG	20.933	NC	22.2		22.2	MG/KG	Max	(5)
	Dioxins/Furans									
	2,3,7,8-TCDD	MG/KG	0.0001773	NC	0.00026117		0.00026117	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.00000061	NC	0.00000083	E	0.00000083	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.000180	NC	0.000264		0.000264	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.000181	NC	0.000265		0.000265	MG/KG	Max	(5)
	Toxicity Equivalency - Fish	MG/KG	0.000180	NC	0.000263		0.000263	MG/KG	Max	(5)
LYMAN MILL	**Pesticides/PCBs**									
	4,4'-DDD	MG/KG	0.00031	NC	0.00027	J	0.00027	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.00404	NC	0.00501		0.00501	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.0003	NC	0.0006	J	0.0006	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	0.07651	NC	0.10842		0.10842	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.0713	NC	0.1007		0.1007	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.00521	NC	0.00772	J	0.00772	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.00044	NC	0.00063	J	0.00063	MG/KG	Max	(5)
	Endosulfan Sulfate	MG/KG	0.000545	NC	0.00105		0.00105	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.00036	NC	0.00055	J	0.00055	MG/KG	Max	(5)
	Heptachlor	MG/KG	0.00034	NC	0.00022	J	0.00022	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.02251	NC	0.0275	J	0.0275	MG/KG	Max	(5)
	Inorganics									
	Antimony	MG/KG	0.0146	NC	0.0166	J	0.0166	MG/KG	Max	(5)
	Barium	MG/KG	28.1	NC	30.5	J	30.5	MG/KG	Max	(5)
	Cadmium	MG/KG	0.0888	NC	0.164	J	0.164	MG/KG	Max	(5)
	Chromium	MG/KG	0.24	NC	0.346	J	0.346	MG/KG	Max	(5)
	Cobalt	MG/KG	0.3	NC	0.35	J	0.35	MG/KG	Max	(5)
	Copper	MG/KG	30.0	NC	33.2		33.2	MG/KG	Max	(5)
	Iron	MG/KG	122.250	NC	181	J	181	MG/KG	Max	(5)

Table 30
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Crayfish

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Crayfish
Exposure Medium: Crayfish

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
LYMAN MILL (continued)	Lead	MG/KG	0.859	NC	1.16 J	1.16	MG/KG	Max	(5)
	Manganese	MG/KG	125	NC	214	214	MG/KG	Max	(5)
	Mercury	MG/KG	0.0203	NC	0.0259	0.0259	MG/KG	Max	(5)
	Mercury (methyl)	MG/KG	0.015	NC	0.0215	0.0215	MG/KG	Max	(5)
	Molybdenum	MG/KG	0.124	NC	0.198 J	0.198	MG/KG	Max	(5)
	Nickel	MG/KG	0.485	NC	0.584	0.584	MG/KG	Max	(5)
	Selenium	MG/KG	0.138	NC	0.162 J	0.162	MG/KG	Max	(5)
	Silver	MG/KG	0.24	NC	0.252	0.252	MG/KG	Max	(5)
	Thallium	MG/KG	0.00961	NC	0.0113 J	0.0113	MG/KG	Max	(5)
	Vanadium	MG/KG	0.27	NC	0.361 J	0.361	MG/KG	Max	(5)
	Zinc	MG/KG	26.2	NC	32.5	32.5	MG/KG	Max	(5)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.00009950	NC	0.00015603	0.00015603	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.00000067	NC	0.00000085 J#	0.00000085	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.000103	NC	0.000161	0.000161	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.000105	NC	0.000163	0.000163	MG/KG	Max	(5)
	Toxicity Equivalency - Fish	MG/KG	0.000104	NC	0.000162	0.000162	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.00000263	NC	0.00000413	0.00000413	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.00000811	NC	0.0000121	0.0000121	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.000000112	NC	0.000000171	0.000000171	MG/KG	Max	(5)

Table 30
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Crayfish

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Crayfish
Exposure Medium: Crayfish

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale

(1) Chemicals of potential concern are identified in Table 4 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(5) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:
J = Value is estimated.
E = Value is estimated due to significant matrix interference.
# = Value is result from second column confirmation analysis.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

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Table 31
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Emerging Insects

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Emerging Insects
Exposure Medium: Emerging Insects

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
GREYSTONE	**Dioxins/Furans**									
(Background area)	2,3,7,8-TCDD	MG/KG	0.00000141	NC	0.00000141	J	0.00000141	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.00000077	NC	0.00000077	EJ	0.00000077	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.0000102	NC	0.0000102		0.0000102	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.0000132	NC	0.0000132		0.0000132	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.0000101	NC	0.0000101		0.0000101	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.00000283	NC	0.00000283		0.00000283	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000133	NC	0.0000133		0.0000133	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.000000105	NC	0.000000105		0.000000105	MG/KG	Mean	(2)
LYMAN MILL	**Dioxins/Furans**									
	2,3,7,8-TCDD	MG/KG	0.00024557	NC	0.00024557		0.00024557	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.00000175	NC	0.00000175	J	0.00000175	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.000297	NC	0.000297		0.000297	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.00031	NC	0.00031		0.00031	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.000304	NC	0.000304		0.000304	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.00000843	NC	0.00000843		0.00000843	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000262	NC	0.0000262		0.0000262	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.000000362	NC	0.000000362		0.000000362	MG/KG	Mean	(2)

(1) Chemicals of potential concern are identified in Table 5 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(2) Mean: Arithmetic Mean

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

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Table 31
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Emerging Insects

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Emerging Insects
Exposure Medium: Emerging Insects

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

Qualifier Definitions:

J = Value is estimated.

E = Value is estimated due to significant matrix interference.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

Table 32
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Emerging Insects

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Emerging Insects
Exposure Medium: Emerging Insects

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
GREYSTONE	**Dioxins/Furans**								
(Background area)	2,3,7,8-TCDD	MG/KG	0.00000141	NC	0.00000141 J	0.00000141	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.00000077	NC	0.00000077 EJ	0.00000077	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.0000102	NC	0.0000102	0.0000102	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.0000132	NC	0.0000132	0.0000132	MG/KG	Max	(5)
	Toxicity Equivalency - Fish	MG/KG	0.0000101	NC	0.0000101	0.0000101	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.00000283	NC	0.00000283	0.00000283	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000133	NC	0.0000133	0.0000133	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.000000105	NC	0.000000105	0.000000105	MG/KG	Max	(5)
LYMAN MILL	**Dioxins/Furans**								
	2,3,7,8-TCDD	MG/KG	0.00024557	NC	0.00024557	0.00024557	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.00000175	NC	0.00000175 J	0.00000175	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.000297	NC	0.000297	0.000297	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.00031	NC	0.00031	0.00031	MG/KG	Max	(5)
	Toxicity Equivalency - Fish	MG/KG	0.000304	NC	0.000304	0.000304	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.00000843	NC	0.00000843	0.00000843	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000262	NC	0.0000262	0.0000262	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.000000362	NC	0.000000362	0.000000362	MG/KG	Max	(5)

(1) Chemicals of potential concern are identified in Table 5 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(5) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Table 32
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Emerging Insects

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Emerging Insects
Exposure Medium: Emerging Insects

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

Qualifier Definitions:

J = Value is estimated.

E = Value is estimated due to significant matrix interference.

mg/Kg = milligrams per kilogram

EPC = Exposure Point Concentration

UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

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Table 33
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Tree Swallow - Stomach Contents

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Tree Swallow
Exposure Medium: Stomach Contents

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
GREYSTONE	**Dioxins/Furans**								
(Background area)	2,3,7,8-TCDD	MG/KG	0.00000295	NC	0.00000566 J	0.00000295	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.00000060	NC	0.0000007 J	0.00000060	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.00000422	NC	0.00000696	0.00000422	MG/KG	Mean	(2)
ALLENDALE	**Dioxins/Furans**								
	2,3,7,8-TCDD	MG/KG	0.0001450	NC	0.00021852 J	0.0001450	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.00000099	NC	0.00000086 J	0.00000086	MG/KG	Max	(3)
	Toxicity Equivalency - Birds	MG/KG	0.000149	NC	0.000224	0.000149	MG/KG	Mean	(2)
LYMAN MILL	**Dioxins/Furans**								
	2,3,7,8-TCDD	MG/KG	0.00011945	NC	0.00011945 J	0.00011945	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000121	NC	0.000121	0.000121	MG/KG	Mean	(2)
MANTON	**Dioxins/Furans**								
	2,3,7,8-TCDD	MG/KG	0.0000696	NC	0.00006959	0.00006959	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.00000085	NC	0.00000085	0.00000085	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.000070	NC	0.00007044	0.00007044	MG/KG	Max	(5)

(1) Chemicals of potential concern are identified in Table 6 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(2) Mean: Arithmetic Mean
(3) Max: Maximum, applied in the special case where the arithmetic mean has been selected, but because of elevated detection limits in non-detects, it is greater than the maximum detected concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Table 33
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Tree Swallow - Stomach Contents

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Tree Swallow
Exposure Medium: Stomach Contents

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

Qualifier Definitions:
J = Value is estimated.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

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Table 34
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Tree Swallow - Stomach Contents

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Tree Swallow
Exposure Medium: Stomach Contents

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
GREYSTONE	**Dioxins/Furans**								
(Background area)	2,3,7,8-TCDD	MG/KG	0.0000029	NC	0.00000566 J	0.00000566	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.00000060	NC	0.0000007 J	0.0000007	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.0000042	NC	0.00000696	0.00000696	MG/KG	Max	(5)
ALLENDALE	**Dioxins/Furans**								
	2,3,7,8-TCDD	MG/KG	0.00014	NC	0.00021852 J	0.00021852	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.00000099	NC	0.00000086 J	0.00000086	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.00015	NC	0.000224	0.000224	MG/KG	Max	(5)
LYMAN MILL	**Dioxins/Furans**								
	2,3,7,8-TCDD	MG/KG	0.00012	NC	0.00011945 J	0.00011945	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.00012	NC	0.000121	0.000121	MG/KG	Max	(5)
MANTON	**Dioxins/Furans**								
	2,3,7,8-TCDD	MG/KG	0.0000696	NC	0.00006959	0.00006959	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.00000085	NC	0.00000085	0.00000085	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.000070	NC	0.00007044	0.00007044	MG/KG	Max	(5)

(1) Chemicals of potential concern are identified in Table 6 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(5) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

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Table 34
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Tree Swallow - Stomach Contents

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Tree Swallow
Exposure Medium: Stomach Contents

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

Qualifier Definitions:
J = Value is estimated.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

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TABLE 35
HAZARD QUOTIENTS FOR COIs IN ASSAPUMPSET POND SURFACE WATER

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Metals, Dissolved							
Aluminum, Dissolved	1 / 2	MG/L	0.019	0.019	0.087	2.2E-01	2.2E-01
Copper, Dissolved	1 / 2	MG/L	0.0034	0.0025	0.0027	**1.3E+00**	9.3E-01
Iron, Dissolved	2 / 2	MG/L	0.551	0.52	1	5.5E-01	5.2E-01
Lead, Dissolved	1 / 2	MG/L	0.000232	0.000232	0.00054	4.3E-01	4.3E-01
Manganese, Dissolved	2 / 2	MG/L	0.127	0.075	1.1	1.2E-01	6.8E-02
Thallium, Dissolved	1 / 2	MG/L	0.00000806	0.00000806	0.001	8.1E-03	8.1E-03
Zinc, Dissolved	1 / 2	MG/L	0.0206	0.012	0.032	6.4E-01	3.6E-01
					Total Inorganics/Metals	**3.2E+00**	**2.5E+00**
Inorganics							
Nitrogen, Ammonia	1 / 1	MG/L	0.011	0.011	3.0	3.7E-03	3.7E-03
						3.7E-03	3.7E-03
Dioxins/Furans							
Toxicity Equivalency - Fish	1 / 1	MG/L	5.7E-09	5.7E-09	0.00000001	5.7E-01	5.7E-01
					Total TCDD TEQ	5.7E-01	5.7E-01
					Total	**3.8E+00**	**3.1E+00**

Notes:
[a] CT and RME EPCs presented in Tables 23 and 24, respectively.
[b] Surface water TRVs presented in Table D-1.
[c] Hazard Quotient is the ratio of the RME concentration to the TRV.
[d] Hazard Quotient is the ratio of the CT concentration to the TRV.

Prepared by: SGD
Checked by: RAR

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TABLE 36
HAZARD QUOTIENTS FOR COIs IN GREYSTONE MILL POND REACH SURFACE WATER

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Metals, Dissolved							
Aluminum, Dissolved	2 / 4	MG/L	0.0251	0.016	0.087	2.9E-01	1.9E-01
Cadmium, Dissolved	3 / 4	MG/L	0.004	0.0011	0.000094	**4.3E+01**	**1.2E+01**
Copper, Dissolved	4 / 4	MG/L	0.0055	0.0028	0.0027	**2.0E+00**	**1.0E+00**
Iron, Dissolved	4 / 4	MG/L	0.51	0.34	1	5.1E-01	3.4E-01
Lead, Dissolved	2 / 4	MG/L	0.000542	0.000542	0.00054	**1.0E+00**	**1.0E+00**
Manganese, Dissolved	4 / 4	MG/L	0.112	0.088	1.1	1.0E-01	8.0E-02
Nickel, Dissolved	4 / 4	MG/L	0.0232	0.0072	0.016	**1.5E+00**	4.5E-01
Thallium, Dissolved	2 / 4	MG/L	0.00000908	0.00000908	0.001	9.1E-03	9.1E-03
Zinc, Dissolved	4 / 4	MG/L	0.0343	0.018	0.032	**1.1E+00**	5.7E-01
					Total Inorganics/Metals	**4.9E+01**	**1.6E+01**
Inorganics							
Nitrogen, Ammonia	4 / 4	MG/L	0.306	0.39	3.0	1.0E-01	1.3E-01
					Total Inorganics	1.0E-01	1.3E-01
Dioxins/Furans							
Toxicity Equivalency - Fish	1/1	MG/L	5.94E-09	5.94E-09	0.00000001	5.9E-01	5.9E-01
					Total TCDD TEQ	5.9E-01	5.9E-01
					Total	**5.0E+01**	**1.6E+01**

[a] CT and RME EPCs presented in Tables 23 and 24, respectively.
[b] Surface water TRVs presented in Table D-1.
[c] Hazard Quotient is the ratio of the RME concentration to the TRV.
[d] Hazard Quotient is the ratio of the CT concentration to the TRV.

Prepared by: SGD
Checked by: RAR

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TABLE 37
HAZARD QUOTIENTS FOR COPCs IN ALLENDALE POND REACH SURFACE WATER

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Pesticides							
alpha-Chlordane	3 / 21	MG/L	0.00000069	0.00000069	0.0000043	1.6E-01	1.6E-01
Endosulfan Sulfate	3 / 21	MG/L	0.00043	0.000059	0.000051	**8.4E+00**	**1.2E+00**
gamma-Chlordane	4 / 21	MG/L	0.000025	0.000025	0.0000043	**5.8E+00**	**5.8E+00**
					Total Pesticides	**1.4E+01**	**7.1E+00**
Metals, Dissolved							
Aluminum, Dissolved	10 / 22	MG/L	0.049	0.034	0.087	5.6E-01	3.9E-01
Copper, Dissolved	21 / 22	MG/L	0.0065	0.0042	0.0027	**2.4E+00**	**1.5E+00**
Iron, Dissolved	22 / 22	MG/L	0.84	0.84	1	8.4E-01	8.4E-01
Lead, Dissolved	4 / 22	MG/L	0.000501	0.000501	0.00054	9.3E-01	9.3E-01
Manganese, Dissolved	22 / 22	MG/L	0.77	0.29	1.1	7.0E-01	2.7E-01
Selenium, Dissolved	2 / 22	MG/L	0.0039	0.0018	0.0046	8.5E-01	3.8E-01
Silver, Dissolved	5 / 22	MG/L	0.00078	0.00078	0.00003	**2.6E+01**	**2.6E+01**
Thallium, Dissolved	8 / 22	MG/L	0.0029	0.0029	0.001	**2.9E+00**	**2.9E+00**
Zinc, Dissolved	21 / 22	MG/L	0.06	0.058	0.032	**1.9E+00**	**1.8E+00**
					Total Inorganics/Metals	**3.7E+01**	**3.5E+01**
Inorganics							
Nitrogen, Ammonia	4 / 4	MG/L	0.306	0.24	3.0	1.0E-01	8.0E-02
					Total Inorganics	1.0E-01	8.0E-02
Dioxins							
2,3,7,8-TCDD[1]	7 / 16	MG/L	0.0000011	0.0000011	1E-08	**1.1E+02**	**1.1E+02**
Toxicity Equivalency - Fish	16/16	MG/L	0.0000011	0.0000011	1E-08	**1.1E+02**	**1.1E+02**
					Total TCDD TEQ	**1.1E+02**	**1.1E+02**
					Total	**1.6E+02**	**1.5E+02**

Notes:
[a] CT and RME EPCs presented in Tables 23 and 24, respectively.
[b] Surface water TRVs presented in Table D-1.
[c] Hazard Quotient is the ratio of the RME concentration to the TRV.
[d] Hazard Quotient is the ratio of the CT concentration to the TRV.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

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Checked by: RAR

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TABLE 39
HAZARD QUOTIENTS FOR COPCs IN ALLENDALE POND REACH OVERBURDEN GROUNDWATER

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Volatile Organics							
Tetrachloroethene	3 / 3	MG/L	61	20.5	0.0053	**1.2E+04**	**3.9E+03**
Trichloroethene	1 / 3	MG/L	2.5	0.84	0.043	**5.8E+01**	**2.0E+01**
					Total Volatile Organics	**1.2E+04**	**3.9E+03**
Semivolatile Organics							
2,4,6-Trichlorophenol	1 / 2	MG/L	2.9	1.5	0.00036	**8.1E+03**	**4.2E+03**
2,4-Dichlorophenol	1 / 2	MG/L	0.06	0.033	0.0022	**2.7E+01**	**1.5E+01**
Benzo(k)fluoranthene	1 / 3	MG/L	0.00018	0.00018	0.00014	**1.3E+00**	**1.3E+00**
Chrysene	1 / 3	MG/L	0.00028	0.00028	0.00007	**4.0E+00**	**4.0E+00**
Naphthalene	1 / 3	MG/L	0.011	0.0054	0.0026	**4.2E+00**	**2.1E+00**
Pyrene	1 / 3	MG/L	0.00061	0.00061	0.0004	**1.5E+00**	**1.5E+00**
					Total Semivolatile Organics	**8.1E+03**	**4.2E+03**
					Total	**2.0E+04**	**8.1E+03**

Notes:
[a] CT and RME EPCs presented in Tables 25 and 26, respectively.
[b] Surface water TRVs presented in Table D-1.
[c] Hazard Quotient is the ratio of the RME concentration to the TRV.
[d] Hazard Quotient is the ratio of the CT concentration to the TRV.

Prepared by: SGD
Checked by: RAR

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TABLE 40
HAZARD QUOTIENTS FOR COIs IN ASSAPUMPSET POND SEDIMENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Semivolatile Organics							
2-Methylnaphthalene	1 / 5	MG/KG	0.01855	0.01855	0.070	2.7E-01	2.7E-01
Acenaphthene	1 / 5	MG/KG	0.03411	0.03411	0.016	**2.1E+00**	**2.1E+00**
Acenaphthylene	2 / 5	MG/KG	0.0589	0.0589	0.044	**1.3E+00**	**1.3E+00**
Anthracene	2 / 5	MG/KG	0.14754	0.14754	0.032	**4.7E+00**	**4.7E+00**
Benzo(a)anthracene	4 / 5	MG/KG	1	0.52	0.108	**9.3E+00**	**4.8E+00**
Benzo(a)pyrene	4 / 5	MG/KG	0.84	0.53	0.150	**5.6E+00**	**3.6E+00**
Benzo(b)fluoranthene	5 / 5	MG/KG	1.4	0.63			
Benzo(g,h,i)perylene	4 / 5	MG/KG	0.59468	0.40	0.063	**9.4E+00**	**6.3E+00**
Benzo(k)fluoranthene	5 / 5	MG/KG	0.80433	0.41	0.027	**3.0E+01**	**1.5E+01**
bis(2-Ethylhexyl)phthalate	3 / 5	MG/KG	1	0.47	5810	1.7E-04	8.1E-05
Carbazole	2 / 4	MG/KG	0.089	0.089	1.6	5.6E-02	5.6E-02
Chrysene	4 / 5	MG/KG	1.1	0.68	0.17	**6.6E+00**	**4.1E+00**
Dibenzo(a,h)anthracene	4 / 5	MG/KG	0.17898	0.15	0.0028	**6.3E+01**	**5.3E+01**
Dibenzofuran	1 / 5	MG/KG	0.03586	0.03586	2.4	1.5E-02	1.5E-02
Di-n-Butylphthalate	3 / 4	MG/KG	0.08	0.08			
Fluoranthene	5 / 5	MG/KG	1.7	1.09	0.064	**2.6E+01**	**1.7E+01**
Fluorene	2 / 5	MG/KG	0.08068	0.08068	0.019	**4.2E+00**	**4.2E+00**
Indeno(1,2,3-cd)pyrene	4 / 5	MG/KG	0.65	0.43	0.063	**1.0E+01**	**6.8E+00**
Naphthalene	1 / 5	MG/KG	0.01905	0.01905	0.033	5.8E-01	5.8E-01
Phenanthrene	4 / 5	MG/KG	0.79474	0.54	0.20	3.9E+00	2.6E+00
Pyrene	4 / 5	MG/KG	1.6	0.94			
PAH ESG[1]	4 / 4		2.2	0.79	1	**2.2E+00**	7.9E-01
Total PAH[1]	3 / 3	MG/KG	9.63	6.7	2.28	4.2E+00	2.9E+00
					Total Semivolatile Organics	**1.8E+02**	**1.3E+02**
Pesticides							
4,4'-DDD	2 / 6	MG/KG	0.00317	0.0026	0.0020	**1.6E+00**	**1.3E+00**
4,4'-DDE	2 / 6	MG/KG	0.00547	0.0033	0.0022	**2.5E+00**	**1.5E+00**
alpha-Chlordane	2 / 6	MG/KG	0.00133	0.00133	0.0005	**2.7E+00**	**2.7E+00**
Dieldrin	2 / 6	MG/KG	0.00191	0.002	0.00002	**9.6E+01**	**9.6E+01**
gamma-Chlordane	1 / 6	MG/KG	0.00065	0.001	0.00050	**1.3E+00**	**1.3E+00**
Technical Chlordane	2 / 2	MG/KG	0.15253	0.108	0.00050	**3.1E+02**	**2.2E+02**
					Total Pesticides	**4.1E+02**	**3.2E+02**

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TABLE 40
HAZARD QUOTIENTS FOR COIs IN ASSAPUMPSET POND SEDIMENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
PCBs							
Aroclor, Total	3 / 4	MG/KG	0.09922	0.058	0.023	**4.4E+00**	**2.5E+00**
Aroclor-1254	3 / 6	MG/KG	0.05755	0.032	0.060	9.6E-01	5.4E-01
Aroclor-1268	2 / 2	MG/KG	0.04166	0.023	0.005	**8.3E+00**	**4.6E+00**
					Total PCBs	**1.4E+01**	**7.7E+00**
Inorganics/Metals							
Arsenic	5 / 6	MG/KG	5.21	2.7	6	8.7E-01	4.5E-01
Barium	6 / 6	MG/KG	204	93.6	-		
Cadmium	2 / 6	MG/KG	0.858	0.37	0.59	**1.4E+00**	6.2E-01
Chromium	6 / 6	MG/KG	17.5	10	26	6.7E-01	4.0E-01
Cobalt	6 / 6	MG/KG	10.1	6.2	50	2.0E-01	1.2E-01
Copper	6 / 6	MG/KG	18.3	11.8	16	**1.1E+00**	7.4E-01
Iron	6 / 6	MG/KG	23357	14362.8	20000	**1.2E+00**	7.2E-01
Lead	6 / 6	MG/KG	88.6	41	31	**2.9E+00**	**1.3E+00**
Mercury	2 / 6	MG/KG	0.114	0.051	0.15	7.6E-01	3.4E-01
Mercury (methyl)	2 / 2	MG/KG	0.000863	0.00056	-		
Molybdenum	2 / 2	MG/KG	1.59	1.575	-		
Selenium	1 / 6	MG/KG	2.2	0.62	-		
Silver	3 / 6	MG/KG	6.5	1.6	0.5	**1.3E+01**	**3.1E+00**
Thallium	2 / 6	MG/KG	0.354	0.354	-		
Zinc	6 / 6	MG/KG	227	101	120.0	**1.9E+00**	8.4E-01
					Total Inorganics/Metals	**2.4E+01**	**8.6E+00**
AVS/SEM							
Carbon-Normalized Excess SEM[1]	4 / 4	UMOL/G	133	79.2	130	**1.0E+00**	6.1E-01
SEM/AVS[1]	6 / 6		12.9	3.14	1	**1.3E+01**	**3.1E+00**
Dioxins							
2,3,7,8-TCDD[1,2]	3 / 5	MG/KG	0.0000045	0.0000019	0.0000072	6.3E-01	2.6E-01
Toxicity Equivalency - Fish	5/5	MG/KG	0.00000723	0.0000034	0.0000072	**1.0E+00**	4.7E-01
					Total TCDD TEQ	**1.0E+00**	4.7E-01

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TABLE 40
HAZARD QUOTIENTS FOR COIs IN ASSAPUMPSET POND SEDIMENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Total						6.3E+02	4.6E+02

Notes:
[a] CT and RME EPCs presented in Tables 27 and 28, respectively.
[b] Sediment TRVs based on minimum of available sediment screening benchmark values as summarized in Table D-2.
[c] Hazard Quotient is the ratio of the RME concentration to the TRV.
[d] Hazard Quotient is the ratio of the CT concentration to the TRV.
[1]Analyte is not included in the HI totals.
[2] HQs for 2,3,7,8-TCDD are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 41
HAZARD QUOTIENTS FOR COIs IN GREYSTONE MILL POND REACH SEDIMENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Semivolatile Organics							
2-Methylnaphthalene	1 / 9	MG/KG	0.07478	0.07478	0.070	**1.1E+00**	**1.1E+00**
Acenaphthene	4 / 9	MG/KG	0.48	0.48	0.016	**3.0E+01**	**3.0E+01**
Acenaphthylene	1 / 9	MG/KG	0.19279	0.19279	0.044	**4.4E+00**	**4.4E+00**
Anthracene	4 / 9	MG/KG	0.93	0.93	0.032	**2.9E+01**	**2.9E+01**
Benzo(a)anthracene	8 / 9	MG/KG	3.5	1.5	0.11	**3.2E+01**	**1.4E+01**
Benzo(a)pyrene	8 / 9	MG/KG	3.1	1.4	0.15	**2.1E+01**	**9.3E+00**
Benzo(b)fluoranthene	9 / 9	MG/KG	3.1	1.51	1	**3.1E+00**	**1.5E+00**
Benzo(g,h,i)perylene	8 / 9	MG/KG	2.07671	0.9	0.063	**3.3E+01**	**1.3E+01**
Benzo(k)fluoranthene	8 / 9	MG/KG	3.6	1.4	0.027	**1.3E+02**	**5.1E+01**
bis(2-Ethylhexyl)phthalate	6 / 9	MG/KG	0.95	0.95	5810	1.6E-04	1.6E-04
Carbazole	4 / 9	MG/KG	0.66	0.66	1.60	4.1E-01	4.1E-01
Chrysene	9 / 9	MG/KG	4.1	1.8	0.17	**2.5E+01**	**1.1E+01**
Dibenzo(a,h)anthracene	4 / 9	MG/KG	0.77	0.77	0.0028	**2.7E+02**	**2.7E+02**
Dibenzofuran	2 / 9	MG/KG	0.29	0.29	2.40	1.2E-01	1.2E-01
Di-n-Butylphthalate	4 / 9	MG/KG	0.47	0.47	1	4.7E-01	4.7E-01
Fluoranthene	9 / 9	MG/KG	7	3.3	0.064	**1.1E+02**	**5.1E+01**
Fluorene	4 / 9	MG/KG	0.47	0.47	0.019	**2.5E+01**	**2.5E+01**
Indeno(1,2,3-cd)pyrene	8 / 9	MG/KG	2.18335	1.0	0.063	**3.4E+01**	**1.6E+01**
Naphthalene	1 / 9	MG/KG	0.09382	0.09382	0.033	**2.9E+00**	**2.9E+00**
Phenanthrene	9 / 9	MG/KG	4.8	2.1	0.20	**2.4E+01**	**1.0E+01**
Pyrene	9 / 9	MG/KG	6.5	2.8	1	**6.5E+00**	**2.8E+00**
PAH ESG[1]	4 / 4		0.84	0.5	1	8.4E-01	5.5E-01
Total PAH[1]	9 / 9	MG/KG	40	18.4	2.28	**1.8E+01**	**8.1E+00**
					Total Semivolatile Organics	**7.9E+02**	**5.5E+02**
Pesticides							
4,4'-DDD	4 / 12	MG/KG	0.0049	0.0049	0.0020	**2.4E+00**	**2.4E+00**
4,4'-DDE	4 / 12	MG/KG	0.0060	0.0060	0.0022	**2.7E+00**	**2.7E+00**
alpha-Chlordane	8 / 12	MG/KG	0.0061	0.0061	0.0005	**1.2E+01**	**1.2E+01**
Dieldrin	4 / 12	MG/KG	0.0026	0.0026	0.00002	**1.3E+02**	**1.3E+02**
Endrin	1 / 12	MG/KG	0.0019	0.0019	0.00002	**9.6E+01**	**9.6E+01**
gamma-Chlordane	8 / 12	MG/KG	0.0048	0.0048	0.00050	**9.6E+00**	**9.6E+00**
Technical Chlordane	4 / 4	MG/KG	0.62618	0.40	0.00050	**1.3E+03**	**8.0E+02**
					Total Pesticides	**1.5E+03**	**1.1E+03**

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TABLE 41
HAZARD QUOTIENTS FOR COIs IN GREYSTONE MILL POND REACH SEDIMENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
PCBs							
Aroclor, Total	10 / 12	MG/KG	0.2	0.2	0.023	**9.2E+00**	**9.2E+00**
Aroclor-1254	10 / 12	MG/KG	0.3800	0.15	0.06000	**6.3E+00**	**2.5E+00**
Aroclor-1260	1 / 12	MG/KG	0.0250	0.025	0.00500	**5.0E+00**	**5.0E+00**
Aroclor-1268	4 / 4	MG/KG	0.24667	0.14	0.00500	**4.9E+01**	**2.7E+01**
					Total PCBs	**7.0E+01**	**4.4E+01**
Inorganics/Metals							
Antimony	4 / 13	MG/KG	4.3	0.73	2	**2.2E+00**	3.7E-01
Arsenic	12 / 13	MG/KG	9.6	3.9	6	**1.6E+00**	6.5E-01
Barium	13 / 13	MG/KG	374	134	-		
Cadmium	7 / 13	MG/KG	4.35	0.81	0.59	**7.3E+00**	**1.4E+00**
Chromium	13 / 13	MG/KG	271	99.3	26	**1.0E+01**	**3.8E+00**
Cobalt	10 / 13	MG/KG	23.8	8.1	50	4.8E-01	1.6E-01
Copper	11 / 13	MG/KG	436	72.8	16	**2.7E+01**	**4.6E+00**
Iron	13 / 13	MG/KG	13426	13426	20000	6.7E-01	6.7E-01
Lead	13 / 13	MG/KG	179.1	179	31	**5.8E+00**	**5.8E+00**
Mercury	13 / 13	MG/KG	0.757	0.21	0.15	**5.0E+00**	**1.4E+00**
Mercury (methyl)	4 / 4	MG/KG	0.000658	0.00026	-		
Molybdenum	5 / 5	MG/KG	17.2	12.6	-		
Selenium	7 / 13	MG/KG	3.6	1.1	-		
Silver	8 / 13	MG/KG	9.2	2.6	1	**1.8E+01**	**5.1E+00**
Thallium	6 / 13	MG/KG	0.37	0.37	-		
Zinc	12 / 13	MG/KG	780	221	120	**6.5E+00**	**1.8E+00**
					Total Inorganics/Metals	**8.6E+01**	**2.6E+01**
AVS/SEM							
Carbon-Normalized Excess SEM[1]	7 / 7	UMOL/G	303	106	130	**2.3E+00**	8.1E-01
SEM/AVS[1]	7 / 7		306	53.0	1	**3.1E+02**	**5.3E+01**
Dioxins							
2,3,7,8-TCDD[1,2]	8 / 11	MG/KG	0.0000866	0.000015	0.0000072	**1.2E+01**	**2.0E+00**
Toxicity Equivalency - Fish	11/11	MG/KG	0.0001077	0.000030	0.0000072	**1.5E+01**	**4.2E+00**
Toxicity Equivalency (PCB) - Fish	1/1	MG/KG	0.00000122	0.0000012	0.0000072	1.7E-01	1.7E-01
					Total TCDD TEQ	**1.5E+01**	**4.4E+00**
					Total	**2.5E+03**	**1.7E+03**

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TABLE 41
HAZARD QUOTIENTS FOR COIs IN GREYSTONE MILL POND REACH SEDIMENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]

Notes:

[a] CT and RME EPCs presented in Tables 27 and 28, respectively.

[b] Sediment TRVs based on minimum of available sediment screening benchmark values as summarized in Table D-2.

[c] Hazard Quotient is the ratio of the RME concentration to the TRV.

[d] Hazard Quotient is the ratio of the CT concentration to the TRV.

[1] Analyte is not included in the HI totals.

[2] HQs for 2,3,7,8-TCDD are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 42
HAZARD QUOTIENTS FOR COPCs IN ALLENDALE POND REACH SEDIMENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Semivolatile Organics							
2-Methylnaphthalene	7 / 44	MG/KG	0.13608	0.13608	0.07	**1.9E+00**	**1.9E+00**
Acenaphthene	14 / 45	MG/KG	1.2	1.2	0.016	**7.5E+01**	**7.5E+01**
Acenaphthylene	12 / 46	MG/KG	0.97	0.97	0.044	**2.2E+01**	**2.2E+01**
Anthracene	26 / 47	MG/KG	1.8	1.2	0.032	**5.7E+01**	**3.9E+01**
Benzo(a)anthracene	43 / 48	MG/KG	3.4	2.2	0.11	**3.1E+01**	**2.0E+01**
Benzo(a)pyrene	45 / 48	MG/KG	4.0	2.3	0.15	**2.7E+01**	**1.5E+01**
Benzo(b)fluoranthene	45 / 48	MG/KG	4.4	2.8	0.03	**1.6E+02**	**1.0E+02**
Benzo(g,h,i)perylene	33 / 48	MG/KG	2.0	2.0	0.063	**3.2E+01**	**3.2E+01**
Benzo(k)fluoranthene	46 / 48	MG/KG	3.9	2.6	0.027	**1.4E+02**	**9.4E+01**
bis(2-Ethylhexyl)phthalate	22 / 47	MG/KG	3.2	2.3	5810	5.5E-04	3.9E-04
Carbazole	19 / 45	MG/KG	1.8	1.5	1.6	**1.1E+00**	9.5E-01
Chrysene	47 / 48	MG/KG	5.1	3.0	0.17	**3.1E+01**	**1.8E+01**
Dibenzo(a,h)anthracene	26 / 47	MG/KG	2.0	1.4	0.0028	**7.1E+02**	**5.0E+02**
Dibenzofuran	9 / 44	MG/KG	0.64	0.64	2.4	2.7E-01	2.7E-01
Di-n-Butylphthalate	7 / 43	MG/KG	0.61	0.61	0.04	**1.5E+01**	**1.5E+01**
Fluoranthene	47 / 48	MG/KG	9.6	5.2	0.064	**1.5E+02**	**8.1E+01**
Fluorene	16 / 45	MG/KG	0.93	0.93	0.019	**4.9E+01**	**4.9E+01**
Indeno(1,2,3-cd)pyrene	43 / 48	MG/KG	3.2	1.9	0.063	**5.0E+01**	**3.0E+01**
Naphthalene	8 / 45	MG/KG	0.18126	0.18126	0.033	**5.5E+00**	**5.5E+00**
Phenanthrene	41 / 47	MG/KG	4.8	2.9	0.20	**2.4E+01**	**1.4E+01**
Pyrene	46 / 48	MG/KG	7.7	4.4	0.20	**3.9E+01**	**2.3E+01**
PAH ESG[1]	27 / 27		8.4	1.5	1.00	**8.4E+00**	**1.5E+00**
Total PAH[1]	47 / 48	MG/KG	63.3	28.9	2.28	**2.8E+01**	**1.3E+01**
					Total Semivolatile Organics	**1.6E+03**	**1.1E+03**
Pesticides							
4,4'-DDD	18 / 52	MG/KG	0.0060	0.0060	0.0020	**3.0E+00**	**3.0E+00**
4,4'-DDE	29 / 58	MG/KG	0.016	0.016	0.0022	**7.3E+00**	**7.3E+00**
alpha-Chlordane	36 / 54	MG/KG	0.011	0.011	0.0005	**2.2E+01**	**2.3E+01**
Dieldrin	19 / 53	MG/KG	0.0090	0.0090	0.00002	**4.5E+02**	**4.5E+02**
Endosulfan II	16 / 54	MG/KG	0.037	0.037	0.036	**1.0E+00**	**1.0E+00**
Endosulfan sulfate	4 / 50	MG/KG	0.0027	0.0027	0.03591	7.5E-02	7.4E-02
Endrin	4 / 52	MG/KG	0.003	0.0032	0.00002	**1.6E+02**	**1.6E+02**
gamma-Chlordane	35 / 54	MG/KG	0.017	0.0097	0.0005	**3.4E+01**	**1.9E+01**
Methoxychlor	9 / 56	MG/KG	0.011	0.011	0.12	8.9E-02	8.8E-02

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TABLE 42
HAZARD QUOTIENTS FOR COPCs IN ALLENDALE POND REACH SEDIMENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Technical Chlordane	10 / 11	MG/KG	0.651	0.515	0.0005	**1.3E+03**	**1.0E+03**
					Total Pesticides	**2.0E+03**	**1.7E+03**
PCBs							
Aroclor, Total	84 / 88	MG/KG	2.3	1.53	0.023	**1.0E+02**	**6.8E+01**
Aroclor-1248	6 / 80	MG/KG	0.14	0.14	0.030	**4.7E+00**	**4.7E+00**
Aroclor-1254	84 / 88	MG/KG	2.4	1.5	0.060	**4.0E+01**	**2.5E+01**
Aroclor-1260	2 / 80	MG/KG	0.2	0.20	0.005	**4.0E+01**	**4.0E+01**
Aroclor-1268	11 / 11	MG/KG	0.079	0.079	0.005	**1.6E+01**	**1.6E+01**
					Total PCBs	**2.0E+02**	**1.5E+02**
Inorganics/Metals							
Antimony	24 / 51	MG/KG	4.8	2.3	2	**2.4E+00**	**1.1E+00**
Arsenic	48 / 51	MG/KG	5.8	5.8	6	9.7E-01	9.7E-01
Barium	48 / 51	MG/KG	157.6	138	-		
Cadmium	30 / 49	MG/KG	1.2	1.2	0.59	**2.0E+00**	**2.1E+00**
Chromium	51 / 51	MG/KG	238	142	26	**9.2E+00**	**5.4E+00**
Cobalt	48 / 51	MG/KG	8.7	7.1	50	1.7E-01	1.4E-01
Copper	51 / 51	MG/KG	192	119	16	**1.2E+01**	**7.4E+00**
Cyanide	1 / 1	MG/KG	2.4	2	0.10	**2.4E+01**	**2.4E+01**
Iron	51 / 51	MG/KG	21005	17994	20000	**1.1E+00**	9.0E-01
Lead	51 / 51	MG/KG	488	329	31	**1.6E+01**	**1.1E+01**
Mercury	37 / 49	MG/KG	0.97	0.47	0.15	**6.5E+00**	**3.1E+00**
Mercury (methyl)	10 / 10	MG/KG	0.00	0.00080	-		
Molybdenum	11 / 11	MG/KG	13.2	13.2	-		
Selenium	13 / 49	MG/KG	1.4	1.1	-		
Silver	37 / 51	MG/KG	4.4	2.8	1	**8.9E+00**	**5.6E+00**
Thallium	14 / 49	MG/KG	6.8000	6.8000	-		
Zinc	50 / 51	MG/KG	482	354	120	**4.0E+00**	**2.9E+00**
					Total Inorganics/Metals	**8.7E+01**	**6.4E+01**
AVS/SEM							
Carbon-Normalized Excess SEM[1]	25 / 25	UMOL/G	530	73.0	130	**4.1E+00**	5.6E-01
SEM/AVS[1]	25 / 25		200	26.0	1	**2.0E+02**	**2.6E+01**
Dioxins							
2,3,7,8-TCDD[1,2]	144 / 147	MG/KG	0.0058	0.0058	0.0000072	**8.0E+02**	**8.0E+02**
Toxicity Equivalency - Fish	148/148	MG/KG	0.006	0.0058	0.0000072	**8.0E+02**	**8.0E+02**
Toxicity Equivalency (PCB) - Fish	2/2	MG/KG	0.000000112	0.000000112	0.0000072	1.6E-02	1.6E-02

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TABLE 42
HAZARD QUOTIENTS FOR COPCs IN ALLENDALE POND REACH SEDIMENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
					Total TCDD TEQ	8.0E+02	8.0E+02
					Total	4.7E+03	3.8E+03

Notes:
[a] CT and RME EPCs presented in Tables 27 and 28, respectively.
[b] Sediment TRVs based on minimum of available sediment screening benchmark values as summarized in Table D-2.
[c] Hazard Quotient is the ratio of the RME concentration to the TRV.
[d] Hazard Quotient is the ratio of the CT concentration to the TRV.
[1]Analyte is not included in the HI totals.
[2] HQs for 2,3,7,8-TCDD are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 43
HAZARD QUOTIENTS FOR COPCs IN LYMAN MILL POND REACH SEDIMENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Semivolatile Organics							
2-Methylnaphthalene	4 / 36	MG/KG	0.1	0.9	0.07	**1.4E+00**	**1.4E+01**
Acenaphthene	11 / 39	MG/KG	0.93	0.93	0.016	**5.8E+01**	**5.8E+01**
Acenaphthylene	10 / 40	MG/KG	0.42856	0.42856	0.044	**9.7E+00**	**9.7E+00**
Anthracene	17 / 40	MG/KG	0.79	0.79	0.032	**2.5E+01**	**2.5E+01**
Benzo(a)anthracene	33 / 40	MG/KG	2.8	1.4	0.11	**2.6E+01**	**1.3E+01**
Benzo(a)pyrene	34 / 40	MG/KG	2.9	1.4	0.15	**1.9E+01**	**9.1E+00**
Benzo(b)fluoranthene	34 / 40	MG/KG	4.5	2.1	0.027	**1.7E+02**	**7.8E+01**
Benzo(g,h,i)perylene	27 / 40	MG/KG	3.0	1.3	0.063	**4.7E+01**	**2.0E+01**
Benzo(k)fluoranthene	34 / 40	MG/KG	2.1	1.1	0.027	**7.8E+01**	**4.0E+01**
bis(2-Ethylhexyl)phthalate	32 / 39	MG/KG	5.2	2.6	5810	8.9E-04	4.5E-04
Carbazole	14 / 39	MG/KG	0.80	0.80	1.60	5.0E-01	5.0E-01
Chrysene	35 / 40	MG/KG	3.6	1.66	0.17	**2.2E+01**	**1.0E+01**
Dibenzo(a,h)anthracene	17 / 40	MG/KG	1.0694	0.77	0.0028	**3.8E+02**	**2.7E+02**
Dibenzofuran	10 / 38	MG/KG	0.31	0.89	2.40	1.3E-01	3.7E-01
Di-n-Butylphthalate	6 / 38	MG/KG	1.8	1.0	0.042	**4.3E+01**	**2.3E+01**
Fluoranthene	38 / 40	MG/KG	6.8	2.7	0.064	**1.1E+02**	**4.2E+01**
Fluorene	12 / 40	MG/KG	0.67084	0.67084	0.019	**3.5E+01**	**3.5E+01**
Indeno(1,2,3-cd)pyrene	31 / 40	MG/KG	2.7	1.28	0.063	**4.3E+01**	**2.0E+01**
Naphthalene	6 / 37	MG/KG	0.18514	0.18514	0.033	**5.7E+00**	**5.7E+00**
Pentachlorophenol	1 / 34	MG/KG	1.4	1.4	47.17	3.0E-02	3.0E-02
Phenanthrene	33 / 40	MG/KG	2.8	1.5	0.20	**1.4E+01**	**7.5E+00**
Pyrene	35 / 40	MG/KG	5.1	2.4	0.195	**2.6E+01**	**1.2E+01**
PAH ESG[1]	24 / 24		8.2	1.0	1.000	**8.2E+00**	**1.0E+00**
Total PAH[1]	30 / 32	MG/KG	47.24819801	11.1	2.280	**2.1E+01**	**4.9E+00**
					Total Semivolatile Organics	**1.1E+03**	**7.0E+02**
Pesticides							
4,4'-DDD	15 / 44	MG/KG	0.0093	0.0093	0.002	**4.7E+00**	**4.6E+00**
4,4'-DDE	20 / 44	MG/KG	0.011	0.0083	0.0022	**5.0E+00**	**3.8E+00**
alpha-Chlordane	26 / 47	MG/KG	0.032	0.016	0.0005	**6.4E+01**	**3.1E+01**
Dieldrin	12 / 44	MG/KG	0.0044	0.0038	0.000020	**2.2E+02**	**1.9E+02**
Endosulfan II	8 / 43	MG/KG	0.0047	0.0038	0.036	1.3E-01	1.1E-01
Endosulfan sulfate	3 / 42	MG/KG	0.0029	0.0029	0.036	8.1E-02	8.0E-02
Endrin	2 / 43	MG/KG	0.0026	0.0026	0.000020	**1.3E+02**	**1.3E+02**
Methoxychlor	2 / 42	MG/KG	0.0053	0.0053	0.1240	4.3E-02	4.3E-02

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TABLE 43
HAZARD QUOTIENTS FOR COPCs IN LYMAN MILL POND REACH SEDIMENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
gamma-Chlordane	20 / 45	MG/KG	0.015	0.0089	0.0005	**2.9E+01**	**1.8E+01**
Technical Chlordane	7 / 7	MG/KG	2.21273	1.3	0.0005	**4.4E+03**	**2.6E+03**
					Total Pesticides	**4.9E+03**	**3.0E+03**
PCBs							
Aroclor, Total	26 / 39	MG/KG	0.390	0.2629	0.023	**1.7E+01**	**1.2E+01**
Aroclor-1248	7 / 43	MG/KG	0.0278	0.02	0.030	9.3E-01	8.3E-01
Aroclor-1254	30 / 46	MG/KG	0.49	0.27	0.060	**8.2E+00**	**4.5E+00**
Aroclor-1260	5 / 43	MG/KG	0.027	0.024	0.0050	**5.4E+00**	**4.8E+00**
Aroclor-1268	8 / 8	MG/KG	0.314	0.12	0.0050	**6.3E+01**	**2.3E+01**
					Total PCBs	**9.4E+01**	**4.5E+01**
Inorganics/Metals							
Antimony	19 / 38	MG/KG	3.1	1.3	2	**1.6E+00**	6.6E-01
Arsenic	37 / 39	MG/KG	6.4	5.2	6	**1.1E+00**	8.7E-01
Barium	39 / 39	MG/KG	207	130	-		
Cadmium	26 / 38	MG/KG	2.1	2.1	0.59	**3.5E+00**	**3.6E+00**
Chromium	39 / 39	MG/KG	200	98.9	26	**7.7E+00**	**3.8E+00**
Cobalt	26 / 39	MG/KG	12.1	7.8	50	2.4E-01	1.6E-01
Copper	38 / 39	MG/KG	199	112.2	16	**1.2E+01**	**7.0E+00**
Iron	39 / 39	MG/KG	20068	16468	20000	**1.0E+00**	8.2E-01
Lead	39 / 39	MG/KG	375	236	31	**1.2E+01**	**7.6E+00**
Mercury	33 / 38	MG/KG	0.62	0.29	0.15	**4.1E+00**	**1.9E+00**
Mercury (methyl)	7 / 7	MG/KG	0.00959	0.0021	-		
Molybdenum	7 / 7	MG/KG	13.4	6.5	-		
Selenium	14 / 38	MG/KG	1.2	1.0	-		
Silver	19 / 39	MG/KG	4.31723258	2.88	0.50	**8.6E+00**	**5.8E+00**
Thallium	9 / 38	MG/KG	0.58	0.58	-		
Zinc	38 / 39	MG/KG	758	391	120.00	**6.3E+00**	**3.3E+00**
					Total Inorganics/Metals	**5.9E+01**	**3.5E+01**
AVS/SEM							
Carbon-Normalized Excess SEM[1]	20 / 20	UMOL/G	375	16.3	130	**2.9E+00**	1.3E-01
SEM/AVS[1]	20 / 20		5.1	5.1	1	**5.1E+00**	**5.1E+00**
Dioxins							
2,3,7,8-TCDD[1,2]	45 / 46	MG/KG	0.0018	0.0018	0.0000072	**2.5E+02**	**2.5E+02**
Toxicity Equivalency - Fish	46/46	MG/KG	0.00805	0.00179	0.0000072	**1.1E+03**	**2.5E+02**
Toxicity Equivalency (PCB) - Fish	3/3	MG/KG	0.00000336	0.0000018	0.0000072	4.7E-01	2.5E-01

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TABLE 43
HAZARD QUOTIENTS FOR COPCs IN LYMAN MILL POND REACH SEDIMENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Total TCDD TEQ						1.1E+03	2.5E+02
Total						7.3E+03	4.0E+03

Notes:
[a] CT and RME EPCs presented in Tables 27 and 28, respectively.
[b] Sediment TRVs based on minimum of available sediment screening benchmark values as summarized in Table D-2.
[c] Hazard Quotient is the ratio of the RME concentration to the TRV.
[d] Hazard Quotient is the ratio of the CT concentration to the TRV.
[1]Analyte is not included in the HI totals.
[2] HQs for 2,3,7,8-TCDD are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 44
HAZARD QUOTIENTS FOR COPCs IN MANTON POND REACH SEDIMENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Semivolatile Organics							
Benzo(a)anthracene	3 / 3	MG/KG	0.3	0.15	0.11	**2.8E+00**	**1.3E+00**
Benzo(a)pyrene	3 / 3	MG/KG	0.37	0.18	0.15	**2.5E+00**	**1.2E+00**
Benzo(b)fluoranthene	3 / 3	MG/KG	0.64	0.31	0.027	**2.4E+01**	**1.1E+01**
Benzo(g,h,i)perylene	3 / 3	MG/KG	0.22	0.11	0.063	**3.5E+00**	**1.8E+00**
Benzo(k)fluoranthene	2 / 3	MG/KG	0.2	0.18	0.027	**7.4E+00**	**6.5E+00**
bis(2-Ethylhexyl)phthalate	3 / 3	MG/KG	0.43	0.31	5810.38	7.4E-05	5.3E-05
Carbazole	1 / 3	MG/KG	0.052	0.052	1.60	3.3E-02	3.3E-02
Chrysene	3 / 3	MG/KG	0.46	0.23	0.17	**2.8E+00**	**1.4E+00**
Fluoranthene	3 / 3	MG/KG	0.81	0.39	0.064	**1.3E+01**	**6.1E+00**
Indeno(1,2,3-cd)pyrene	3 / 3	MG/KG	0.29	0.15	0.063	**4.6E+00**	**2.3E+00**
Phenanthrene	3 / 3	MG/KG	0.3	0.14	0.204	**1.5E+00**	6.9E-01
Pyrene	3 / 3	MG/KG	0.6	0.30	0.195	**3.1E+00**	**1.5E+00**
PAH ESG[1]	3 / 3	MG/KG	0.93	0.65	1.000	9.3E-01	6.5E-01
					Total Semivolatile Organics	**6.4E+01**	**3.4E+01**
Pesticides/PCBs							
alpha-Chlordane	1 / 3	MG/KG	0.004	0.0022	0.001	**8.0E+00**	**4.4E+00**
gamma-Chlordane	1 / 3	MG/KG	0.005	0.0025	0.001	**1.0E+01**	**5.0E+00**
					Total Pesticides	**1.8E+01**	**9.4E+00**
Inorganics/Metals							
Arsenic	3 / 3	MG/KG	0.97	0.77	6	1.6E-01	1.3E-01
Barium	3 / 3	MG/KG	38.1	24.4	-		
Cadmium	2 / 3	MG/KG	0.96	0.68	0.59	**1.6E+00**	**1.1E+00**
Chromium	3 / 3	MG/KG	18.6	13.4	26	7.2E-01	5.2E-01
Cobalt	3 / 3	MG/KG	3.5	2.3	50	7.0E-02	4.6E-02
Copper	3 / 3	MG/KG	63.5	29.5	16	**4.0E+00**	**1.8E+00**
Iron	3 / 3	MG/KG	4770	4013	20000	2.4E-01	2.0E-01
Lead	3 / 3	MG/KG	91	46	31	**2.9E+00**	**1.5E+00**
Zinc	3 / 3	MG/KG	161	78.5	120	**1.3E+00**	6.5E-01
					Total Inorganics/Metals	**1.1E+01**	**6.0E+00**
AVS/SEM							
Carbon-Normalized Excess SEM[1]	3 / 3	UMOL/G	7.9	-22.9	120	6.6E-02	-1.9E-01
SEM/AVS[1]	3 / 3	MG/KG	1.2	0.9	1	**1.2E+00**	8.5E-01

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TABLE 44
HAZARD QUOTIENTS FOR COPCs IN MANTON POND REACH SEDIMENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Dioxins							
2,3,7,8-TCDD[1,2]	3 / 3	MG/KG	0.000982	0.000427	0.0000072	**1.4E+02**	**5.9E+01**
Toxicity Equivalency - Fish	3 / 3	MG/KG	0.000992	0.00043	0.0000072	**1.4E+02**	**6.0E+01**
					Total TCDD TEQ	**1.4E+02**	**6.0E+01**
					Total	**2.3E+02**	**1.1E+02**

Notes:

[a] CT and RME EPCs presented in Tables 27 and 28, respectively.

[b] Sediment TRVs based on minimum of available sediment screening benchmark values as summarized in Table D-2.

[c] Hazard Quotient is the ratio of the RME concentration to the TRV.

[d] Hazard Quotient is the ratio of the CT concentration to the TRV.

[1] Analyte is not included in the HI totals.

[2] HQs for 2,3,7,8-TCDD are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 45
HAZARD QUOTIENTS FOR COPCs IN DYERVILLE REACH SEDIMENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Semivolatile Organics							
2-Methylnaphthalene	1 / 2	MG/KG	0.031	0.031	0.070	4.4E-01	4.4E-01
Acenaphthene	2 / 3	MG/KG	0.14	0.14	0.016	**8.8E+00**	**8.5E+00**
Acenaphthylene	3 / 3	MG/KG	0.27	0.16	0.044	**6.1E+00**	**3.6E+00**
Anthracene	3 / 3	MG/KG	0.55	0.30	0.032	**1.7E+01**	**9.4E+00**
Benzo(a)anthracene	3 / 3	MG/KG	2.6	1.4	0.11	**2.4E+01**	**1.3E+01**
Benzo(a)pyrene	3 / 3	MG/KG	2.2	1.4	0.15	**1.5E+01**	**9.4E+00**
Benzo(b)fluoranthene	3 / 3	MG/KG	4	2.5	0.03	**1.5E+02**	**9.1E+01**
Benzo(g,h,i)perylene	3 / 3	MG/KG	1.6	1.1	0.063	**2.5E+01**	**1.7E+01**
Benzo(k)fluoranthene	3 / 3	MG/KG	1.1	0.7	0.027	**4.0E+01**	**2.6E+01**
bis(2-Ethylhexyl)phthalate	2 / 2	MG/KG	1.6	1.10	5810	2.8E-04	1.9E-04
Carbazole	2 / 2	MG/KG	0.41	0.22	1.6	2.6E-01	1.4E-01
Chrysene	3 / 3	MG/KG	2.4	1.5	0.17	**1.4E+01**	**9.2E+00**
Dibenzo(a,h)anthracene	3 / 3	MG/KG	0.32	0.20	0.0028	**1.1E+02**	**7.2E+01**
Dibenzofuran	1 / 2	MG/KG	0.10	0.1	2.4	4.2E-02	4.2E-02
Di-n-Butylphthalate	1 / 2	MG/KG	0.051	0.051	0.04	**1.2E+00**	**1.2E+00**
Fluoranthene	3 / 3	MG/KG	5.4	2.80	0.064	**8.4E+01**	**4.4E+01**
Fluorene	3 / 3	MG/KG	0.22	0.12	0.019	**1.2E+01**	**6.5E+00**
Indeno(1,2,3-cd)pyrene	3 / 3	MG/KG	2	1.4	0.063	**3.2E+01**	**2.1E+01**
Naphthalene	2 / 3	MG/KG	0.064	0.064	0.033	**2.0E+00**	**2.0E+00**
Phenanthrene	3 / 3	MG/KG	2.9	1.4	0.20	**1.4E+01**	**6.7E+00**
Pyrene	3 / 3	MG/KG	4.2	2.4	0.20	**2.2E+01**	**1.2E+01**
PAH ESG[1]	3 / 3		4.7	2.4	2.28	**2.1E+00**	**1.0E+00**
Total PAH[1]	1 / 1	MG/KG	19	19.0	2.28	**8.3E+00**	**8.3E+00**
					Total Semivolatile Organics	**5.8E+02**	**3.5E+02**
Pesticides							
4,4'-DDD	1 / 3	MG/KG	0.013	0.0058	0.0020	**6.5E+00**	**2.9E+00**
4,4'-DDE	2 / 3	MG/KG	0.007	0.0039	0.0022	**3.2E+00**	**1.8E+00**
alpha-Chlordane	1 / 3	MG/KG	0.011	0.0043	0.0005	**2.2E+01**	**8.6E+00**
Dieldrin	1 / 3	MG/KG	0.03	0.01	0.00002	**1.5E+03**	**5.8E+02**
Endosulfan sulfate	1 / 3	MG/KG	0.011	0.0052	0.036	3.1E-01	1.4E-01
					Total Pesticides	**1.5E+03**	**5.9E+02**

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TABLE 45
HAZARD QUOTIENTS FOR COPCs IN DYERVILLE REACH SEDIMENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
PCBs							
Aroclor, Total	1 / 1	MG/KG	1.42	1.4	0.023	**6.3E+01**	**6.2E+01**
Aroclor-1254	2 / 3	MG/KG	1.3	0.49	0.060	**2.2E+01**	**8.2E+00**
Aroclor-1268	1 / 1	MG/KG	0.12	0.120	0.005	**2.4E+01**	**2.4E+01**
					Total PCBs	**1.1E+02**	**9.4E+01**
Inorganics/Metals							
Arsenic	2 / 3	MG/KG	2.1	2.1	6	3.5E-01	3.5E-01
Barium	3 / 3	MG/KG	116	67.8	-		
Cadmium	2 / 3	MG/KG	4.0	1.7	1	**6.8E+00**	**2.9E+00**
Chromium	3 / 3	MG/KG	385	156	26	**1.5E+01**	**6.0E+00**
Cobalt	3 / 3	MG/KG	9.1	5.8	50	1.8E-01	1.2E-01
Copper	3 / 3	MG/KG	210	90.5	16	**1.3E+01**	**5.7E+00**
Iron	3 / 3	MG/KG	15300	10443	20000	7.7E-01	5.2E-01
Lead	3 / 3	MG/KG	307	160	31	**9.9E+00**	**5.1E+00**
Mercury	1 / 3	MG/KG	1.06	0.40	0.15	**7.1E+00**	**2.7E+00**
Zinc	3 / 3	MG/KG	1930	719.30	120.00	**1.6E+01**	**6.0E+00**
					Total Inorganics/Metals	**6.9E+01**	**2.9E+01**
AVS/SEM							
Carbon-Normalized Excess SEM[1]	2 / 2	UMOL/G	1371	733	130	**1.1E+01**	**5.6E+00**
SEM/AVS[1]	2 / 2	MG/KG	4.7	3.4	1	**4.7E+00**	**3.4E+00**
Dioxins							
2,3,7,8-TCDD[1,2]	2 / 3	MG/KG	0.00014	0.000091	0.0000072	**2.0E+01**	**1.3E+01**
Toxicity Equivalency - Fish	4/4	MG/KG	0.00015	0.000079	0.0000072	**2.1E+01**	**1.1E+01**
Toxicity Equivalency (PCB) - Fish	2/2	MG/KG	0.0000000253	0.000000025	0.0000072	3.5E-03	3.5E-03
					Total TCDD TEQ	**2.1E+01**	**1.1E+01**
					Total	**2.3E+03**	**1.1E+03**

Notes:

[a] CT and RME EPCs presented in Tables 27 and 28, respectively.

[b] Sediment TRVs based on minimum of available sediment screening benchmark values as summarized in Table D-2.

[c] Hazard Quotient is the ratio of the RME concentration to the TRV.

[d] Hazard Quotient is the ratio of the CT concentration to the TRV.

[1] Analyte is not included in the HI totals.

[2] HQs for 2,3,7,8-TCDD are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

TABLE 46
SUMMARY OF ANALYTICAL SEDIMENT CHEMISTRY RESULTS FOR INVERTEBRATE LABORATORY BIOASSAY

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

PARAMETER	Frequency of Detection		Minimum SQL	Maximum SQL	Minimum Detect	Maximum Detect	Average	Sediment Benchmark[a]	Basis	APB-SD-4008-0000-01 7/9/2001		APB-SD-4009-0000-01 7/9/2001		APB-SD-4010-0000-01 7/10/2001		GMP-SD-5007-0000-01 7/9/2001		LPX-SD-4011-0000-01 7/10/2001		LPX-SD-4012-0000-01 7/10/2001		LPX-SD-4013-0000-01 7/10/2001		RAB-SD-5008-0000-01 7/9/2001		LAB CONTROL
H.azteca 42-d survival										62.5%	b	80.0%	b	73.8%	b	97.5%		91.3%		77.5%	b	92.5%		93.8%		92.5%
H.azteca 42-d growth										0.315		0.418		0.494		0.325		0.339		0.438		0.331		0.318		0.361
H.azteca 42-d average # young/female										2.6	b	6.9		6.8		7.0		5.6	b	5.7		4.6	b	9.3		6.9
H.azteca 42-d total young production										95		215		204		315		184		193		169		287		262
H. azteca 42-d females										36		32		30		45		33		34		37		31		38
H. azteca 42-d males										30		31		29		31		39		29		37		44		36
H. azteca 42-d % females										55%		51%		51%		59%		46%		54%		50%		41%		51%
C. tentans 49-d survival										47.9%	c	32.3%	c	0.0%	c	85.4%	c	47.9%	c	50.0%	c	52.1%		74.0%		66.7%
C. tentans % adult emerged										26.1%		71.0%		-		97.1%		100.0%		100.0%		100.0%		94.4%		85.9%
C. tentans 20-d growth										0.685	c	1.900			c	2.173		1.937		1.729		1.799		1.780		1.106
C. tentans 42-d females										4		16		-		15		35		33		24		43		32
C. tentans 42-d males										8		6		-		18		11		15		26		24		23
C. tentans 42-d % females										33%		73%		-		45%		76%		69%		48%		64%		58%
Semivolatile Organics (mg/Kg)																										
1,1'-Biphenyl	8	8			0.00644	0.08503	0.045235	1.1	G	0.04026	J	0.06482		0.08503		0.03042	J	0.05587	J	0.03545		0.04359	J	0.00644	J	
2,4,5-Trichlorophenol	1	3	2.3	2.6	0.08	0.08	0.84333333	2.04	I			2.3	U	0.08	J							2.6	U			
2-Methylnaphthalene	8	8			0.01855	0.13608	0.08411	0.07	D	0.06688	J	0.12244		0.13608		0.07478	J	0.09009	J	0.09848		0.06558	J	0.01855		
4-Methylphenol	2	4	0.45	0.5	0.47	0.83	0.44375	0.111	I	0.47	J	0.45	U	0.83								0.5	U			
Acenaphthene	8	8			0.03411	0.32721	0.1682075	0.016	D	0.11384	J	0.28752		0.26336		0.15113	J	0.11463	J	0.32721		0.05386	J	0.03411	J	
Acenaphthylene	8	8			0.0589	0.42856	0.23377375	0.044	D	0.23679	J	0.30814		0.08966		0.19279	J	0.3358	J	0.42856		0.21955	J	0.0589		
Anthracene	8	8			0.14754	1.1242	0.493105	0.027	H	0.36998	J	0.78807		0.43679		0.43335	J	0.41795	J	1.1242		0.22696	J	0.14754		
Benzaldehyde	8	8			0.04089	0.34935	0.24097	0.462	I	0.34935	J	0.19453		0.04089		0.25829	J	0.33617	J	0.27921		0.19076	J	0.27856		
Benzo(a)anthracene	8	8			0.69332	5.42747	2.40305375	0.108	B	2.46687	J	3.82886		1.49994		2.19925	J	2.11123	J	5.42747		0.99749	J	0.69332		
Benzo(a)pyrene	8	8			0.79685	6.17711	2.67131875	0.14	G	2.63303	J	4.31576		1.17966		2.51731	J	2.65683	J	6.17711		1.094	J	0.79685		
Benzo(b)fluoranthene	8	8			0.82204	7.48175	3.40177125	0.0272	A	4.03838	J	5.09955		1.58889		3.08553	J	3.31638	J	7.48175		1.78165	J	0.82204		
Benzo(g,h,i)perylene	8	8			0.59468	4.85176	2.3115625	0.0634	D	2.73288	J	3.5096		0.86989		2.07671	J	2.3996	J	4.85176		1.45738	J	0.59468		
Benzo(k)fluoranthene	8	8			0.80433	7.30225	3.19571125	0.0272	A	3.63135	J	4.80201		1.45618		2.83467	J	3.19557	J	7.30225		1.53933	J	0.80433		
bis(2-Ethylhexyl)phthalate	8	8			0.65	7.9	3.2125	890	G	0.9	J	1.2		6.4	J	0.95	J	2	J	7.9	J	5.7	J	0.65	J	
Butylbenzylphthalate	6	6			0.087	1.2	0.5095	11	G	0.27	J	0.14	J	0.087	J			0.26	J	1.2	J	1.1	J			
Carbazole	7	7			0.11	1.6	0.54142857	0.36	E	0.11	J	1.6		0.83	J	0.13	J	0.11	J	0.66	J	0.35	J			
Chrysene	8	8			0.98197	8.9397	3.77370625	0.166	B	4.14406	J	5.7071		2.08132		3.40889	J	3.44517	J	8.9397		1.48144	J	0.98197		
Dibenzo(a,h)anthracene	8	8			0.17898	1.0694	0.53380125	0.00282	A	0.62843	J	0.81943		0.19626		0.49272	J	0.5222	J	1.0694		0.36299	J	0.17898		
Dibenzofuran	8	8			0.03586	0.27301	0.14945375	0.42	G	0.1185	J	0.25358		0.17283		0.14389	J	0.12233	J	0.27301		0.07563	J	0.03586		
Di-n-Butylphthalate	4	5	0.45	0.45	0.11	0.29	0.175	0.042	E			0.45	U	0.12	J	0.11	J			0.29	J	0.13	J			
Di-n-octylphthalate	3	4	0.45	0.45	0.16	0.4	0.27375	2752	I			0.45	UJ	0.16	J					0.4	J	0.31	J			
Fluoranthene	8	8			1.58372	16.763	6.8043325	0.06423	A	6.35484	J	10.34386		5.09793		5.82721	J	5.4198	J	16.763		3.0443	J	1.58372		
Fluorene	8	8			0.08068	0.67084	0.3027875	0.019	D	0.21494	J	0.43514		0.36576		0.277	J	0.24255	J	0.67084		0.13539	J	0.08068		
Indeno(1,2,3-cd)pyrene	8	8			0.64922	5.25309	2.44658375	0.0634	D	2.90651	J	3.77581		0.83042		2.18335	J	2.42998	J	5.25309		1.54429	J	0.64922		
Naphthalene	8	8			0.01905	0.18514	0.1127025	0.03275	A	0.09897	J	0.18126		0.1083		0.09382	J	0.13216	J	0.18514		0.08292	J	0.01905		
Phenanthrene	8	8			0.79474	8.37861	3.250995	0.204	B	2.42987	J	5.17694		3.31194		2.54979	J	2.13156	J	8.37861		1.23251	J	0.79474		
Pyrene	8	8			1.32973	13.14306	5.5618875	0.195	B	5.22866	J	8.43349		3.95464		4.96158	J	4.70276	J	13.14306		2.74118	J	1.32973		
Total PAH	8	8			9.63072	87.93009	37.9440963	2.28	B	38.45505	J	58.25536		23.72486		33.53418	J	33.84247	J	87.93009		18.18004	J	9.63072		
PAH ESG_{Tot}								1		0.47		0.97		2.6		0.31		0.43		0.67		0.3		0.29		
PAH ESG_{Tot} (11.5-fold UF)								1		5.405		11.155		29.9		3.565		4.945		7.705		3.45		3.335		
Pesticides (mg/Kg)																										
4,4'-DDD	8	8			0.00317	0.05019	0.024075	0.002	D	0.01781	J	0.01975	J	0.01676	J	0.01471	J	0.03589	J	0.03432	J	0.05019	J	0.00317	J	
4,4'-DDE	8	8			0.00547	0.04293	0.0228575	0.0022	D	0.01904		0.01477		0.01604		0.02075	J	0.04293		0.02714		0.03672		0.00547	J	
4,4'-DDT	5	8	0.00084	0.00359	0.00484	0.00908	0.00483813	0.001	D	0.00254	UJ	0.00484	J	0.00084	UJ	0.00359	UJ	0.00908	J	0.00764	J	0.00596	J	0.0077	J	
alpha-Chlordane	8	8			0.00133	0.11265	0.03154625	0.0005	D	0.02173		0.01807		0.00626		0.01746	J	0.04281		0.11265		0.03206	J	0.00133	J	
Dieldrin	8	8			0.00191	0.11297	0.01896625	0.00002	D	0.00497	J	0.00813	J	0.11297	J	0.0046	J	0.00679	J	0.0061	J	0.00626	J	0.00191	J	
gamma-BHC	1	8	0.00162	0.00359	0.0003	0.0003	0.00112438	0.00157	F	0.00254	UJ	0.00184	UJ	0.0003	J	0.00359	UJ	0.00289	UJ	0.00189	UJ	0.00302	UJ	0.00162	UJ	
gamma-Chlordane	3	8	0.00084	0.00254	0.00879	0.06988	0.01682438	0.0005	D	0.00254	U	0.00184	U	0.00084	U	0.00879	J	0.06988		0.00189	U	0.05156	J	0.00162	UJ	
Technical Chlordane	8	8			0.15253	1.78167	0.78546625	0.0005	D	0.75105		0.67159		0.40648		0.62618		1.02915		1.78167		0.86508		0.15253	J	
Aroclor-1254	8	8			0.05755	3.21148	1.1376625	0.06	C	0.65323		1.46665		3.21148		0.15911		2.02277		0.2429		1.28761		0.05755		
Aroclor-1268	8	8			0.04036	0.31379	0.14516625	0.005	C	0.15642		0.1233		0.04036		0.24263		0.18928		0.05389		0.31379	J	0.04166		
Aroclor, Total	8	8			0.09922	3.25184	1.28283125	0.005	C	0.80966		1.58996		3.25184		0.40174		2.21205		0.29678		1.6014		0.09922	J	

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TABLE 46
SUMMARY OF ANALYTICAL SEDIMENT CHEMISTRY RESULTS FOR INVERTEBRATE LABORATORY BIOASSAY

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

PARAMETER	Frequency of Detection		Minimum SQL	Maximum SQL	Minimum Detect	Maximum Detect	Average	Sediment Benchmark[a]	Basis	APB-SD-4008-0000-01 7/9/2001	APB-SD-4009-0000-01 7/9/2001	APB-SD-4010-0000-01 7/10/2001	GMP-SD-5007-0000-01 7/9/2001	LPX-SD-4011-0000-01 7/10/2001	LPX-SD-4012-0000-01 7/10/2001	LPX-SD-4013-0000-01 7/10/2001	RAB-SD-5008-0000-01 7/9/2001	LAB CONTROL
Inorganics (mg/Kg)																		
Aluminum	8	8			5759	27773	19877.625	5803	A	22168 J	16155 J	5759 J	20568 J	27773 J	25502 J	19322 J	21774 J	
Antimony	2	8	0.0103	0.315	0.368	0.969	0.21679375	2	D	0.196 U	0.315 U	0.0566 U	0.368 J	0.135 U	0.969 J	0.0818 U	0.0103 U	
Arsenic	8	8			1.4	13.2	5.79125	6	C	5.38 J	3.78 J	1.4 J	7.03 J	6.13 J	13.2 J	4.2	5.21 J	
Barium	8	8			39.5	373	222.1875	-	-	292 J	223 J	39.5 J	293 J	373 J	162 J	191 J	204 J	
Beryllium	8	8			0.441	4.67	3.043875	-	-	4.12	2.5	0.441	4.67	4.13	4.36	1.47	2.66	
Cadmium	8	8			0.858	4.65	2.399875	0.592	A	2.22 J	1.74 J	0.941	3.68	4.65	3.16 J	1.95 J	0.858	
Chromium	8	8			17.5	259	161.9375	26	C	186 J	166 J	150 J	109 J	259 J	257 J	151 J	17.5 J	
Cobalt	8	8			2.69	26.6	13.49375	50	C	16.5	10.1	2.69	15.3	17.2	26.6	9.46	10.1	
Copper	8	8			9.78	244	83.1975	16	C	69.7	43.5	11.6 J	53.4	244	178	55.6 J	9.78	
Iron	8	8			10358	41293	26759.25	20000	C	30051	21582	10358	28339	31842	41293	27252	23357	
Lead	8	8			88.6	613	348.575	31	C	396 J	258 J	191 J	293 J	613 J	567 J	382 J	88.6 J	
Manganese	8	8			256	1321	751.75	460	C	936 J	728 J	256 J	1019 J	1321 J	276 J	648 J	830 J	
Mercury	8	8			0.113	0.924	0.593875	0.15	D	0.673 J	0.632 J	0.924 J	0.58 J	0.804 J	0.739 J	0.286 J	0.113 J	
Mercury (methyl)	8	8			0.000142	0.00285	0.000708	-	-	0.000926 J	0.00285 J	0.000196 J	0.000142 J	0.000259 J	0.000579 J	0.000454 J	0.000258 J	
Molybdenum	8	8			1.24	13.3	7.205	-	-	13.3	12.3	1.24 J	7.01	10.9	8.47	2.83	1.59 J	
Nickel	8	8			5.41	94.6	33.25125	16	C	94.6	31.8	5.41	19.2	62.2 J	14.9 J	18.2 J	19.7	
Selenium	4	8	0.245	0.596	0.806	1.57	0.651	-	-	0.806 J	0.596 U	0.245 U	1.06 J	0.815 J	1.57 J	0.491 U	0.582 U	
Silver	8	8			0.302	4.31	2.002625	0.5	C	2.37	1.26	0.359 J	2.21	4.31	4.15	1.06	0.302 J	
Thallium	8	8			0.168	0.883	0.500875	-	-	0.541 J	0.377 J	0.168 J	0.524 J	0.712 J	0.883 J	0.448 J	0.354 J	
Vanadium	8	8			17.4	91.7	50.0125	-	-	56.4	45.9	17.4	43.7	62	91.7	51	32	
Zinc	8	8			131	1662	728.25	120	C	1123 J	548 J	131 J	736 J	917 J	1662 J	482 J	227 J	
TOC (%)																		
Total Organic Carbon	9	9			1.24	16.96	8.96	na		10.35	7.75	1.24	14.09	10.1	16.96	8	4.3	
AVS/SEM (mg/Kg)																		
Cadmium	8	8			0.0539	3.16	1.7329875			2.22 J	1.74 J	0.52 J	3.03 J	1.19 J	3.16 J	1.95 J	0.0539 J	
Copper	8	8			9.78	91.7	49.2225			69.7	43.5	11.6 J	53.4	91.7 J	58.5 J	55.6 J	9.78	
Lead	8	8			88.6	587	306.4125			331	258 J	95.7 J	271	587 J	492 J	328 J	88.6 J	
Mercury	8	8			0.00377	0.0634	0.02008125			0.0166 J	0.0112 J	0.0634 J	0.00873 J	0.0265 J	0.0205 J	0.00995 J	0.00377 J	
Nickel	8	8			1.68	94.6	32.785			94.6	31.8	1.68 J	19.2	62.2 J	14.9 J	18.2 J	19.7	
Zinc	6	8	65.6	165	393	1287	582.6625			924	548 J	65.6 U	608	786 J	1287 J	393 J	165 U	
Acid Volatile Sulfide	8	8			55.7	328	225.9625			116 J	325 J	55.7 J	304 J	328 J	118 J	326 J	235 J	
AVS/SEM Ratio	8	8			0.845	7.8	3.111875			0.845	3.11	1.28	4.81	2.77	1.21	3.07	7.8	
AVS/SEM Ratio	8	8						1		5.1	1.1	0.69	1.2	1.7	6.3	0.87	0.3	
C-Normalized Excess SEM								130		144	10.5	-41.8	14.09	10.1	16.96	8	4.3	

Nootes:

a. Sediment screening benchmark values are summarized in Table D-2 in Appendix D. The benchmarks were derived from the following sources:
   a. ARCS = Assessment and Remediation of Contaminated Sediments Program; values as derived in Jones et al., 1997.
   b. CV = Consensus Values; values as presented in MacDonald, et al., 2000a,b.
   c. Ontario Ministry of the Environment Lowest Effect Level (LELs) Provincial Sediment Quality Guidelines as presented in Persaud et al., 1993.
   d. National Oceanic and Atmospheric Administration (NOAA) Effects Range-Low (ER-L) Sediment Guidelines corresponds to the lower 10th percentile of effects data for each chemical, a range intended to estimate conditions in which effects would be rarely observed (Long et al., 1994). Based on data for estuarine and saltwater species.
   e. Washington State Freshwater Sediment Quality Values (SQVs) as presented in Cubbage et al., 1997.
   f. U.S. Environmental Protection Agency (USEPA) Sediment Quality Criteria (SQCs) or Equilibrium Partitioning Sediment Guidelines (ESGs) adjusted by an assumed TOC content of 1 percent.
   g. Sediment screening benchmarks derived using equilibrium partitioning assumptions and based on Chronic Tier II values; values as summarized in Jones et al., 1997.
   h. Sediment quality benchmarks (Jones et al., 1997) derived using equlibrium partitioning assumptions and conventional aqueous benchmarks as presented in Suter and Tsao (1996). 1 percent TOC assumed.
   i. Derived based on equilibrium partioning assumptions using selected surface water quality screening benchmarks, see Table E-1. Values are presented only for analytes lacking sediment benchmarks from other sources.
   j. Miscellaneous sediment benchmarks.
   k. Value is the minimum of the available sediment screening benchmarks.
   l. Basis for the selected screening benchmark is indicated; refer to the above footnotes.
   m. Sediment concentration protective of semi-aquatic wildlife exposure to sediment via incidental sediment ingestion and consumption of contaminated prey item exposure pathways; value is minimum of selected receptor species.
b. Significantly less than control (p = 0.05)
c. Significantly less than reference site contol (p - 0.05)

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TABLE 47
CORRELATION MATRIX FOR ANALYTES DETECTED IN BIOASSAY SEDIMENT SAMPLES THAT EXCEED PAH BENCHMARKS

Baseline Ecological Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Analyte	*Acenaphthene*	*Acenaphthylene*	*Anthracene*	*Benzaldehyde*	*Benzo(a)anthracene*	*Benzo(a)pyrene*	*Benzo(b)fluoranthene*	*Benzo(g,h,i)perylene*	*Benzo(k)fluoranthene*	*Chrysene*	*Dibenzo(a,h)anthracene*	*Dibenzofuran*
Acenaphthene	1											
Acenaphthylene	0.61818484	1										
Anthracene	0.91588403	0.83018637	1									
Benzaldehyde	0.06010475	0.63108236	0.31923698	1								
Benzo(a)anthracene	0.84845423	0.87346659	0.98037933	0.44512152	1							
Benzo(a)pyrene	0.79952751	0.89925634	0.96542066	0.49230481	0.9941434	1						
Benzo(b)fluoranthene	0.77669416	0.91687217	0.94571394	0.53189886	0.98872077	0.99067186	1					
Benzo(g,h,i)perylene	0.73709141	0.94184883	0.92470737	0.56997551	0.97518619	0.98372848	0.99567806	1				
Benzo(k)fluoranthene	0.7799546	0.91463299	0.95246546	0.52171916	0.99102358	0.99450673	0.99880804	0.9929012	1			
Chrysene	0.81661945	0.88191669	0.96857941	0.47419581	0.99688954	0.99416889	0.99341313	0.97999187	0.99622331	1		
Dibenzo(a,h)anthracene	0.72812887	0.93526019	0.91724958	0.58532822	0.970301	0.97888498	0.99099569	0.99783695	0.98664464	0.9727571	1	
Dibenzofuran	0.97221761	0.76388202	0.96184694	0.23046555	0.92643646	0.89493837	0.88012848	0.85820342	0.87931836	0.89882507	0.85494904	1
Fluoranthene	0.87136009	0.84653811	0.98990923	0.36885786	0.99124311	0.97877897	0.97122415	0.95070152	0.97645107	0.98903163	0.94209967	0.92854985
Fluorene	0.95952622	0.75799918	0.98131896	0.22427158	0.93651977	0.90597098	0.88787232	0.85491931	0.89495894	0.92181709	0.84285817	0.96815933
Indeno(1,2,3-cd)pyrene	0.73240844	0.93383065	0.92451568	0.5633408	0.97586587	0.98441831	0.99545349	0.99938457	0.9929054	0.98078326	0.99822349	0.85362606
Naphthalene	0.87714154	0.89166966	0.91907127	0.36547176	0.90580899	0.89277614	0.89517665	0.89666787	0.89088454	0.88542623	0.89073893	0.95120434
Phenanthrene	0.92254914	0.76635705	0.98987082	0.23683879	0.96099865	0.93668151	0.9177255	0.88684897	0.92635177	0.95123904	0.8767878	0.94391284
Pyrene	0.86447744	0.86734683	0.98933253	0.39628919	0.99477241	0.98516556	0.97902544	0.9622412	0.98306906	0.99222817	0.95475161	0.93095966
Total PAH	0.84166761	0.88478229	0.98101387	0.44054315	0.99829872	0.99277605	0.98982689	0.97680642	0.99267371	0.99754435	0.97029278	0.91970939
PAH ESGTot (11.5-fold UF)	0.62608973	-0.04357547	0.28870972	-0.37590676	0.15538351	0.06476916	0.06152065	0.00805045	0.06009687	0.11236192	-0.005229	0.46448536
C. tentans 49-d survival	-0.58147682	0.04886144	-0.22994305	0.39394855	-0.10720853	-0.02058507	-0.02766767	0.01978307	-0.01888279	-0.06450782	0.0338315	-0.43790043
H.azteca 42-d survival	**-0.74860824**	-0.33409578	**-0.60345094**	0.14576002	-0.54934234	-0.47544835	-0.4973258	-0.45235508	-0.49707311	-0.53171356	-0.43380763	**-0.66210082**

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TABLE 47
CORRELATION MATRIX FOR ANALYTES DETECTED IN BIOASSAY SEDIMENT SAMPLES THAT EXCEED PAH BENCHMARKS

Baseline Ecological Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Analyte	*Fluoranthene*	*Fluorene*	*Indeno(1,2,3-cd)pyrene*	*Naphthalene*	*Phenanthrene*	*Pyrene*	*Total PAH*	***PAH ESGTot (11.5-fold UF)***	*C. tentans 49-d survival*	*H.azteca 42-d survival*
Acenaphthene										
Acenaphthylene										
Anthracene										
Benzaldehyde										
Benzo(a)anthracene										
Benzo(a)pyrene										
Benzo(b)fluoranthene										
Benzo(g,h,i)perylene										
Benzo(k)fluoranthene										
Chrysene										
Dibenzo(a,h)anthracene										
Dibenzofuran										
Fluoranthene	1									
Fluorene	0.96210435	1								
Indeno(1,2,3-cd)pyrene	0.95221598	0.85211942	1							
Naphthalene	0.89182804	0.90150185	0.88636851	1						
Phenanthrene	0.98517292	0.98455453	0.88911766	0.87247333	1					
Pyrene	0.99880606	0.95716038	0.96299981	0.90490281	0.97802546	1				
Total PAH	0.99466265	0.93912977	0.97740501	0.90544715	0.96411747	0.99777503	1			
PAH ESGTot (11.5-fold UF)	0.20975182	0.44141135	-0.00536876	0.3570763	0.33305529	0.19131926	0.1505311	1		
C. tentans 49-d survival	-0.15192893	-0.39051175	0.03736956	-0.34803851	-0.25727033	-0.14186168	-0.10204351	**-0.95009091**	1	
H.azteca 42-d survival	-0.59137547	**-0.66502544**	-0.44994723	-0.59834531	**-0.66076379**	-0.56912642	-0.55139001	**-0.72543546**	0.58022791	1

TABLE 48
CORRELATION MATRIX FOR ANALYTES DETECTED IN BIOASSAY SEDIMENTS THAT EXCEED PCB/PESTICIDE BENCHMARKS

Baseline Ecological Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Analyte	*4,4'-DDD*	*4,4'-DDE*	*4,4'-DDT*	*alpha-Chlordane*	***Dieldrin***	*gamma-BHC*	*gamma-Chlordane*	*Technical Chlordane*	*Total Pesticides*	***Aroclor-1254***	*Aroclor-1268*	***Aroclor, Total***	*C. tentans 49-d survival*	*H.azteca 42-d survival*
4,4'-DDD	1													
4,4'-DDE	0.91660007	1												
4,4'-DDT	0.52661316	0.59545181	1											
alpha-Chlordane	0.60860511	0.54964143	0.54072138	1										
Dieldrin	-0.0565901	-0.0662732	-0.4206363	-0.2026748	1									
gamma-BHC	0.55216003	0.68053836	0.54188366	0.27575856	-0.4777681	1								
gamma-Chlordane	0.71559968	0.83375834	0.54615212	0.1665421	-0.1806647	0.52198979	1							
Technical Chlordane	0.74376397	0.71610067	0.56779542	0.95374155	-0.1612105	0.46662159	0.29275491	1						
Total Pesticides	0.78354023	0.76028086	0.57387245	0.94115826	-0.1090137	0.46413712	0.34895765	0.99622104	1					
Aroclor-1254	0.33933217	0.37527343	-0.0825853	-0.1199856	0.78843414	-0.1618836	0.33332319	0.03576073	0.10594977	1				
Aroclor-1268	0.67103283	0.70821776	0.28816829	0.0628135	-0.2773076	0.86917265	0.65213506	0.28591446	0.31025187	0.08593649	1			
Aroclor, Total	0.39912722	0.43816376	-0.0539944	-0.1124567	0.75187662	-0.076758	0.39139036	0.06262392	0.13424334	0.99545727	0.18040327	1		
C. tentans 49-d survival	-0.144044	-0.1696731	0.36125499	0.05063625	**-0.8205969**	0.09500713	0.10384102	-0.1013646	-0.1395826	**-0.7806436**	-0.0645995	**-0.776859**	1	
H.azteca 42-d survival	-0.1150045	0.01672834	0.18782941	-0.3331922	**-0.60578**	0.4246687	0.37272007	-0.35296	-0.3573049	-0.5222577	0.41616147	-0.4758261	0.61478233	1

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TABLE 49
CORRELATION MATRIX FOR ANALYTES DETECTED IN BIOASSAY SEDIMENT SAMPLES THAT EXCEED INORGANIC BENCHMARKS

Baseline Ecological Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Analyte	*Aluminum*	*Antimony*	*Arsenic*	*Barium*	*Beryllium*	*Cadmium*	*Chromium*	*Cobalt*	*Copper*	*Iron*	*Lead*	*Manganese*
Aluminum	1											
Antimony	0.35778663	1										
Arsenic	0.70050459	0.88164344	1									
Barium	0.76367133	-0.05056802	0.21647948	1								
Beryllium	0.81117354	0.53592082	0.73044656	0.74707245	1							
Cadmium	0.68283156	0.39156797	0.54144361	0.72316672	0.75463256	1						
Chromium	0.32660694	0.52168823	0.42767429	0.21733176	0.32372838	0.62996752	1					
Cobalt	0.81266532	0.80457631	0.94594164	0.45237923	0.85388759	0.67967744	0.57230847	1				
Copper	0.70881387	0.44398814	0.59992219	0.52258314	0.57682277	0.83968208	0.81847115	0.72526748	1			
Iron	0.89098978	0.6940332	0.90023384	0.52008139	0.8025494	0.67510023	0.51687829	0.95958872	0.71302774	1		
Lead	0.64439464	0.51150788	0.60042027	0.46341751	0.54261073	0.81102051	0.90776834	0.74490853	0.92932616	0.76275788	1	
Manganese	0.56961218	-0.3726728	-0.08389172	0.93465372	0.5308752	0.55957163	-0.02029345	0.13867308	0.3284814	0.21833111	0.21335263	1
Mercury	-0.22831942	0.30790062	0.05234096	-0.07603197	0.09383427	0.36741012	0.7163748	0.15448922	0.41636405	-0.04226716	0.44698035	-0.159232063
Mercury (methyl)	-0.13220059	0.13746302	-0.15142016	0.04177458	-0.06233512	-0.20531886	0.1251294	-0.06473094	-0.14947557	-0.09961787	-0.09711712	-0.048583641
Molybdenum	0.4691516	0.35160245	0.29141545	0.65113658	0.64865466	0.52766859	0.5964428	0.54730108	0.49244453	0.47943969	0.54996997	0.440877204
Nickel	0.45028557	-0.15989061	-0.01627717	0.6874445	0.47375586	0.32570583	0.34780209	0.2929813	0.33980105	0.2997208	0.39462346	0.617816229
Selenium	0.68192123	0.89352988	0.97392725	0.31410486	0.826412	0.62722506	0.4581331	0.95870906	0.59184938	0.88741519	0.61127948	0.007587534
Silver	0.74012738	0.62414794	0.74253532	0.56132643	0.76805036	0.88665423	0.8136598	0.8733374	0.94208891	0.82396223	0.92818419	0.305362393
Thallium	0.84731615	0.73164663	0.89886974	0.50186838	0.79484578	0.77647363	0.67364095	0.96922039	0.84970344	0.96604293	0.86415855	0.202829109
Vanadium	0.75553385	0.79222143	0.87589114	0.35900533	0.66772813	0.6203072	0.71293325	0.93620627	0.76269677	0.94519757	0.84172428	0.022186305
Zinc	0.67425148	0.82142527	0.86792783	0.35652685	0.76268211	0.62868665	0.71776563	0.95637966	0.70506246	0.89726023	0.80148298	0.019406081
C. tentans 49-d survival	0.85269758	0.14314553	0.48967127	0.60688832	0.56234091	0.2629042	-0.10136086	0.54075042	0.28187616	0.69020313	0.2372526	0.480765705
H.azteca 42-d survival	0.44276725	-0.30327399	0.02985265	0.57860977	0.33676416	0.3398399	-0.45480057	0.03052192	-0.01065306	0.19119534	-0.08662137	0.676550402

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TABLE 49
CORRELATION MATRIX FOR ANALYTES DETECTED IN BIOASSAY SEDIMENT SAMPLES THAT EXCEED INORGANIC BENCHMARKS

Baseline Ecological Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Analyte	*Mercury*	*Mercury (methyl)*	*Molybdenum*	*Nickel*	*Selenium*	*Silver*	*Thallium*	*Vanadium*	*Zinc*	*C. tentans 49-d survival*	*H.azteca 42-d survival*
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Manganese											
Mercury	1										
Mercury (methyl)	0.07006016	1									
Molybdenum	0.40638215	0.56201147	1								
Nickel	0.18299258	0.16725846	0.74584608	1							
Selenium	0.1581791	-0.08921607	0.42669141	0.07483087	1						
Silver	0.46065899	-0.11070354	0.62360211	0.39809445	0.78260121	1					
Thallium	0.17950312	-0.11707802	0.52063697	0.28911663	0.89590472	0.93401713	1				
Vanadium	0.15945331	0.07178019	0.54733345	0.26126878	0.85670365	0.85126775	0.95670391	1			
Zinc	0.33701241	0.02656501	0.63475377	0.37703558	0.89980459	0.8703454	0.92573953	0.94259662	1		
C. tentans 49-d survival	**-0.67359776**	0.01905733	0.24763281	0.31160172	0.42977398	0.30116955	0.53328497	0.51217999	0.36745527	1	
H.azteca 42-d survival	**-0.61541021**	-0.39240579	-0.17974015	-0.00936921	0.04736846	-0.01365986	0.07659582	-0.10135642	-0.18705834	0.55136298	1

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TABLE 50
CBR-BASED HAZARD QUOTIENTS FOR COIs IN ASSAPUMPSET CRAYFISH TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Pesticides								
4,4'-DDE	1 / 1	MG/KG	0.00361	0.00361	0.042	0.29	8.6E-02	1.2E-02
Heptachlor Epoxide	1 / 1	MG/KG	0.00009	0.00009	0.01	0.01	9.0E-03	9.0E-03
Technical Chlordane	1 / 1	MG/KG	0.00883	0.00883		0.02		4.4E-01
						Total Pesticides	9.5E-02	4.6E-01
PCBs								
Aroclor, Total	1 / 1	MG/KG	0.01102	0.01102				
Aroclor-1254	1 / 1	MG/KG	0.01034	0.01034		8.1		1.3E-03
Aroclor-1268	1 / 1	MG/KG	0.00069	0.00069		0.45		1.5E-03
						Total PCBs	0.0E+00	2.8E-03
Inorganics/Metals								
Barium	1 / 1	MG/KG	39.7	39.7		0.41		**9.7E+01**
Cadmium	1 / 1	MG/KG	0.0819	0.0819		0.0934		8.8E-01
Cobalt	1 / 1	MG/KG	0.0829	0.0829				
Copper	1 / 1	MG/KG	15	15	3.4	4.4	**4.4E+00**	**3.4E+00**
Iron	1 / 1	MG/KG	29.4	29.4				
Lead	1 / 1	MG/KG	0.14	0.14	2.28	5.8	6.1E-02	2.4E-02
Manganese	1 / 1	MG/KG	112	112	18.4		**6.1E+00**	
Mercury	1 / 1	MG/KG	0.0389	0.0389	1.53	1.64	2.5E-02	2.4E-02
Mercury (methyl)	1 / 1	MG/KG	0.0389	0.0389		0.043		9.0E-01
Molybdenum	1 / 1	MG/KG	0.0425	0.0425				
Nickel	1 / 1	MG/KG	0.25	0.25	0.59	0.59	4.2E-01	4.2E-01
Selenium	1 / 1	MG/KG	0.125	0.125		0.2		6.3E-01
Silver	1 / 1	MG/KG	0.215	0.215	5.36	1650	4.0E-02	1.3E-04
Thallium	1 / 1	MG/KG	0.00712	0.00712	2.72		2.6E-03	
Zinc	1 / 1	MG/KG	22.9	22.9	12.7	19.5	**1.8E+00**	**1.2E+00**
						Total Inorganics/Metals	**1.3E+01**	**1.0E+02**
Dioxins								
2,3,7,8-TCDD[1]	1 / 1	MG/KG	0.00000039	0.00000039	0.0003	0.003	1.3E-03	1.3E-04
Toxicity Equivalency - Fish	1 / 1	MG/KG	0.000003	0.00000324	0.0003	0.003	1.1E-02	1.1E-03
						Total TCDD TEQ	1.1E-02	1.1E-03
						Total	**1.3E+01**	**1.0E+02**

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TABLE 50
CBR-BASED HAZARD QUOTIENTS FOR COIs IN ASSAPUMPSET CRAYFISH TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b]		Hazard Quotients [c]	
					NOAEL	LOAEL	NOAEL	LOAEL

Notes:
[a] RME and CT EPCs presented in Tables 29 and 30, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 51
CBR-BASED HAZARD QUOTIENTS FOR COIs IN GREYSTONE CRAYFISH TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Pesticides								
4,4'-DDE	4 / 4	MG/KG	0.00705	0.00433	0.042	0.29	1.0E-01	1.5E-02
alpha-Chlordane	3 / 4	MG/KG	0.00028	0.0003				
Endosulfan Sulfate	1 / 4	MG/KG	0.00053	0.00051				
gamma-Chlordane	1 / 4	MG/KG	0.00009	0.00009				
Technical Chlordane	4 / 4	MG/KG	0.02241	0.0183		0.02		9.1E-01
						Total Pesticides	1.0E-01	9.3E-01
PCBs								
Aroclor, Total	4 / 4	MG/KG	0.05647	0.04395				
Aroclor-1254	4 / 4	MG/KG	0.05142	0.03774		8.1		4.7E-03
Aroclor-1268	4 / 4	MG/KG	0.00899	0.00621		0.45		1.4E-02
						Total PCBs	0.0E+00	1.8E-02
Inorganics/Metals								
Aluminum	1 / 4	MG/KG	1.95	0.900	1	8	9.0E-01	1.1E-01
Antimony	3 / 4	MG/KG	0.0155	0.0139	5	9	2.8E-03	1.5E-03
Barium	4 / 4	MG/KG	28.9	25.5		0.41		**6.2E+01**
Cadmium	4 / 4	MG/KG	0.117	0.086		0.0934		9.2E-01
Chromium	3 / 4	MG/KG	0.368	0.224				
Cobalt	4 / 4	MG/KG	0.308	0.240				
Copper	4 / 4	MG/KG	29.7	26.8	3.4	4.4	**7.9E+00**	**6.1E+00**
Iron	4 / 4	MG/KG	158	79.6				
Lead	4 / 4	MG/KG	0.673	0.519	2.28	5.8	2.3E-01	8.9E-02
Manganese	4 / 4	MG/KG	146	116	18.4		**6.3E+00**	
Mercury	4 / 4	MG/KG	0.027	0.0224	1.53	1.64	1.5E-02	1.4E-02
Mercury (methyl)	4 / 4	MG/KG	0.0286	0.0223		0.043		5.2E-01
Molybdenum	4 / 4	MG/KG	0.247	0.141				
Nickel	4 / 4	MG/KG	0.374	0.282	0.59	0.59	4.8E-01	4.8E-01
Selenium	4 / 4	MG/KG	0.139	0.125		0.2		6.2E-01
Silver	4 / 4	MG/KG	0.31	0.215	5.36	1650	4.0E-02	1.3E-04
Thallium	4 / 4	MG/KG	0.0138	0.00988	2.72		3.6E-03	
Vanadium	4 / 4	MG/KG	0.278	0.166		0.41		4.0E-01
Zinc	4 / 4	MG/KG	28.1	22.55000	12.7	19.5	**1.8E+00**	**1.2E+00**
						Total Inorganics/Metals	**1.8E+01**	**7.3E+01**

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TABLE 51
CBR-BASED HAZARD QUOTIENTS FOR COIs IN GREYSTONE CRAYFISH TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Dioxins								
2,3,7,8-TCDD[1]	2 / 4	MG/KG	0.00000041	0.00000041	0.0003	0.003	1.4E-03	1.4E-04
Toxicity Equivalency - Fish	4 / 4	MG/KG	0.00000665	0.00000347	0.0003	0.003	1.2E-02	1.2E-03
Toxicity Equivalency (PCB) - Fish	1 / 1	MG/KG	0.0000000382	0.0000000382	0.0003	0.003	1.3E-04	1.3E-05
						Total TCDD TEQ	1.2E-02	1.2E-03
						Total	**1.8E+01**	**7.4E+01**

Notes:
[a] RME and CT EPCs presented in Tables 29 and 30, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 52
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN ALLENDALE CRAYFISH TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Pesticides								
4,4'-DDD	2 / 3	MG/KG	0.00049	0.00037	0.008	0.6	4.6E-02	6.2E-04
4,4'-DDE	3 / 3	MG/KG	0.00342	0.00321	0.042	0.29	7.6E-02	1.1E-02
alpha-Chlordane	2 / 3	MG/KG	0.00043	0.0003				
Dieldrin	1 / 3	MG/KG	0.00065	0.00047	0.01	0.08	4.7E-02	5.9E-03
Technical Chlordane	3 / 3	MG/KG	0.01968	0.01646		0.02		8.2E-01
						Total Pesticides	1.7E-01	8.4E-01
PCBs								
Aroclor, Total	3 / 3	MG/KG	0.10873	0.07589				
Aroclor-1254	3 / 3	MG/KG	0.10112	0.06991		8.1		8.6E-03
Aroclor-1268	3 / 3	MG/KG	0.00761	0.00597		0.45		1.3E-02
						Total PCBs	0.0E+00	2.2E-02
Inorganics/Metals								
Aluminum	2 / 3	MG/KG	2.63	1.57	1	8	**1.6E+00**	2.0E-01
Antimony	2 / 3	MG/KG	0.0171	0.017	5	9	3.3E-03	1.9E-03
Barium	3 / 3	MG/KG	24.2	20.9		0.41		**5.1E+01**
Cadmium	3 / 3	MG/KG	0.101	0.0915		0.0934		9.8E-01
Chromium	3 / 3	MG/KG	0.399	0.282				
Cobalt	3 / 3	MG/KG	0.194	0.174				
Copper	3 / 3	MG/KG	34.7	30.3	3.4	4.4	**8.9E+00**	**6.9E+00**
Iron	3 / 3	MG/KG	90.4	62.7				
Lead	3 / 3	MG/KG	0.814	0.59	2.28	5.8	2.6E-01	1.0E-01
Manganese	3 / 3	MG/KG	90.8	71.7	18.4		**3.9E+00**	
Mercury	3 / 3	MG/KG	0.0302	0.0246	1.53	1.64	1.6E-02	1.5E-02
Mercury (methyl)	3 / 3	MG/KG	0.0271	0.0225		0.043		5.2E-01
Molybdenum	3 / 3	MG/KG	0.142	0.128				
Nickel	3 / 3	MG/KG	0.366	0.317	0.59	0.59	5.4E-01	5.4E-01
Selenium	3 / 3	MG/KG	0.141	0.126		0.2		6.3E-01
Silver	3 / 3	MG/KG	0.246	0.209	5.36	1650	3.9E-02	1.3E-04
Thallium	2 / 3	MG/KG	0.00885	0.00885	2.72		3.3E-03	
Vanadium	3 / 3	MG/KG	0.257	0.219		0.41		5.3E-01
Zinc	3 / 3	MG/KG	22.2	21	12.7	19.5	**1.6E+00**	**1.1E+00**
						Total Inorganics/Metals	**1.7E+01**	**6.3E+01**

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TABLE 52
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN ALLENDALE CRAYFISH TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b]		Hazard Quotients [c]	
					NOAEL	LOAEL	NOAEL	LOAEL
Dioxins								
2,3,7,8-TCDD[1]	3 / 3	MG/KG	0.00026117	0.0001773	0.0003	0.003	5.9E-01	5.9E-02
Toxicity Equivalency - Fish	3 / 3	MG/KG	0.000263	0.000180	0.0003	0.003	6.0E-01	6.0E-02
						Total TCDD TEQ	6.0E-01	6.0E-02
						Total	**1.8E+01**	**6.3E+01**

Notes:
[a] RME and CT EPCs presented in Tables 29 and 30, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 53
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN LYMAN MILL CRAYFISH TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Pesticides								
4,4'-DDD	2 / 4	MG/KG	0.00027	0.00027	0.008	0.6	3.4E-02	4.5E-04
4,4'-DDE	4 / 4	MG/KG	0.00501	0.00404	0.042	0.29	9.6E-02	1.4E-02
alpha-Chlordane	4 / 4	MG/KG	0.0006	0.0003				
Dieldrin	1 / 4	MG/KG	0.00063	0.00044	0.01	0.08	4.4E-02	5.5E-03
Endosulfan Sulfate	1 / 4	MG/KG	0.00105	0.000545				
gamma-Chlordane	2 / 4	MG/KG	0.00055	0.00036				
Heptachlor	1 / 4	MG/KG	0.00022	0.00022	0.01	0.021	2.2E-02	1.0E-02
Technical Chlordane	4 / 4	MG/KG	0.0275	0.02251		0.02		**1.1E+00**
						Total Pesticides	2.0E-01	**1.2E+00**
PCBs								
Aroclor, Total	4 / 4	MG/KG	0.10842	0.07651				
Aroclor-1254	4 / 4	MG/KG	0.1007	0.0713		8.1		8.8E-03
Aroclor-1268	4 / 4	MG/KG	0.00772	0.00521		0.45		1.2E-02
						Total PCBs	0.0E+00	2.0E-02
Inorganics/Metals								
Antimony	3 / 4	MG/KG	0.0166	0.0146	5	9	2.9E-03	1.6E-03
Barium	4 / 4	MG/KG	30.5	28.1		0.41		**6.9E+01**
Cadmium	4 / 4	MG/KG	0.164	0.0888		0.0934		9.5E-01
Chromium	3 / 4	MG/KG	0.346	0.24				
Cobalt	4 / 4	MG/KG	0.35	0.3				
Copper	4 / 4	MG/KG	33.2	30.0	3.4	4.4	**8.8E+00**	**6.8E+00**
Iron	4 / 4	MG/KG	181	122				
Lead	4 / 4	MG/KG	1.16	0.859	2.28	5.8	3.8E-01	1.5E-01
Manganese	4 / 4	MG/KG	214	125	18.4		**6.8E+00**	
Mercury	4 / 4	MG/KG	0.0259	0.0203	1.53	1.64	1.3E-02	1.2E-02
Mercury (methyl)	4 / 4	MG/KG	0.0215	0.015		0.043		3.6E-01
Molybdenum	4 / 4	MG/KG	0.198	0.124				
Nickel	4 / 4	MG/KG	0.584	0.485	0.59	0.59	8.2E-01	8.2E-01
Selenium	4 / 4	MG/KG	0.162	0.14		0.2		6.9E-01
Silver	4 / 4	MG/KG	0.252	0.24	5.36	1650	4.5E-02	1.5E-04
Thallium	3 / 4	MG/KG	0.0113	0.00961	2.72		3.5E-03	
Vanadium	4 / 4	MG/KG	0.361	0.27		0.41		6.6E-01
Zinc	4 / 4	MG/KG	32.5	26.2	12.7	19.5	**2.1E+00**	**1.3E+00**

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TABLE 53
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN LYMAN MILL CRAYFISH TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
						Total Inorganics/Metals	**1.9E+01**	**8.0E+01**
Dioxins								
2,3,7,8-TCDD[1]	4 / 4	MG/KG	0.00015603	0.00009950	0.0003	0.003	3.3E-01	3.3E-02
Toxicity Equivalency - Fish	4 / 4	MG/KG	0.000162	0.000104	0.0003	0.003	3.5E-01	3.5E-02
Toxicity Equivalency (PCB) - Fish	2 / 2	MG/KG	0.000000171	0.000000112	0.0003	0.003	3.7E-04	3.7E-05
						Total TCDD TEQ	3.5E-01	3.5E-02
						Total	**1.9E+01**	**8.2E+01**

Notes:
[a] RME and CT EPCs presented in Tables 29 and 30, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 54
CBR-BASED HAZARD QUOTIENTS FOR COIs IN GREYSTONE EMERGING INSECT TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Dioxins								
2,3,7,8-TCDD[1]	1 / 1	MG/KG	0.00000141	0.00000141	0.0003	0.003	4.7E-03	4.7E-04
Toxicity Equivalency - Fish	1 / 1	MG/KG	0.0000101	0.0000101	0.0003	0.003	3.4E-02	3.4E-03
Toxicity Equivalency (PCB) - Fish	1 / 1	MG/KG	0.000000105	0.000000105	0.0003	0.003	3.5E-04	3.5E-05
						Total TCDD TEQ	3.4E-02	3.4E-03
						Total	3.4E-02	3.4E-03

Notes:
[a] RME and CT EPCs presented in Tables 31 and 32, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 55
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN LYMAN MILL EMERGING INSECT TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Dioxins								
2,3,7,8-TCDD[1]	1 / 1	MG/KG	0.00024557	0.00024557	0.0003	0.003	8.2E-01	8.2E-02
Toxicity Equivalency - Fish	1 / 1	MG/KG	0.000304	0.000304	0.0003	0.003	**1.0E+00**	1.0E-01
Toxicity Equivalency (PCB) - Fish	1 / 1	MG/KG	0.00000036	0.000000362	0.0003	0.003	1.2E-03	1.2E-04
						Total TCDD TEQ	**1.0E+00**	1.0E-01
						Total	**1.0E+00**	1.0E-01

Notes:
[a] RME and CT EPCs presented in Tables 31 and 32, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 56
CBR-BASED HAZARD QUOTIENTS FOR COIs IN GREYSTONE TREE SWALLOW STOMACH CONTENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Dioxins								
2,3,7,8-TCDD[1]	1 / 2	MG/KG	0.00000566	0.00000295	0.0003	0.003	9.8E-03	9.8E-04
Toxicity Equivalency - Fish	2 / 2	MG/KG	0.00000661	0.00000370	0.0003	0.003	1.2E-02	1.2E-03
						Total TCDD TEQ	1.2E-02	1.2E-03
						Total	1.2E-02	1.2E-03

Notes:
[a] RME and CT EPCs presented in Tables 33 and 34, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 57
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN ALLENDALE TREE SWALLOW STOMACH CONTENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Dioxins								
2,3,7,8-TCDD[1]	2 / 2	MG/KG	0.00021852	0.0001450	0.0003	0.003	4.8E-01	4.8E-02
Toxicity Equivalency - Fish	2 / 2	MG/KG	0.000223	0.000148	0.0003	0.003	4.9E-01	4.9E-02
						Total TCDD TEQ	4.9E-01	4.9E-02
						Total	4.9E-01	4.9E-02

Notes:
[a] RME and CT EPCs presented in Tables 33 and 34, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 58
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN LYMAN MILL TREE SWALLOW STOMACH CONTENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Dioxins								
2,3,7,8-TCDD[1]	1 / 1	MG/KG	0.00011945	0.0001195	0.0003	0.003	4.0E-01	4.0E-02
Toxicity Equivalency - Fish	1 / 1	MG/KG	0.000121	0.000121	0.0003	0.003	4.0E-01	4.0E-02
						Total TCDD TEQ	4.0E-01	4.0E-02
						Total	4.0E-01	4.0E-02

Notes:
[a] RME and CT EPCs presented in Tables 33 and 34, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 59
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN MANTON POND TREE SWALLOW STOMACH CONTENTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Dioxins								
2,3,7,8-TCDD[1]	1 / 1	MG/KG	0.00006959	0.0000696	0.0003	0.003	2.3E-01	2.3E-02
Toxicity Equivalency - Fish	1 / 1	MG/KG	0.000070	0.000070	0.0003	0.003	2.3E-01	2.3E-02
						Total TCDD TEQ	2.3E-01	2.3E-02
						Total	2.3E-01	2.3E-02

Notes:
[a] RME and CT EPCs presented in Tables 33 and 34, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

TABLE 60
INCREMENTAL RISK SUMMARY FOR SURFACE WATER (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Greystone			
Analyte	RME	CT	RME	CT	RME	CT
Toxicity Equivalency - Fish	**1.1E+02**	**1.1E+02**	5.9E-01	5.9E-01	**1.1E+02**	**1.1E+02**
Silver, Dissolved	**2.6E+01**	**2.6E+01**			**2.6E+01**	**2.6E+01**
gamma-Chlordane	**5.8E+00**	**5.8E+00**			**5.8E+00**	**5.8E+00**
Thallium, Dissolved	**2.9E+00**	**2.9E+00**	9.1E-03	9.1E-03	**2.9E+00**	**2.9E+00**
Zinc, Dissolved	**1.9E+00**	**1.8E+00**	**1.1E+00**	5.7E-01	8.0E-01	**1.3E+00**
Endosulfan Sulfate	**8.4E+00**	**1.2E+00**			**8.4E+00**	**1.2E+00**
Copper, Dissolved	**2.4E+00**	**1.5E+00**	**2.0E+00**	**1.0E+00**	3.7E-01	5.1E-01

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	RME	CT	RME	CT	RME	CT
Silver, Dissolved	**1.8E+01**	**1.8E+01**			**1.8E+01**	**1.8E+01**
Toxicity Equivalency - Fish	**8.6E+01**	**1.3E+01**	5.9E-01	5.9E-01	**8.5E+01**	1.2E+01
gamma-Chlordane	**4.9E+00**	**4.9E+00**			**4.9E+00**	**4.9E+00**
alpha-Chlordane	**4.4E+00**	**4.4E+00**			**4.4E+00**	**4.4E+00**
Thallium, Dissolved	**2.9E+00**	**2.9E+00**	9.1E-03	9.1E-03	**2.9E+00**	**2.9E+00**
Lead, Dissolved	**2.2E+00**	**2.2E+00**	**1.0E+00**	**1.0E+00**	**1.2E+00**	**1.2E+00**
Zinc, Dissolved	**1.5E+00**	**1.5E+00**	**1.1E+00**	5.7E-01	4.3E-01	9.1E-01
Copper, Dissolved	**2.1E+00**	**1.6E+00**	**2.0E+00**	**1.0E+00**	1.1E-01	6.0E-01

Notes:
Risk estimates as calculated and presented in Tables 36 through 38.
Incremental risks calculated for all analytes with RME-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

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TABLE 61
INCREMENTAL RISK SUMMARY FOR SURFACE WATER (Assapumpset)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Assapumpset			
Analyte	RME	CT	RME	CT	RME	CT
Toxicity Equivalency - Fish	**1.1E+02**	**1.1E+02**	5.7E-01	5.7E-01	**1.1E+02**	**1.1E+02**
Silver, Dissolved	**2.6E+01**	**2.6E+01**			**2.6E+01**	**2.6E+01**
gamma-Chlordane	**5.8E+00**	**5.8E+00**			**5.8E+00**	**5.8E+00**
Thallium, Dissolved	**2.9E+00**	**2.9E+00**	8.1E-03	8.1E-03	**2.9E+00**	**2.9E+00**
Zinc, Dissolved	**1.9E+00**	**1.8E+00**	6.4E-01	3.6E-01	**1.2E+00**	**1.5E+00**
Copper, Dissolved	**2.4E+00**	**1.5E+00**	**1.3E+00**	9.3E-01	**1.1E+00**	6.2E-01
Endosulfan Sulfate	**8.4E+00**	**1.2E+00**			**8.4E+00**	**1.2E+00**

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Assapumpset			
Analyte	RME	CT	RME	CT	RME	CT
Silver, Dissolved	**1.8E+01**	**1.8E+01**			**1.8E+01**	**1.8E+01**
Toxicity Equivalency - Fish	**8.6E+01**	**1.3E+01**	5.7E-01	5.7E-01	**8.5E+01**	**1.2E+01**
gamma-Chlordane	**4.9E+00**	**4.9E+00**			**4.9E+00**	**4.9E+00**
alpha-Chlordane	**4.4E+00**	4.4E+00			**4.4E+00**	**4.4E+00**
Thallium, Dissolved	**2.9E+00**	**2.9E+00**	8.1E-03	8.1E-03	**2.9E+00**	**2.9E+00**
Lead, Dissolved	**2.2E+00**	**2.2E+00**	4.3E-01	4.3E-01	**1.8E+00**	**1.8E+00**
Zinc, Dissolved	**1.5E+00**	**1.5E+00**	6.4E-01	3.6E-01	8.6E-01	**1.1E+00**
Copper, Dissolved	**2.1E+00**	**1.6E+00**	**1.3E+00**	9.3E-01	8.9E-01	7.1E-01

Notes:
Risk estimates as calculated and presented in Tables 35, 37, 38.
Incremental risks calculated for all analytes with RME-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

TABLE 62
INCREMENTAL RISK SUMMARY FOR SEDIMENT (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Greystone			
Analyte	RME	CT	RME	CT	RME	CT
Toxicity Equivalency - Fish	8.0E+02	8.0E+02	1.5E+01	4.2E+00	7.8E+02	8.0E+02
Dibenzo(a,h)anthracene	7.1E+02	5.0E+02	2.7E+02	2.7E+02	4.4E+02	2.2E+02
Benzo(b)fluoranthene	1.6E+02	1.0E+02	3.1E+00	1.5E+00	1.6E+02	1.0E+02
Aroclor, Total	1.0E+02	6.8E+01	9.2E+00	9.2E+00	9.2E+01	5.8E+01
Acenaphthene	7.5E+01	7.5E+01	3.0E+01	3.0E+01	4.5E+01	4.5E+01
Benzo(k)fluoranthene	1.4E+02	9.4E+01	1.3E+02	5.1E+01	1.0E+01	4.3E+01
Aroclor-1260	4.0E+01	4.0E+01	5.0E+00	5.0E+00	3.5E+01	3.5E+01
Fluoranthene	1.5E+02	8.1E+01	1.1E+02	5.1E+01	4.1E+01	2.9E+01
Fluorene	4.9E+01	4.9E+01	2.5E+01	2.5E+01	2.4E+01	2.4E+01
Cyanide	2.4E+01	2.4E+01			2.4E+01	2.4E+01
Aroclor-1254	4.0E+01	2.5E+01	6.3E+00	2.5E+00	3.4E+01	2.3E+01
Pyrene	3.9E+01	2.3E+01	6.5E+00	2.8E+00	3.3E+01	2.0E+01
Benzo(g,h,i)perylene	3.2E+01	3.2E+01	3.3E+01	1.3E+01		1.8E+01
Acenaphthylene	2.2E+01	2.2E+01	4.4E+00	4.4E+00	1.8E+01	1.8E+01
Indeno(1,2,3-cd)pyrene	5.0E+01	3.0E+01	3.4E+01	1.6E+01	1.6E+01	1.4E+01
Di-n-Butylphthalate	1.5E+01	1.5E+01	4.7E-01	4.7E-01	1.4E+01	1.4E+01
Anthracene	5.7E+01	3.9E+01	2.9E+01	2.9E+01	2.8E+01	9.7E+00
Chrysene	3.1E+01	1.8E+01	2.5E+01	1.1E+01	6.0E+00	7.0E+00
Benzo(a)anthracene	3.1E+01	2.0E+01	3.2E+01	1.4E+01		6.8E+00
Benzo(a)pyrene	2.7E+01	1.5E+01	2.1E+01	9.3E+00	6.0E+00	6.1E+00
Lead	1.6E+01	1.1E+01	5.8E+00	5.8E+00	1.0E+01	4.8E+00
Aroclor-1248	4.7E+00	4.7E+00			4.7E+00	4.7E+00
Phenanthrene	2.4E+01	1.4E+01	2.4E+01	1.0E+01	0.0E+00	4.1E+00
Copper	1.2E+01	7.4E+00	2.7E+01	4.6E+00		2.9E+00
Naphthalene	5.5E+00	5.5E+00	2.9E+00	2.9E+00	2.7E+00	2.7E+00
Mercury	6.5E+00	3.1E+00	5.0E+00	1.4E+00	1.4E+00	1.7E+00
Chromium	9.2E+00	5.4E+00	1.0E+01	3.8E+00		1.6E+00
Zinc	4.0E+00	2.9E+00	6.5E+00	1.8E+00		1.1E+00
2-Methylnaphthalene	1.9E+00	1.9E+00	1.1E+00	1.1E+00	8.8E-01	8.8E-01
Antimony	2.4E+00	1.1E+00	2.2E+00	3.7E-01	2.5E-01	7.8E-01
Cadmium	2.0E+00	2.1E+00	7.3E+00	1.4E+00		6.9E-01
Carbazole	1.1E+00	9.5E-01	4.1E-01	4.1E-01	7.1E-01	5.4E-01
Silver	8.9E+00	5.6E+00	1.8E+01	5.1E+00		4.5E-01
Iron	1.1E+00	9.0E-01	6.7E-01	6.7E-01	3.8E-01	2.3E-01

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TABLE 62
INCREMENTAL RISK SUMMARY FOR SEDIMENT (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	RME	CT	RME	CT	RME	CT
Technical Chlordane	**4.4E+03**	**2.6E+03**	**1.3E+03**	**8.0E+02**	**3.2E+03**	**1.8E+03**
Toxicity Equivalency - Fish	**1.1E+03**	**2.5E+02**	**1.5E+01**	**4.2E+00**	**1.1E+03**	**2.4E+02**
Benzo(b)fluoranthene	**1.7E+02**	**7.8E+01**	**3.1E+00**	**1.5E+00**	**1.6E+02**	**7.6E+01**
Dieldrin	**2.2E+02**	**1.9E+02**	**1.3E+02**	**1.3E+02**	**9.3E+01**	**6.3E+01**
Endrin	**1.3E+02**	**1.3E+02**	**9.6E+01**	**9.6E+01**	**3.4E+01**	**3.5E+01**
Acenaphthene	**5.8E+01**	**5.8E+01**	**3.0E+01**	**3.0E+01**	**2.8E+01**	**2.8E+01**
Di-n-Butylphthalate	**4.3E+01**	**2.3E+01**	4.7E-01	4.7E-01	**4.2E+01**	**2.3E+01**
alpha-Chlordane	**6.4E+01**	**3.1E+01**	**1.2E+01**	**1.2E+01**	**5.2E+01**	**1.9E+01**
2-Methylnaphthalene	**1.4E+00**	**1.4E+01**	**1.1E+00**	**1.1E+00**	3.6E-01	**1.2E+01**
Fluorene	**3.5E+01**	**3.5E+01**	**2.5E+01**	**2.5E+01**	**1.1E+01**	**1.1E+01**
Pyrene	**2.6E+01**	**1.2E+01**	**6.5E+00**	**2.8E+00**	**1.9E+01**	**9.5E+00**
gamma-Chlordane	**2.9E+01**	**1.8E+01**	**9.6E+00**	**9.6E+00**	**2.0E+01**	**8.3E+00**
Benzo(g,h,i)perylene	**4.7E+01**	**2.0E+01**	**3.3E+01**	**1.3E+01**	**1.5E+01**	**6.4E+00**
Acenaphthylene	**9.7E+00**	**9.7E+00**	**4.4E+00**	**4.4E+00**	**5.4E+00**	**5.4E+00**
Indeno(1,2,3-cd)pyrene	**4.3E+01**	**2.0E+01**	**3.4E+01**	**1.6E+01**	**8.1E+00**	**4.1E+00**
Naphthalene	**5.7E+00**	**5.7E+00**	**2.9E+00**	**2.9E+00**	**2.8E+00**	**2.8E+00**
Copper	**1.2E+01**	**7.0E+00**	**2.7E+01**	**4.6E+00**		**2.5E+00**
Aroclor, Total	**1.7E+01**	**1.2E+01**	**9.2E+00**	**9.2E+00**	**8.0E+00**	**2.4E+00**
Cadmium	**3.5E+00**	**3.6E+00**	**7.3E+00**	**1.4E+00**		**2.2E+00**
4,4'-DDD	**4.7E+00**	**4.6E+00**	**2.4E+00**	**2.4E+00**	**2.2E+00**	**2.2E+00**
Aroclor-1254	**8.2E+00**	**4.5E+00**	**6.3E+00**	**2.5E+00**	**1.8E+00**	**2.0E+00**
Lead	**1.2E+01**	**7.6E+00**	**5.8E+00**	**5.8E+00**	**6.3E+00**	**1.8E+00**
Zinc	**6.3E+00**	**3.3E+00**	**6.5E+00**	**1.8E+00**		**1.4E+00**
Dibenzo(a,h)anthracene	**3.8E+02**	**2.7E+02**	**2.7E+02**	**2.7E+02**	**1.1E+02**	**1.2E+00**
4,4'-DDE	**5.0E+00**	**3.8E+00**	**2.7E+00**	**2.7E+00**	**2.3E+00**	**1.0E+00**
Silver	**8.6E+00**	**5.8E+00**	**1.8E+01**	**5.1E+00**		6.3E-01
Mercury	**4.1E+00**	**1.9E+00**	**5.0E+00**	**1.4E+00**		5.2E-01
Antimony	**1.6E+00**	6.6E-01	**2.2E+00**	3.7E-01		2.9E-01
Arsenic	**1.1E+00**	8.7E-01	**1.6E+00**	6.5E-01		2.2E-01
Iron	**1.0E+00**	8.2E-01	6.7E-01	6.7E-01	3.3E-01	1.5E-01
Aroclor-1268	**6.3E+01**	**2.3E+01**	**4.9E+01**	**2.7E+01**	**1.3E+01**	
Aroclor-1260	**5.4E+00**	**4.8E+00**	**5.0E+00**	**5.0E+00**	4.0E-01	

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TABLE 62
INCREMENTAL RISK SUMMARY FOR SEDIMENT (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Manton Pond Reach	Risk Summary				Incremental Risk	
	Manton		Greystone			
Analyte	RME	CT	RME	CT	RME	CT
Toxicity Equivalency - Fish	**1.4E+02**	**6.0E+01**	**1.5E+01**	**4.2E+00**	**1.2E+02**	**5.6E+01**
Benzo(b)fluoranthene	**2.4E+01**	**1.1E+01**	**3.1E+00**	**1.5E+00**	**2.0E+01**	**9.8E+00**
gamma-Chlordane	**1.0E+01**	**5.0E+00**	**9.6E+00**	**9.6E+00**	4.3E-01	

Dyerville Reach	Risk Summary				Incremental Risk	
	Dyerville		Greystone			
Analyte	RME	CT	RME	CT	RME	CT
Dieldrin	**1.5E+03**	**5.8E+02**	**1.3E+02**	**1.3E+02**	**1.4E+03**	**4.5E+02**
Benzo(b)fluoranthene	**1.5E+02**	**9.1E+01**	**3.1E+00**	**1.5E+00**	**1.4E+02**	**8.9E+01**
Aroclor, Total	**6.3E+01**	**6.2E+01**	**9.2E+00**	**9.2E+00**	**5.3E+01**	**5.2E+01**
Pyrene	**2.2E+01**	**1.2E+01**	**6.5E+00**	**2.8E+00**	**1.5E+01**	**9.3E+00**
Toxicity Equivalency - Fish	**2.1E+01**	**1.1E+01**	**1.5E+01**	**4.2E+00**	**5.9E+00**	**6.8E+00**
Aroclor-1254	**2.2E+01**	**8.2E+00**	**6.3E+00**	**2.5E+00**	**1.5E+01**	**5.7E+00**
Indeno(1,2,3-cd)pyrene	**3.2E+01**	**2.1E+01**	**3.4E+01**	**1.6E+01**		**5.3E+00**
Zinc	**1.6E+01**	**6.0E+00**	**6.5E+00**	**1.8E+00**	**9.6E+00**	**4.2E+00**
Benzo(g,h,i)perylene	**2.5E+01**	**1.7E+01**	**3.3E+01**	**1.3E+01**		**3.3E+00**
Chromium	**1.5E+01**	**6.0E+00**	**1.0E+01**	**3.8E+00**	**4.4E+00**	**2.2E+00**
Cadmium	**6.8E+00**	**2.9E+00**	**7.3E+00**	**1.4E+00**		**1.5E+00**
Mercury	**7.1E+00**	**2.7E+00**	**5.0E+00**	**1.4E+00**	**2.0E+00**	**1.3E+00**
Copper	**1.3E+01**	**5.7E+00**	**2.7E+01**	**4.6E+00**		**1.1E+00**
Di-n-Butylphthalate	**1.2E+00**	**1.2E+00**	4.7E-01	4.7E-01	7.4E-01	7.4E-01
4,4'-DDD	**6.5E+00**	**2.9E+00**	**2.4E+00**	**2.4E+00**	**4.1E+00**	4.7E-01
Benzo(a)pyrene	**1.5E+01**	**9.4E+00**	**2.1E+01**	**9.3E+00**		6.9E-02
alpha-Chlordane	**2.2E+01**	**8.6E+00**	**1.2E+01**	**1.2E+01**	**9.9E+00**	
Lead	**9.9E+00**	**5.1E+00**	**5.8E+00**	**5.8E+00**	**4.1E+00**	
Acenaphthylene	**6.1E+00**	**3.6E+00**	**4.4E+00**	**4.4E+00**	**1.8E+00**	
4,4'-DDE	**3.2E+00**	**1.8E+00**	**2.7E+00**	**2.7E+00**	4.5E-01	

Notes:
Risk estimates as calculated and presented in Tables 41 through 45.
Incremental risks calculated for all analytes with RME-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

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TABLE 63
INCREMENTAL RISK SUMMARY FOR SEDIMENT (Assapumpset)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Assapumpset			
Analyte	RME	CT	RME	CT	RME	CT
Toxicity Equivalency - Fish	8.0E+02	8.0E+02	1.0E+00	4.7E-01	8.0E+02	8.0E+02
Dibenzo(a,h)anthracene	7.1E+02	5.0E+02	6.3E+01	5.3E+01	6.5E+02	4.5E+02
Benzo(b)fluoranthene	1.6E+02	1.0E+02			1.6E+02	1.0E+02
Benzo(k)fluoranthene	1.4E+02	9.4E+01	3.0E+01	1.5E+01	1.1E+02	7.9E+01
Acenaphthene	7.5E+01	7.5E+01	2.1E+00	2.1E+00	7.3E+01	7.3E+01
Aroclor, Total	1.0E+02	6.8E+01	4.4E+00	2.5E+00	9.7E+01	6.5E+01
Fluoranthene	1.5E+02	8.1E+01	2.6E+01	1.7E+01	1.2E+02	6.4E+01
Fluorene	4.9E+01	4.9E+01	4.2E+00	4.2E+00	4.5E+01	4.5E+01
Aroclor-1260	4.0E+01	4.0E+01			4.0E+01	4.0E+01
Anthracene	5.7E+01	3.9E+01	4.7E+00	4.7E+00	5.2E+01	3.4E+01
Benzo(g,h,i)perylene	3.2E+01	3.2E+01	9.4E+00	6.3E+00	2.2E+01	2.5E+01
Aroclor-1254	4.0E+01	2.5E+01	9.6E-01	5.4E-01	3.9E+01	2.5E+01
Cyanide	2.4E+01	2.4E+01			2.4E+01	2.4E+01
Indeno(1,2,3-cd)pyrene	5.0E+01	3.0E+01	1.0E+01	6.8E+00	4.0E+01	2.4E+01
Pyrene	3.9E+01	2.3E+01			3.9E+01	2.3E+01
Acenaphthylene	2.2E+01	2.2E+01	1.3E+00	1.3E+00	2.1E+01	2.1E+01
Benzo(a)anthracene	3.1E+01	2.0E+01	9.3E+00	4.8E+00	2.2E+01	1.6E+01
Di-n-Butylphthalate	1.5E+01	1.5E+01			1.5E+01	1.5E+01
Chrysene	3.1E+01	1.8E+01	6.6E+00	4.1E+00	2.4E+01	1.4E+01
Benzo(a)pyrene	2.7E+01	1.5E+01	5.6E+00	3.6E+00	2.1E+01	1.2E+01
Phenanthrene	2.4E+01	1.4E+01	3.9E+00	2.6E+00	2.0E+01	1.2E+01
Aroclor-1268	1.6E+01	1.6E+01	8.3E+00	4.6E+00	7.5E+00	1.1E+01
Lead	1.6E+01	1.1E+01	2.9E+00	1.3E+00	1.3E+01	9.3E+00
Copper	1.2E+01	7.4E+00	1.1E+00	7.4E-01	1.1E+01	6.7E+00
Chromium	9.2E+00	5.4E+00	6.7E-01	4.0E-01	8.5E+00	5.1E+00
Naphthalene	5.5E+00	5.5E+00	5.8E-01	5.8E-01	5.0E+00	5.0E+00
Aroclor-1248	4.7E+00	4.7E+00			4.7E+00	4.7E+00
Mercury	6.5E+00	3.1E+00	7.6E-01	3.4E-01	5.7E+00	2.8E+00
Silver	8.9E+00	5.6E+00	1.3E+01	3.1E+00		2.5E+00
Zinc	4.0E+00	2.9E+00	1.9E+00	8.4E-01	2.1E+00	2.1E+00
2-Methylnaphthalene	1.9E+00	1.9E+00	2.7E-01	2.7E-01	1.7E+00	1.7E+00
Cadmium	2.0E+00	2.1E+00	1.4E+00	6.2E-01	5.8E-01	1.4E+00
Antimony	2.4E+00	1.1E+00			2.4E+00	1.1E+00
Carbazole	1.1E+00	9.5E-01	5.6E-02	5.6E-02	1.1E+00	8.9E-01
Iron	1.1E+00	9.0E-01	1.2E+00	7.2E-01		1.8E-01

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Assapumpset			
Analyte	RME	CT	RME	CT	RME	CT
Technical Chlordane	4.4E+03	2.6E+03	3.1E+02	2.2E+02	4.1E+03	2.4E+03
Toxicity Equivalency - Fish	1.1E+03	2.5E+02	1.0E+00	4.7E-01	1.1E+03	2.5E+02
Dibenzo(a,h)anthracene	3.8E+02	2.7E+02	6.3E+01	5.3E+01	3.2E+02	2.2E+02
Endrin	1.3E+02	1.3E+02			1.3E+02	1.3E+02
Dieldrin	2.2E+02	1.9E+02	9.6E+01	9.6E+01	1.3E+02	9.5E+01
Benzo(b)fluoranthene	1.7E+02	7.8E+01			1.7E+02	7.8E+01
Acenaphthene	5.8E+01	5.8E+01	2.1E+00	2.1E+00	5.6E+01	5.6E+01
Fluorene	3.5E+01	3.5E+01	4.2E+00	4.2E+00	3.1E+01	3.1E+01
alpha-Chlordane	6.4E+01	3.1E+01	2.7E+00	2.7E+00	6.1E+01	2.8E+01
Benzo(k)fluoranthene	7.8E+01	4.0E+01	3.0E+01	1.5E+01	4.8E+01	2.5E+01
Fluoranthene	1.1E+02	4.2E+01	2.6E+01	1.7E+01	7.9E+01	2.5E+01

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TABLE 63
INCREMENTAL RISK SUMMARY FOR SEDIMENT (Assapumpset)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Di-n-Butylphthalate	4.3E+01	2.3E+01			4.3E+01	2.3E+01
Anthracene	2.5E+01	2.5E+01	4.7E+00	4.7E+00	2.0E+01	2.0E+01
Aroclor-1268	6.3E+01	2.3E+01	8.3E+00	4.6E+00	5.4E+01	1.9E+01
gamma-Chlordane	2.9E+01	1.8E+01	1.3E+00	1.3E+00	2.8E+01	1.7E+01
Benzo(g,h,i)perylene	4.7E+01	2.0E+01	9.4E+00	6.3E+00	3.8E+01	1.4E+01
Indeno(1,2,3-cd)pyrene	4.3E+01	2.0E+01	1.0E+01	6.8E+00	3.2E+01	1.3E+01
2-Methylnaphthalene	1.4E+00	1.4E+01	2.7E-01	2.7E-01	1.2E+00	1.3E+01
Pyrene	2.6E+01	1.2E+01			2.6E+01	1.2E+01
Aroclor, Total	1.7E+01	1.2E+01	4.4E+00	2.5E+00	1.3E+01	9.0E+00
Acenaphthylene	9.7E+00	9.7E+00	1.3E+00	1.3E+00	8.4E+00	8.4E+00
Benzo(a)anthracene	2.6E+01	1.3E+01	9.3E+00	4.8E+00	1.7E+01	8.1E+00
Lead	1.2E+01	7.6E+00	2.9E+00	1.3E+00	9.2E+00	6.3E+00
Copper	1.2E+01	7.0E+00	1.1E+00	7.4E-01	1.1E+01	6.3E+00
Chrysene	2.2E+01	1.0E+01	6.6E+00	4.1E+00	1.5E+01	5.9E+00
Benzo(a)pyrene	1.9E+01	9.1E+00	5.6E+00	3.6E+00	1.4E+01	5.5E+00
Naphthalene	5.7E+00	5.7E+00	5.8E-01	5.8E-01	5.1E+00	5.1E+00
Phenanthrene	1.4E+01	7.5E+00	3.9E+00	2.6E+00	9.8E+00	4.9E+00
Aroclor-1260	5.4E+00	4.8E+00			5.4E+00	4.8E+00
Aroclor-1254	8.2E+00	4.5E+00	9.6E-01	5.4E-01	7.2E+00	4.0E+00
Chromium	7.7E+00	3.8E+00	6.7E-01	4.0E-01	7.0E+00	3.4E+00
4,4'-DDD	4.7E+00	4.6E+00	1.6E+00	1.3E+00	3.1E+00	3.3E+00
Cadmium	3.5E+00	3.6E+00	1.4E+00	6.2E-01	2.1E+00	3.0E+00
Silver	8.6E+00	5.8E+00	1.3E+01	3.1E+00		2.6E+00
Zinc	6.3E+00	3.3E+00	1.9E+00	8.4E-01	4.4E+00	2.4E+00
4,4'-DDE	5.0E+00	3.8E+00	2.5E+00	1.5E+00	2.5E+00	2.2E+00
Mercury	4.1E+00	1.9E+00	7.6E-01	3.4E-01	3.4E+00	1.6E+00
Antimony	1.6E+00	6.6E-01			1.6E+00	6.6E-01
Arsenic	1.1E+00	8.7E-01	8.7E-01	4.5E-01	2.0E-01	4.3E-01
Iron	1.0E+00	8.2E-01	1.2E+00	7.2E-01		1.1E-01

Manton Pond Reach

	Risk Summary				Incremental Risk	
	Manton		Assapumpset			
Analyte	RME	CT	RME	CT	RME	CT
Toxicity Equivalency - Fish	1.4E+02	6.0E+01	1.0E+00	4.7E-01	1.4E+02	5.9E+01
Benzo(b)fluoranthene	2.4E+01	1.1E+01			2.4E+01	1.1E+01
gamma-Chlordane	1.0E+01	5.0E+00	1.3E+00	1.3E+00	8.7E+00	3.7E+00
alpha-Chlordane	8.0E+00	4.4E+00	2.7E+00	2.7E+00	5.3E+00	1.7E+00
Pyrene	3.1E+00	1.5E+00			3.1E+00	1.5E+00
Copper	4.0E+00	1.8E+00	1.1E+00	7.4E-01	2.8E+00	1.1E+00
Cadmium	1.6E+00	1.1E+00	1.4E+00	6.2E-01	1.7E-01	5.3E-01
Lead	2.9E+00	1.5E+00	2.9E+00	1.3E+00	7.7E-02	1.7E-01

Dyerville Reach

	Risk Summary				Incremental Risk	
	Dyerville		Assapumpset			
Analyte	RME	CT	RME	CT	RME	CT
Dieldrin	1.5E+03	5.8E+02	9.6E+01	9.6E+01	1.4E+03	4.8E+02
Benzo(b)fluoranthene	1.5E+02	9.1E+01			1.5E+02	9.1E+01
Aroclor, Total	6.3E+01	6.2E+01	4.4E+00	2.5E+00	5.8E+01	5.9E+01
Fluoranthene	8.4E+01	4.4E+01	2.6E+01	1.7E+01	5.8E+01	2.7E+01
Aroclor-1268	2.4E+01	2.4E+01	8.3E+00	4.6E+00	1.6E+01	1.9E+01
Dibenzo(a,h)anthracene	1.1E+02	7.2E+01	6.3E+01	5.3E+01	5.0E+01	1.9E+01
Indeno(1,2,3-cd)pyrene	3.2E+01	2.1E+01	1.0E+01	6.8E+00	2.1E+01	1.5E+01
Pyrene	2.2E+01	1.2E+01			2.2E+01	1.2E+01
Benzo(k)fluoranthene	4.0E+01	2.6E+01	3.0E+01	1.5E+01	1.1E+01	1.1E+01

TABLE 63
INCREMENTAL RISK SUMMARY FOR SEDIMENT (Assapumpset)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Toxicity Equivalency - Fish	**2.1E+01**	**1.1E+01**	**1.0E+00**	4.7E-01	**2.0E+01**	**1.1E+01**
Benzo(g,h,i)perylene	**2.5E+01**	**1.7E+01**	**9.4E+00**	**6.3E+00**	**1.6E+01**	**1.0E+01**
Benzo(a)anthracene	**2.4E+01**	**1.3E+01**	**9.3E+00**	**4.8E+00**	**1.5E+01**	**8.4E+00**
Aroclor-1254	**2.2E+01**	**8.2E+00**	9.6E-01	5.4E-01	**2.1E+01**	**7.6E+00**
Acenaphthene	**8.8E+00**	**8.5E+00**	**2.1E+00**	**2.1E+00**	**6.6E+00**	**6.4E+00**
alpha-Chlordane	**2.2E+01**	**8.6E+00**	**2.7E+00**	**2.7E+00**	**1.9E+01**	**5.9E+00**
Benzo(a)pyrene	**1.5E+01**	**9.4E+00**	**5.6E+00**	**3.6E+00**	**9.1E+00**	**5.8E+00**
Chromium	**1.5E+01**	**6.0E+00**	6.7E-01	4.0E-01	**1.4E+01**	**5.6E+00**
Zinc	**1.6E+01**	**6.0E+00**	**1.9E+00**	8.4E-01	**1.4E+01**	**5.2E+00**
Chrysene	**1.4E+01**	**9.2E+00**	**6.6E+00**	**4.1E+00**	**7.8E+00**	**5.1E+00**
Copper	**1.3E+01**	**5.7E+00**	**1.1E+00**	7.4E-01	**1.2E+01**	**4.9E+00**
Anthracene	**1.7E+01**	**9.4E+00**	**4.7E+00**	**4.7E+00**	**1.3E+01**	**4.7E+00**
Phenanthrene	**1.4E+01**	**6.7E+00**	**3.9E+00**	**2.6E+00**	**1.0E+01**	**4.1E+00**
Lead	**9.9E+00**	**5.1E+00**	**2.9E+00**	**1.3E+00**	**7.0E+00**	**3.8E+00**
Mercury	**7.1E+00**	**2.7E+00**	7.6E-01	3.4E-01	**6.3E+00**	**2.3E+00**
Fluorene	**1.2E+01**	**6.5E+00**	**4.2E+00**	**4.2E+00**	**7.3E+00**	**2.3E+00**
Cadmium	**6.8E+00**	**2.9E+00**	**1.4E+00**	6.2E-01	**5.3E+00**	**2.3E+00**
Acenaphthylene	**6.1E+00**	**3.6E+00**	**1.3E+00**	**1.3E+00**	**4.8E+00**	**2.2E+00**
4,4'-DDD	**6.5E+00**	**2.9E+00**	**1.6E+00**	**1.3E+00**	**4.9E+00**	**1.6E+00**
Naphthalene	**2.0E+00**	**2.0E+00**	5.8E-01	5.8E-01	**1.4E+00**	**1.4E+00**
Di-n-Butylphthalate	**1.2E+00**	**1.2E+00**			**1.2E+00**	**1.2E+00**
4,4'-DDE	**3.2E+00**	**1.8E+00**	**2.5E+00**	**1.5E+00**	7.0E-01	2.6E-01

Notes:
Risk estimates as calculated and presented in Tables 40, 42, 43, 44, and 45.
Incremental risks calculated for all analytes with RME-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

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TABLE 64
INCREMENTAL RISK SUMMARY FOR CRAYFISH TISSUE (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Copper	**8.9E+00**	**6.9E+00**	**7.9E+00**	**6.1E+00**	**1.0E+00**	8.0E-01
Aluminum	**1.6E+00**	2.0E-01	9.0E-01	1.1E-01	6.7E-01	8.3E-02
Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Barium		**6.9E+01**		**6.2E+01**		**6.3E+00**
Copper	**8.8E+00**	**6.8E+00**	**7.9E+00**	**6.1E+00**	9.6E-01	7.4E-01
Technical Chlordane		**1.1E+00**		9.1E-01		2.1E-01
Zinc	**2.1E+00**	**1.3E+00**	**1.8E+00**	**1.2E+00**	2.9E-01	1.9E-01
Manganese	**6.8E+00**		**6.3E+00**		4.8E-01	

Notes:
Risk estimates as calculated and presented in Tables 51 through 53.
Incremental risks calculated for all analytes with NOAEL-based HQs[1] greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

[1] LOAEL-based HQs were used when NOAEL-based values were not available.

Prepared by: NAR
Checked by: RAR

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TABLE 65
INCREMENTAL RISK SUMMARY FOR CRAYFISH TISSUE (Assapumpset)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Copper	**8.9E+00**	**6.9E+00**	**4.4E+00**	**3.4E+00**	**4.5E+00**	**3.5E+00**
Aluminum	**1.6E+00**	2.0E-01			**1.6E+00**	2.0E-01
Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Copper	**8.8E+00**	**6.8E+00**	**4.4E+00**	**3.4E+00**	**4.4E+00**	**3.4E+00**
Technical Chlordane		**1.1E+00**		4.4E-01		6.8E-01
Zinc	**2.1E+00**	**1.3E+00**	**1.8E+00**	**1.2E+00**	2.6E-01	1.7E-01
Manganese	**6.8E+00**		**6.1E+00**		7.1E-01	

Notes:
Risk estimates as calculated and presented in Tables 50, 52, and 53.
Incremental risks calculated for all analytes with NOAEL-based HQs[1] greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

[1] LOAEL-based HQs were used when NOAEL-based values were not available.

Prepared by: NAR
Checked by: RAR

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TABLE 66
WEIGHT-OF-EVIDENCE INTEGRATION: AQUATIC MACROINVERTEBRATE COMMUNITY

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Assessment Endpoint 1a. Protection and maintenance (i.e., survival, growth, reproduction) of aquatic invertebrate communities which are a forage base for fish and wildlife.

A. Do measured concentrations of COPCs in surface water exceed appropriate criteria and/or guidelines for the protection of aquatic life, with special consideration of reproduction and early lifestage survival?
B. Do measured concentrations of COPCs in whole sediment exceed appropriate guidelines for the protection of benthic macroinvertebrate populations?
C. Are sediments toxic to aquatic macroinvertebrates under chronic laboratory exposure conditions?
D. Do measured and modeled concentrations of COPCs in the tissues of aquatic macroinvertebrates (such as aquatic insects, crayfish, and molluscs) exceed benchmarks for residue effects on survival, growth or reproduction?
E. Do the available aquatic macroinvertebrate data indicate presence/absence of ecological integrity due to VOC discharge in riffle/run habitat adjacent to the Site?

Measurement Endpoints[a]

A. Comparison of surface water COPC concentrations to criteria/guidelines
B. Comparison of sediment COPC concentrations to benchmarks/guidelines
C. Site-specific whole sediment laboratory bioassays
D. Comparison of measured COPC concentrations in aquatic macroinvertebrates to CBRs
E_1. Site-specific study of aquatic macroinvertebrate community structure/function
E_2. Site-specific study of emerging aquatic macroinvertebrate productivity

Weight-of-Evidence Integration[b]

	WEIGHT				
RISK/MAGNITUDE	Low	Low - Medium	Medium	Medium - High	High
Yes/High		**A**	**B**	**C**	
Yes/Low		**D**			
Undeterminate					
No/Low		**E_2**			
No/Very Low				**E_1**	

TABLE 66
WEIGHT-OF-EVIDENCE INTEGRATION: AQUATIC MACROINVERTEBRATE COMMUNITY

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Risk Conclusion:

The benthic macroinvertebrate community that occurs in low-gradient habitats (lentic) upstream of impoundments within the study area is at substantial risk of harm due to exposure to Site-related contaminants in surface water, sediment, and tissue residues. However, the discharge of VOC-contaminated groundwater into the reach of the Woonasquatucket River adjacent to the Site does not appear to have adversely affected the benthic macroinvertebrate community associated with lotic (riffle/run) habitats.

Notes:
a. Measurement endpoints and assigned weights are discussed in Section 2.6.
b. WOE integration is discussed in Section 3.4.

Prepared by: NAR
Checked by: SGH

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Table 67
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Floodplain Soil

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Floodplain Soil
Exposure Medium: Floodplain Soil (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
GREYSTONE	**Semivolatile Organics**									
(Background area)	Anthracene	MG/KG	0.71	NC	0.98295		0.71	MG/KG	Mean	(2)
	Benzo(a)anthracene	MG/KG	3.1	NC	3.41086		3.1	MG/KG	Mean	(2)
	Benzo(a)pyrene	MG/KG	3.1	NC	3.41803		3.1	MG/KG	Mean	(2)
	Benzo(b)fluoranthene	MG/KG	3.5	NC	4.28861		3.5	MG/KG	Mean	(2)
	Benzo(g,h,i)perylene	MG/KG	2.3	NC	2.87139		2.3	MG/KG	Mean	(2)
	Benzo(k)fluoranthene	MG/KG	3.2	NC	3.86354		3.2	MG/KG	Mean	(2)
	Chrysene	MG/KG	3.84	NC	4.48851		3.8	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.61	NC	0.72851		0.61	MG/KG	Mean	(2)
	Fluoranthene	MG/KG	7.0	NC	7.73124		7.0	MG/KG	Mean	(2)
	Indeno(1,2,3-cd)pyrene	MG/KG	2.5	NC	3.0929		2.5	MG/KG	Mean	(2)
	Phenanthrene	MG/KG	4.0	NC	5.30136		4.0	MG/KG	Mean	(2)
	Pyrene	MG/KG	5.8	NC	6.37272		5.8	MG/KG	Mean	(2)
	Total PAH	MG/KG	41.2	NC	45.71117		41.2	MG/KG	Mean	(2)
	Pesticides/PCBs									
	4,4'-DDD	MG/KG	0.0082	NC	0.01517		0.0082	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.013	NC	0.02061		0.013	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.0085	NC	0.01827	J	0.0085	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.52	NC	0.83872		0.52	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.084	NC	0.13953	J	0.084	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.0063	NC	0.00941		0.0063	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.43	NC	0.73538		0.43	MG/KG	Mean	(2)
	Inorganics									
	Aluminum	MG/KG	15899	NC	21793	J	15899	MG/KG	Mean	(2)
	Antimony	MG/KG	0.62	NC	0.982	J	0.62	MG/KG	Mean	(2)
	Arsenic	MG/KG	7.7	NC	12.2		7.7	MG/KG	Mean	(2)
	Barium	MG/KG	231	NC	282		231	MG/KG	Mean	(2)
	Beryllium	MG/KG	3.1	NC	4.46		3.1	MG/KG	Mean	(2)
	Cadmium	MG/KG	1.6	NC	3.46		1.6	MG/KG	Mean	(2)
	Chromium	MG/KG	231	NC	291		231	MG/KG	Mean	(2)
	Cobalt	MG/KG	13.1	NC	20.3		13.1	MG/KG	Mean	(2)
	Copper	MG/KG	205	NC	324		205	MG/KG	Mean	(2)

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Table 67
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Floodplain Soil

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Floodplain Soil
Exposure Medium: Floodplain Soil (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
GREYSTONE (continued)	Iron	MG/KG	27261	NC	37162	27261	MG/KG	Mean	(2)
(Background area)	Lead	MG/KG	450	NC	591	450	MG/KG	Mean	(2)
	Manganese	MG/KG	1841	NC	4126	1841	MG/KG	Mean	(2)
	Mercury	MG/KG	0.58	NC	0.811	0.58	MG/KG	Mean	(2)
	Molybdenum	MG/KG	54.0	NC	87.7 J	54.0	MG/KG	Mean	(2)
	Selenium	MG/KG	0.70	NC	0.963 J	0.70	MG/KG	Mean	(2)
	Thallium	MG/KG	0.46	NC	0.585	0.46	MG/KG	Mean	(2)
	Vanadium	MG/KG	82.3	NC	103	82.3	MG/KG	Mean	(2)
	Zinc	MG/KG	288	NC	497	288	MG/KG	Mean	(2)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.000017	NC	0.0000567	0.000017	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.000043	NC	0.00011028 J	0.000043	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.000055	NC	0.000109	0.000055	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000090	NC	0.000202	0.000090	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.000045	NC	0.0000933	0.000045	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.000038	NC	0.0000379	0.000038	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.000060	NC	0.0000595	0.000060	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.0000019	NC	0.00000188	0.0000019	MG/KG	Mean	(2)
ALLENDALE	**Semivolatile Organics**								
	Anthracene	MG/KG	0.50	NC	0.9 J	0.50	MG/KG	Mean	(2)
	Benzo(a)anthracene	MG/KG	1.1	NC	2.2	1.1	MG/KG	Mean	(2)
	Benzo(a)pyrene	MG/KG	0.99	NC	2.4	0.99	MG/KG	Mean	(2)
	Benzo(b)fluoranthene	MG/KG	1.6	NC	5.2	1.6	MG/KG	Mean	(2)
	Benzo(g,h,i)perylene	MG/KG	0.50	NC	0.94	0.50	MG/KG	Mean	(2)
	Benzo(k)fluoranthene	MG/KG	0.65	NC	3.1 J	0.65	MG/KG	Mean	(2)
	Chrysene	MG/KG	1.2	NC	2.7	1.2	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.42	NC	0.35 J	0.35	MG/KG	Max	(3)
	Fluoranthene	MG/KG	2.4	NC	4.7	2.4	MG/KG	Mean	(2)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.53	NC	1.1	0.53	MG/KG	Mean	(2)
	Phenanthrene	MG/KG	1.6	NC	3.5	1.6	MG/KG	Mean	(2)
	Pyrene	MG/KG	2.2	NC	5.2 J	2.2	MG/KG	Mean	(2)
	Total PAH	MG/KG	13.3	NC	27	13.3	MG/KG	Mean	(2)

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Table 67
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Floodplain Soil

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Floodplain Soil
Exposure Medium: Floodplain Soil (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
ALLENDALE (continued)	**Pesticides/PCBs**								
	4,4'-DDD	MG/KG	0.0096	NC	0.015 J	0.0096	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.019	NC	0.049 J	0.019	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.03	NC	0.14 J	0.03	MG/KG	Mean	(2)
	Aroclor-1248	MG/KG	0.57	1.6 T	2.3 J	0.57	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	2.1	7.0 T	27	2.1	MG/KG	Mean	(2)
	beta-BHC	MG/KG	0.0043	NC	0.0031 J	0.0031	MG/KG	Max	(3)
	Dieldrin	MG/KG	0.0086	NC	0.027 J	0.0086	MG/KG	Mean	(2)
	Endrin	MG/KG	0.0087	NC	0.011 J	0.0087	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.013	NC	0.0061 J	0.0061	MG/KG	Max	(3)
	Inorganics								
	Aluminum	MG/KG	6254	NC	10000	6254	MG/KG	Mean	(2)
	Antimony	MG/KG	2.2	NC	0.59 J	0.6	MG/KG	Max	(3)
	Arsenic	MG/KG	2.3	NC	5 J	2.3	MG/KG	Mean	(2)
	Barium	MG/KG	35.1	NC	66.6	35.1	MG/KG	Mean	(2)
	Beryllium	MG/KG	0.49	NC	0.74 J	0.49	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.21	NC	0.53 J	0.21	MG/KG	Mean	(2)
	Calcium	MG/KG	1643	NC	2710	1643	MG/KG	Mean	(2)
	Chromium	MG/KG	12.1	NC	30.5	12.1	MG/KG	Mean	(2)
	Cobalt	MG/KG	5.3	NC	13.8 J	5.3	MG/KG	Mean	(2)
	Copper	MG/KG	16.9	NC	28.5	16.9	MG/KG	Mean	(2)
	Iron	MG/KG	13230	NC	25200	13230	MG/KG	Mean	(2)
	Lead	MG/KG	52.3	NC	139	52.3	MG/KG	Mean	(2)
	Magnesium	MG/KG	2081	NC	5690 J	2081	MG/KG	Mean	(2)
	Manganese	MG/KG	325	NC	1130	325	MG/KG	Mean	(2)
	Mercury	MG/KG	0.068	NC	0.14 J	0.068	MG/KG	Mean	(2)
	Molybdenum	MG/KG	2.2	NC	6.7	2.2	MG/KG	Mean	(2)
	Potassium	MG/KG	859	NC	1700	859	MG/KG	Mean	(2)
	Selenium	MG/KG	3.8	NC	1.4 J	1.4	MG/KG	Max	(3)
	Sodium	MG/KG	185	NC	338 J	185	MG/KG	Mean	(2)
	Vanadium	MG/KG	17.2	NC	34.6 J	17.2	MG/KG	Mean	(2)

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Table 67
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Floodplain Soil

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Floodplain Soil
Exposure Medium: Floodplain Soil (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
ALLENDALE (continued)	Zinc	MG/KG	60.6	NC	114	60.6	MG/KG	Mean	(2)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.00083	0.0024 T	0.0281	0.00083	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.0000098	NC	0.0000098	0.0000098	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.00083	0.0024 T	0.0281	0.00083	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.00083	0.0024 T	0.0281	0.00083	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.00083	0.0024 T	0.0281	0.00083	MG/KG	Mean	(2)
LYMAN MILL	**Semivolatile Organics**								
	Anthracene	MG/KG	0.13	NC	0.27532	0.13	MG/KG	Mean	(2)
	Benzo(a)anthracene	MG/KG	0.76	NC	1.74881	0.76	MG/KG	Mean	(2)
	Benzo(a)pyrene	MG/KG	0.90	NC	2.06637	0.90	MG/KG	Mean	(2)
	Benzo(b)fluoranthene	MG/KG	1.2	NC	2.81441	1.2	MG/KG	Mean	(2)
	Benzo(g,h,i)perylene	MG/KG	0.83	NC	1.97047	0.83	MG/KG	Mean	(2)
	Benzo(k)fluoranthene	MG/KG	1.0	NC	2.38312	1.0	MG/KG	Mean	(2)
	Chrysene	MG/KG	1.2	NC	2.83046	1.2	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.20	NC	0.46627	0.20	MG/KG	Mean	(2)
	Fluoranthene	MG/KG	2.1	NC	4.87119	2.1	MG/KG	Mean	(2)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.89	NC	2.1227	0.89	MG/KG	Mean	(2)
	Phenanthrene	MG/KG	0.93	NC	2.13094	0.93	MG/KG	Mean	(2)
	Pyrene	MG/KG	1.7	NC	3.84604	1.7	MG/KG	Mean	(2)
	Total PAH	MG/KG	12.0	NC	28.10184	12.0	MG/KG	Mean	(2)
	Pesticides/PCBs								
	4,4'-DDD	MG/KG	0.0069	NC	0.01315	0.0069	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.017	NC	0.03159	0.017	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.018	NC	0.04313	0.018	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.15	NC	0.25305 J	0.15	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.024	NC	0.02507 J	0.024	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.0028	NC	0.0054	0.0028	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.21	NC	0.45584	0.21	MG/KG	Mean	(2)

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Table 67
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Floodplain Soil

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Floodplain Soil
Exposure Medium: Floodplain Soil (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
LYMAN MILL (continued)	**Inorganics**								
	Aluminum	MG/KG	16078	NC	20313 J	16078	MG/KG	Mean	(2)
	Antimony	MG/KG	0.32	NC	0.704 J	0.32	MG/KG	Mean	(2)
	Arsenic	MG/KG	5.5	NC	7.42	5.5	MG/KG	Mean	(2)
	Barium	MG/KG	340	NC	842	340	MG/KG	Mean	(2)
	Beryllium	MG/KG	0.80	NC	1.06	0.80	MG/KG	Mean	(2)
	Cadmium	MG/KG	1.8	NC	3.18	1.8	MG/KG	Mean	(2)
	Chromium	MG/KG	51.5	NC	107	51.5	MG/KG	Mean	(2)
	Cobalt	MG/KG	5.8	NC	7.47	5.8	MG/KG	Mean	(2)
	Copper	MG/KG	173	NC	400	173	MG/KG	Mean	(2)
	Iron	MG/KG	20754	NC	25516	20754	MG/KG	Mean	(2)
	Lead	MG/KG	436	NC	901	436	MG/KG	Mean	(2)
	Manganese	MG/KG	506	NC	740	506	MG/KG	Mean	(2)
	Mercury	MG/KG	0.20	NC	0.245	0.20	MG/KG	Mean	(2)
	Molybdenum	MG/KG	2.5	NC	3.48 J	2.5	MG/KG	Mean	(2)
	Selenium	MG/KG	0.43	NC	0.779 J	0.43	MG/KG	Mean	(2)
	Thallium	MG/KG	0.38	NC	0.575	0.38	MG/KG	Mean	(2)
	Vanadium	MG/KG	37.6	NC	42.6	37.6	MG/KG	Mean	(2)
	Zinc	MG/KG	489	NC	1150	489	MG/KG	Mean	(2)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.00042	NC	0.00113007	0.00042	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.000016	NC	0.00003551	0.000016	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.00046	NC	0.00113	0.00046	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.00047	NC	0.00114	0.00047	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.00045	NC	0.00113	0.00045	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0000061	NC	0.0000062	0.0000061	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.000023	NC	0.0000293	0.000023	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.00000032	NC	0.000000341	0.00000032	MG/KG	Mean	(2)

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Table 67
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Floodplain Soil

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Floodplain Soil
Exposure Medium: Floodplain Soil (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

(1) Chemicals of potential concern are identified in Table 7 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(2) Mean: Arithmetic Mean
(3) Max: Maximum, applied in the special case where the arithmetic mean has been selected, but because of elevated detection limits in non-detects, it is greater than the maximum detected concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:
J = Value is estimated.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

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Table 68
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Floodplain Soil

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Floodplain Soil
Exposure Medium: Floodplain Soil (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
GREYSTONE	**Semivolatile Organics**								
(Background area)	Anthracene	MG/KG	0.71	NC	0.98295	0.98295	MG/KG	Max	(5)
	Benzo(a)anthracene	MG/KG	3.1	NC	3.41086	3.41086	MG/KG	Max	(5)
	Benzo(a)pyrene	MG/KG	3.1	NC	3.41803	3.41803	MG/KG	Max	(5)
	Benzo(b)fluoranthene	MG/KG	3.5	NC	4.28861	4.28861	MG/KG	Max	(5)
	Benzo(g,h,i)perylene	MG/KG	2.3	NC	2.87139	2.87139	MG/KG	Max	(5)
	Benzo(k)fluoranthene	MG/KG	3.2	NC	3.86354	3.86354	MG/KG	Max	(5)
	Chrysene	MG/KG	3.84	NC	4.48851	4.48851	MG/KG	Max	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.61	NC	0.72851	0.72851	MG/KG	Max	(5)
	Fluoranthene	MG/KG	7.0	NC	7.73124	7.73124	MG/KG	Max	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	2.5	NC	3.0929	3.0929	MG/KG	Max	(5)
	Phenanthrene	MG/KG	4.0	NC	5.30136	5.30136	MG/KG	Max	(5)
	Pyrene	MG/KG	5.8	NC	6.37272	6.37272	MG/KG	Max	(5)
	Total PAH	MG/KG	41.2	NC	45.71117	45.71117	MG/KG	Max	(5)
	Pesticides/PCBs								
	4,4'-DDD	MG/KG	0.0082	NC	0.01517	0.01517	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.013	NC	0.02061	0.02061	MG/KG	Max	(5)
	4,4'-DDT	MG/KG	0.0085	NC	0.01827 J	0.01827	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.52	NC	0.83872	0.83872	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.084	NC	0.13953 J	0.13953	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.0063	NC	0.00941	0.00941	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.43	NC	0.73538	0.73538	MG/KG	Max	(5)
	Inorganics								
	Aluminum	MG/KG	15899	NC	21793 J	21793	MG/KG	Max	(5)
	Antimony	MG/KG	0.62	NC	0.982 J	0.982	MG/KG	Max	(5)
	Arsenic	MG/KG	7.7	NC	12.2	12.2	MG/KG	Max	(5)
	Barium	MG/KG	231	NC	282	282	MG/KG	Max	(5)
	Beryllium	MG/KG	3.1	NC	4.46	4.46	MG/KG	Max	(5)
	Cadmium	MG/KG	1.6	NC	3.46	3.46	MG/KG	Max	(5)
	Chromium	MG/KG	231	NC	291	291	MG/KG	Max	(5)
	Cobalt	MG/KG	13.1	NC	20.3	20.3	MG/KG	Max	(5)

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Table 68
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Floodplain Soil

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Floodplain Soil
Exposure Medium: Floodplain Soil (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic (1)	Rationale
GREYSTONE (continued)	Copper	MG/KG	205.0	NC	324		324	MG/KG	Max	(5)
(Background area)	Iron	MG/KG	27261	NC	37162		37162	MG/KG	Max	(5)
	Lead	MG/KG	450.0	NC	591		591	MG/KG	Max	(5)
	Manganese	MG/KG	1841	NC	4126		4126	MG/KG	Max	(5)
	Mercury	MG/KG	0.58	NC	0.811		0.811	MG/KG	Max	(5)
	Molybdenum	MG/KG	54.0	NC	87.7	J	87.7	MG/KG	Max	(5)
	Selenium	MG/KG	0.70	NC	0.963	J	0.963	MG/KG	Max	(5)
	Thallium	MG/KG	0.46	NC	0.585		0.585	MG/KG	Max	(5)
	Vanadium	MG/KG	82.3	NC	103		103	MG/KG	Max	(5)
	Zinc	MG/KG	288	NC	497		497	MG/KG	Max	(5)
	Dioxins/Furans									
	2,3,7,8-TCDD	MG/KG	0.000017	NC	0.0000567		0.0000567	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.000043	NC	0.00011028	J	0.00011028	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.000055	NC	0.000109		0.000109	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.000090	NC	0.000202		0.000202	MG/KG	Max	(5)
	Toxicity Equivalency - Fish	MG/KG	0.000045	NC	0.0000933		0.0000933	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.000038	NC	0.0000379		0.0000379	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.000060	NC	0.0000595		0.0000595	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.0000019	NC	0.00000188		0.00000188	MG/KG	Max	(5)
ALLENDALE	**Semivolatile Organics**									
	Anthracene	MG/KG	0.50	NC	0.9	J	0.9	MG/KG	Max	(5)
	Benzo(a)anthracene	MG/KG	1.1	NC	2.2		2.2	MG/KG	Max	(5)
	Benzo(a)pyrene	MG/KG	0.99	NC	2.4		2.4	MG/KG	Max	(5)
	Benzo(b)fluoranthene	MG/KG	1.6	NC	5.2		5.2	MG/KG	Max	(5)
	Benzo(g,h,i)perylene	MG/KG	0.50	NC	0.94		0.94	MG/KG	Max	(5)
	Benzo(k)fluoranthene	MG/KG	0.65	NC	3.1	J	3.1	MG/KG	Max	(5)
	Chrysene	MG/KG	1.2	NC	2.7		2.7	MG/KG	Max	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.42	NC	0.35	J	0.35	MG/KG	Max	(5)
	Fluoranthene	MG/KG	2.4	NC	4.7		4.7	MG/KG	Max	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.53	NC	1.1		1.1	MG/KG	Max	(5)
	Phenanthrene	MG/KG	1.630	NC	3.5		3.5	MG/KG	Max	(5)

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Table 68
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Floodplain Soil

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Floodplain Soil
Exposure Medium: Floodplain Soil (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
ALLENDALE (continued)	Pyrene	MG/KG	2.2	NC	5.2 J	5.2	MG/KG	Max	(5)
	Total PAH	MG/KG	13.300	NC	27	27	MG/KG	Max	(5)
	Pesticides/PCBs								
	4,4'-DDD	MG/KG	0.0096	NC	0.015 J	0.015	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.019	NC	0.049 J	0.049	MG/KG	Max	(5)
	4,4'-DDT	MG/KG	0.028	NC	0.14 J	0.14	MG/KG	Max	(5)
	Aroclor-1248	MG/KG	0.57	1.6 T	2.3 J	1.6	MG/KG	95% UCL-T	(3)
	Aroclor-1254	MG/KG	2.1	7.0 T	27	7.0	MG/KG	95% UCL-T	(3)
	beta-BHC	MG/KG	0.0043	NC	0.0031 J	0.0031	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.0086	NC	0.027 J	0.027	MG/KG	Max	(5)
	Endrin	MG/KG	0.0087	NC	0.011 J	0.011	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.013	NC	0.0061 J	0.0061	MG/KG	Max	(5)
	Inorganics								
	Aluminum	MG/KG	6254	NC	10000	10000	MG/KG	Max	(5)
	Antimony	MG/KG	2.2	NC	0.59 J	0.59	MG/KG	Max	(5)
	Arsenic	MG/KG	2.3	NC	5 J	5	MG/KG	Max	(5)
	Barium	MG/KG	35.1	NC	66.6	66.6	MG/KG	Max	(5)
	Beryllium	MG/KG	0.49	NC	0.74 J	0.74	MG/KG	Max	(5)
	Cadmium	MG/KG	0.21	NC	0.53 J	0.53	MG/KG	Max	(5)
	Calcium	MG/KG	1643	NC	2710	2710	MG/KG	Max	(5)
	Chromium	MG/KG	12.1	NC	30.5	30.5	MG/KG	Max	(5)
	Cobalt	MG/KG	5.3	NC	13.8 J	13.8	MG/KG	Max	(5)
	Copper	MG/KG	16.9	NC	28.5	28.5	MG/KG	Max	(5)
	Iron	MG/KG	13230	NC	25200	25200	MG/KG	Max	(5)
	Lead	MG/KG	52.3	NC	139	139	MG/KG	Max	(5)
	Magnesium	MG/KG	2081	NC	5690 J	5690	MG/KG	Max	(5)
	Manganese	MG/KG	325	NC	1130	1130	MG/KG	Max	(5)
	Mercury	MG/KG	0.068	NC	0.14 J	0.14	MG/KG	Max	(5)
	Molybdenum	MG/KG	2.2	NC	6.7	6.7	MG/KG	Max	(5)
	Potassium	MG/KG	859	NC	1700	1700	MG/KG	Max	(5)

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Table 68
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Floodplain Soil

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Floodplain Soil
Exposure Medium: Floodplain Soil (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
ALLENDALE (continued)	Selenium	MG/KG	3.8	NC	1.4 J	1.4	MG/KG	Max	(5)
	Sodium	MG/KG	185	NC	338 J	338	MG/KG	Max	(5)
	Vanadium	MG/KG	17.2	NC	34.6 J	34.6	MG/KG	Max	(5)
	Zinc	MG/KG	60.6	NC	114	114	MG/KG	Max	(5)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.00083	0.0024 T	0.0281	0.0024	MG/KG	95% UCL-T	(3)
	2,3,7,8-TCDF	MG/KG	0.0000098	NC	0.0000098	0.0000098	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.00083	0.0024 T	0.0281	0.0024	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency - Birds	MG/KG	0.00083	0.0024 T	0.0281	0.0024	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency - Fish	MG/KG	0.00083	0.0024 T	0.0281	0.0024	MG/KG	95% UCL-T	(3)
LYMAN MILL	**Semivolatile Organics**								
	Anthracene	MG/KG	0.13	NC	0.27532	0.27532	MG/KG	Max	(5)
	Benzo(a)anthracene	MG/KG	0.76	NC	1.74881	1.74881	MG/KG	Max	(5)
	Benzo(a)pyrene	MG/KG	0.90	NC	2.06637	2.06637	MG/KG	Max	(5)
	Benzo(b)fluoranthene	MG/KG	1.2	NC	2.81441	2.81441	MG/KG	Max	(5)
	Benzo(g,h,i)perylene	MG/KG	0.83	NC	1.97047	1.97047	MG/KG	Max	(5)
	Benzo(k)fluoranthene	MG/KG	1.0	NC	2.38312	2.38312	MG/KG	Max	(5)
	Chrysene	MG/KG	1.2	NC	2.83046	2.83046	MG/KG	Max	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.20	NC	0.46627	0.46627	MG/KG	Max	(5)
	Fluoranthene	MG/KG	2.1	NC	4.87119	4.87119	MG/KG	Max	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.89	NC	2.1227	2.1227	MG/KG	Max	(5)
	Phenanthrene	MG/KG	0.93	NC	2.13094	2.13094	MG/KG	Max	(5)
	Pyrene	MG/KG	1.7	NC	3.84604	3.84604	MG/KG	Max	(5)
	Total PAH	MG/KG	12.0	NC	28.10184	28.10184	MG/KG	Max	(5)
	Pesticides/PCBs								
	4,4'-DDD	MG/KG	0.0069	NC	0.01315	0.01315	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.017	NC	0.03159	0.03159	MG/KG	Max	(5)
	4,4'-DDT	MG/KG	0.018	NC	0.04313	0.04313	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.15	NC	0.25305 J	0.25305	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.024	NC	0.02507 J	0.02507	MG/KG	Max	(5)
	Dieldrin	MG/KG	0	NC	0.0054	0.0054	MG/KG	Max	(5)

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Table 68
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Floodplain Soil

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Floodplain Soil
Exposure Medium: Floodplain Soil (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
LYMAN MILL (continued)	Technical Chlordane	MG/KG	0.21	NC	0.45584	0.45584	MG/KG	Max	(5)
	Inorganics								
	Aluminum	MG/KG	16078	NC	20313 J	20313	MG/KG	Max	(5)
	Antimony	MG/KG	0.32	NC	0.704 J	0.704	MG/KG	Max	(5)
	Arsenic	MG/KG	5.5	NC	7.42	7.42	MG/KG	Max	(5)
	Barium	MG/KG	340	NC	842	842	MG/KG	Max	(5)
	Beryllium	MG/KG	0.80	NC	1.06	1.06	MG/KG	Max	(5)
	Cadmium	MG/KG	1.8	NC	3.18	3.18	MG/KG	Max	(5)
	Chromium	MG/KG	51.5	NC	107	107	MG/KG	Max	(5)
	Cobalt	MG/KG	5.8	NC	7.47	7.47	MG/KG	Max	(5)
	Copper	MG/KG	173.1	NC	400	400	MG/KG	Max	(5)
	Iron	MG/KG	20754	NC	25516	25516	MG/KG	Max	(5)
	Lead	MG/KG	436	NC	901	901	MG/KG	Max	(5)
	Manganese	MG/KG	506	NC	740	740	MG/KG	Max	(5)
	Mercury	MG/KG	0.20	NC	0.245	0.245	MG/KG	Max	(5)
	Molybdenum	MG/KG	2.5	NC	3.48 J	3.48	MG/KG	Max	(5)
	Selenium	MG/KG	0.43	NC	0.779 J	0.779	MG/KG	Max	(5)
	Thallium	MG/KG	0.38	NC	0.575	0.575	MG/KG	Max	(5)
	Vanadium	MG/KG	37.6	NC	42.6	42.6	MG/KG	Max	(5)
	Zinc	MG/KG	489	NC	1150	1150	MG/KG	Max	(5)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.00042	NC	0.00113007	0.00113007	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.000016	NC	0.00003551	0.00003551	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.00046	NC	0.00113	0.00113	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.00047	NC	0.00114	0.00114	MG/KG	Max	(5)
	Toxicity Equivalency - Fish	MG/KG	0.00045	NC	0.00113	0.00113	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0000061	NC	0.0000062	0.0000062	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.000023	NC	0.0000293	0.0000293	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.00000032	NC	0.000000341	0.000000341	MG/KG	Max	(5)

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Table 68
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Floodplain Soil

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Floodplain Soil
Exposure Medium: Floodplain Soil (0-1 ft bgs)

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale

(1) Chemicals of potential concern are identified in Table 7 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(2) 95% UCL-N: 95% Upper Concentration Limit on the mean, normal distribution
(3) 95% UCL-T: 95% Upper Concentration Limit on the mean, lognormal distribution
(4) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(5) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:
J = Value is estimated.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

Table 69
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Earthworm

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Earthworm
Exposure Medium: Earthworm

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
GREYSTONE	**Pesticides/PCBs**								
(Background area)	4,4'-DDD	MG/KG	0.0013	NC	0.00205	0.0013	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.0017	NC	0.0019	0.0017	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.000961	NC	0.00242	0.000961	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.00144	NC	0.00192	0.00144	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.05029	NC	0.07083 J	0.05029	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.03891	NC	0.05875	0.03891	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.0114	NC	0.01287 J	0.0114	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.00081	NC	0.00135	0.00081	MG/KG	Mean	(2)
	Endosulfan Sulfate	MG/KG	0.0014	NC	0.00203	0.0014	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.00128	NC	0.00152	0.00128	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.00043	NC	0.00031 J	0.00031	MG/KG	Max	(3)
	Technical Chlordane	MG/KG	0.04054	NC	0.0526 J	0.04054	MG/KG	Mean	(2)
	Inorganics								
	Aluminum	MG/KG	2684	NC	3764 J	2684	MG/KG	Mean	(2)
	Antimony	MG/KG	0.224	NC	0.357	0.224	MG/KG	Mean	(2)
	Arsenic	MG/KG	0.601	NC	0.833	0.601	MG/KG	Mean	(2)
	Barium	MG/KG	36.1	NC	51.9	36.1	MG/KG	Mean	(2)
	Beryllium	MG/KG	0.253	NC	0.335 J	0.253	MG/KG	Mean	(2)
	Cadmium	MG/KG	2.97	NC	4.13	2.97	MG/KG	Mean	(2)
	Chromium	MG/KG	9.47	NC	17.2	9.47	MG/KG	Mean	(2)
	Cobalt	MG/KG	1.16	NC	1.74	1.16	MG/KG	Mean	(2)
	Copper	MG/KG	14	NC	19.4	14	MG/KG	Mean	(2)
	Iron	MG/KG	1891	NC	2494	1891	MG/KG	Mean	(2)
	Lead	MG/KG	28.5	NC	63.2 J	28.5	MG/KG	Mean	(2)
	Manganese	MG/KG	227	NC	319	227	MG/KG	Mean	(2)
	Mercury	MG/KG	0.0476	NC	0.0762	0.0476	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.00395	NC	0.00468	0.00395	MG/KG	Mean	(2)
	Molybdenum	MG/KG	2.29	NC	5.36	2.29	MG/KG	Mean	(2)
	Nickel	MG/KG	4.99	NC	10.5	4.99	MG/KG	Mean	(2)
	Selenium	MG/KG	0.563	NC	0.996 J	0.563	MG/KG	Mean	(2)
	Silver	MG/KG	0.1858	NC	0.324	0.1858	MG/KG	Mean	(2)

Table 69
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Earthworm

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Earthworm
Exposure Medium: Earthworm

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
GREYSTONE (continued)	Thallium	MG/KG	0.06	NC	0.0839	0.06	MG/KG	Mean	(2)
(Background area)	Vanadium	MG/KG	4.02	NC	6.37	4.02	MG/KG	Mean	(2)
	Zinc	MG/KG	85.48	NC	117	85.48	MG/KG	Mean	(2)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.0000004	NC	0.00000047 J	0.0000004	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.00000071	NC	0.00000086 #	0.00000071	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.00000350	NC	0.00000574	0.00000350	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.00000428	NC	0.00000714	0.00000428	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.00000306	NC	0.00000543	0.00000306	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0000110	NC	0.000011	0.0000110	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000170	NC	0.000017	0.0000170	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.000000546	NC	0.0000005460	0.000000546	MG/KG	Mean	(2)
ALLENDALE	**Pesticides/PCBs**								
	4,4'-DDD	MG/KG	0.00209	NC	0.00371	0.00209	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.00229	NC	0.003	0.00229	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.00256	NC	0.00318	0.00256	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.08849	NC	0.12173	0.08849	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.08331	NC	0.11584	0.08331	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.00518	NC	0.00589 J	0.00518	MG/KG	Mean	(2)
	delta-BHC	MG/KG	0.00046	NC	0.00066 J	0.00046	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.00286	NC	0.00297	0.00286	MG/KG	Mean	(2)
	Endosulfan Sulfate	MG/KG	0.00285	NC	0.00426	0.00285	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.00359	NC	0.00518	0.00359	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.00055	NC	0.00127	0.00055	MG/KG	Mean	(2)
	Methoxychlor	MG/KG	0.00195	NC	0.004	0.00195	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.09396	NC	0.11924	0.09396	MG/KG	Mean	(2)
	Inorganics								
	Aluminum	MG/KG	4314	NC	5581	4314	MG/KG	Mean	(2)
	Antimony	MG/KG	0.208	NC	0.241	0.208	MG/KG	Mean	(2)
	Arsenic	MG/KG	0.567	NC	0.61	0.567	MG/KG	Mean	(2)
	Barium	MG/KG	44.1	NC	51.5	44.1	MG/KG	Mean	(2)
	Beryllium	MG/KG	0.26	NC	0.297 J	0.26	MG/KG	Mean	(2)

Table 69
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Earthworm

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Earthworm
Exposure Medium: Earthworm

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
ALLENDALE (continued)	Cadmium	MG/KG	2.37	NC	2.85	2.37	MG/KG	Mean	(2)
	Chromium	MG/KG	8	NC	9.63	8	MG/KG	Mean	(2)
	Cobalt	MG/KG	0.964	NC	1.12	0.964	MG/KG	Mean	(2)
	Copper	MG/KG	10.3	NC	11.7	10.3	MG/KG	Mean	(2)
	Iron	MG/KG	2186	NC	2583	2186	MG/KG	Mean	(2)
	Lead	MG/KG	28	NC	54.6 J	28	MG/KG	Mean	(2)
	Manganese	MG/KG	159	NC	256	159	MG/KG	Mean	(2)
	Mercury	MG/KG	0.0448	NC	0.0535	0.0448	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.0033	NC	0.00436	0.0033	MG/KG	Mean	(2)
	Molybdenum	MG/KG	1.26	NC	1.37	1.26	MG/KG	Mean	(2)
	Nickel	MG/KG	2.80	NC	3.01	2.80	MG/KG	Mean	(2)
	Selenium	MG/KG	0.32	NC	0.382 J	0.32	MG/KG	Mean	(2)
	Silver	MG/KG	0.0768	NC	0.105	0.0768	MG/KG	Mean	(2)
	Thallium	MG/KG	0.068	NC	0.0757	0.0678	MG/KG	Mean	(2)
	Vanadium	MG/KG	4.82	NC	5.76	4.82	MG/KG	Mean	(2)
	Zinc	MG/KG	101	NC	116	101	MG/KG	Mean	(2)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.00016469	NC	0.0002155 J	0.00016469	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.00000072	NC	0.00000067 #	0.00000067	MG/KG	Max	(3)
	Toxicity Equivalency - Mammals	MG/KG	0.000170	NC	0.000221	0.000170	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000170	NC	0.000221	0.000170	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.000169	NC	0.00022	0.000169	MG/KG	Mean	(2)
LYMAN MILL	**Pesticides/PCBs**								
	4,4'-DDD	MG/KG	0.00122	NC	0.00217	0.00122	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.00322	NC	0.00524	0.00322	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.0028	NC	0.00717	0.0028	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.00238	NC	0.00317	0.00238	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.04197	NC	0.06009 J	0.04197	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.03469	NC	0.05326	0.03469	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.00728	NC	0.0129	0.00728	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.00082	NC	0.00119	0.00082	MG/KG	Mean	(2)
	Endosulfan Sulfate	MG/KG	0.00109	NC	0.00139	0.00109	MG/KG	Mean	(2)

Table 69
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Earthworm

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Earthworm
Exposure Medium: Earthworm

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
LYMAN MILL (continued)	gamma-Chlordane	MG/KG	0.001	NC	0.00301		0.001	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.0005	NC	0.00086		0.0005	MG/KG	Mean	(2)
	Methoxychlor	MG/KG	0.001	NC	0.00213		0.001	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.04216	NC	0.07661	J	0.04216	MG/KG	Mean	(2)
	Inorganics									
	Aluminum	MG/KG	2333	NC	3462	J	2333	MG/KG	Mean	(2)
	Antimony	MG/KG	0.137	NC	0.198		0.137	MG/KG	Mean	(2)
	Arsenic	MG/KG	0.74	NC	1.17		0.74	MG/KG	Mean	(2)
	Barium	MG/KG	27.8	NC	31.7		27.8	MG/KG	Mean	(2)
	Beryllium	MG/KG	0.119	NC	0.173	J	0.119	MG/KG	Mean	(2)
	Cadmium	MG/KG	5.29	NC	7.78		5.29	MG/KG	Mean	(2)
	Chromium	MG/KG	3.15	NC	3.21		3.15	MG/KG	Mean	(2)
	Cobalt	MG/KG	0.627	NC	0.756		0.627	MG/KG	Mean	(2)
	Copper	MG/KG	7.4	NC	10.7		7.4	MG/KG	Mean	(2)
	Iron	MG/KG	1260	NC	1580		1260	MG/KG	Mean	(2)
	Lead	MG/KG	64	NC	99.5	J	64	MG/KG	Mean	(2)
	Manganese	MG/KG	47.1	NC	75		47.1	MG/KG	Mean	(2)
	Mercury	MG/KG	0.0720	NC	0.151		0.0720	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.0011	NC	0.00157	J	0.0011	MG/KG	Mean	(2)
	Molybdenum	MG/KG	0.280	NC	0.462		0.280	MG/KG	Mean	(2)
	Nickel	MG/KG	1.26	NC	1.63		1.26	MG/KG	Mean	(2)
	Selenium	MG/KG	2.00	NC	5.22	J	2.00	MG/KG	Mean	(2)
	Silver	MG/KG	0.104	NC	0.182		0.104	MG/KG	Mean	(2)
	Thallium	MG/KG	0.0562	NC	0.0681		0.0562	MG/KG	Mean	(2)
	Vanadium	MG/KG	2.63	NC	3.44		2.63	MG/KG	Mean	(2)
	Zinc	MG/KG	173	NC	214		173	MG/KG	Mean	(2)
	Dioxins/Furans									
	2,3,7,8-TCDD	MG/KG	0.0000292	NC	0.00007954	J	0.0000292	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.00000030	NC	0.00000048	J	0.00000030	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.0000341	NC	0.0000837		0.0000341	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.0000337	NC	0.0000842		0.0000337	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.0000335	NC	0.0000845		0.0000335	MG/KG	Mean	(2)

Table 69
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Earthworm

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Earthworm
Exposure Medium: Earthworm

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
LYMAN MILL (continued)	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.00000246	NC	0.00000246	0.00000246	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000104	NC	0.0000104	0.0000104	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.000000124	NC	0.000000124	0.000000124	MG/KG	Mean	(2)

(1) Chemicals of potential concern are identified in Table 8 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(2) Mean: Arithmetic Mean

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:
J = Value is estimated.
# = Value is result from second column confirmation analysis.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

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Table 70
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Earthworm

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Earthworm
Exposure Medium: Earthworm

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
GREYSTONE	**Pesticides/PCBs**								
(Background area)	4,4'-DDD	MG/KG	0.0013	NC	0.00205	0.00205	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.0017	NC	0.0019	0.0019	MG/KG	Max	(5)
	4,4'-DDT	MG/KG	0.000961	NC	0.00242	0.00242	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.00144	NC	0.00192	0.00192	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	0.05029	NC	0.07083 J	0.07083	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.03891	NC	0.05875	0.05875	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.0114	NC	0.01287 J	0.01287	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.00081	NC	0.00135	0.00135	MG/KG	Max	(5)
	Endosulfan Sulfate	MG/KG	0.0014	NC	0.00203	0.00203	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.00128	NC	0.00152	0.00152	MG/KG	Max	(5)
	Heptachlor Epoxide	MG/KG	0.00043	NC	0.00031 J	0.00031	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.04054	NC	0.0526 J	0.0526	MG/KG	Max	(5)
	Inorganics								
	Aluminum	MG/KG	2684	NC	3764 J	3764	MG/KG	Max	(5)
	Antimony	MG/KG	0.224	NC	0.357	0.357	MG/KG	Max	(5)
	Arsenic	MG/KG	0.601	NC	0.833	0.833	MG/KG	Max	(5)
	Barium	MG/KG	36.1	NC	51.9	51.9	MG/KG	Max	(5)
	Beryllium	MG/KG	0.253	NC	0.335 J	0.335	MG/KG	Max	(5)
	Cadmium	MG/KG	2.97	NC	4.13	4.13	MG/KG	Max	(5)
	Chromium	MG/KG	9.47	NC	17.2	17.2	MG/KG	Max	(5)
	Cobalt	MG/KG	1.16	NC	1.74	1.74	MG/KG	Max	(5)
	Copper	MG/KG	14	NC	19.4	19.4	MG/KG	Max	(5)
	Iron	MG/KG	1891	NC	2494	2494	MG/KG	Max	(5)
	Lead	MG/KG	28.5	NC	63.2 J	63.2	MG/KG	Max	(5)
	Manganese	MG/KG	227	NC	319	319	MG/KG	Max	(5)
	Mercury	MG/KG	0.0476	NC	0.0762	0.0762	MG/KG	Max	(5)
	Mercury (methyl)	MG/KG	0.00395	NC	0.00468	0.00468	MG/KG	Max	(5)
	Molybdenum	MG/KG	2.29	NC	5.36	5.36	MG/KG	Max	(5)
	Nickel	MG/KG	4.99	NC	10.5	10.5	MG/KG	Max	(5)
	Selenium	MG/KG	0.563	NC	0.996 J	0.996	MG/KG	Max	(5)
	Silver	MG/KG	0.186	NC	0.324	0.324	MG/KG	Max	(5)
	Thallium	MG/KG	0.0551	NC	0.0839	0.0839	MG/KG	Max	(5)

Table 70
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Earthworm

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Earthworm
Exposure Medium: Earthworm

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
GREYSTONE (continued)	Vanadium	MG/KG	4.02	NC	6.37	6.37	MG/KG	Max	(5)
(Background area)	Zinc	MG/KG	85.5	NC	117	117	MG/KG	Max	(5)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.0000004	NC	0.00000047 J	0.00000047	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.00000071	NC	0.00000086 #	0.00000086	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.00000350	NC	0.00000574	0.00000574	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.00000428	NC	0.00000714	0.00000714	MG/KG	Max	(5)
	Toxicity Equivalency - Fish	MG/KG	0.00000306	NC	0.00000543	0.00000543	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0000110	NC	0.000011	0.000011	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000170	NC	0.000017	0.000017	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.000000546	NC	0.0000005460	0.000000546	MG/KG	Max	(5)
ALLENDALE	**Pesticides/PCBs**								
	4,4'-DDD	MG/KG	0.00209	NC	0.00371	0.00371	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.00229	NC	0.003	0.003	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.00256	NC	0.00318	0.00318	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	0.08849	NC	0.12173	0.12173	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.08331	NC	0.11584	0.11584	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.00518	NC	0.00589 J	0.00589	MG/KG	Max	(5)
	delta-BHC	MG/KG	0.00046	NC	0.00066 J	0.00066	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.00286	NC	0.00297	0.00297	MG/KG	Max	(5)
	Endosulfan Sulfate	MG/KG	0.00285	NC	0.00426	0.00426	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.00359	NC	0.00518	0.00518	MG/KG	Max	(5)
	Heptachlor Epoxide	MG/KG	0.00055	NC	0.00127	0.00127	MG/KG	Max	(5)
	Methoxychlor	MG/KG	0.00195	NC	0.004	0.004	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.09396	NC	0.11924	0.11924	MG/KG	Max	(5)
	Inorganics								
	Aluminum	MG/KG	4314	NC	5581	5581	MG/KG	Max	(5)
	Antimony	MG/KG	0.208	NC	0.241	0.241	MG/KG	Max	(5)
	Arsenic	MG/KG	0.567	NC	0.61	0.61	MG/KG	Max	(5)
	Barium	MG/KG	44.1	NC	51.5	51.5	MG/KG	Max	(5)
	Beryllium	MG/KG	0.257	NC	0.297 J	0.297	MG/KG	Max	(5)
	Cadmium	MG/KG	2.37	NC	2.85	2.85	MG/KG	Max	(5)

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Table 70
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Earthworm

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Earthworm
Exposure Medium: Earthworm

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
ALLENDALE (continued)	Chromium	MG/KG	8.16	NC	9.63	9.63	MG/KG	Max	(5)
	Cobalt	MG/KG	0.964	NC	1.12	1.12	MG/KG	Max	(5)
	Copper	MG/KG	10.3	NC	11.7	11.7	MG/KG	Max	(5)
	Iron	MG/KG	2186	NC	2583	2583	MG/KG	Max	(5)
	Lead	MG/KG	28.3	NC	54.6 J	54.6	MG/KG	Max	(5)
	Manganese	MG/KG	159	NC	256	256	MG/KG	Max	(5)
	Mercury	MG/KG	0.0448	NC	0.0535	0.0535	MG/KG	Max	(5)
	Mercury (methyl)	MG/KG	0.0032925	NC	0.00436	0.00436	MG/KG	Max	(5)
	Molybdenum	MG/KG	1.26	NC	1.37	1.37	MG/KG	Max	(5)
	Nickel	MG/KG	2.80	NC	3.01	3.01	MG/KG	Max	(5)
	Selenium	MG/KG	0.32	NC	0.382 J	0.382	MG/KG	Max	(5)
	Silver	MG/KG	0.0768	NC	0.105	0.105	MG/KG	Max	(5)
	Thallium	MG/KG	0.068	NC	0.0757	0.0757	MG/KG	Max	(5)
	Vanadium	MG/KG	4.82	NC	5.76	5.76	MG/KG	Max	(5)
	Zinc	MG/KG	101	NC	116	116	MG/KG	Max	(5)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.00016469	NC	0.0002155 J	0.0002155	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.00000072	NC	0.00000067 #	0.00000067	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.000170	NC	0.000221	0.000221	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.000170	NC	0.000221	0.000221	MG/KG	Max	(5)
	Toxicity Equivalency - Fish	MG/KG	0.000169	NC	0.00022	0.00022	MG/KG	Max	(5)
LYMAN MILL	**Pesticides/PCBs**								
	4,4'-DDD	MG/KG	0.00122	NC	0.00217	0.00217	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.00322	NC	0.00524	0.00524	MG/KG	Max	(5)
	4,4'-DDT	MG/KG	0.0028	NC	0.00717	0.00717	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.00238	NC	0.00317	0.00317	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	0.04197	NC	0.06009 J	0.06009	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.03469	NC	0.05326	0.05326	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.00728	NC	0.0129	0.0129	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.00082	NC	0.00119	0.00119	MG/KG	Max	(5)
	Endosulfan Sulfate	MG/KG	0.0011	NC	0.00139	0.00139	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.001	NC	0.00301	0.00301	MG/KG	Max	(5)

Table 70
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Earthworm

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Earthworm
Exposure Medium: Earthworm

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
LYMAN MILL (continued)	Heptachlor Epoxide	MG/KG	0.0005	NC	0.00086	0.00086	MG/KG	Max	(5)
	Methoxychlor	MG/KG	0.00096	NC	0.00213	0.00213	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.04216	NC	0.07661 J	0.07661	MG/KG	Max	(5)
	Inorganics								
	Aluminum	MG/KG	2333	NC	3462 J	3462	MG/KG	Max	(5)
	Antimony	MG/KG	0.137	NC	0.198	0.198	MG/KG	Max	(5)
	Arsenic	MG/KG	0.74	NC	1.17	1.17	MG/KG	Max	(5)
	Barium	MG/KG	27.77	NC	31.7	31.7	MG/KG	Max	(5)
	Beryllium	MG/KG	0.119	NC	0.173 J	0.173	MG/KG	Max	(5)
	Cadmium	MG/KG	5.29	NC	7.78	7.78	MG/KG	Max	(5)
	Chromium	MG/KG	3.15	NC	3.21	3.21	MG/KG	Max	(5)
	Cobalt	MG/KG	0.6	NC	0.756	0.756	MG/KG	Max	(5)
	Copper	MG/KG	7.4	NC	10.7	10.7	MG/KG	Max	(5)
	Iron	MG/KG	1260	NC	1580	1580	MG/KG	Max	(5)
	Lead	MG/KG	64	NC	99.5 J	99.5	MG/KG	Max	(5)
	Manganese	MG/KG	47.1	NC	75	75	MG/KG	Max	(5)
	Mercury	MG/KG	0.0720	NC	0.151	0.151	MG/KG	Max	(5)
	Mercury (methyl)	MG/KG	0.0011	NC	0.00157 J	0.00157	MG/KG	Max	(5)
	Molybdenum	MG/KG	0.280	NC	0.462	0.462	MG/KG	Max	(5)
	Nickel	MG/KG	1.26	NC	1.63	1.63	MG/KG	Max	(5)
	Selenium	MG/KG	2	NC	5.22 J	5.22	MG/KG	Max	(5)
	Silver	MG/KG	0.104	NC	0.182	0.182	MG/KG	Max	(5)
	Thallium	MG/KG	0.0562	NC	0.0681	0.0681	MG/KG	Max	(5)
	Vanadium	MG/KG	2.63	NC	3.44	3.44	MG/KG	Max	(5)
	Zinc	MG/KG	173	NC	214	214	MG/KG	Max	(5)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.0000292	NC	0.00007954 J	0.00007954	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.00000030	NC	0.00000048 J	0.00000048	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.0000341	NC	0.0000837	0.0000837	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.0000337	NC	0.0000842	0.0000842	MG/KG	Max	(5)
	Toxicity Equivalency - Fish	MG/KG	0.0000335	NC	0.0000845	0.0000845	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.00000246	NC	0.00000246	0.00000246	MG/KG	Max	(5)

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Table 70
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Earthworm

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Earthworm
Exposure Medium: Earthworm

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
LYMAN MILL (continued)	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000104	NC	0.0000104	0.0000104	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.000000124	NC	0.000000124	0.000000124	MG/KG	Max	(5)

(1) Chemicals of potential concern are identified in Table 8 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(5) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test-indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:
J = Value is estimated.
# = Value is result from second column confirmation analysis.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

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TABLE 71
HAZARD QUOTIENTS FOR COIs IN GREYSTONE MILL POND REACH FLOODPLAIN SOILS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Cobalt	4 / 4	MG/KG	20.3	13.1	1000	2.0E-02	1.3E-02
Copper	4 / 4	MG/KG	324	205	50	**6.5E+00**	**4.1E+00**
Lead	4 / 4	MG/KG	591	450	500	**1.2E+00**	9.0E-01
Manganese	4 / 4	MG/KG	4126	1841	100	**4.1E+01**	**1.8E+01**
Mercury	4 / 4	MG/KG	0.811	0.58	0.1	**8.1E+00**	**5.8E+00**
Molybdenum	4 / 4	MG/KG	87.7	54.0	200.00	4.4E-01	2.7E-01
Selenium	3 / 4	MG/KG	0.963	0.70	70	1.4E-02	1.0E-02
Thallium	4 / 4	MG/KG	0.585	0.46	1	5.9E-01	4.6E-01
Vanadium	4 / 4	MG/KG	103	82.3	20	**5.2E+00**	**4.1E+00**
Zinc	4 / 4	MG/KG	497	288	100	**5.0E+00**	**2.9E+00**
					Total Inorganics/Metals	**8.0E+02**	**6.2E+02**
Dioxins							
2,3,7,8-TCDD	1 / 4	MG/KG	0.0000567	0.000017	0.0048	1.2E-02	3.6E-03
					Total TCDD TEQ	1.2E-02	3.6E-03
					Total	**1.1E+03**	**8.5E+02**

Notes:
[a] CT and RME EPCs presented in Tables 67 and 68, respectively.
[b] Soil TRVs based on minimum of available invertebrate screening benchmark values as summarized in Table D-3.
[c] Hazard Quotient is the ratio of the RME concentration to the TRV.
[d] Hazard Quotient is the ratio of the CT concentration to the TRV.
[1]Analyte is not included in the HI totals.

Prepared by: SGD
Checked by: RAR

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TABLE 72
HAZARD QUOTIENTS FOR COPCs IN ALLENDALE POND REACH FLOODPLAIN SOILS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Semivolatile Organics							
Anthracene	7 / 9	MG/KG	0.9	0.50	0.10	**9.0E+00**	**5.0E+00**
Benzo(a)anthracene	9 / 9	MG/KG	2.2	1.1	19.5	1.1E-01	5.5E-02
Benzo(a)pyrene	9 / 9	MG/KG	2.4	0.99	0.10	**2.4E+01**	**9.9E+00**
Benzo(b)fluoranthene	8 / 9	MG/KG	5.2	1.6	21.3	2.4E-01	7.7E-02
Benzo(g,h,i)perylene	7 / 9	MG/KG	0.94	0.50	12.7	7.4E-02	3.9E-02
Benzo(k)fluoranthene	3 / 9	MG/KG	3.1	0.65	16.8	1.8E-01	3.8E-02
Chrysene	9 / 9	MG/KG	2.7	1.2	18.8	1.4E-01	6.2E-02
Dibenzo(a,h)anthracene	4 / 9	MG/KG	0.35	0.35	11.8	3.0E-02	3.0E-02
Fluoranthene	9 / 9	MG/KG	4.7	2.4	0.10	**4.7E+01**	**2.4E+01**
Indeno(1,2,3-cd)pyrene	7 / 9	MG/KG	1.1	0.53	12.1	9.1E-02	4.3E-02
Phenanthrene	9 / 9	MG/KG	3.5	1.6	0.10	**3.5E+01**	**1.6E+01**
Pyrene	9 / 9	MG/KG	5.2	2.2	0.10	**5.2E+01**	**2.2E+01**
Total PAH[1]	9 / 9	MG/KG	27	13.3	1.0	**2.7E+01**	**1.3E+01**
					Total Semivolatile Organics	**1.7E+02**	7.8E+01
Pesticides							
4,4'-DDD	2 / 9	MG/KG	0.015	0.0096	0.0025	**6.0E+00**	**3.8E+00**
4,4'-DDE	4 / 9	MG/KG	0.049	0.019	0.0025	**2.0E+01**	**7.4E+00**
4,4'-DDT	4 / 9	MG/KG	0.14	0.03	0.0025	**5.6E+01**	**1.1E+01**
beta-BHC	1 / 9	MG/KG	0.0031	0.0031	0.0010	**3.1E+00**	**3.1E+00**
Dieldrin	3 / 9	MG/KG	0.027	0.0086	0.00050	**5.4E+01**	**1.7E+01**
Endrin	2 / 9	MG/KG	0.011	0.0087	0.0010	**1.1E+01**	**8.7E+00**
Technical Chlordane	1 / 7	MG/KG	0.0061	0.0061	0.10	6.1E-02	6.1E-02
					Total Pesticides	**1.5E+02**	**5.1E+01**
PCBs							
Aroclor-1248	3 / 39	MG/KG	1.6	0.57	18.3	8.9E-02	3.1E-02
Aroclor-1254	37 / 39	MG/KG	7.0	2.1	16.5	4.3E-01	1.3E-01
					Total PCBs	5.2E-01	1.6E-01
Inorganics/Metals							
Antimony	1 / 6	MG/KG	0.59	0.59	3.5	1.7E-01	1.7E-01
Arsenic	8 / 8	MG/KG	5	2.3	60	8.3E-02	3.9E-02
Barium	8 / 8	MG/KG	66.6	35.1	3000	2.2E-02	1.2E-02

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TABLE 72
HAZARD QUOTIENTS FOR COPCs IN ALLENDALE POND REACH FLOODPLAIN SOILS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Beryllium	8 / 8	MG/KG	0.74	0.49	1.1	6.7E-01	4.5E-01
Cadmium	2 / 8	MG/KG	0.53	0.21	20	2.7E-02	1.1E-02
Chromium	8 / 8	MG/KG	30.5	12.1	0.40	**7.6E+01**	**3.0E+01**
Cobalt	8 / 8	MG/KG	13.8	5.3	1000	1.4E-02	5.3E-03
Copper	8 / 8	MG/KG	28.5	16.9	50	5.7E-01	3.4E-01
Lead	8 / 8	MG/KG	139	52.3	500	2.8E-01	1.0E-01
Manganese	8 / 8	MG/KG	1130	325	100	**1.1E+01**	**3.3E+00**
Mercury	4 / 8	MG/KG	0.14	0.068	0.10	**1.4E+00**	6.8E-01
Molybdenum	6 / 7	MG/KG	6.7	2.2	200	3.4E-02	1.1E-02
Selenium	5 / 8	MG/KG	1.4	1.4	70	2.0E-02	2.0E-02
Vanadium	8 / 8	MG/KG	34.6	17.2	20	**1.7E+00**	8.6E-01
Zinc	8 / 8	MG/KG	114	60.6	100	**1.1E+00**	6.1E-01
					Total Inorganics/Metals	**9.4E+01**	**3.7E+01**
Dioxins							
2,3,7,8-TCDD	91 / 108	MG/KG	0.0024	0.00083	0.0048	5.0E-01	1.7E-01
					Total TCDD TEQ	5.0E-01	1.7E-01
					Total	**4.1E+02**	**1.7E+02**

Notes:
[a] CT and RME EPCs presented in Tables 67 and 68, respectively.
[b] Soil TRVs based on minimum of available invertebrate screening benchmark values as summarized in Table D-3.
[c] Hazard Quotient is the ratio of the RME concentration to the TRV.
[d] Hazard Quotient is the ratio of the CT concentration to the TRV.
[1]Analyte is not included in the HI totals.

Prepared by: SGD
Checked by: RAR

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TABLE 73
HAZARD QUOTIENTS FOR COPCs IN LYMAN MILL POND REACH FLOODPLAIN SOILS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Semivolatile Organics							
Anthracene	3 / 3	MG/KG	0.27532	0.13	0.10	**2.8E+00**	**1.3E+00**
Benzo(a)anthracene	3 / 3	MG/KG	1.74881	0.76	19.5	9.0E-02	3.9E-02
Benzo(a)pyrene	3 / 3	MG/KG	2.06637	0.90	0.10	**2.1E+01**	**9.0E+00**
Benzo(b)fluoranthene	3 / 3	MG/KG	2.81441	1.2	21.3	1.3E-01	5.5E-02
Benzo(g,h,i)perylene	3 / 3	MG/KG	1.97047	0.83	12.7	1.5E-01	6.5E-02
Benzo(k)fluoranthene	3 / 3	MG/KG	2.38312	1.0	16.8	1.4E-01	6.0E-02
Chrysene	3 / 3	MG/KG	2.83046	1.2	18.8	1.5E-01	6.4E-02
Dibenzo(a,h)anthracene	3 / 3	MG/KG	0.46627	0.20	11.8	4.0E-02	1.7E-02
Fluoranthene	3 / 3	MG/KG	4.87119	2.1	0.10	**4.9E+01**	**2.1E+01**
Indeno(1,2,3-cd)pyrene	3 / 3	MG/KG	2.1227	0.89	12.1	1.7E-01	7.4E-02
Phenanthrene	3 / 3	MG/KG	2.13094	0.93	0.10	**2.1E+01**	**9.3E+00**
Pyrene	3 / 3	MG/KG	3.84604	1.7	0.10	**3.8E+01**	**1.7E+01**
Total PAH[1]	3 / 3	MG/KG	28.10184	12.0	1.0	**2.8E+01**	**1.2E+01**
					Total Semivolatile Organics	**1.3E+02**	**5.7E+01**
Pesticides							
4,4'-DDD	3 / 3	MG/KG	0.01315	0.0069	0.0025	**5.3E+00**	**2.8E+00**
4,4'-DDE	3 / 3	MG/KG	0.03159	0.017	0.0025	**1.3E+01**	**6.7E+00**
4,4'-DDT	3 / 3	MG/KG	0.04313	0.018	0.0025	**1.7E+01**	**7.3E+00**
Dieldrin	2 / 3	MG/KG	0.0054	0.0028	0.00050	**1.1E+01**	**5.6E+00**
Technical Chlordane	3 / 3	MG/KG	0.45584	0.21	0.10	**4.6E+00**	**2.1E+00**
					Total Pesticides	**5.1E+01**	**2.4E+01**
PCBs							
Aroclor-1254	3 / 3	MG/KG	0.25305	0.15	16.5	1.5E-02	9.1E-03
Aroclor-1268	3 / 3	MG/KG	0.02507	0.024	861	2.9E-05	2.8E-05
					Total PCBs	1.5E-02	9.1E-03
Inorganics/Metals							
Antimony	2 / 3	MG/KG	0.704	0.32	3.5	2.0E-01	9.3E-02
Arsenic	3 / 3	MG/KG	7.42	5.5	60	1.2E-01	9.2E-02
Barium	3 / 3	MG/KG	842	340	3000	2.8E-01	1.1E-01
Beryllium	3 / 3	MG/KG	1.06	0.80	1.1	9.6E-01	7.3E-01
Cadmium	3 / 3	MG/KG	3.18	1.8	20	1.6E-01	9.0E-02
Chromium	2 / 3	MG/KG	107	51.5	0.4	**2.7E+02**	**1.3E+02**

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TABLE 73
HAZARD QUOTIENTS FOR COPCs IN LYMAN MILL POND REACH FLOODPLAIN SOILS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	TRV [b]	Hazard Quotients RME [c]	Hazard Quotients CT [d]
Cobalt	3 / 3	MG/KG	7.47	5.8	1000	7.5E-03	5.8E-03
Copper	3 / 3	MG/KG	400	173	50	**8.0E+00**	**3.5E+00**
Lead	3 / 3	MG/KG	901	436	500	**1.8E+00**	8.7E-01
Manganese	3 / 3	MG/KG	740	506	100	**7.4E+00**	**5.1E+00**
Mercury	3 / 3	MG/KG	0.245	0.20	0.10	**2.5E+00**	**2.0E+00**
Molybdenum	3 / 3	MG/KG	3.48	2.5	200	1.7E-02	1.3E-02
Selenium	1 / 3	MG/KG	0.779	0.43	70	1.1E-02	6.1E-03
Thallium	3 / 3	MG/KG	0.575	0.38	1.0	5.8E-01	3.8E-01
Vanadium	3 / 3	MG/KG	42.6	37.6	20	**2.1E+00**	**1.9E+00**
Zinc	3 / 3	MG/KG	1150	489	100	**1.2E+01**	**4.9E+00**
					Total Inorganics/Metals	**3.0E+02**	**1.5E+02**
Dioxins							
2,3,7,8-TCDD	2 / 3	MG/KG	0.00113007	0.00042	0.0048	2.3E-01	8.7E-02
					Total TCDD TEQ	2.3E-01	8.7E-02
					Total	**4.9E+02**	**2.3E+02**

Notes:
[a] CT and RME EPCs presented in Tables 67 and 68, respectively.
[b] Soil TRVs based on minimum of available invertebrate screening benchmark values as summarized in Table D-3.
[c] Hazard Quotient is the ratio of the RME concentration to the TRV.
[d] Hazard Quotient is the ratio of the CT concentration to the TRV.
[1]Analyte is not included in the HI totals.

Prepared by: SGD
Checked by: RAR

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TABLE 74
CBR-BASED HAZARD QUOTIENTS FOR COIs IN GREYSTONE EARTHWORM TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Pesticides								
4,4'-DDD	4 / 4	MG/KG	0.00205	0.0013	0.008	0.6	1.7E-01	2.2E-03
4,4'-DDE	4 / 4	MG/KG	0.0019	0.0017	0.042	0.29	4.1E-02	5.9E-03
4,4'-DDT	1 / 4	MG/KG	0.00242	0.000961	0.13	0.15	7.4E-03	6.4E-03
alpha-Chlordane	4 / 4	MG/KG	0.00192	0.00144				
Dieldrin	2 / 4	MG/KG	0.00135	0.00081	0.01	0.08	8.1E-02	1.0E-02
Endosulfan Sulfate	4 / 4	MG/KG	0.00203	0.0014				
gamma-Chlordane	4 / 4	MG/KG	0.00152	0.00128				
Heptachlor Epoxide	1 / 4	MG/KG	0.00031	0.00031	0.01	0.01	3.1E-02	3.1E-02
Technical Chlordane	4 / 4	MG/KG	0.0526	0.04054		0.02		**2.0E+00**
						Total Pesticides	3.3E-01	**2.1E+00**
PCBs								
Aroclor, Total	4 / 4	MG/KG	0.07083	0.05029				
Aroclor-1254	4 / 4	MG/KG	0.05875	0.03891		8.1		4.8E-03
Aroclor-1268	4 / 4	MG/KG	0.01287	0.0114		0.45		2.5E-02
						Total PCBs	0.0E+00	3.0E-02
Inorganics/Metals								
Aluminum	4 / 4	MG/KG	3764	2684	1	8	**2.7E+03**	**3.4E+02**
Antimony	4 / 4	MG/KG	0.357	0.224	5	9	4.5E-02	2.5E-02
Arsenic	4 / 4	MG/KG	0.833	0.601	1.03	4.2	5.8E-01	1.4E-01
Barium	4 / 4	MG/KG	51.9	36.1		0.41		**8.8E+01**
Beryllium	4 / 4	MG/KG	0.335	0.253	5.13		4.9E-02	
Cadmium	4 / 4	MG/KG	4.13	2.97		0.0934		**3.2E+01**
Chromium	4 / 4	MG/KG	17.2	9.47				
Cobalt	4 / 4	MG/KG	1.74	1.16				
Copper	4 / 4	MG/KG	19.4	14	3.4	4.4	**4.1E+00**	**3.2E+00**
Iron	4 / 4	MG/KG	2494	1891				
Lead	4 / 4	MG/KG	63.2	28.5	2.28	5.8	**1.2E+01**	**4.9E+00**
Manganese	4 / 4	MG/KG	319	227	18.4		**1.2E+01**	
Mercury	4 / 4	MG/KG	0.0762	0.0476	1.53	1.64	3.1E-02	2.9E-02
Mercury (methyl)	4 / 4	MG/KG	0.00468	0.00395		0.043		9.2E-02
Molybdenum	4 / 4	MG/KG	5.36	2.29				
Nickel	4 / 4	MG/KG	10.5	4.99	0.59	0.59	**8.5E+00**	**8.5E+00**
Selenium	4 / 4	MG/KG	0.996	0.56		0.2		**2.8E+00**

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TABLE 74
CBR-BASED HAZARD QUOTIENTS FOR COIs IN GREYSTONE EARTHWORM TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Silver	4 / 4	MG/KG	0.324	0.1858	5.36	1650	3.5E-02	1.1E-04
Thallium	4 / 4	MG/KG	0.0839	0.06	2.72		2.0E-02	
Vanadium	4 / 4	MG/KG	6.37	4.02		0.41		**9.8E+00**
Zinc	4 / 4	MG/KG	117	85.48	12.7	19.5	**6.7E+00**	**4.4E+00**
						Total Inorganics/Metals	**2.7E+03**	**4.9E+02**
Dioxins								
2,3,7,8-TCDD[1]	3 / 4	MG/KG	0.00000047	0.0000004	0.0003	0.003	1.2E-03	1.2E-04
Toxicity Equivalency - Fish	4 / 4	MG/KG	0.00000543	0.00000306	0.0003	0.003	1.0E-02	1.0E-03
Toxicity Equivalency (PCB) - Fish	1 / 1	MG/KG	0.0000005460	0.000000546	0.0003	0.003	1.8E-03	1.8E-04
						Total TCDD TEQ	1.2E-02	1.2E-03
						Total	**2.7E+03**	**4.9E+02**

Notes:
[a] CT and RME EPCs presented in Tables 69 and 70, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 75
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN ALLENDALE EARTHWORM TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Pesticides								
4,4'-DDD	4 / 4	MG/KG	0.00371	0.00209	0.008	0.6	2.6E-01	3.5E-03
4,4'-DDE	4 / 4	MG/KG	0.003	0.00229	0.042	0.29	5.4E-02	7.9E-03
alpha-Chlordane	4 / 4	MG/KG	0.00318	0.00256				
delta-BHC	1 / 4	MG/KG	0.00066	0.00046				
Dieldrin	4 / 4	MG/KG	0.00297	0.00286	0.01	0.08	2.9E-01	3.6E-02
Endosulfan Sulfate	4 / 4	MG/KG	0.00426	0.00285				
gamma-Chlordane	4 / 4	MG/KG	0.00518	0.00359				
Heptachlor Epoxide	4 / 4	MG/KG	0.00127	0.00055	0.01	0.01	5.5E-02	5.5E-02
Methoxychlor	2 / 4	MG/KG	0.004	0.00195	0.1	0.1	2.0E-02	2.0E-02
Technical Chlordane	4 / 4	MG/KG	0.11924	0.09396		0.02		**4.7E+00**
						Total Pesticides	6.8E-01	**4.8E+00**
PCBs								
Aroclor, Total	4 / 4	MG/KG	0.12173	0.08849				
Aroclor-1254	4 / 4	MG/KG	0.11584	0.08331		8.1		1.0E-02
Aroclor-1268	4 / 4	MG/KG	0.00589	0.00518		0.45		1.2E-02
						Total PCBs	0.0E+00	2.2E-02
Inorganics/Metals								
Aluminum	4 / 4	MG/KG	5581	4314	1	8	**4.3E+03**	**5.4E+02**
Antimony	4 / 4	MG/KG	0.241	0.208	5	9	4.2E-02	2.3E-02
Arsenic	4 / 4	MG/KG	0.61	0.567	1.03	4.2	5.5E-01	1.3E-01
Barium	4 / 4	MG/KG	51.5	44.1		0.41		**1.1E+02**
Beryllium	4 / 4	MG/KG	0.297	0.26	5.13		5.0E-02	
Cadmium	4 / 4	MG/KG	2.85	2.37		0.0934		**2.5E+01**
Chromium	4 / 4	MG/KG	9.63	8				
Cobalt	4 / 4	MG/KG	1.12	0.964				
Copper	4 / 4	MG/KG	11.7	10.3	3.4	4.4	**3.0E+00**	**2.3E+00**
Iron	4 / 4	MG/KG	2583	2186				
Lead	4 / 4	MG/KG	54.6	28	2.28	5.8	**1.2E+01**	**4.9E+00**
Manganese	4 / 4	MG/KG	256	159	18.4		**8.6E+00**	
Mercury	4 / 4	MG/KG	0.0535	0.0448	1.53	1.64	2.9E-02	2.7E-02
Mercury (methyl)	4 / 4	MG/KG	0.00436	0.0033		0.043		7.7E-02
Molybdenum	4 / 4	MG/KG	1.37	1.26				
Nickel	4 / 4	MG/KG	3.01	2.7950	0.59	0.59	**4.7E+00**	**4.7E+00**

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TABLE 75
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN ALLENDALE EARTHWORM TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Selenium	4 / 4	MG/KG	0.382	0.32		0.2		**1.6E+00**
Silver	4 / 4	MG/KG	0.105	0.08	5.36	1650	1.4E-02	4.7E-05
Thallium	4 / 4	MG/KG	0.0757	0.0678	2.72		2.5E-02	
Vanadium	4 / 4	MG/KG	5.76	4.82		0.41		**1.2E+01**
Zinc	4 / 4	MG/KG	116	101	12.7	19.5	**8.0E+00**	**5.2E+00**
						Total Inorganics/Metals	**4.4E+03**	**7.0E+02**
Dioxins								
2,3,7,8-TCDD[1]	4 / 4	MG/KG	0.0002155	0.00016469	0.0003	0.003	5.5E-01	5.5E-02
Toxicity Equivalency - Fish	4 / 4	MG/KG	0.00022	0.000169	0.0003	0.003	5.6E-01	5.6E-02
						Total TCDD TEQ	5.6E-01	5.6E-02
						Total	**4.4E+03**	**7.1E+02**

Notes:
[a] CT and RME EPCs presented in Tables 69 and 70, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 76
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN LYMAN MILL EARTHWORM TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Pesticides								
4,4'-DDD	2 / 3	MG/KG	0.00217	0.00122	0.008	0.6	1.5E-01	2.0E-03
4,4'-DDE	3 / 3	MG/KG	0.00524	0.00322	0.042	0.29	7.7E-02	1.1E-02
4,4'-DDT	3 / 3	MG/KG	0.00717	0.0028	0.13	0.15	2.2E-02	1.9E-02
alpha-Chlordane	3 / 3	MG/KG	0.00317	0.00238				
Dieldrin	3 / 3	MG/KG	0.00119	0.00082	0.01	0.08	8.2E-02	1.0E-02
Endosulfan Sulfate	3 / 3	MG/KG	0.00139	0.00109				
gamma-Chlordane	3 / 3	MG/KG	0.00301	0.001				
Heptachlor Epoxide	2 / 3	MG/KG	0.00086	0.0005	0.01	0.01	5.4E-02	5.4E-02
Methoxychlor	2 / 3	MG/KG	0.00213	0.001	0.1	0.1	9.6E-03	9.6E-03
Technical Chlordane	3 / 3	MG/KG	0.07661	0.04216		0.02		**2.1E+00**
						Total Pesticides	4.0E-01	**2.2E+00**
PCBs								
Aroclor, Total	3 / 3	MG/KG	0.06009	0.04197				
Aroclor-1254	3 / 3	MG/KG	0.05326	0.03469		8.1		4.3E-03
Aroclor-1268	3 / 3	MG/KG	0.0129	0.00728		0.45		1.6E-02
						Total PCBs	0.0E+00	2.0E-02
Inorganics/Metals								
Aluminum	3 / 3	MG/KG	3462	2333	1	8	**2.3E+03**	**2.9E+02**
Antimony	3 / 3	MG/KG	0.198	0.137	5	9	2.7E-02	1.5E-02
Arsenic	3 / 3	MG/KG	1.17	0.74	1.03	4.2	7.2E-01	1.8E-01
Barium	3 / 3	MG/KG	31.7	27.8		0.41		**6.8E+01**
Beryllium	3 / 3	MG/KG	0.173	0.119	5.13		2.3E-02	
Cadmium	3 / 3	MG/KG	7.78	5.29		0.0934		**5.7E+01**
Chromium	3 / 3	MG/KG	3.21	3.15				
Cobalt	3 / 3	MG/KG	0.756	0.627				
Copper	3 / 3	MG/KG	10.7	7.4	3.4	4.4	**2.2E+00**	**1.7E+00**
Iron	3 / 3	MG/KG	1580	1260				
Lead	3 / 3	MG/KG	99.5	64	2.28	5.8	**2.8E+01**	**1.1E+01**
Manganese	3 / 3	MG/KG	75	47.1	18.4		**2.6E+00**	
Mercury	3 / 3	MG/KG	0.151	0.0720	1.53	1.64	4.7E-02	4.4E-02
Mercury (methyl)	3 / 3	MG/KG	0.00157	0.0011		0.043		2.6E-02
Molybdenum	3 / 3	MG/KG	0.462	0.280				
Nickel	3 / 3	MG/KG	1.63	1.255	0.59	0.59	**2.1E+00**	**2.1E+00**

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TABLE 76
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN LYMAN MILL EARTHWORM TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Selenium	3 / 3	MG/KG	5.22	2.00		0.2		**1.0E+01**
Silver	3 / 3	MG/KG	0.182	0.10	5.36	1650	1.9E-02	6.3E-05
Thallium	3 / 3	MG/KG	0.0681	0.0562	2.72		2.1E-02	
Vanadium	3 / 3	MG/KG	3.44	2.63		0.41		**6.4E+00**
Zinc	3 / 3	MG/KG	214	173	12.7	19.5	**1.4E+01**	**8.9E+00**
						Total Inorganics/Metals	**2.4E+03**	**4.6E+02**
Dioxins								
2,3,7,8-TCDD[1]	3 / 3	MG/KG	0.00007954	0.0000292	0.0003	0.003	9.7E-02	9.7E-03
Toxicity Equivalency - Fish	3 / 3	MG/KG	0.0000845	0.0000335	0.0003	0.003	1.1E-01	1.1E-02
Toxicity Equivalency (PCB) - Fish	1 / 1	MG/KG	0.000000124	0.000000124	0.0003	0.003	4.1E-04	4.1E-05
						Total TCDD TEQ	1.1E-01	1.1E-02
						Total	**2.4E+03**	**4.6E+02**

Notes:
[a] CT and RME EPCs presented in Tables 69 and 70, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

TABLE 77
INCREMENTAL RISK SUMMARY FOR FLOODPLAIN SOIL (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Greystone			
Analyte	RME	CT	RME	CT	RME	CT
Endrin	**1.1E+01**	**8.7E+00**			**1.1E+01**	**8.7E+00**
4,4'-DDT	**5.6E+01**	**1.1E+01**	**7.3E+00**	**3.4E+00**	**4.9E+01**	**7.7E+00**
Dieldrin	**5.4E+01**	**1.7E+01**	**1.9E+01**	**1.3E+01**	**3.5E+01**	**4.6E+00**
beta-BHC	**3.1E+00**	**3.1E+00**			**3.1E+00**	**3.1E+00**
4,4'-DDE	**2.0E+01**	**7.4E+00**	**8.2E+00**	**5.3E+00**	**1.1E+01**	**2.1E+00**
4,4'-DDD	**6.0E+00**	**3.8E+00**	**6.1E+00**	**3.3E+00**		5.3E-01
Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	RME	CT	RME	CT	RME	CT
4,4'-DDT	**1.7E+01**	**7.3E+00**	**7.3E+00**	**3.4E+00**	**9.9E+00**	**3.8E+00**
Zinc	**1.2E+01**	**4.9E+00**	**5.0E+00**	**2.9E+00**	**6.5E+00**	**2.0E+00**
4,4'-DDE	**1.3E+01**	**6.7E+00**	**8.2E+00**	**5.3E+00**	**4.4E+00**	**1.4E+00**
Copper	**8.0E+00**	**3.5E+00**	**6.5E+00**	**4.1E+00**	**1.5E+00**	
Lead	**1.8E+00**	8.7E-01	**1.2E+00**	9.0E-01	6.2E-01	

Notes:
Risk estimates as calculated and presented in Tables 71 through 73.
Incremental risks calculated for all analytes with RME-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

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TABLE 79
WEIGHT-OF-EVIDENCE INTEGRATION: FLOODPLAIN SOIL INVERTEBRATE COMMUNITY

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Assessment Endpoint 1b. Protection and maintenance (i.e., survival, growth, reproduction) of floodplain invertebrate communities which are a forage base for wildlife.

A. Do measured concentrations of COPCs in floodplain soil exceed appropriate guidelines for the protection of floodplain soil invertebrate populations?
B. Do measured and modeled concentrations of COPCs in the tissues of floodplain soil invertebrates (such as earthworms) exceed benchmarks for residue effects on survival, growth or reproduction?
C. Do the available floodplain soil invertebrate data indicate presence/absence of ecological integrity?

Measurement Endpoints[a]

A. Comparison of floodplain soil COPC concentrations to benchmarks/guidelines
B. Comparison of measured site-specific COPC concentrations in floodplain soil invertebrates to CBRs
C. Site-specific study of floodplain soil invertebrate community structure/function

Weight-of-Evidence Integration[b]

	WEIGHT				
RISK/MAGNITUDE	Low	Low - Medium	Medium	Medium - High	High
Yes/High		**A, B**			
Yes/Low					
Undeterminate					
No/Low					
No/Very Low			**C**		

Risk Conclusion:

The soil invertebrate community occuring within the Woonasquatucket River floodplain at the study area is not likely at substantial risk of harm due to exposure to Site-related contaminants in floodplain soil or tissue residues.

Notes:
a. Measurement endpoints and assigned weights are discussed in Section 2.6.
b. WOE integration is discussed in Section 4.4.

Prepared by: NAR
Checked by: SGH

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Table 80
Medium-Specific Exposure Point Concentration Summary - Central Tendency
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
ASSAPUMPSET	**Semivolatile Organics**									
(Reference area)	1,1'-Biphenyl	MG/KG	0.00064	NC	0.00076	J	0.00064	MG/KG	Mean	(2)
Brown Bullhead used as	2-Methylnaphthalene	MG/KG	0.0173	NC	0.02429		0.0173	MG/KG	Mean	(2)
a surrogate species for	Acenaphthene	MG/KG	0.00059	NC	0.00041	J	0.00041	MG/KG	Max	(3)
Assapumpset	Acenaphthylene	MG/KG	0.00091	NC	0.00122	J	0.00091	MG/KG	Mean	(2)
	Anthracene	MG/KG	0.00079	NC	0.00105	J	0.00079	MG/KG	Mean	(2)
	Benzo(a)anthracene	MG/KG	0.00334	NC	0.00808		0.00334	MG/KG	Mean	(2)
	Benzo(a)pyrene	MG/KG	0.00329	NC	0.00791		0.00329	MG/KG	Mean	(2)
	Benzo(b)fluoranthene	MG/KG	0.004177	NC	0.01058		0.004177	MG/KG	Mean	(2)
	Benzo(g,h,i)perylene	MG/KG	0.00219	NC	0.00462		0.00219	MG/KG	Mean	(2)
	Benzo(k)fluoranthene	MG/KG	0.00363	NC	0.00894		0.00363	MG/KG	Mean	(2)
	Chrysene	MG/KG	0.004520	NC	0.01161		0.004520	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.00108	NC	0.00129	J	0.00108	MG/KG	Mean	(2)
	Dibenzofuran	MG/KG	0.00055	NC	0.00067	J	0.00055	MG/KG	Mean	(2)
	Fluoranthene	MG/KG	0.00960	NC	0.02088		0.00960	MG/KG	Mean	(2)
	Fluorene	MG/KG	0.00090	NC	0.00119	J	0.00090	MG/KG	Mean	(2)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.00283	NC	0.00653		0.00283	MG/KG	Mean	(2)
	Naphthalene	MG/KG	0.00774	NC	0.01204		0.00774	MG/KG	Mean	(2)
	Phenanthrene	MG/KG	0.0071	NC	0.00776		0.0071	MG/KG	Mean	(2)
	Pyrene	MG/KG	0.005867	NC	0.01562		0.005867	MG/KG	Mean	(2)
	Total PAH	MG/KG	0.07003	NC	0.1145	J	0.07003	MG/KG	Mean	(2)
	Pesticides/PCBs									
	4,4'-DDD	MG/KG	0.00236	NC	0.00413		0.00236	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.01270	NC	0.02374		0.01270	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.00174	NC	0.00288		0.00174	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.00094	NC	0.0013	J	0.00094	MG/KG	Mean	(2)
	Inorganics									
	Aluminum	MG/KG	9.94	NC	13.5		9.94	MG/KG	Mean	(2)
	Barium	MG/KG	0.923	NC	1.21	J	0.923	MG/KG	Mean	(2)
	Beryllium	MG/KG	0.0014	NC	0.000348	J	0.000348	MG/KG	Max	(3)
	Cadmium	MG/KG	0.015	NC	0.0319	J	0.015	MG/KG	Mean	(2)
	Chromium	MG/KG	0.0912	NC	0.1	J	0.0912	MG/KG	Mean	(2)

Table 80
Medium-Specific Exposure Point Concentration Summary - Central Tendency
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ASSAPUMPSET (continued)	Cobalt	MG/KG	0.0396	NC		0.0456	J	0.0396	MG/KG	Mean	(2)
(Reference area)	Copper	MG/KG	0.5803	NC		0.688		0.580	MG/KG	Mean	(2)
	Iron	MG/KG	50	NC		58.1	J	50	MG/KG	Mean	(2)
	Lead	MG/KG	0.0894	NC		0.129	J	0.0894	MG/KG	Mean	(2)
	Manganese	MG/KG	4.32	NC		5.42	J	4.32	MG/KG	Mean	(2)
	Mercury	MG/KG	0.077	NC		0.137	J	0.077	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.0775	NC		0.145		0.0775	MG/KG	Mean	(2)
	Nickel	MG/KG	0.0381	NC		0.0439	J	0.0381	MG/KG	Mean	(2)
	Selenium	MG/KG	0.194	NC		0.196	J	0.194	MG/KG	Mean	(2)
	Silver	MG/KG	0.0212	NC		0.0236	J	0.0212	MG/KG	Mean	(2)
	Thallium	MG/KG	0.00838	NC		0.00315	J	0.00315	MG/KG	Max	(3)
	Vanadium	MG/KG	0.0706	NC		0.0711	J	0.0706	MG/KG	Mean	(2)
	Zinc	MG/KG	9.78	NC		12.2		9.78	MG/KG	Mean	(2)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.000000605	NC		0.00000151	J	0.000000605	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.00000021	NC		0.0000002	J	0.0000002	MG/KG	Max	(3)
	Toxicity Equivalency - Mammals	MG/KG	0.00000216	NC		0.00000258		0.00000216	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.00000239	NC		0.00000284		0.00000239	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.00000220	NC		0.00000263		0.00000220	MG/KG	Mean	(2)
GREYSTONE	**Semivolatile Organics**										
(Background area)	1,1'-Biphenyl	MG/KG	0.001	0.001	NP	0.00174	J	0.001	MG/KG	Mean	(2)
	2-Methylnaphthalene	MG/KG	0.00554	0.00652	T	0.0073		0.00554	MG/KG	Mean	(2)
	Acenaphthene	MG/KG	0.00404	0.00404	NP	0.00607		0.00404	MG/KG	Mean	(2)
	Acenaphthylene	MG/KG	0.00388	0.00482	N	0.00706		0.00388	MG/KG	Mean	(2)
	Anthracene	MG/KG	0.005	0.006	N	0.00928		0.005	MG/KG	Mean	(2)
	Benzo(a)anthracene	MG/KG	0.00175	0.00227	T	0.00331		0.00175	MG/KG	Mean	(2)
	Benzo(a)pyrene	MG/KG	0.00112	0.00112	NP	0.00273		0.00112	MG/KG	Mean	(2)
	Benzo(b)fluoranthene	MG/KG	0.00148	0.00148	NP	0.0035		0.00148	MG/KG	Mean	(2)
	Benzo(g,h,i)perylene	MG/KG	0.000988	0.000988	NP	0.00138	J	0.000988	MG/KG	Mean	(2)
	Benzo(k)fluoranthene	MG/KG	0.00141	0.00141	NP	0.00313		0.00141	MG/KG	Mean	(2)
	Chrysene	MG/KG	0.00316	0.00557	T	0.00563		0.00316	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.00069	0.00069	NP	0.00039	J	0.00039	MG/KG	Max	(3)

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Table 80
Medium-Specific Exposure Point Concentration Summary - Central Tendency
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
GREYSTONE (continued)	Dibenzofuran	MG/KG	0.00355	0.00417	N	0.00542		0.00355	MG/KG	Mean	(2)
(Background area)	Fluoranthene	MG/KG	0.01304	0.01700	T	0.02085		0.01304	MG/KG	Mean	(2)
	Fluorene	MG/KG	0.00608	0.00608	NP	0.00977		0.00608	MG/KG	Mean	(2)
	Naphthalene	MG/KG	0.00232	0.00232	NP	0.00524		0.00232	MG/KG	Mean	(2)
	Phenanthrene	MG/KG	0.0172	0.0172	NP	0.02832		0.0172	MG/KG	Mean	(2)
	Pyrene	MG/KG	0.00576	0.00576	NP	0.0114		0.00576	MG/KG	Mean	(2)
	Total PAH	MG/KG	0.07101	0.07101	NP	0.11303	J	0.07101	MG/KG	Mean	(2)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0174	0.0218	T	0.02488		0.0174	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.04306	0.05130	N	0.06803		0.04306	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.00626	0.00626	NP	0.01314	J	0.00626	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.02094	0.02431	T	0.02862		0.02094	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.25748	0.25748	NP	0.51925		0.25748	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.20236	0.20236	NP	0.35135		0.20236	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.05512	0.05512	NP	0.16789		0.05512	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.00417	0.00417	NP	0.02346		0.00417	MG/KG	Mean	(2)
	gamma-BHC	MG/KG	0.00081	0.00081	NP	0.00103	J	0.00081	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.0112	0.0112	NP	0.01453		0.0112	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.00081	0.00081	NP	0.00123	J	0.00081	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.2820	0.2820	NP	0.34491		0.2820	MG/KG	Mean	(2)
	Inorganics										
	Aluminum	MG/KG	30.3	48.1	T	52.8		30.3	MG/KG	Mean	(2)
	Antimony	MG/KG	0.0122	0.0122	NP	0.00105	J	0.00105	MG/KG	Max	(3)
	Barium	MG/KG	0.913	0.913	NP	1.25		0.913	MG/KG	Mean	(2)
	Beryllium	MG/KG	0.00518	0.00595	N	0.00736		0.00518	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.0395	0.0395	NP	0.0289	J	0.0289	MG/KG	Max	(3)
	Chromium	MG/KG	0.118	0.118	NP	0.163	J	0.118	MG/KG	Mean	(2)
	Cobalt	MG/KG	0.0791	0.0791	NP	0.388	J	0.0791	MG/KG	Mean	(2)
	Copper	MG/KG	1.01	1.18	T	1.52	J	1.01	MG/KG	Mean	(2)
	Iron	MG/KG	48.2	55.9	N	66.3		48.2	MG/KG	Mean	(2)
	Lead	MG/KG	0.012	0.012	NP	0.022	J	0.012	MG/KG	Mean	(2)
	Manganese	MG/KG	6.21	9.57	T	12.1	J	6.21	MG/KG	Mean	(2)

Table 80
Medium-Specific Exposure Point Concentration Summary - Central Tendency
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
GREYSTONE (continued)	Mercury	MG/KG	0.190	0.190	NP	0.278		0.190	MG/KG	Mean	(2)
(Background area)	Mercury (methyl)	MG/KG	0.193	0.193	NP	0.299		0.193	MG/KG	Mean	(2)
	Nickel	MG/KG	0.071	0.071	NP	0.117	J	0.071	MG/KG	Mean	(2)
	Silver	MG/KG	0.031	0.031	NP	0.0383	J	0.031	MG/KG	Mean	(2)
	Thallium	MG/KG	0.006	0.006	NP	0.00193	J	0.00193	MG/KG	Max	(3)
	Vanadium	MG/KG	0.101	0.101	NP	0.296	J	0.101	MG/KG	Mean	(2)
	Zinc	MG/KG	16.170	17.848	T	21.1		16.170	MG/KG	Mean	(2)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.0000007	0.000001	T	0.00000122	J	0.0000007	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.0000051	0.0000075	T	0.00000971	J#	0.0000051	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.00000211	0.00000311	T	0.00000395		0.00000211	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.0000069	0.0000098	T	0.000012		0.0000069	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.00000189	0.00000289	T	0.00000381		0.00000189	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0000116	NC		0.0000116		0.0000116	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000512	NC		0.0000512		0.0000512	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.000000520	NC		0.00000052		0.000000520	MG/KG	Mean	(2)
ALLENDALE	**Semivolatile Organics**										
	1,1'-Biphenyl	MG/KG	0.00099	0.0011	T	0.00142		0.00099	MG/KG	Mean	(2)
	2-Methylnaphthalene	MG/KG	0.00383	0.00383	NP	0.00551		0.00383	MG/KG	Mean	(2)
	Acenaphthene	MG/KG	0.00350	0.00397	T	0.0049		0.00350	MG/KG	Mean	(2)
	Acenaphthylene	MG/KG	0.00215	0.00268	T	0.00387		0.00215	MG/KG	Mean	(2)
	Anthracene	MG/KG	0.00271	0.00312	N	0.00406		0.00271	MG/KG	Mean	(2)
	Benzo(a)anthracene	MG/KG	0.0013	0.0022	T	0.00301		0.0013	MG/KG	Mean	(2)
	Benzo(a)pyrene	MG/KG	0.00095	0.00238	T	0.00279		0.00095	MG/KG	Mean	(2)
	Benzo(b)fluoranthene	MG/KG	0.0012	0.0025	T	0.00401		0.0012	MG/KG	Mean	(2)
	Benzo(g,h,i)perylene	MG/KG	0.000632	0.000632	NP	0.00243		0.000632	MG/KG	Mean	(2)
	Benzo(k)fluoranthene	MG/KG	0.0011	0.0021	T	0.00338		0.0011	MG/KG	Mean	(2)
	Chrysene	MG/KG	0.0019	0.0030	T	0.00453		0.0019	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.00027	0.00040	T	0.00069		0.00027	MG/KG	Mean	(2)
	Dibenzofuran	MG/KG	0.00248	0.00248	NP	0.00337		0.00248	MG/KG	Mean	(2)
	Fluoranthene	MG/KG	0.00826	0.0106	T	0.01385		0.00826	MG/KG	Mean	(2)
	Fluorene	MG/KG	0.00407	0.00407	NP	0.0056		0.00407	MG/KG	Mean	(2)

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Table 80
Medium-Specific Exposure Point Concentration Summary - Central Tendency
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ALLENDALE (continued)	Indeno(1,2,3-cd)pyrene	MG/KG	0.00079	0.00079	NP	0.00267		0.00079	MG/KG	Mean	(2)
	Naphthalene	MG/KG	0.00284	0.00284	NP	0.00409		0.00284	MG/KG	Mean	(2)
	Phenanthrene	MG/KG	0.00958	0.0114	N	0.01451		0.00958	MG/KG	Mean	(2)
	Pyrene	MG/KG	0.00229	0.00283	N	0.00389		0.00229	MG/KG	Mean	(2)
	Total PAH	MG/KG	0.0505	0.0589	N	0.07392		0.0505	MG/KG	Mean	(2)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0126	0.0126	NP	0.03498	J	0.0126	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.02869	0.02869	NP	0.05383	J	0.02869	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.00686	0.00686	NP	0.02462	J	0.00686	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.0168	0.0236	T	0.03511	J	0.0168	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	1.6127	2.9178	T	3.27419	J	1.6127	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	1.5832	2.8888	T	3.24344	J	1.5832	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.02949	0.03843	T	0.05274	J	0.02949	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.00537	0.00866	T	0.0099	J	0.00537	MG/KG	Mean	(2)
	gamma-BHC	MG/KG	0.0002	0.0002	NP	0.00025	J	0.0002	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.0089	0.0089	NP	0.0247	J	0.0089	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.00061	0.00070	N	0.00083	J	0.00061	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.346	0.674	T	1.24742	J	0.346	MG/KG	Mean	(2)
	Inorganics										
	Aluminum	MG/KG	8.02	8.02	NP	25.8	J	8.02	MG/KG	Mean	(2)
	Barium	MG/KG	0.7	1	T	1.45	J	0.7	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.0241	0.0316	T	0.0484	J	0.0241	MG/KG	Mean	(2)

Table 80
Medium-Specific Exposure Point Concentration Summary - Central Tendency
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ALLENDALE (continued)	Chromium	MG/KG	0.112	0.112	NP	0.229	J	0.112	MG/KG	Mean	(2)
	Cobalt	MG/KG	0.0889	0.103	T	0.127	J	0.0889	MG/KG	Mean	(2)
	Copper	MG/KG	0.872	0.872	NP	2.23		0.872	MG/KG	Mean	(2)
	Iron	MG/KG	23.8	23.8	NP	46.4		23.8	MG/KG	Mean	(2)
	Lead	MG/KG	0.16	0.39	T	0.349		0.16	MG/KG	Mean	(2)
	Manganese	MG/KG	6.78	8.36	N	12.3	J	6.78	MG/KG	Mean	(2)
	Mercury	MG/KG	0.136	0.136	NP	0.216		0.136	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.147	0.147	NP	0.225		0.147	MG/KG	Mean	(2)
	Molybdenum	MG/KG	0.130	0.130	NP	0.0939	J	0.0939	MG/KG	Max	(3)
	Nickel	MG/KG	0.147	0.147	NP	0.221	J	0.147	MG/KG	Mean	(2)
	Selenium	MG/KG	0.285	0.313	T	0.349	J	0.285	MG/KG	Mean	(2)
	Vanadium	MG/KG	0.097	0.097	NP	0.154	J	0.097	MG/KG	Mean	(2)
	Zinc	MG/KG	20.9	23.4	T	26.3	J	20.9	MG/KG	Mean	(2)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.0003330	0.0006018	T	0.00080121	J	0.0003330	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.0000015	0.0000019	N	0.00000272	J#	0.0000015	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.000334	0.000603	T	0.000802		0.000334	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000335	0.000602	T	0.000804		0.000335	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.000334	0.000603	T	0.000802		0.000334	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0000485	NC		0.0000938		0.0000485	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000752	NC		0.000128		0.0000752	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.00000236	NC		0.00000455		0.00000236	MG/KG	Mean	(2)
LYMAN MILL	**Semivolatile Organics**										
	1,1'-Biphenyl	MG/KG	0.0012	0.0014	T	0.00162		0.0012	MG/KG	Mean	(2)
	2-Methylnaphthalene	MG/KG	0.00422	0.00422	NP	0.00553		0.00422	MG/KG	Mean	(2)
	Acenaphthene	MG/KG	0.00406	0.00406	NP	0.00561		0.00406	MG/KG	Mean	(2)
	Acenaphthylene	MG/KG	0.00297	0.00355	T	0.00458		0.00297	MG/KG	Mean	(2)
	Anthracene	MG/KG	0.00353	0.00353	NP	0.00541		0.00353	MG/KG	Mean	(2)
	Benzo(a)anthracene	MG/KG	0.00447	0.00946	T	0.01173		0.00447	MG/KG	Mean	(2)

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Table 80
Medium-Specific Exposure Point Concentration Summary - Central Tendency
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
LYMAN MILL (continued)	Benzo(a)pyrene	MG/KG	0.00488	0.0236	T	0.01469		0.00488	MG/KG	Mean	(2)
	Benzo(b)fluoranthene	MG/KG	0.0067	0.0067	NP	0.02077		0.0067	MG/KG	Mean	(2)
	Benzo(g,h,i)perylene	MG/KG	0.00376	0.0191	T	0.01143		0.00376	MG/KG	Mean	(2)
	Benzo(k)fluoranthene	MG/KG	0.0059	0.045	T	0.01739		0.0059	MG/KG	Mean	(2)
	Chrysene	MG/KG	0.00815	0.0246	T	0.02304		0.00815	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.00096	0.0027	T	0.00273		0.00096	MG/KG	Mean	(2)
	Dibenzofuran	MG/KG	0.00329	0.00329	NP	0.00461		0.00329	MG/KG	Mean	(2)
	Fluoranthene	MG/KG	0.0220	0.0353	T	0.04906		0.0220	MG/KG	Mean	(2)
	Fluorene	MG/KG	0.00515	0.00667	T	0.00814		0.00515	MG/KG	Mean	(2)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.0043	0.034	T	0.01347		0.0043	MG/KG	Mean	(2)
	Naphthalene	MG/KG	0.00351	0.00351	NP	0.00492		0.00351	MG/KG	Mean	(2)
	Phenanthrene	MG/KG	0.0154	0.0212	T	0.02954		0.0154	MG/KG	Mean	(2)
	Pyrene	MG/KG	0.0106	0.0142	N	0.02235		0.0106	MG/KG	Mean	(2)
	Total PAH	MG/KG	0.1149	0.1791	T	0.251		0.1149	MG/KG	Mean	(2)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.03866	0.06351	T	0.0668	J	0.03866	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.1309	0.2134	T	0.28651	J	0.1309	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.0037	0.0052	N	0.00847	J	0.0037	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.03963	0.04690	N	0.05956	J	0.03963	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	4.22949	5.25493	T	7.14443	J	4.22949	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	4.19359	5.21365	T	7.09977	J	4.19359	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.03590	0.04370	T	0.04566	J	0.03590	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.00556	0.00862	T	0.00971	J	0.00556	MG/KG	Mean	(2)
	gamma-BHC	MG/KG	0.00021	0.00021	NP	0.00047	J	0.00021	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.02921	0.02921	NP	0.0408	J	0.02921	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.0014	0.0017	T	0.002	J	0.0014	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	1.3657	2.5751	T	2.61185	J	1.3657	MG/KG	Mean	(2)

Table 80
Medium-Specific Exposure Point Concentration Summary - Central Tendency
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
LYMAN MILL (continued)	**Inorganics**										
	Aluminum	MG/KG	48.6	69.9	N	117		48.6	MG/KG	Mean	(2)
	Antimony	MG/KG	0.0111	0.0111	NP	0.01	J	0.01	MG/KG	Max	(3)
	Arsenic	MG/KG	0.0276	0.0276	NP	0.0715		0.0276	MG/KG	Mean	(2)
	Barium	MG/KG	1.10	1.58	T	2.06		1.10	MG/KG	Mean	(2)
	Beryllium	MG/KG	0.00579	0.00824	N	0.0137		0.00579	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.0184	0.0228	T	0.0322	J	0.0184	MG/KG	Mean	(2)
	Chromium	MG/KG	0.270	0.378	T	0.513		0.270	MG/KG	Mean	(2)
	Cobalt	MG/KG	0.0775	0.0904	N	0.115	J	0.0775	MG/KG	Mean	(2)
	Copper	MG/KG	0.840	0.977	T	1.17		0.840	MG/KG	Mean	(2)
	Iron	MG/KG	75	128	T	174		75	MG/KG	Mean	(2)
	Lead	MG/KG	0.428	0.594	N	1.01	J	0.428	MG/KG	Mean	(2)
	Manganese	MG/KG	7.49	7.49	NP	10.7		7.49	MG/KG	Mean	(2)
	Mercury	MG/KG	0.0984	0.118	T	0.157		0.0984	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.0927	0.109	T	0.139		0.0927	MG/KG	Mean	(2)
	Molybdenum	MG/KG	0.0363	0.0456	T	0.0642	J	0.0363	MG/KG	Mean	(2)
	Nickel	MG/KG	0.154	0.186	T	0.252	J	0.154	MG/KG	Mean	(2)
	Selenium	MG/KG	0.214	0.214	NP	0.245	J	0.214	MG/KG	Mean	(2)
	Silver	MG/KG	0.0222	0.0283	N	0.0167	J	0.0167	MG/KG	Max	(3)
	Vanadium	MG/KG	0.127	0.166	T	0.254		0.127	MG/KG	Mean	(2)
	Zinc	MG/KG	20.6	22.2	T	24.9		20.6	MG/KG	Mean	(2)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.00055494	0.00076657	T	0.00136549	J	0.0005549	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.00000344	0.00000458	T	0.00000809	J#	0.00000344	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.000557	0.000768	T	0.00137		0.000557	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000560	0.000772	T	0.00138		0.000560	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.000557	0.000768	T	0.00137		0.000557	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0002471	NC		0.000977		0.0002471	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.000402	NC		0.00147		0.000402	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.00001235	NC		0.0000488		0.00001235	MG/KG	Mean	(2)

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Table 80
Medium-Specific Exposure Point Concentration Summary - Central Tendency
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

(1) Chemicals of potential concern are identified in Table 9 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(2) Mean: Arithmetic Mean
(3) Max: Maximum, applied in the special case where the arithmetic mean has been selected, but because of elevated detection limits in non-detects, it is greater than the maximum detected concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:
J = Value is estimated.
# = Value is result from second column confirmation analysis.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

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Table 81
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (I)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
ASSAPUMPSET	**Semivolatile Organics**								
(Reference area)	1,1'-Biphenyl	MG/KG	0.00064	NC	0.00076 J	0.00076	MG/KG	Max	(5)
Brown Bullhead used as	2-Methylnaphthalene	MG/KG	0.0173	NC	0.02429	0.02429	MG/KG	Max	(5)
a surrogate species for	Acenaphthene	MG/KG	0.000593	NC	0.00041 J	0.00041	MG/KG	Max	(5)
Assapumpset	Acenaphthylene	MG/KG	0.000913	NC	0.00122 J	0.00122	MG/KG	Max	(5)
	Anthracene	MG/KG	0.000787	NC	0.00105 J	0.00105	MG/KG	Max	(5)
	Benzo(a)anthracene	MG/KG	0.0033	NC	0.00808	0.00808	MG/KG	Max	(5)
	Benzo(a)pyrene	MG/KG	0.0033	NC	0.00791	0.00791	MG/KG	Max	(5)
	Benzo(b)fluoranthene	MG/KG	0.0042	NC	0.01058	0.01058	MG/KG	Max	(5)
	Benzo(g,h,i)perylene	MG/KG	0.00219	NC	0.00462	0.00462	MG/KG	Max	(5)
	Benzo(k)fluoranthene	MG/KG	0.0036	NC	0.00894	0.00894	MG/KG	Max	(5)
	Chrysene	MG/KG	0.0045	NC	0.01161	0.01161	MG/KG	Max	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.0011	NC	0.00129 J	0.00129	MG/KG	Max	(5)
	Dibenzofuran	MG/KG	0.000553	NC	0.00067 J	0.00067	MG/KG	Max	(5)
	Fluoranthene	MG/KG	0.00960	NC	0.02088	0.02088	MG/KG	Max	(5)
	Fluorene	MG/KG	0.000897	NC	0.00119 J	0.00119	MG/KG	Max	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.0028	NC	0.00653	0.00653	MG/KG	Max	(5)
	Naphthalene	MG/KG	0.00774	NC	0.01204	0.01204	MG/KG	Max	(5)
	Phenanthrene	MG/KG	0.00709	NC	0.00776	0.00776	MG/KG	Max	(5)
	Pyrene	MG/KG	0.00587	NC	0.01562	0.01562	MG/KG	Max	(5)
	Total PAH	MG/KG	0.07003	NC	0.1145 J	0.1145	MG/KG	Max	(5)
	Pesticides/PCBs								
	4,4'-DDD	MG/KG	0.00236	NC	0.00413	0.00413	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.01270	NC	0.02374	0.0237	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.00174	NC	0.00288	0.00288	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.00094	NC	0.0013 J	0.0013	MG/KG	Max	(5)
	Inorganics								
	Aluminum	MG/KG	9.94	NC	13.5	13.5	MG/KG	Max	(5)
	Barium	MG/KG	0.9	NC	1.21 J	1.21	MG/KG	Max	(5)
	Beryllium	MG/KG	0.00145	NC	0.000348 J	0.000348	MG/KG	Max	(5)
	Cadmium	MG/KG	0.0149	NC	0.0319 J	0.0319	MG/KG	Max	(5)

Table 81
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
ASSAPUMPSET (continued)	Chromium	MG/KG	0.0912	NC	0.1 J	0.1	MG/KG	Max	(5)
(Reference area)	Cobalt	MG/KG	0.040	NC	0.0456 J	0.0456	MG/KG	Max	(5)
	Copper	MG/KG	0.580	NC	0.688	0.688	MG/KG	Max	(5)
	Iron	MG/KG	50.0	NC	58.1 J	58.1	MG/KG	Max	(5)
	Lead	MG/KG	0.0894	NC	0.129 J	0.129	MG/KG	Max	(5)
	Manganese	MG/KG	4.32	NC	5.42 J	5.42	MG/KG	Max	(5)
	Mercury	MG/KG	0.0766	NC	0.137 J	0.137	MG/KG	Max	(5)
	Mercury (methyl)	MG/KG	0.0775	NC	0.145	0.145	MG/KG	Max	(5)
	Nickel	MG/KG	0.0381	NC	0.0439 J	0.0439	MG/KG	Max	(5)
	Selenium	MG/KG	0.194	NC	0.196 J	0.196	MG/KG	Max	(5)
	Silver	MG/KG	0.0212	NC	0.0236 J	0.0236	MG/KG	Max	(5)
	Vanadium	MG/KG	0.071	NC	0.0711 J	0.0711	MG/KG	Max	(5)
	Zinc	MG/KG	9.78	NC	12.2	12.2	MG/KG	Max	(5)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.0000	NC	0.00000151 J	0.00000151	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.0000	NC	0.0000002 J	0.0000002	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.0000	NC	0.00000258	0.00000258	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.0000	NC	0.00000284	0.00000284	MG/KG	Max	(5)
	Toxicity Equivalency - Fish	MG/KG	0.0000	NC	0.00000263	0.00000263	MG/KG	Max	(5)
GREYSTONE	**Semivolatile Organics**								
(Background area)	1,1'-Biphenyl	MG/KG	0.0014	0.0014 NP	0.00174 J	0.0014	MG/KG	95% UCL-NP	(4)
	2-Methylnaphthalene	MG/KG	0.0055	0.0065 T	0.0073	0.0065	MG/KG	95% UCL-T	(3)
	Acenaphthene	MG/KG	0.0040	0.0040 NP	0.00607	0.0040	MG/KG	95% UCL-NP	(4)
	Acenaphthylene	MG/KG	0.0039	0.0048 N	0.00706	0.0048	MG/KG	95% UCL-N	(2)
	Anthracene	MG/KG	0.0046	0.0060 N	0.00928	0.0060	MG/KG	95% UCL-N	(2)
	Benzo(a)anthracene	MG/KG	0.0017	0.0023 T	0.00331	0.0023	MG/KG	95% UCL-T	(3)
	Benzo(a)pyrene	MG/KG	0.0011	0.0011 NP	0.00273	0.0011	MG/KG	95% UCL-NP	(4)
	Benzo(b)fluoranthene	MG/KG	0.0015	0.0015 NP	0.0035	0.0015	MG/KG	95% UCL-NP	(4)
	Benzo(g,h,i)perylene	MG/KG	0.0010	0.0010 NP	0.00138 J	0.0010	MG/KG	95% UCL-NP	(4)
	Benzo(k)fluoranthene	MG/KG	0.0014	0.0014 NP	0.00313	0.0014	MG/KG	95% UCL-NP	(4)
	Chrysene	MG/KG	0.0032	0.0056 T	0.00563	0.0056	MG/KG	95% UCL-T	(3)
	Dibenzo(a,h)anthracene	MG/KG	0.0007	0.0007 NP	0.00039 J	0.00039	MG/KG	Max	(5)

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Table 81
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
GREYSTONE (continued)	Dibenzofuran	MG/KG	0.0036	0.0042	N	0.00542		0.0042	MG/KG	95% UCL-N	(2)
(Background area)	Fluoranthene	MG/KG	0.0130	0.0170	T	0.02085		0.0170	MG/KG	95% UCL-T	(3)
	Fluorene	MG/KG	0.0061	0.0061	NP	0.00977		0.0061	MG/KG	95% UCL-NP	(4)
	Naphthalene	MG/KG	0.0023	0.0023	NP	0.00524		0.0023	MG/KG	95% UCL-NP	(4)
	Phenanthrene	MG/KG	0.0172	0.0172	NP	0.02832		0.0172	MG/KG	95% UCL-NP	(4)
	Pyrene	MG/KG	0.0058	0.0058	NP	0.0114		0.0058	MG/KG	95% UCL-NP	(4)
	Total PAH	MG/KG	0.0710	0.0710	NP	0.11303	J	0.0710	MG/KG	95% UCL-NP	(4)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0174	0.0218	T	0.02488		0.0218	MG/KG	95% UCL-T	(3)
	4,4'-DDE	MG/KG	0.0431	0.0513	N	0.06803		0.0513	MG/KG	95% UCL-N	(2)
	4,4'-DDT	MG/KG	0.0063	0.0063	NP	0.01314	J	0.0063	MG/KG	95% UCL-NP	(4)
	alpha-Chlordane	MG/KG	0.0209	0.0243	T	0.02862		0.0243	MG/KG	95% UCL-T	(3)
	Aroclor, Total	MG/KG	0.2575	0.2575	NP	0.51925		0.2575	MG/KG	95% UCL-NP	(4)
	Aroclor-1254	MG/KG	0.2024	0.2024	NP	0.35135		0.2024	MG/KG	95% UCL-NP	(4)
	Aroclor-1268	MG/KG	0.0551	0.0551	NP	0.16789		0.0551	MG/KG	95% UCL-NP	(4)
	Dieldrin	MG/KG	0.0042	0.0042	NP	0.02346		0.0042	MG/KG	95% UCL-NP	(4)
	gamma-BHC	MG/KG	0.0008	0.0008	NP	0.00103	J	0.0008	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.0112	0.0112	NP	0.01453		0.0112	MG/KG	95% UCL-NP	(4)
	Heptachlor Epoxide	MG/KG	0.0008	0.0008	NP	0.00123	J	0.0008	MG/KG	95% UCL-NP	(4)
	Technical Chlordane	MG/KG	0.2820	0.2820	NP	0.34491		0.2820	MG/KG	95% UCL-NP	(4)
	Inorganics										
	Aluminum	MG/KG	30.3440	48.1403	T	52.8		48.1403	MG/KG	95% UCL-T	(3)
	Antimony	MG/KG	0.0122	0.0122	NP	0.00105	J	0.00105	MG/KG	Max	(5)
	Barium	MG/KG	0.9127	0.9127	NP	1.25		0.9127	MG/KG	95% UCL-NP	(4)
	Beryllium	MG/KG	0.0052	0.0059	N	0.00736		0.0059	MG/KG	95% UCL-N	(2)
	Cadmium	MG/KG	0.0395	0.0395	NP	0.0289	J	0.0289	MG/KG	Max	(5)
	Chromium	MG/KG	0.1177	0.1177	NP	0.163	J	0.1177	MG/KG	95% UCL-NP	(4)
	Cobalt	MG/KG	0.0791	0.0791	NP	0.388	J	0.0791	MG/KG	95% UCL-NP	(4)
	Copper	MG/KG	1.0072	1.1823	T	1.52	J	1.1823	MG/KG	95% UCL-T	(3)
	Iron	MG/KG	48.2000	55.8720	N	66.3		55.8720	MG/KG	95% UCL-N	(2)
	Lead	MG/KG	0.0121	0.0121	NP	0.022	J	0.0121	MG/KG	95% UCL-NP	(4)
	Manganese	MG/KG	6.2130	9.5729	T	12.1	J	9.5729	MG/KG	95% UCL-T	(3)

Table 81
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
GREYSTONE (continued)	Mercury	MG/KG	0.1897	0.1897	NP	0.278		0.1897	MG/KG	95% UCL-NP	(4)
(Background area)	Mercury (methyl)	MG/KG	0.1926	0.1926	NP	0.299		0.1926	MG/KG	95% UCL-NP	(4)
	Nickel	MG/KG	0.0705	0.0705	NP	0.117	J	0.0705	MG/KG	95% UCL-NP	(4)
	Silver	MG/KG	0.0308	0.0308	NP	0.0383	J	0.0308	MG/KG	95% UCL-NP	(4)
	Thallium	MG/KG	0.0062	0.0062	NP	0.00193	J	0.00193	MG/KG	Max	(5)
	Vanadium	MG/KG	0.1013	0.1013	NP	0.296	J	0.1013	MG/KG	95% UCL-NP	(4)
	Zinc	MG/KG	16.1700	17.8479	T	21.1		17.8479	MG/KG	95% UCL-T	(3)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.00000070	0.0000013	T	0.00000122	J	0.00000122	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.00000513	0.0000075	T	0.00000971	J#	0.0000075	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency - Mammals	MG/KG	0.00000211	0.0000031	T	0.00000395		0.0000031	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency - Birds	MG/KG	0.00000689	0.0000098	T	0.000012		0.0000098	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency - Fish	MG/KG	0.00000189	0.0000029	T	0.00000381		0.0000029	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0000116	NC		0.0000116		0.0000116	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000512	NC		0.0000512		0.0000512	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.00000052	NC		0.00000052		0.00000052	MG/KG	Max	(5)
ALLENDALE	**Semivolatile Organics**										
	1,1'-Biphenyl	MG/KG	0.0010	0.0011	T	0.00142		0.0011	MG/KG	95% UCL-T	(3)
	2-Methylnaphthalene	MG/KG	0.0038	0.0038	NP	0.00551		0.0038	MG/KG	95% UCL-NP	(4)
	Acenaphthene	MG/KG	0.0035	0.0040	T	0.0049		0.0040	MG/KG	95% UCL-T	(3)
	Acenaphthylene	MG/KG	0.0022	0.0027	T	0.00387		0.0027	MG/KG	95% UCL-T	(3)
	Anthracene	MG/KG	0.0027	0.0031	N	0.00406		0.0031	MG/KG	95% UCL-N	(2)
	Benzo(a)anthracene	MG/KG	0.0013	0.0022	T	0.00301		0.0022	MG/KG	95% UCL-T	(3)
	Benzo(a)pyrene	MG/KG	0.0010	0.0024	T	0.00279		0.0024	MG/KG	95% UCL-T	(3)
	Benzo(b)fluoranthene	MG/KG	0.0012	0.0025	T	0.00401		0.0025	MG/KG	95% UCL-T	(3)
	Benzo(g,h,i)perylene	MG/KG	0.0006	0.0006	NP	0.00243		0.0006	MG/KG	95% UCL-NP	(4)
	Benzo(k)fluoranthene	MG/KG	0.0011	0.0021	T	0.00338		0.0021	MG/KG	95% UCL-T	(3)
	Chrysene	MG/KG	0.0019	0.0030	T	0.00453		0.0030	MG/KG	95% UCL-T	(3)
	Dibenzo(a,h)anthracene	MG/KG	0.0003	0.0004	T	0.00069		0.0004	MG/KG	95% UCL-T	(3)
	Dibenzofuran	MG/KG	0.0025	0.0025	NP	0.00337		0.0025	MG/KG	95% UCL-NP	(4)
	Fluoranthene	MG/KG	0.0083	0.0106	T	0.01385		0.0106	MG/KG	95% UCL-T	(3)
	Fluorene	MG/KG	0.0041	0.0041	NP	0.0056		0.0041	MG/KG	95% UCL-NP	(4)

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Table 81
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ALLENDALE (continued)	Indeno(1,2,3-cd)pyrene	MG/KG	0.0008	0.0008	NP	0.00267		0.0008	MG/KG	95% UCL-NP	(4)
	Naphthalene	MG/KG	0.0028	0.0028	NP	0.00409		0.0028	MG/KG	95% UCL-NP	(4)
	Phenanthrene	MG/KG	0.0096	0.0114	N	0.01451		0.0114	MG/KG	95% UCL-N	(2)
	Pyrene	MG/KG	0.0023	0.0028	N	0.00389		0.0028	MG/KG	95% UCL-N	(2)
	Total PAH	MG/KG	0.0505	0.0589	N	0.07392		0.0589	MG/KG	95% UCL-N	(2)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0126	0.0126	NP	0.03498	J	0.0126	MG/KG	95% UCL-NP	(4)
	4,4'-DDE	MG/KG	0.0287	0.0287	NP	0.05383	J	0.0287	MG/KG	95% UCL-NP	(4)
	4,4'-DDT	MG/KG	0.0069	0.0069	NP	0.02462	J	0.0069	MG/KG	95% UCL-NP	(4)
	alpha-Chlordane	MG/KG	0.0168	0.0236	T	0.03511	J	0.0236	MG/KG	95% UCL-T	(3)
	Aroclor, Total	MG/KG	1.6127	2.9178	T	3.27419	J	2.9178	MG/KG	95% UCL-T	(3)
	Aroclor-1254	MG/KG	1.5832	2.8888	T	3.24344	J	2.8888	MG/KG	95% UCL-T	(3)
	Aroclor-1268	MG/KG	0.0295	0.0384	T	0.05274	J	0.0384	MG/KG	95% UCL-T	(3)
	Dieldrin	MG/KG	0.0054	0.0087	T	0.0099	J	0.0087	MG/KG	95% UCL-T	(3)
	gamma-BHC	MG/KG	0.0002	0.0002	NP	0.00025	J	0.0002	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.0089	0.0089	NP	0.0247	J	0.0089	MG/KG	95% UCL-NP	(4)
	Heptachlor Epoxide	MG/KG	0.0006	0.0007	N	0.00083	J	0.0007	MG/KG	95% UCL-N	(2)
	Technical Chlordane	MG/KG	0.3462	0.6736	T	1.24742	J	0.6736	MG/KG	95% UCL-T	(3)
	Inorganics										
	Aluminum	MG/KG	8.02	8.02	NP	25.8	J	8.02	MG/KG	95% UCL-NP	(4)
	Barium	MG/KG	0.7	1	T	1.45	J	1	MG/KG	95% UCL-T	(3)
	Cadmium	MG/KG	0.0241	0.0316	T	0.0484	J	0.0316	MG/KG	95% UCL-T	(3)
	Chromium	MG/KG	0.112	0.112	NP	0.229	J	0.112	MG/KG	95% UCL-NP	(4)
	Cobalt	MG/KG	0.0889	0.103	T	0.127	J	0.103	MG/KG	95% UCL-T	(3)
	Copper	MG/KG	0.872	0.872	NP	2.23		0.872	MG/KG	95% UCL-NP	(4)
	Iron	MG/KG	23.8	23.8	NP	46.4		23.8	MG/KG	95% UCL-NP	(4)
	Lead	MG/KG	0.16	0.394	T	0.349		0.349	MG/KG	Max	(5)
	Manganese	MG/KG	6.78	8.36	N	12.3	J	8.36	MG/KG	95% UCL-N	(2)
	Mercury	MG/KG	0.136	0.136	NP	0.216		0.136	MG/KG	95% UCL-NP	(4)
	Mercury (methyl)	MG/KG	0.147	0.147	NP	0.225		0.147	MG/KG	95% UCL-NP	(4)
	Molybdenum	MG/KG	0.130	0.130	NP	0.0939	J	0.0939	MG/KG	Max	(5)
	Nickel	MG/KG	0.147	0.147	NP	0.221	J	0.147	MG/KG	95% UCL-NP	(4)

Table 81
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ALLENDALE (continued)	Selenium	MG/KG	0.285	0.313	T	0.349	J	0.313	MG/KG	95% UCL-T	(3)
	Vanadium	MG/KG	0.097	0.097	NP	0.154	J	0.097	MG/KG	95% UCL-NP	(4)
	Zinc	MG/KG	20.9	23.4	T	26.3	J	23.4	MG/KG	95% UCL-T	(3)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.0003330	0.0006018	T	0.00080121	J	0.0006018	MG/KG	95% UCL-T	(3)
	2,3,7,8-TCDF	MG/KG	0.0000015	0.0000019	N	0.00000272	J#	0.0000019	MG/KG	95% UCL-N	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.0003340	0.0006026	T	0.000802		0.0006026	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency - Birds	MG/KG	0.0003354	0.0006018	T	0.000804		0.0006018	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency - Fish	MG/KG	0.0003339	0.0006026	T	0.000802		0.0006026	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0000485	NC		0.0000938		0.0000938	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000752	NC		0.000128		0.000128	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.000002364	NC		0.00000455		0.00000455	MG/KG	Max	(5)
LYMAN MILL	**Semivolatile Organics**										
	1,1'-Biphenyl	MG/KG	0.0012	0.0014	T	0.00162		0.0014	MG/KG	95% UCL-T	(3)
	2-Methylnaphthalene	MG/KG	0.00422	0.00422	NP	0.00553		0.00422	MG/KG	95% UCL-NP	(4)
	Acenaphthene	MG/KG	0.00406	0.00406	NP	0.00561		0.00406	MG/KG	95% UCL-NP	(4)
	Acenaphthylene	MG/KG	0.00297	0.00355	T	0.00458		0.00355	MG/KG	95% UCL-T	(3)
	Anthracene	MG/KG	0.00353	0.00353	NP	0.00541		0.00353	MG/KG	95% UCL-NP	(4)
	Benzo(a)anthracene	MG/KG	0.00447	0.00946	T	0.01173		0.00946	MG/KG	95% UCL-T	(3)
	Benzo(a)pyrene	MG/KG	0.0049	0.024	T	0.01469		0.01469	MG/KG	Max	(5)
	Benzo(b)fluoranthene	MG/KG	0.0067	0.0067	NP	0.02077		0.0067	MG/KG	95% UCL-NP	(4)
	Benzo(g,h,i)perylene	MG/KG	0.00376	0.0191	T	0.01143		0.01143	MG/KG	Max	(5)
	Benzo(k)fluoranthene	MG/KG	0.0059	0.045	T	0.01739		0.01739	MG/KG	Max	(5)
	Chrysene	MG/KG	0.00815	0.0246	T	0.02304		0.02304	MG/KG	Max	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.00096	0.0027	T	0.00273		0.00268	MG/KG	95% UCL-T	(3)
	Dibenzofuran	MG/KG	0.00329	0.0033	NP	0.00461		0.0033	MG/KG	95% UCL-NP	(4)
	Fluoranthene	MG/KG	0.0220	0.0353	T	0.04906		0.0353	MG/KG	95% UCL-T	(3)
	Fluorene	MG/KG	0.00515	0.00667	T	0.00814		0.00667	MG/KG	95% UCL-T	(3)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.0043	0.034	T	0.01347		0.01347	MG/KG	Max	(5)
	Naphthalene	MG/KG	0.00351	0.00351	NP	0.00492		0.00351	MG/KG	95% UCL-NP	(4)
	Phenanthrene	MG/KG	0.0154	0.0212	T	0.02954		0.0212	MG/KG	95% UCL-T	(3)
	Pyrene	MG/KG	0.0106	0.0142	N	0.02235		0.0142	MG/KG	95% UCL-N	(2)

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Table 81
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
LYMAN MILL (continued)	Total PAH	MG/KG	0.1149	0.1791	T	0.251		0.1791	MG/KG	95% UCL-T	(3)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.03866	0.06351	T	0.0668	J	0.06351	MG/KG	95% UCL-T	(3)
	4,4'-DDE	MG/KG	0.1309	0.2134	T	0.28651	J	0.2134	MG/KG	95% UCL-T	(3)
	4,4'-DDT	MG/KG	0.0037	0.0052	N	0.00847	J	0.0052	MG/KG	95% UCL-N	(2)
	alpha-Chlordane	MG/KG	0.0396	0.0469	N	0.05956	J	0.0469	MG/KG	95% UCL-N	(2)
	Aroclor, Total	MG/KG	4.22949	5.25493	T	7.14443	J	5.25493	MG/KG	95% UCL-T	(3)
	Aroclor-1254	MG/KG	4.1936	5.2136	T	7.09977	J	5.2136	MG/KG	95% UCL-T	(3)
	Aroclor-1268	MG/KG	0.0359	0.0437	T	0.04566	J	0.0437	MG/KG	95% UCL-T	(3)
	Dieldrin	MG/KG	0.0056	0.0086	T	0.00971	J	0.0086	MG/KG	95% UCL-T	(3)
	gamma-BHC	MG/KG	0.00021	0.00021	NP	0.00047	J	0.00021	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.02921	0.02921	NP	0.0408	J	0.02921	MG/KG	95% UCL-NP	(4)
	Heptachlor Epoxide	MG/KG	0.0014	0.0017	T	0.002	J	0.0017	MG/KG	95% UCL-T	(3)
	Technical Chlordane	MG/KG	1.3657	2.5751	T	2.61185	J	2.5751	MG/KG	95% UCL-T	(3)
	Inorganics										
	Aluminum	MG/KG	48.6	69.9	N	117		69.9	MG/KG	95% UCL-N	(2)
	Antimony	MG/KG	0.0111	0.0111	NP	0.01	J	0.01	MG/KG	Max	(5)
	Arsenic	MG/KG	0.0276	0.0276	NP	0.0715		0.0276	MG/KG	95% UCL-NP	(4)
	Barium	MG/KG	1.10	1.58	T	2.06		1.58	MG/KG	95% UCL-T	(3)
	Beryllium	MG/KG	0.00579	0.00824	N	0.0137		0.00824	MG/KG	95% UCL-N	(2)
	Cadmium	MG/KG	0.0184	0.0228	T	0.0322	J	0.0228	MG/KG	95% UCL-T	(3)
	Chromium	MG/KG	0.270	0.378	T	0.513		0.378	MG/KG	95% UCL-T	(3)
	Cobalt	MG/KG	0.0775	0.0904	N	0.115	J	0.0904	MG/KG	95% UCL-N	(2)
	Copper	MG/KG	0.840	0.977	T	1.17		0.977	MG/KG	95% UCL-T	(3)
	Iron	MG/KG	75	128	T	174		128	MG/KG	95% UCL-T	(3)
	Lead	MG/KG	0.428	0.594	N	1.01	J	0.594	MG/KG	95% UCL-N	(2)
	Manganese	MG/KG	7.49	7.49	NP	10.7		7.49	MG/KG	95% UCL-NP	(4)
	Mercury	MG/KG	0.0984	0.118	T	0.157		0.118	MG/KG	95% UCL-T	(3)
	Mercury (methyl)	MG/KG	0.0927	0.109	T	0.139		0.109	MG/KG	95% UCL-T	(3)
	Molybdenum	MG/KG	0.0363	0.0456	T	0.0642	J	0.0456	MG/KG	95% UCL-T	(3)
	Nickel	MG/KG	0.154	0.186	T	0.252	J	0.186	MG/KG	95% UCL-T	(3)
	Selenium	MG/KG	0.214	0.214	NP	0.245	J	0.214	MG/KG	95% UCL-NP	(4)

Table 81
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
LYMAN MILL (continued)	Silver	MG/KG	0.0222	0.0283	N	0.0167	J	0.0167	MG/KG	Max	(5)
	Vanadium	MG/KG	0.127	0.166	T	0.254		0.166	MG/KG	95% UCL-T	(3)
	Zinc	MG/KG	20.6	22.2	T	24.9		22.2	MG/KG	95% UCL-T	(3)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.00055494	0.00076657	T	0.00136549	J	0.00076657	MG/KG	95% UCL-T	(3)
	2,3,7,8-TCDF	MG/KG	0.00000344	0.00000458	T	0.00000809	J#	0.00000458	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency - Mammals	MG/KG	0.000557	0.001	T	0.00137		0.001	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency - Birds	MG/KG	0.000560	0.000772	T	0.00138		0.000772	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency - Fish	MG/KG	0.000557	0.000768	T	0.00137		0.000768	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0002471	NC		0.000977		0.000977	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.000402	NC		0.00147		0.00147	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.00001235	NC		0.0000488		0.0000488	MG/KG	Max	(5)

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Table 81
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
White Sucker

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: White Sucker
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

(1) Chemicals of potential concern are identified in Table 9 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(2) 95% UCL-N: 95% Upper Concentration Limit on the mean, normal distribution
(3) 95% UCL-T: 95% Upper Concentration Limit on the mean, lognormal distribution
(4) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(5) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:
J = Value is estimated.
# = Value is result from second column confirmation analysis.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

Table 82
Medium-Specific Exposure Point Concentration Summary - Central Tendency
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
ASSAPUMPSET	**Semivolatile Organics**									
(Reference area)	2-Methylnaphthalene	MG/KG	0.0134	NC	0.02339		0.0134	MG/KG	Mean	(2)
	Acenaphthene	MG/KG	0.0013	NC	0.00208		0.0013	MG/KG	Mean	(2)
	Acenaphthylene	MG/KG	0.000943	NC	0.00179		0.000943	MG/KG	Mean	(2)
	Anthracene	MG/KG	0.00066	NC	0.00083	J	0.00066	MG/KG	Mean	(2)
	Fluoranthene	MG/KG	0.00217	NC	0.00871		0.00217	MG/KG	Mean	(2)
	Fluorene	MG/KG	0.00087	NC	0.0018		0.00087	MG/KG	Mean	(2)
	Naphthalene	MG/KG	0.0148	NC	0.02459		0.0148	MG/KG	Mean	(2)
	Phenanthrene	MG/KG	0.00246	NC	0.00876		0.00246	MG/KG	Mean	(2)
	Total PAH	MG/KG	0.03390	NC	0.05098	J	0.03390	MG/KG	Mean	(2)
	Pesticides/PCBs									
	4,4'-DDD	MG/KG	0.00461	NC	0.00828	J	0.00461	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.0176	NC	0.0373	J	0.0176	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.0013	NC	0.00319	J	0.0013	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.0025	NC	0.00487	J	0.0025	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.08025	NC	0.10246	J	0.08025	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.03178	NC	0.10246	J	0.03178	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.0013	NC	0.00246	J	0.0013	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.00089	NC	0.00185	J	0.00089	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.00077	NC	0.00138	J	0.00077	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.11622	NC	0.16108	J	0.11622	MG/KG	Mean	(2)
	Inorganics									
	Aluminum	MG/KG	7.79	NC	19.9		7.79	MG/KG	Mean	(2)
	Barium	MG/KG	0.406	NC	0.632		0.406	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.0130	NC	0.0176	J	0.0130	MG/KG	Mean	(2)
	Chromium	MG/KG	0.0961	NC	0.0811	J	0.0811	MG/KG	Max	(3)
	Cobalt	MG/KG	0.0249	NC	0.0328	J	0.0249	MG/KG	Mean	(2)
	Copper	MG/KG	0.554	NC	0.847		0.554	MG/KG	Mean	(2)
	Iron	MG/KG	29.3	NC	53.5		29.3	MG/KG	Mean	(2)
	Lead	MG/KG	0.0466	NC	0.0893	J	0.0466	MG/KG	Mean	(2)
	Manganese	MG/KG	5.39	NC	7.75	J	5.39	MG/KG	Mean	(2)
	Mercury	MG/KG	0.09	NC	0.14		0.09	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.0889	NC	0.137		0.0889	MG/KG	Mean	(2)
	Nickel	MG/KG	0.0836	NC	0.309	J	0.0836	MG/KG	Mean	(2)

Table 82
Medium-Specific Exposure Point Concentration Summary - Central Tendency
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ASSAPUMPSET (continued)	Selenium	MG/KG	0.241	NC		0.282	J	0.241	MG/KG	Mean	(2)
(Reference area)	Silver	MG/KG	0.0221	NC		0.0202	J	0.0202	MG/KG	Max	(3)
	Thallium	MG/KG	0.00791	NC		0.00842	J	0.00791	MG/KG	Mean	(2)
	Vanadium	MG/KG	0.0382	NC		0.0295	J	0.0295	MG/KG	Max	(3)
	Zinc	MG/KG	16.9	NC		26.2		16.9	MG/KG	Mean	(2)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.000000355	NC		0.00000153	J	0.000000355	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.000000557	NC		0.00000178		0.000000557	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000000612	NC		0.00000182		0.000000612	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.000000537	NC		0.00000179		0.000000537	MG/KG	Mean	(2)
GREYSTONE	**Semivolatile Organics**										
(Background area)	2-Methylnaphthalene	MG/KG	0.0035	0.0043	N	0.00551		0.0035	MG/KG	Mean	(2)
	Acenaphthene	MG/KG	0.0023	0.002	NP	0.00403		0.0023	MG/KG	Mean	(2)
	Acenaphthylene	MG/KG	0.00104	0.00121	N	0.00155		0.00104	MG/KG	Mean	(2)
	Anthracene	MG/KG	0.00094	0.00094	NP	0.00128		0.00094	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.000799	0.000799	NP	0.00156		0.000799	MG/KG	Mean	(2)
	Fluoranthene	MG/KG	0.00500	0.0143	T	0.00906		0.00500	MG/KG	Mean	(2)
	Fluorene	MG/KG	0.001	0.001	N	0.00148		0.001	MG/KG	Mean	(2)
	Naphthalene	MG/KG	0.00343	0.00594	T	0.00689		0.00343	MG/KG	Mean	(2)
	Phenanthrene	MG/KG	0.00286	0.00475	T	0.00689		0.00286	MG/KG	Mean	(2)
	Total PAH	MG/KG	0.0184	0.0553	T	0.0582	J	0.0184	MG/KG	Mean	(2)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0128	0.0150	T	0.0163	J	0.0128	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.03161	0.03161	NP	0.0439	J	0.03161	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.00201	0.00201	NP	0.0042	J	0.00201	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.0140	0.0170	N	0.0222	J	0.0140	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.30999	0.37635	T	0.4387	J	0.30999	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.20781	0.25318	T	0.2928	J	0.20781	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.00353	0.00353	NP	0.00885	J	0.00353	MG/KG	Mean	(2)
	gamma-BHC	MG/KG	0.000877	0.000877	NP	0.00125	J	0.000877	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.0055	0.0069	N	0.00902	J	0.0055	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.0012	0.0012	NP	0.0026	J	0.0012	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.26541	0.31695	N	0.41089	J	0.26541	MG/KG	Mean	(2)

Table 82
Medium-Specific Exposure Point Concentration Summary - Central Tendency
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
GREYSTONE (continued)	**Inorganics**										
(Background area)	Aluminum	MG/KG	19.3	157	T	41.4		19.3	MG/KG	Mean	(2)
	Barium	MG/KG	0.548	0.687	N	0.853		0.548	MG/KG	Mean	(2)
	Beryllium	MG/KG	0.00473	0.00656	T	0.00828		0.00473	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.0330	0.0513	T	0.0581	J	0.0330	MG/KG	Mean	(2)
	Chromium	MG/KG	0.131	0.131	NP	0.187	J	0.131	MG/KG	Mean	(2)
	Cobalt	MG/KG	0.0332	0.0332	NP	0.0433	J	0.0332	MG/KG	Mean	(2)
	Copper	MG/KG	0.804	0.921	N	1.18	J	0.804	MG/KG	Mean	(2)
	Iron	MG/KG	36	44	N	55.5		36	MG/KG	Mean	(2)
	Lead	MG/KG	0.214	6.36	T	1.47		0.214	MG/KG	Mean	(2)
	Manganese	MG/KG	3.2	4.5	T	5.61	J	3.2	MG/KG	Mean	(2)
	Mercury	MG/KG	0.0706	0.0706	NP	0.227		0.0706	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.0825	0.165	T	0.234		0.0825	MG/KG	Mean	(2)
	Nickel	MG/KG	0.0903	0.155	T	0.098	J	0.0903	MG/KG	Mean	(2)
	Selenium	MG/KG	0.317	0.317	NP	0.436	J	0.317	MG/KG	Mean	(2)
	Thallium	MG/KG	0.00313	0.00313	NP	0.00351	J	0.00313	MG/KG	Mean	(2)
	Vanadium	MG/KG	0.0821	0.0821	NP	0.15	J	0.0821	MG/KG	Mean	(2)
	Zinc	MG/KG	33.4	41.5	T	53.3	J	33.4	MG/KG	Mean	(2)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.00000015	0.00000015	NP	0.00000045	J	0.00000015	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.0000001	0.0000001	NP	0.0000003	J	0.0000001	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.0000006	0.0000007	T	0.000000851		0.0000006	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000000750	0.000000931	T	0.00000124		0.000000750	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.000000579	0.000000737	T	0.000000801		0.000000579	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.00000183	NC		0.00000183		0.00000183	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.00000292	NC		0.00000292		0.00000292	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.0000000846	NC		0.0000000846		0.0000000846	MG/KG	Mean	(2)
ALLENDALE	**Semivolatile Organics**										
	1,1'-Biphenyl	MG/KG	0.00063	0.00066	T	0.0007	J	0.00063	MG/KG	Mean	(2)
	2-Methylnaphthalene	MG/KG	0.00315	0.00357	N	0.00445		0.00315	MG/KG	Mean	(2)
	Acenaphthene	MG/KG	0.00401	0.00503	T	0.0056		0.00401	MG/KG	Mean	(2)
	Acenaphthylene	MG/KG	0.0013	0.0013	NP	0.00187		0.0013	MG/KG	Mean	(2)
	Anthracene	MG/KG	0.0015	0.0015	NP	0.00216		0.0015	MG/KG	Mean	(2)
	Dibenzofuran	MG/KG	0.0011	0.0012	T	0.00133		0.0011	MG/KG	Mean	(2)

Table 82
Medium-Specific Exposure Point Concentration Summary - Central Tendency
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ALLENDALE (continued)	Fluoranthene	MG/KG	0.00761	0.00761	NP	0.01253		0.00761	MG/KG	Mean	(2)
	Fluorene	MG/KG	0.00170	0.00189	N	0.00224		0.00170	MG/KG	Mean	(2)
	Naphthalene	MG/KG	0.00417	0.00459	N	0.00546		0.00417	MG/KG	Mean	(2)
	Phenanthrene	MG/KG	0.00807	0.00807	NP	0.01063		0.00807	MG/KG	Mean	(2)
	Pyrene	MG/KG	0.00213	0.00213	NP	0.00665		0.00213	MG/KG	Mean	(2)
	Total PAH	MG/KG	0.03343	0.04014	T	0.05118		0.03343	MG/KG	Mean	(2)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0131	0.0131	NP	0.04205		0.0131	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.02104	0.02104	NP	0.03305		0.02104	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.00386	0.00892	T	0.01106		0.00386	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.0192	0.0192	NP	0.06327		0.0192	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.67383	0.89607	N	1.23323	J	0.67383	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.65474	0.88187	N	1.15576		0.65474	MG/KG	Mean	(2)
	beta-BHC	MG/KG	0.00062	0.00062	NP	0.00072	J	0.00062	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.00667	0.00912	N	0.01448		0.0067	MG/KG	Mean	(2)
	gamma-BHC	MG/KG	0.0005	0.0005	NP	0.00072	J	0.0005	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.0071	0.0071	NP	0.02296		0.0071	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.0015	0.0015	NP	0.00446		0.0015	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.2615	0.2615	NP	0.76253		0.2615	MG/KG	Mean	(2)
	Inorganics										
	Aluminum	MG/KG	7.40	11.2	N	19.5	J	7.40	MG/KG	Mean	(2)
	Barium	MG/KG	0.43	0.43	NP	0.681	J	0.43	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.0971	0.0971	NP	0.248		0.0971	MG/KG	Mean	(2)
	Chromium	MG/KG	0.0650	0.0933	T	0.123	J	0.0650	MG/KG	Mean	(2)
	Cobalt	MG/KG	0.0745	0.0745	NP	0.138	J	0.0745	MG/KG	Mean	(2)
	Copper	MG/KG	0.750	0.750	NP	1.03	J	0.750	MG/KG	Mean	(2)
	Iron	MG/KG	27.8	27.8	NP	39.3		27.8	MG/KG	Mean	(2)
	Lead	MG/KG	0.428	0.580	N	0.952	J	0.428	MG/KG	Mean	(2)
	Manganese	MG/KG	3.51	5.04	T	7.7	J	3.51	MG/KG	Mean	(2)
	Mercury	MG/KG	0.111	0.153	N	0.24		0.111	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.134	0.269	T	0.471		0.134	MG/KG	Mean	(2)
	Molybdenum	MG/KG	0.1555	0.156	NP	0.115	J	0.115	MG/KG	Max	(3)
	Nickel	MG/KG	0.118	0.151	T	0.214	J	0.118	MG/KG	Mean	(2)
	Selenium	MG/KG	0.379	0.421	T	0.523		0.379	MG/KG	Mean	(2)

Table 82
Medium-Specific Exposure Point Concentration Summary - Central Tendency
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ALLENDALE (continued)	Vanadium	MG/KG	0.0905	0.0905	NP	0.109	J	0.0905	MG/KG	Mean	(2)
	Zinc	MG/KG	28.6	31.0	T	34.6	J	28.6	MG/KG	Mean	(2)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.000111	0.000111	NP	0.00030691	J	0.000111	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.0000001	0.0000001	NP	0.00000008	J	0.0000001	MG/KG	Max	(3)
	Toxicity Equivalency - Mammals	MG/KG	0.000111	0.000111	NP	0.000308		0.000111	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000112	0.000112	NP	0.000308		0.000112	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.000111	0.000111	NP	0.000307		0.000111	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0000356	NC		0.000042		0.0000356	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000328	NC		0.0000388		0.0000328	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.00000158	NC		0.00000189		0.00000158	MG/KG	Mean	(2)
LYMAN MILL	**Semivolatile Organics**										
	1,1'-Biphenyl	MG/KG	0.0008	0.0008	NP	0.00128	J	0.0008	MG/KG	Mean	(2)
	2-Methylnaphthalene	MG/KG	0.00392	0.00444	T	0.00534		0.00392	MG/KG	Mean	(2)
	Acenaphthene	MG/KG	0.00689	0.00768	T	0.0082		0.00689	MG/KG	Mean	(2)
	Acenaphthylene	MG/KG	0.00193	0.00193	NP	0.00294		0.00193	MG/KG	Mean	(2)
	Anthracene	MG/KG	0.00267	0.00267	NP	0.00379		0.00267	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.00065	0.00065	NP	0.00075	J	0.00065	MG/KG	Mean	(2)
	Dibenzofuran	MG/KG	0.00163	0.00187	T	0.00231		0.00163	MG/KG	Mean	(2)
	Fluoranthene	MG/KG	0.0137	0.0137	NP	0.02309		0.0137	MG/KG	Mean	(2)
	Fluorene	MG/KG	0.0034	0.0034	NP	0.00511		0.0034	MG/KG	Mean	(2)
	Naphthalene	MG/KG	0.00553	0.00618	T	0.00666		0.00553	MG/KG	Mean	(2)
	Phenanthrene	MG/KG	0.01554	0.02012	T	0.02717		0.01554	MG/KG	Mean	(2)
	Pyrene	MG/KG	0.00385	0.00385	NP	0.01165		0.00385	MG/KG	Mean	(2)
	Total PAH	MG/KG	0.06141	0.07662	T	0.1109		0.06141	MG/KG	Mean	(2)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.01469	0.01469	NP	0.02072	J	0.01469	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.04451	0.04451	NP	0.07891	J	0.04451	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.00238	0.00337	N	0.00566	J	0.00238	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.02007	0.02007	NP	0.04272		0.02007	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.70316	0.95861	T	1.17773	J	0.70316	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.70316	0.95861	T	1.17773	J	0.70316	MG/KG	Mean	(2)
	beta-BHC	MG/KG	0.0012	0.0018	T	0.00255	J	0.0012	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.00789	0.00789	NP	0.01115	J	0.00789	MG/KG	Mean	(2)

Table 82
Medium-Specific Exposure Point Concentration Summary - Central Tendency
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
LYMAN MILL (continued)	gamma-BHC	MG/KG	0.0011	0.0012	N	0.0014	J	0.0011	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.00859	0.00859	NP	0.01605		0.00859	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.002	0.002	NP	0.00559		0.002	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.44722	0.44722	NP	0.76577		0.44722	MG/KG	Mean	(2)
	Inorganics										
	Aluminum	MG/KG	9.48	9.48	NP	41.6		9.48	MG/KG	Mean	(2)
	Barium	MG/KG	0.4	0.4	NP	0.781		0.4	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.026	0.026	NP	0.0425	J	0.026	MG/KG	Mean	(2)
	Chromium	MG/KG	0.131	0.131	NP	0.187	J	0.131	MG/KG	Mean	(2)
	Cobalt	MG/KG	0.0539	0.0595	T	0.0688	J	0.0539	MG/KG	Mean	(2)
	Copper	MG/KG	0.659	0.659	NP	0.793		0.659	MG/KG	Mean	(2)
	Iron	MG/KG	29.7	37.3	T	53.2		29.7	MG/KG	Mean	(2)
	Lead	MG/KG	0.27	0.38	T	0.473	J	0.27	MG/KG	Mean	(2)
	Manganese	MG/KG	3.50	4.98	T	7.65		3.50	MG/KG	Mean	(2)
	Mercury	MG/KG	0.0349	0.0349	NP	0.0756		0.0349	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.0367	0.0367	NP	0.0673		0.0367	MG/KG	Mean	(2)
	Molybdenum	MG/KG	0.131	0.131	NP	0.019	J	0.019	MG/KG	Max	(3)
	Nickel	MG/KG	0.0906	0.104	T	0.124	J	0.0906	MG/KG	Mean	(2)
	Selenium	MG/KG	0.341	0.386	T	0.432	J	0.341	MG/KG	Mean	(2)
	Silver	MG/KG	0.0247	0.0247	NP	0.0238	J	0.0238	MG/KG	Max	(3)
	Thallium	MG/KG	0.00886	0.00886	NP	0.00815	J	0.00815	MG/KG	Max	(3)
	Vanadium	MG/KG	0.0892	0.0892	NP	0.108	J	0.0892	MG/KG	Mean	(2)
	Zinc	MG/KG	23.9	26.3	T	29.3		23.9	MG/KG	Mean	(2)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.0001401	0.0001798	N	0.00024673	J	0.0001401	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.0000001	0.0000001	NP	0.00000006	J	0.00000006	MG/KG	Max	(3)
	Toxicity Equivalency - Mammals	MG/KG	0.000141	0.000181	N	0.000248		0.000141	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000141	0.000181	N	0.000248		0.000141	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.000141	0.000181	N	0.000248		0.000141	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0000323	NC		0.0000604		0.0000323	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000241	NC		0.000039		0.0000241	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.00000137	NC		0.00000253		0.00000137	MG/KG	Mean	(2)

Table 82
Medium-Specific Exposure Point Concentration Summary - Central Tendency
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
DYERVILLE	**Semivolatile Organics**									
	1,1'-Biphenyl	MG/KG	0.00040	NC	0.00042	J	0.00040	MG/KG	Mean	(2)
	Acenaphthene	MG/KG	0.00198	NC	0.00228		0.00198	MG/KG	Mean	(2)
	Acenaphthylene	MG/KG	0.00076	NC	0.00094	J	0.00076	MG/KG	Mean	(2)
	Anthracene	MG/KG	0.0010	NC	0.00132	J	0.0010	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.00068	NC	0.00017	J	0.00017	MG/KG	Max	(3)
	Dibenzofuran	MG/KG	0.0007	NC	0.00084	J	0.0007	MG/KG	Mean	(2)
	Fluoranthene	MG/KG	0.00539	NC	0.00562		0.00539	MG/KG	Mean	(2)
	Fluorene	MG/KG	0.00123	NC	0.0014	J	0.00123	MG/KG	Mean	(2)
	Phenanthrene	MG/KG	0.00490	NC	0.00632		0.00490	MG/KG	Mean	(2)
	Total PAH	MG/KG	0.0165	NC	0.01914	J	0.0165	MG/KG	Mean	(2)
	Pesticides/PCBs									
	4,4'-DDD	MG/KG	0.03543	NC	0.04068		0.03543	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.0110	NC	0.01474		0.0110	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.0119	NC	0.01467		0.0119	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.01440	NC	0.01914		0.01440	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.37026	NC	0.4495		0.37026	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.37026	NC	0.4495		0.37026	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.00852	NC	0.01086		0.00852	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.00574	NC	0.0068		0.00574	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.0018	NC	0.00228		0.0018	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.31006	NC	0.38798		0.31006	MG/KG	Mean	(2)
	Inorganics									
	Aluminum	MG/KG	1.91	NC	4.12		1.91	MG/KG	Mean	(2)
	Barium	MG/KG	0.519	NC	0.735		0.519	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.157	NC	0.261		0.157	MG/KG	Mean	(2)
	Chromium	MG/KG	0.115	NC	0.125	J	0.115	MG/KG	Mean	(2)
	Cobalt	MG/KG	0.0444	NC	0.0533	J	0.0444	MG/KG	Mean	(2)
	Copper	MG/KG	0.575	NC	0.648		0.575	MG/KG	Mean	(2)
	Iron	MG/KG	13.8	NC	17.1		13.8	MG/KG	Mean	(2)
	Lead	MG/KG	0.341	NC	0.562		0.341	MG/KG	Mean	(2)
	Manganese	MG/KG	12.583	NC	23	J	12.583	MG/KG	Mean	(2)
	Mercury	MG/KG	0.102	NC	0.113		0.102	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.117	NC	0.122		0.117	MG/KG	Mean	(2)

Table 82
Medium-Specific Exposure Point Concentration Summary - Central Tendency
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
DYERVILLE (continued)	Nickel	MG/KG	0.0538	NC	0.0623 J	0.0538	MG/KG	Mean	(2)
	Vanadium	MG/KG	0.0331	NC	0.00778 J	0.00778	MG/KG	Max	(3)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.00005165	NC	0.00007496 J	0.00005165	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.0000522	NC	0.0000757	0.0000522	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.0000523	NC	0.0000759	0.0000523	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.0000522	NC	0.0000756	0.0000522	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0000251	NC	0.0000251	0.0000251	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000198	NC	0.0000198	0.0000198	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.00000106	NC	0.00000106	0.00000106	MG/KG	Mean	(2)

(1) Chemicals of potential concern are identified in Table 10 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.

(2) Mean: Arithmetic Mean

(3) Max: Maximum, applied in the special case where the arithmetic mean has been selected, but because of elevated detection limits in non-detects, it is greater than the maximum detected concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.

NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.

N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:

J = Value is estimated.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by:	KJA
Checked by:	NAR

Table 83
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
ASSAPUMPSET	**Semivolatile Organics**									
(Reference area)	2-Methylnaphthalene	MG/KG	0.0134	NC	0.02339		0.02339	MG/KG	Max	(5)
	Acenaphthene	MG/KG	0.0013	NC	0.00208		0.00208	MG/KG	Max	(5)
	Acenaphthylene	MG/KG	0.000943	NC	0.00179		0.00179	MG/KG	Max	(5)
	Anthracene	MG/KG	0.00066	NC	0.00083	J	0.00083	MG/KG	Max	(5)
	Fluoranthene	MG/KG	0.00217	NC	0.00871		0.00871	MG/KG	Max	(5)
	Fluorene	MG/KG	0.00087	NC	0.0018		0.0018	MG/KG	Max	(5)
	Naphthalene	MG/KG	0.0148	NC	0.02459		0.02459	MG/KG	Max	(5)
	Phenanthrene	MG/KG	0.00246	NC	0.00876		0.00876	MG/KG	Max	(5)
	Total PAH	MG/KG	0.03390	NC	0.05098	J	0.05098	MG/KG	Max	(5)
	Pesticides/PCBs									
	4,4'-DDD	MG/KG	0.00461	NC	0.00828	J	0.00828	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.0176	NC	0.0373	J	0.0373	MG/KG	Max	(5)
	4,4'-DDT	MG/KG	0.0013	NC	0.00319	J	0.00319	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.0025	NC	0.00487	J	0.00487	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	0.08025	NC	0.10246	J	0.10246	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.03178	NC	0.10246	J	0.10246	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.0013	NC	0.00246	J	0.00246	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.00089	NC	0.00185	J	0.00185	MG/KG	Max	(5)
	Heptachlor Epoxide	MG/KG	0.00077	NC	0.00138	J	0.00138	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.11622	NC	0.16108	J	0.16108	MG/KG	Max	(5)
	Inorganics									
	Aluminum	MG/KG	7.79	NC	19.9		19.9	MG/KG	Max	(5)
	Barium	MG/KG	0.406	NC	0.632		0.632	MG/KG	Max	(5)
	Cadmium	MG/KG	0.0130	NC	0.0176	J	0.0176	MG/KG	Max	(5)
	Chromium	MG/KG	0.0961	NC	0.0811	J	0.0811	MG/KG	Max	(5)
	Cobalt	MG/KG	0.0249	NC	0.0328	J	0.0328	MG/KG	Max	(5)
	Copper	MG/KG	0.554	NC	0.847		0.847	MG/KG	Max	(5)
	Iron	MG/KG	29.3	NC	53.5		53.5	MG/KG	Max	(5)
	Lead	MG/KG	0.0466	NC	0.0893	J	0.0893	MG/KG	Max	(5)
	Manganese	MG/KG	5.39	NC	7.75	J	7.75	MG/KG	Max	(5)
	Mercury	MG/KG	0.0926	NC	0.14		0.14	MG/KG	Max	(5)

Table 83
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ASSAPUMPSET (continued)	Mercury (methyl)	MG/KG	0.0889	NC		0.137		0.137	MG/KG	Max	(5)
(Reference area)	Nickel	MG/KG	0.0836	NC		0.309	J	0.309	MG/KG	Max	(5)
	Selenium	MG/KG	0.241	NC		0.282	J	0.282	MG/KG	Max	(5)
	Silver	MG/KG	0.0221	NC		0.0202	J	0.0202	MG/KG	Max	(5)
	Thallium	MG/KG	0.00791	NC		0.00842	J	0.00842	MG/KG	Max	(5)
	Vanadium	MG/KG	0.0382	NC		0.0295	J	0.0295	MG/KG	Max	(5)
	Zinc	MG/KG	16.9	NC		26.2		26.2	MG/KG	Max	(5)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.000000355	NC		0.00000153	J	0.00000153	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.000000557	NC		0.00000178		0.00000178	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.000000612	NC		0.00000182		0.00000182	MG/KG	Max	(5)
	Toxicity Equivalency - Fish	MG/KG	0.000000537	NC		0.00000179		0.00000179	MG/KG	Max	(5)
GREYSTONE	**Semivolatile Organics**										
(Background area)	2-Methylnaphthalene	MG/KG	0.0035	0.0043	N	0.00551		0.0043	MG/KG	95% UCL-N	(2)
	Acenaphthene	MG/KG	0.0023	0.002	NP	0.00403		0.0023	MG/KG	95% UCL-NP	(4)
	Acenaphthylene	MG/KG	0.00104	0.00121	N	0.00155		0.00121	MG/KG	95% UCL-N	(2)
	Anthracene	MG/KG	0.00094	0.00094	NP	0.00128		0.00094	MG/KG	95% UCL-NP	(4)
	Dibenzo(a,h)anthracene	MG/KG	0.000799	0.000799	NP	0.00156		0.000799	MG/KG	95% UCL-NP	(4)
	Fluoranthene	MG/KG	0.00500	0.0143	T	0.00906		0.00906	MG/KG	Max	(5)
	Fluorene	MG/KG	0.001	0.001	N	0.00148		0.001	MG/KG	95% UCL-N	(2)
	Naphthalene	MG/KG	0.00343	0.00594	T	0.00689		0.00594	MG/KG	95% UCL-T	(3)
	Phenanthrene	MG/KG	0.00286	0.00475	T	0.00689		0.00475	MG/KG	95% UCL-T	(3)
	Total PAH	MG/KG	0.0184	0.0553	T	0.0582	J	0.0553	MG/KG	95% UCL-T	(3)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0128	0.0150	T	0.0163	J	0.0150	MG/KG	95% UCL-T	(3)
	4,4'-DDE	MG/KG	0.03161	0.03161	NP	0.0439	J	0.03161	MG/KG	95% UCL-NP	(4)
	4,4'-DDT	MG/KG	0.00201	0.00201	NP	0.0042	J	0.00201	MG/KG	95% UCL-NP	(4)
	alpha-Chlordane	MG/KG	0.0140	0.0170	N	0.0222	J	0.0170	MG/KG	95% UCL-N	(2)
	Aroclor, Total	MG/KG	0.30999	0.37635	T	0.4387	J	0.37635	MG/KG	95% UCL-T	(3)
	Aroclor-1254	MG/KG	0.20781	0.25318	T	0.2928	J	0.25318	MG/KG	95% UCL-T	(3)
	Dieldrin	MG/KG	0.00353	0.00353	NP	0.00885	J	0.00353	MG/KG	95% UCL-NP	(4)
	gamma-BHC	MG/KG	0.000876500	0.00088	NP	0.00125	J	0.0008765	MG/KG	95% UCL-NP	(4)

Table 83
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
GREYSTONE (continued)	gamma-Chlordane	MG/KG	0.0055	0.0069	N	0.00902	J	0.0069	MG/KG	95% UCL-N	(2)
(Background area)	Heptachlor Epoxide	MG/KG	0.0012	0.0012	NP	0.0026	J	0.0012	MG/KG	95% UCL-NP	(4)
	Technical Chlordane	MG/KG	0.26541	0.31695	N	0.41089	J	0.31695	MG/KG	95% UCL-N	(2)
	Inorganics										
	Aluminum	MG/KG	19.3	157	T	41.4		41.4	MG/KG	Max	(5)
	Barium	MG/KG	0.548	0.687	N	0.853		0.687	MG/KG	95% UCL-N	(2)
	Beryllium	MG/KG	0.00473	0.00656	T	0.00828		0.00656	MG/KG	95% UCL-T	(3)
	Cadmium	MG/KG	0.0330	0.0513	T	0.0581	J	0.0513	MG/KG	95% UCL-T	(3)
	Chromium	MG/KG	0.131	0.131	NP	0.187	J	0.131	MG/KG	95% UCL-NP	(4)
	Cobalt	MG/KG	0.0332	0.0332	NP	0.0433	J	0.0332	MG/KG	95% UCL-NP	(4)
	Copper	MG/KG	0.804	0.921	N	1.18	J	0.921	MG/KG	95% UCL-N	(2)
	Iron	MG/KG	36	44	N	55.5		44	MG/KG	95% UCL-N	(2)
	Lead	MG/KG	0.214	6.36	T	1.47		1.47	MG/KG	Max	(5)
	Manganese	MG/KG	3.2	4.5	T	5.61	J	4.5	MG/KG	95% UCL-T	(3)
	Mercury	MG/KG	0.0706	0.0706	NP	0.227		0.0706	MG/KG	95% UCL-NP	(4)
	Mercury (methyl)	MG/KG	0.0825	0.165	T	0.234		0.165	MG/KG	95% UCL-T	(3)
	Nickel	MG/KG	0.0903	0.155	T	0.098	J	0.098	MG/KG	Max	(5)
	Selenium	MG/KG	0.317	0.317	NP	0.436	J	0.317	MG/KG	95% UCL-NP	(4)
	Thallium	MG/KG	0.00313	0.00313	NP	0.00351	J	0.00313	MG/KG	95% UCL-NP	(4)
	Vanadium	MG/KG	0.0821	0.0821	NP	0.15	J	0.0821	MG/KG	95% UCL-NP	(4)
	Zinc	MG/KG	33.4	41.5	T	53.3	J	41.5	MG/KG	95% UCL-T	(3)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.00000015	0.00000015	NP	0.00000045	J	0.00000015	MG/KG	95% UCL-NP	(4)
	2,3,7,8-TCDF	MG/KG	0.0000001	0.0000001	NP	0.0000003	J	0.0000001	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency - Mammals	MG/KG	0.0000006	0.0000007	T	0.000000851		0.0000007	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency - Birds	MG/KG	0.000000750	0.000000931	T	0.00000124		0.000000931	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency - Fish	MG/KG	0.000000579	0.000000737	T	0.000000801		0.000000737	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.00000183	NC		0.00000183		0.00000183	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.00000292	NC		0.00000292		0.00000292	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.0000000846	NC		0.0000000846		0.0000000846	MG/KG	Max	(5)
ALLENDALE	**Semivolatile Organics**										
	1,1'-Biphenyl	MG/KG	0.0006275000	0.000656137	T	0.0007000000	J	0.0006561374	MG/KG	95% UCL-T	(3)

Table 83
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ALLENDALE (continued)	2-Methylnaphthalene	MG/KG	0.00315	0.00357	N	0.00445		0.00357	MG/KG	95% UCL-N	(2)
	Acenaphthene	MG/KG	0.00401	0.00503	T	0.0056		0.00503	MG/KG	95% UCL-T	(3)
	Acenaphthylene	MG/KG	0.0013	0.0013	NP	0.00187		0.0013	MG/KG	95% UCL-NP	(4)
	Anthracene	MG/KG	0.0015	0.0015	NP	0.00216		0.0015	MG/KG	95% UCL-NP	(4)
	Dibenzofuran	MG/KG	0.0011	0.0012	T	0.00133		0.0012	MG/KG	95% UCL-T	(3)
	Fluoranthene	MG/KG	0.00761	0.00761	NP	0.01253		0.00761	MG/KG	95% UCL-NP	(4)
	Fluorene	MG/KG	0.00170	0.00189	N	0.00224		0.00189	MG/KG	95% UCL-N	(2)
	Naphthalene	MG/KG	0.00417	0.00459	N	0.00546		0.00459	MG/KG	95% UCL-N	(2)
	Phenanthrene	MG/KG	0.00807	0.00807	NP	0.01063		0.00807	MG/KG	95% UCL-NP	(4)
	Pyrene	MG/KG	0.00213	0.00213	NP	0.00665		0.00213	MG/KG	95% UCL-NP	(4)
	Total PAH	MG/KG	0.03343	0.04014	T	0.05118		0.04014	MG/KG	95% UCL-T	(3)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0131	0.0131	NP	0.04205		0.0131	MG/KG	95% UCL-NP	(4)
	4,4'-DDE	MG/KG	0.02104	0.02104	NP	0.03305		0.02104	MG/KG	95% UCL-NP	(4)
	4,4'-DDT	MG/KG	0.00386	0.00892	T	0.01106		0.00892	MG/KG	95% UCL-T	(3)
	alpha-Chlordane	MG/KG	0.0192	0.0192	NP	0.06327		0.0192	MG/KG	95% UCL-NP	(4)
	Aroclor, Total	MG/KG	0.67383	0.89607	N	1.23323	J	0.89607	MG/KG	95% UCL-N	(2)
	Aroclor-1254	MG/KG	0.65474	0.88187	N	1.15576		0.88187	MG/KG	95% UCL-N	(2)
	beta-BHC	MG/KG	0.00062	0.00062	NP	0.00072	J	0.00062	MG/KG	95% UCL-NP	(4)
	Dieldrin	MG/KG	0.00667	0.00912	N	0.01448		0.00912	MG/KG	95% UCL-N	(2)
	gamma-BHC	MG/KG	0.0005	0.0005	NP	0.00072	J	0.0005	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.0071	0.0071	NP	0.02296		0.0071	MG/KG	95% UCL-NP	(4)
	Heptachlor Epoxide	MG/KG	0.0015	0.0015	NP	0.00446		0.0015	MG/KG	95% UCL-NP	(4)
	Technical Chlordane	MG/KG	0.2615	0.2615	NP	0.76253		0.2615	MG/KG	95% UCL-NP	(4)
	Inorganics										
	Aluminum	MG/KG	7.40	11.2	N	19.5	J	11.2	MG/KG	95% UCL-N	(2)
	Barium	MG/KG	0.43	0.43	NP	0.681	J	0.43	MG/KG	95% UCL-NP	(4)
	Cadmium	MG/KG	0.0971	0.0971	NP	0.248		0.0971	MG/KG	95% UCL-NP	(4)
	Chromium	MG/KG	0.0650	0.0933	T	0.123	J	0.0933	MG/KG	95% UCL-T	(3)
	Cobalt	MG/KG	0.0745	0.0745	NP	0.138	J	0.0745	MG/KG	95% UCL-NP	(4)
	Copper	MG/KG	0.750	0.750	NP	1.03	J	0.750	MG/KG	95% UCL-NP	(4)
	Iron	MG/KG	27.8	27.8	NP	39.3		27.8	MG/KG	95% UCL-NP	(4)

Table 83
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
ALLENDALE (continued)	Lead	MG/KG	0.428	0.580	N	0.952	J	0.580	MG/KG	95% UCL-N	(2)
	Manganese	MG/KG	3.51	5.04	T	7.7	J	5.04	MG/KG	95% UCL-T	(3)
	Mercury	MG/KG	0.111	0.153	N	0.24		0.153	MG/KG	95% UCL-N	(2)
	Mercury (methyl)	MG/KG	0.134	0.269	T	0.471		0.269	MG/KG	95% UCL-T	(3)
	Molybdenum	MG/KG	0.1555	0.156	NP	0.115	J	0.115	MG/KG	Max	(5)
	Nickel	MG/KG	0.118	0.151	T	0.214	J	0.151	MG/KG	95% UCL-T	(3)
	Selenium	MG/KG	0.379	0.421	T	0.523		0.421	MG/KG	95% UCL-T	(3)
	Vanadium	MG/KG	0.0905	0.0905	NP	0.109	J	0.0905	MG/KG	95% UCL-NP	(4)
	Zinc	MG/KG	28.6	31.0	T	34.6	J	31.0	MG/KG	95% UCL-T	(3)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.000111	0.000111	NP	0.00030691	J	0.000111	MG/KG	95% UCL-NP	(4)
	2,3,7,8-TCDF	MG/KG	0.0000001	0.0000001	NP	0.00000008	J	0.00000008	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.000111	0.000111	NP	0.000308		0.000111	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency - Birds	MG/KG	0.000112	0.000112	NP	0.000308		0.000112	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency - Fish	MG/KG	0.000111	0.000111	NP	0.000307		0.000111	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0000356	NC		0.000042		0.000042	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000328	NC		0.0000388		0.0000388	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.00000158	NC		0.00000189		0.00000189	MG/KG	Max	(5)
LYMAN MILL	**Semivolatile Organics**										
	1,1'-Biphenyl	MG/KG	0.0008	0.0008	NP	0.00128	J	0.0008	MG/KG	95% UCL-NP	(4)
	2-Methylnaphthalene	MG/KG	0.00392	0.00444	T	0.00534		0.00444	MG/KG	95% UCL-T	(3)
	Acenaphthene	MG/KG	0.00689	0.00768	T	0.0082		0.00768	MG/KG	95% UCL-T	(3)
	Acenaphthylene	MG/KG	0.00193	0.00193	NP	0.00294		0.00193	MG/KG	95% UCL-NP	(4)
	Anthracene	MG/KG	0.00267	0.00267	NP	0.00379		0.00267	MG/KG	95% UCL-NP	(4)
	Dibenzo(a,h)anthracene	MG/KG	0.00065	0.00065	NP	0.00075	J	0.00065	MG/KG	95% UCL-NP	(4)
	Dibenzofuran	MG/KG	0.00163	0.00187	T	0.00231		0.00187	MG/KG	95% UCL-T	(3)
	Fluoranthene	MG/KG	0.0137	0.0137	NP	0.02309		0.0137	MG/KG	95% UCL-NP	(4)
	Fluorene	MG/KG	0.0034	0.0034	NP	0.00511		0.0034	MG/KG	95% UCL-NP	(4)
	Naphthalene	MG/KG	0.00553	0.00618	T	0.00666		0.00618	MG/KG	95% UCL-T	(3)
	Phenanthrene	MG/KG	0.01554	0.02012	T	0.02717		0.02012	MG/KG	95% UCL-T	(3)
	Pyrene	MG/KG	0.00385	0.00385	NP	0.01165		0.00385	MG/KG	95% UCL-NP	(4)
	Total PAH	MG/KG	0.06141	0.07662	T	0.1109		0.07662	MG/KG	95% UCL-T	(3)

Table 83
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
LYMAN MILL (continued)	**Pesticides/PCBs**										
	4,4'-DDD	MG/KG	0.01469	0.01469	NP	0.02072	J	0.01469	MG/KG	95% UCL-NP	(4)
	4,4'-DDE	MG/KG	0.04451	0.04451	NP	0.07891	J	0.04451	MG/KG	95% UCL-NP	(4)
	4,4'-DDT	MG/KG	0.00238	0.00337	N	0.00566	J	0.00337	MG/KG	95% UCL-N	(2)
	alpha-Chlordane	MG/KG	0.02007	0.02007	NP	0.04272		0.02007	MG/KG	95% UCL-NP	(4)
	Aroclor, Total	MG/KG	0.70316	0.95861	T	1.17773	J	0.95861	MG/KG	95% UCL-T	(3)
	Aroclor-1254	MG/KG	0.70316	0.95861	T	1.17773	J	0.95861	MG/KG	95% UCL-T	(3)
	beta-BHC	MG/KG	0.0012	0.0018	T	0.00255	J	0.0018	MG/KG	95% UCL-T	(3)
	Dieldrin	MG/KG	0.00789	0.00789	NP	0.01115	J	0.00789	MG/KG	95% UCL-NP	(4)
	gamma-BHC	MG/KG	0.0011	0.0012	N	0.0014	J	0.0012	MG/KG	95% UCL-N	(2)
	gamma-Chlordane	MG/KG	0.00859	0.00859	NP	0.01605		0.00859	MG/KG	95% UCL-NP	(4)
	Heptachlor Epoxide	MG/KG	0.00227	0.00227	NP	0.00559		0.00227	MG/KG	95% UCL-NP	(4)
	Technical Chlordane	MG/KG	0.44722	0.44722	NP	0.76577		0.44722	MG/KG	95% UCL-NP	(4)
	Inorganics										
	Aluminum	MG/KG	9.48	9.48	NP	41.6		9.48	MG/KG	95% UCL-NP	(4)
	Barium	MG/KG	0.4	0.4	NP	0.781		0.4	MG/KG	95% UCL-NP	(4)
	Cadmium	MG/KG	0.026	0.026	NP	0.0425	J	0.026	MG/KG	95% UCL-NP	(4)
	Chromium	MG/KG	0.131	0.131	NP	0.187	J	0.131	MG/KG	95% UCL-NP	(4)
	Cobalt	MG/KG	0.0539	0.0595	T	0.0688	J	0.0595	MG/KG	95% UCL-T	(3)
	Copper	MG/KG	0.659	0.659	NP	0.793		0.659	MG/KG	95% UCL-NP	(4)
	Iron	MG/KG	29.7	37.3	T	53.2		37.3	MG/KG	95% UCL-T	(3)
	Lead	MG/KG	0.27	0.38	T	0.473	J	0.38	MG/KG	95% UCL-T	(3)
	Manganese	MG/KG	3.50	4.98	T	7.65		4.98	MG/KG	95% UCL-T	(3)
	Mercury	MG/KG	0.0349	0.0349	NP	0.0756		0.0349	MG/KG	95% UCL-NP	(4)
	Mercury (methyl)	MG/KG	0.0367	0.0367	NP	0.0673		0.0367	MG/KG	95% UCL-NP	(4)
	Molybdenum	MG/KG	0.131	0.131	NP	0.019	J	0.019	MG/KG	Max	(5)
	Nickel	MG/KG	0.0906	0.104	T	0.124	J	0.104	MG/KG	95% UCL-T	(3)
	Selenium	MG/KG	0.341	0.386	T	0.432	J	0.386	MG/KG	95% UCL-T	(3)
	Silver	MG/KG	0.0247	0.0247	NP	0.0238	J	0.0238	MG/KG	Max	(5)
	Thallium	MG/KG	0.00886	0.00886	NP	0.00815	J	0.00815	MG/KG	Max	(5)
	Vanadium	MG/KG	0.0892	0.0892	NP	0.108	J	0.0892	MG/KG	95% UCL-NP	(4)
	Zinc	MG/KG	23.9	26.3	T	29.3		26.3	MG/KG	95% UCL-T	(3)

Table 83
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
LYMAN MILL (continued)	**Dioxins/Furans**										
	2,3,7,8-TCDD	MG/KG	0.0001401	0.0001798	N	0.00024673	J	0.0001798	MG/KG	95% UCL-N	(2)
	2,3,7,8-TCDF	MG/KG	0.0000001	0.0000001	NP	0.00000006	J	0.00000006	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.000141	0.000181	N	0.000248		0.000181	MG/KG	95% UCL-N	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000141	0.000181	N	0.000248		0.000181	MG/KG	95% UCL-N	(2)
	Toxicity Equivalency - Fish	MG/KG	0.000141	0.000181	N	0.000248		0.000181	MG/KG	95% UCL-N	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0000323	NC		0.0000604		0.0000604	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000241	NC		0.000039		0.000039	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.00000137	NC		0.00000253		0.00000253	MG/KG	Max	(5)
DYERVILLE	**Semivolatile Organics**										
	1,1'-Biphenyl	MG/KG	0.00040	NC		0.00042	J	0.00042	MG/KG	Max	(5)
	Acenaphthene	MG/KG	0.00198	NC		0.00228		0.00228	MG/KG	Max	(5)
	Acenaphthylene	MG/KG	0.00076	NC		0.00094	J	0.00094	MG/KG	Max	(5)
	Anthracene	MG/KG	0.0010	NC		0.00132	J	0.00132	MG/KG	Max	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.00068	NC		0.00017	J	0.00017	MG/KG	Max	(5)
	Dibenzofuran	MG/KG	0.001	NC		0.00084	J	0.00084	MG/KG	Max	(5)
	Fluoranthene	MG/KG	0.00539	NC		0.00562		0.00562	MG/KG	Max	(5)
	Fluorene	MG/KG	0.00123	NC		0.0014	J	0.0014	MG/KG	Max	(5)
	Phenanthrene	MG/KG	0.00490	NC		0.00632		0.00632	MG/KG	Max	(5)
	Total PAH	MG/KG	0.0165	NC		0.01914	J	0.01914	MG/KG	Max	(5)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.03543	NC		0.04068		0.04068	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.0110	NC		0.01474		0.01474	MG/KG	Max	(5)
	4,4'-DDT	MG/KG	0.0119	NC		0.01467		0.01467	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.01440	NC		0.01914		0.01914	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	0.37026	NC		0.4495		0.4495	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.37026	NC		0.4495		0.4495	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.00852	NC		0.01086		0.01086	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.00574	NC		0.0068		0.0068	MG/KG	Max	(5)
	Heptachlor Epoxide	MG/KG	0.0018	NC		0.00228		0.00228	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.31006	NC		0.38798		0.38798	MG/KG	Max	(5)

Table 83
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
DYERVILLE (continued)	**Inorganics**									
	Aluminum	MG/KG	1.91	NC	4.12		4.12	MG/KG	Max	(5)
	Barium	MG/KG	0.519	NC	0.735		0.735	MG/KG	Max	(5)
	Cadmium	MG/KG	0.157	NC	0.261		0.261	MG/KG	Max	(5)
	Chromium	MG/KG	0.115	NC	0.125	J	0.125	MG/KG	Max	(5)
	Cobalt	MG/KG	0.0444	NC	0.0533	J	0.0533	MG/KG	Max	(5)
	Copper	MG/KG	0.575	NC	0.648		0.648	MG/KG	Max	(5)
	Iron	MG/KG	13.8	NC	17.1		17.1	MG/KG	Max	(5)
	Lead	MG/KG	0.341	NC	0.562		0.562	MG/KG	Max	(5)
	Manganese	MG/KG	12.583	NC	23	J	23	MG/KG	Max	(5)
	Mercury	MG/KG	0.102	NC	0.113		0.113	MG/KG	Max	(5)
	Mercury (methyl)	MG/KG	0.117	NC	0.122		0.122	MG/KG	Max	(5)
	Nickel	MG/KG	0.0538	NC	0.0623	J	0.0623	MG/KG	Max	(5)
	Vanadium	MG/KG	0.0331	NC	0.00778	J	0.00778	MG/KG	Max	(5)
	Dioxins/Furans									
	2,3,7,8-TCDD	MG/KG	0.00005165	NC	0.00007496	J	0.00007496	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.0000522	NC	0.0000757		0.0000757	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.0000523	NC	0.0000759		0.0000759	MG/KG	Max	(5)
	Toxicity Equivalency - Fish	MG/KG	0.0000522	NC	0.0000756		0.0000756	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0000251	NC	0.0000251		0.0000251	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000198	NC	0.0000198		0.0000198	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.00000106	NC	0.00000106		0.00000106	MG/KG	Max	(5)

(1) Chemicals of potential concern are identified in Table 10 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(2) 95% UCL-N: 95% Upper Concentration Limit on the mean, normal distribution
(3) 95% UCL-T: 95% Upper Concentration Limit on the mean, lognormal distribution
(4) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(5) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.

Table 83
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
American Eel

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:
J = Value is estimated.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by:	KJA
Checked by:	RAR

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TABLE 84
CBR-BASED HAZARD QUOTIENTS FOR COIs IN ASSAPUMPSET BROWN BULLHEAD TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Semivolatile Organics								
1,1'-Biphenyl	3 / 3	MG/KG	0.00076	0.00064				
2-Methylnaphthalene	3 / 3	MG/KG	0.0243	0.0173	1.79	15.96	9.7E-03	1.1E-03
Acenaphthene	2 / 3	MG/KG	0.00041	0.00041	3.5		1.2E-04	
Acenaphthylene	3 / 3	MG/KG	0.0012	0.00091				
Anthracene	3 / 3	MG/KG	0.00105	0.00079	3.4	6.3	2.3E-04	1.2E-04
Benzo(a)anthracene	1 / 3	MG/KG	0.00808	0.00334	17.5		1.9E-04	
Benzo(a)pyrene	1 / 3	MG/KG	0.00791	0.00329	1.93	2.1	1.7E-03	1.6E-03
Benzo(b)fluoranthene	1 / 3	MG/KG	0.01058	0.004177				
Benzo(g,h,i)perylene	1 / 3	MG/KG	0.00462	0.00219				
Benzo(k)fluoranthene	1 / 3	MG/KG	0.00894	0.00363				
Chrysene	1 / 3	MG/KG	0.01161	0.004520	2.6		1.7E-03	
Dibenzo(a,h)anthracene	1 / 3	MG/KG	0.00129	0.00108				
Dibenzofuran	3 / 3	MG/KG	0.00067	0.00055				
Fluoranthene	3 / 3	MG/KG	0.02088	0.00960		0.22		4.4E-02
Fluorene	3 / 3	MG/KG	0.00119	0.00090	189		4.7E-06	
Indeno(1,2,3-cd)pyrene	1 / 3	MG/KG	0.00653	0.00283				
Naphthalene	2 / 3	MG/KG	0.01204	0.00774		17		4.6E-04
Phenanthrene	3 / 3	MG/KG	0.00776	0.0071	0.78	0.78	9.1E-03	9.1E-03
Pyrene	1 / 3	MG/KG	0.01562	0.005867	1.08	10	5.4E-03	5.9E-04
Total PAH[1]	3 / 3	MG/KG	0.1145	0.07003				
						Total Semivolatile Organics	2.8E-02	5.7E-02
Pesticides								
4,4'-DDD	2 / 3	MG/KG	0.00413	0.00236	0.008	0.6	3.0E-01	3.9E-03
4,4'-DDE	3 / 3	MG/KG	0.0237	0.01270	0.042	0.29	3.0E-01	4.4E-02
alpha-Chlordane	2 / 3	MG/KG	0.00288	0.00174				
gamma-Chlordane	1 / 3	MG/KG	0.0013	0.00094				
						Total Pesticides	6.0E-01	4.8E-02
Inorganics/Metals								
Aluminum	3 / 3	MG/KG	13.5	9.94	1	8	**9.9E+00**	**1.2E+00**
Barium	3 / 3	MG/KG	1.21	0.923		0.41		**2.3E+00**
Beryllium	1 / 3	MG/KG	0.000348	0.000348	5.13		6.8E-05	
Cadmium	3 / 3	MG/KG	0.0319	0.015	0.06	0.12	2.5E-01	1.2E-01
Chromium	3 / 3	MG/KG	0.1	0.091				

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TABLE 84
CBR-BASED HAZARD QUOTIENTS FOR COIs IN ASSAPUMPSET BROWN BULLHEAD TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Cobalt	3 / 3	MG/KG	0.0456	0.0396				
Copper	3 / 3	MG/KG	0.688	0.5803		1.6		3.6E-01
Iron	3 / 3	MG/KG	58.1	50				
Lead	3 / 3	MG/KG	0.129	0.0894	2.55	4.02	3.5E-02	2.2E-02
Manganese	3 / 3	MG/KG	5.42	4.32	18.4		2.3E-01	
Mercury	3 / 3	MG/KG	0.137	0.077	0.093	0.04	8.2E-01	**1.9E+00**
Mercury (methyl)	3 / 3	MG/KG	0.145	0.077	1.91	2	4.1E-02	3.9E-02
Nickel	3 / 3	MG/KG	0.0439	0.0381	0.59	0.59	6.5E-02	6.5E-02
Selenium	2 / 3	MG/KG	0.196	0.194	0.14	0.18	**1.4E+00**	**1.1E+00**
Silver	2 / 3	MG/KG	0.0236	0.0212	5.36	1650	3.9E-03	1.3E-05
Thallium	1 / 3	MG/KG	0.00315	0.00315	2.72		1.2E-03	
Vanadium	2 / 3	MG/KG	0.0711	0.0706	0.02	0.41	**3.5E+00**	1.7E-01
Zinc	2 / 3	MG/KG	12.2	9.78	3.9	4.5	**2.5E+00**	**2.2E+00**
						Total Inorganics/Metals	**1.9E+01**	**9.4E+00**
Dioxins								
2,3,7,8-TCDD[1,2]	1 / 3	MG/KG	0.00000151	0.000000605	0.00015	0.00023	4.0E-03	2.6E-03
Toxicity Equivalency - Fish	3 / 3	MG/KG	0.00000263	0.00000220	0.00015	0.00023	1.5E-02	9.6E-03
						Total TCDD TEQ	1.5E-02	9.6E-03
						Total	**1.9E+01**	**9.6E+00**

Notes:
[a] CT and RME EPCs presented in Tables 80 and 81, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1]Analyte is not included in the HI totals.
[2] HQs for 2,3,7,8-TCDD are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 85
CBR-BASED HAZARD QUOTIENTS FOR COIs IN GREYSTONE WHITE SUCKER TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Semivolatile Organics								
1,1'-Biphenyl	10 / 10	MG/KG	0.001	0.001				
2-Methylnaphthalene	10 / 10	MG/KG	0.00652	0.00554	1.79	15.96	3.1E-03	3.5E-04
Acenaphthene	10 / 10	MG/KG	0.00404	0.00404	3.5		1.2E-03	
Acenaphthylene	10 / 10	MG/KG	0.00482	0.00388				
Anthracene	10 / 10	MG/KG	0.006	0.005	3.4	6.3	1.3E-03	7.3E-04
Benzo(a)anthracene	8 / 10	MG/KG	0.00227	0.00175	17.5		1.0E-04	
Benzo(a)pyrene	1 / 10	MG/KG	0.00112	0.00112	1.93	2.1	5.8E-04	5.3E-04
Benzo(b)fluoranthene	4 / 10	MG/KG	0.00148	0.00148				
Benzo(g,h,i)perylene	1 / 10	MG/KG	0.000988	0.000988				
Benzo(k)fluoranthene	4 / 10	MG/KG	0.00141	0.00141				
Chrysene	8 / 10	MG/KG	0.00557	0.00316	2.6		1.2E-03	
Dibenzo(a,h)anthracene	4 / 10	MG/KG	0.00039	0.00039				
Dibenzofuran	10 / 10	MG/KG	0.00417	0.00355				
Fluoranthene	10 / 10	MG/KG	0.0170	0.01304		0.22		5.9E-02
Fluorene	10 / 10	MG/KG	0.00608	0.00608	189		3.2E-05	
Naphthalene	1 / 10	MG/KG	0.00232	0.00232		17		1.4E-04
Phenanthrene	10 / 10	MG/KG	0.0172	0.0172	0.78	0.78	2.2E-02	2.2E-02
Pyrene	5 / 10	MG/KG	0.00576	0.00576	1.08	10	5.3E-03	5.8E-04
Total PAH[1]	10 / 10	MG/KG	0.07101	0.07101				
						Total Semivolatile Organics	3.5E-02	8.4E-02
Pesticides								
4,4'-DDD	10 / 10	MG/KG	0.0218	0.0174	0.008	0.6	**2.2E+00**	2.9E-02
4,4'-DDE	10 / 10	MG/KG	0.05130	0.04306	0.042	0.29	**1.0E+00**	1.5E-01
4,4'-DDT	6 / 10	MG/KG	0.00626	0.00626	0.26	0.464	2.4E-02	1.3E-02
alpha-Chlordane	10 / 10	MG/KG	0.02431	0.02094				
Dieldrin	3 / 10	MG/KG	0.00417	0.00417	1	1.21	4.2E-03	3.4E-03
gamma-BHC	2 / 10	MG/KG	0.00081	0.00081	6.13	79	1.3E-04	1.0E-05
gamma-Chlordane	10 / 10	MG/KG	0.0112	0.0112				
Heptachlor Epoxide	3 / 10	MG/KG	0.00081	0.00081	0.016	0.02	5.1E-02	4.1E-02
Technical Chlordane	10 / 10	MG/KG	0.2820	0.2820	0.01	0.01	**2.8E+01**	**2.8E+01**
						Total Pesticides	**3.1E+01**	**2.8E+01**
PCBs								
Aroclor, Total	10 / 10	MG/KG	0.25748	0.25748				

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TABLE 85
CBR-BASED HAZARD QUOTIENTS FOR COIs IN GREYSTONE WHITE SUCKER TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Aroclor-1254	10 / 10	MG/KG	0.20236	0.20236	0.98	1.53	2.1E-01	1.3E-01
Aroclor-1268	10 / 10	MG/KG	0.05512	0.05512		0.45		1.2E-01
						Total PCBs	2.1E-01	2.5E-01
Inorganics/Metals								
Aluminum	10 / 10	MG/KG	48.1	30.3	1	8	**3.0E+01**	**3.8E+00**
Antimony	3 / 10	MG/KG	0.00105	0.00105	5	9	2.1E-04	1.2E-04
Barium	10 / 10	MG/KG	0.913	0.913		0.41		**2.2E+00**
Beryllium	10 / 10	MG/KG	0.00595	0.00518	5.13		1.0E-03	
Cadmium	7 / 10	MG/KG	0.0289	0.0289	0.06	0.12	4.8E-01	2.4E-01
Chromium	6 / 10	MG/KG	0.118	0.118				
Cobalt	10 / 10	MG/KG	0.0791	0.0791				
Copper	10 / 10	MG/KG	1.18	1.01		1.6		6.3E-01
Iron	10 / 10	MG/KG	55.9	48.2				
Lead	1 / 10	MG/KG	0.012	0.012	2.55	4.02	4.7E-03	3.0E-03
Manganese	10 / 10	MG/KG	9.57	6.21	18.4		3.4E-01	
Mercury	10 / 10	MG/KG	0.190	0.190		0.04		**4.7E+00**
Mercury (methyl)	10 / 10	MG/KG	0.193	0.193	1.91	2	1.0E-01	9.6E-02
Nickel	10 / 10	MG/KG	0.0705	0.0705	0.59	0.59	1.2E-01	1.2E-01
Silver	1 / 10	MG/KG	0.0308	0.0308	5.36	1650	5.8E-03	1.9E-05
Thallium	5 / 10	MG/KG	0.00193	0.00193	2.72		7.1E-04	
Vanadium	7 / 10	MG/KG	0.101	0.101	0.02	0.41	**5.1E+00**	2.5E-01
Zinc	10 / 10	MG/KG	18	16	3.9	4.5	**4.1E+00**	**3.6E+00**
						Total Inorganics/Metals	**4.1E+01**	**1.6E+01**
Dioxins								
2,3,7,8-TCDD[1,2]	7 / 10	MG/KG	0.00000122	0.0000007	0.00015	0.00023	4.7E-03	3.0E-03
Toxicity Equivalency - Fish	10 / 10	MG/KG	0.00000289	0.00000189	0.00015	0.00023	1.3E-02	8.2E-03
Toxicity Equivalency (PCB) - Fish	1 / 1	MG/KG	0.00000052	0.000000520	0.00015	0.00023	3.5E-03	2.3E-03
						Total TCDD TEQ	1.6E-02	1.0E-02
						Total	**7.2E+01**	**4.4E+01**

Notes:
[a] CT and RME EPCs presented in Tables 80 and 81, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1]Analyte is not included in the HI totals.
[2] HQs for 2,3,7,8-TCDD are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 86
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN ALLENDALE WHITE SUCKER AND FALLFISH TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Semivolatile Organics								
1,1'-Biphenyl	10 / 10	MG/KG	0.0011	0.00099				
2-Methylnaphthalene	10 / 10	MG/KG	0.00383	0.00383	1.79	15.96	2.1E-03	2.4E-04
Acenaphthene	10 / 10	MG/KG	0.00397	0.00350	3.5		1.0E-03	
Acenaphthylene	10 / 10	MG/KG	0.00268	0.00215				
Anthracene	10 / 10	MG/KG	0.00312	0.00271	3.4	6.3	8.0E-04	4.3E-04
Benzo(a)anthracene	10 / 10	MG/KG	0.0022	0.0013	17.5		7.4E-05	
Benzo(a)pyrene	10 / 10	MG/KG	0.0024	0.00095	1.93	2.1	4.9E-04	4.5E-04
Benzo(b)fluoranthene	10 / 10	MG/KG	0.0025	0.0012				
Benzo(g,h,i)perylene	2 / 10	MG/KG	0.000632	0.000632				
Benzo(k)fluoranthene	10 / 10	MG/KG	0.0021	0.0011				
Chrysene	10 / 10	MG/KG	0.0030	0.0019	2.6		7.3E-04	
Dibenzo(a,h)anthracene	10 / 10	MG/KG	0.00040	0.00027				
Dibenzofuran	10 / 10	MG/KG	0.00248	0.00248				
Fluoranthene	10 / 10	MG/KG	0.0106	0.00826		0.22		3.8E-02
Fluorene	10 / 10	MG/KG	0.00407	0.00407	189		2.2E-05	
Indeno(1,2,3-cd)pyrene	10 / 10	MG/KG	0.00079	0.00079				
Naphthalene	10 / 10	MG/KG	0.00284	0.00284		17		1.7E-04
Phenanthrene	10 / 10	MG/KG	0.0114	0.00958	0.78	0.78	1.2E-02	1.2E-02
Pyrene	10 / 10	MG/KG	0.00283	0.00229	1.08	10	2.1E-03	2.3E-04
Total PAH[1]	10 / 10	MG/KG	0.05889	0.0505				
						Total Semivolatile Organics	2.0E-02	5.1E-02
Pesticides								
4,4'-DDD	10 / 10	MG/KG	0.0126	0.0126	0.008	0.6	**1.6E+00**	2.1E-02
4,4'-DDE	10 / 10	MG/KG	0.02869	0.02869	0.042	0.29	6.8E-01	9.9E-02
4,4'-DDT	10 / 10	MG/KG	0.00686	0.00686	0.26	0.464	2.6E-02	1.5E-02
alpha-Chlordane	10 / 10	MG/KG	0.0236	0.0168				
Dieldrin	10 / 10	MG/KG	0.00866	0.00537	1	1.21	5.4E-03	4.4E-03
gamma-BHC	9 / 10	MG/KG	0.0002	0.0002	6.13	79	3.3E-05	2.5E-06
gamma-Chlordane	10 / 10	MG/KG	0.0089	0.0089				
Heptachlor Epoxide	10 / 10	MG/KG	0.00070	0.00061	0.016	0.02	3.8E-02	3.1E-02
Technical Chlordane	10 / 10	MG/KG	0.674	0.346	0.01	0.01	**3.5E+01**	**3.5E+01**
						Total Pesticides	**3.7E+01**	**3.5E+01**
PCBs								
Aroclor, Total	10 / 10	MG/KG	2.9178	1.6127				

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TABLE 86
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN ALLENDALE WHITE SUCKER AND FALLFISH TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Aroclor-1254	10 / 10	MG/KG	2.8888	1.5832	0.98	1.53	**1.6E+00**	**1.0E+00**
Aroclor-1268	10 / 10	MG/KG	0.03843	0.02949		0.45		6.6E-02
						Total PCBs	**1.6E+00**	**1.1E+00**
Inorganics/Metals								
Aluminum	10 / 10	MG/KG	8.02	8.02	1	8	**8.0E+00**	**1.0E+00**
Barium	10 / 10	MG/KG	1	0.7		0.41		**1.7E+00**
Cadmium	10 / 10	MG/KG	0.0316	0.0241	0.06	0.12	4.0E-01	2.0E-01
Chromium	8 / 10	MG/KG	0.112	0.112				
Cobalt	10 / 10	MG/KG	0.103	0.0889				
Copper	10 / 10	MG/KG	0.872	0.872		1.6		5.5E-01
Iron	10 / 10	MG/KG	23.8	23.8				
Lead	6 / 10	MG/KG	0.349	0.16	2.55	4.02	6.3E-02	4.0E-02
Manganese	10 / 10	MG/KG	8.36	6.78	18.4		3.7E-01	
Mercury	10 / 10	MG/KG	0.136	0.136		0.04		**3.4E+00**
Mercury (methyl)	10 / 10	MG/KG	0.147	0.147	1.91	2	7.7E-02	7.4E-02
Molybdenum	3 / 10	MG/KG	0.0939	0.0939				
Nickel	10 / 10	MG/KG	0.147	0.147	0.59	0.59	2.5E-01	2.5E-01
Selenium	10 / 10	MG/KG	0.313	0.285	0.14	0.18	**2.0E+00**	**1.6E+00**
Vanadium	4 / 10	MG/KG	0.097	0.097	0.02	0.41	**4.9E+00**	2.4E-01
Zinc	10 / 10	MG/KG	23.4	20.9	3.9	4.5	**5.4E+00**	**4.6E+00**
						Total Inorganics/Metals	**2.1E+01**	**1.4E+01**
Dioxins								
2,3,7,8-TCDD[1,2]	11 / 11	MG/KG	0.0006018	0.0003330	0.00015	0.00023	**2.2E+00**	**1.4E+00**
Toxicity Equivalency - Fish	11 / 11	MG/KG	0.000603	0.000334	0.00015	0.00023	**2.2E+00**	**1.5E+00**
Toxicity Equivalency (PCB) - Fish	4 / 4	MG/KG	0.00000455	0.00000236	0.00015	0.00023	1.6E-02	1.0E-02
						Total TCDD TEQ	**2.2E+00**	**1.5E+00**
						Total	**6.2E+01**	**5.1E+01**

Notes:
[a] CT and RME EPCs presented in Tables 80 and 81, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1]Analyte is not included in the HI totals.
[2] HQs for 2,3,7,8-TCDD are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 87
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN LYMAN MILL WHITE SUCKER TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Semivolatile Organics								
1,1'-Biphenyl	10 / 10	MG/KG	0.0014	0.0012				
2-Methylnaphthalene	10 / 10	MG/KG	0.00422	0.00422	1.79	15.96	2.4E-03	2.6E-04
Acenaphthene	10 / 10	MG/KG	0.00406	0.00406	3.5		1.2E-03	
Acenaphthylene	10 / 10	MG/KG	0.00355	0.00297				
Anthracene	10 / 10	MG/KG	0.00353	0.00353	3.4	6.3	1.0E-03	5.6E-04
Benzo(a)anthracene	10 / 10	MG/KG	0.00946	0.00447	17.5		2.6E-04	
Benzo(a)pyrene	10 / 10	MG/KG	0.01469	0.00488	1.93	2.1	2.5E-03	2.3E-03
Benzo(b)fluoranthene	10 / 10	MG/KG	0.0067	0.0067				
Benzo(g,h,i)perylene	2 / 10	MG/KG	0.01143	0.00376				
Benzo(k)fluoranthene	10 / 10	MG/KG	0.01739	0.0059				
Chrysene	10 / 10	MG/KG	0.02304	0.00815	2.6		3.1E-03	
Dibenzo(a,h)anthracene	10 / 10	MG/KG	0.00268	0.00096				
Dibenzofuran	10 / 10	MG/KG	0.0033	0.00329				
Fluoranthene	10 / 10	MG/KG	0.0353	0.0220		0.22		1.0E-01
Fluorene	10 / 10	MG/KG	0.00667	0.00515	189		2.7E-05	
Indeno(1,2,3-cd)pyrene	10 / 10	MG/KG	0.01347	0.0043				
Naphthalene	10 / 10	MG/KG	0.00351	0.00351		17		2.1E-04
Phenanthrene	10 / 10	MG/KG	0.0212	0.0154	0.78	0.78	2.0E-02	2.0E-02
Pyrene	10 / 10	MG/KG	0.0142	0.0106	1.08	10	9.8E-03	1.1E-03
Total PAH[1]	10 / 10	MG/KG	0.1791	0.1149				
						Total Semivolatile Organics	4.0E-02	1.2E-01
Pesticides								
4,4'-DDD	10 / 10	MG/KG	0.06351	0.03866	0.008	0.6	**4.8E+00**	6.4E-02
4,4'-DDE	10 / 10	MG/KG	0.2134	0.1309	0.042	0.29	**3.1E+00**	4.5E-01
4,4'-DDT	10 / 10	MG/KG	0.0052	0.0037	0.26	0.464	1.4E-02	8.0E-03
alpha-Chlordane	10 / 10	MG/KG	0.0469	0.03963				
Dieldrin	10 / 10	MG/KG	0.0086	0.00556	1	1.21	5.6E-03	4.6E-03
gamma-BHC	9 / 10	MG/KG	0.00021	0.00021	6.13	79	3.4E-05	2.7E-06
gamma-Chlordane	10 / 10	MG/KG	0.02921	0.02921				
Heptachlor Epoxide	10 / 10	MG/KG	0.0017	0.0014	0.016	0.02	8.8E-02	7.0E-02
Technical Chlordane	10 / 10	MG/KG	2.5751	1.3657	0.01	0.01	**1.4E+02**	**1.4E+02**
						Total Pesticides	**1.4E+02**	**1.4E+02**
PCBs								

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TABLE 87
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN LYMAN MILL WHITE SUCKER TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Aroclor, Total	10 / 10	MG/KG	5.25493	4.22949				
Aroclor-1254	10 / 10	MG/KG	5.2136	4.19359	0.98	1.53	**4.3E+00**	**2.7E+00**
Aroclor-1268	10 / 10	MG/KG	0.0437	0.03590		0.45		8.0E-02
						Total PCBs	**4.3E+00**	**2.8E+00**
Inorganics/Metals								
Aluminum	10 / 10	MG/KG	69.9	48.6	1	8	**4.9E+01**	**6.1E+00**
Antimony			0.01	0.01	5	9	2.0E-03	1.1E-03
Arsenic			0.0276	0.0276				
Barium	10 / 10	MG/KG	1.58	1.10		0.41		**2.7E+00**
Beryllium			0.00824	0.00579	5.13		1.1E-03	
Cadmium	10 / 10	MG/KG	0.0228	0.0184	0.06	0.12	3.1E-01	1.5E-01
Chromium	8 / 10	MG/KG	0.378	0.270				
Cobalt	10 / 10	MG/KG	0.0904	0.0775				
Copper	10 / 10	MG/KG	0.977	0.840		1.6		5.3E-01
Iron	10 / 10	MG/KG	128	75				
Lead	6 / 10	MG/KG	0.594	0.428	2.55	4.02	1.7E-01	1.1E-01
Manganese	10 / 10	MG/KG	7.49	7.49	18.4		4.1E-01	
Mercury	10 / 10	MG/KG	0.118	0.0984		0.04		**2.5E+00**
Mercury (methyl)	10 / 10	MG/KG	0.109	0.0927	1.91	2	4.9E-02	4.6E-02
Molybdenum	3 / 10	MG/KG	0.0456	0.0363				
Nickel	10 / 10	MG/KG	0.186	0.154	0.59	0.59	2.6E-01	2.6E-01
Selenium	10 / 10	MG/KG	0.214	0.214	0.14	0.18	**1.5E+00**	**1.2E+00**
Silver			0.0167	0.0167	5.36	1650	3.1E-03	1.0E-05
Vanadium	4 / 10	MG/KG	0.166	0.127	0.02	0.41	**6.4E+00**	3.1E-01
Zinc	10 / 10	MG/KG	22.2	20.6	3.9	4.5	**5.3E+00**	**4.6E+00**
						Total Inorganics/Metals	**6.3E+01**	**1.8E+01**
Dioxins								
2,3,7,8-TCDD[1,2]	11 / 11	MG/KG	0.00076657	0.0005549	0.00015	0.00023	**3.7E+00**	**2.4E+00**
Toxicity Equivalency - Fish	11 / 11	MG/KG	0.000768	0.000557	0.00015	0.00023	**3.7E+00**	**2.4E+00**
Toxicity Equivalency (PCB) - Fish	4 / 4	MG/KG	0.00004880	0.00001235	0.00015	0.00023	8.2E-02	5.4E-02
						Total TCDD TEQ	**3.8E+00**	**2.5E+00**
						Total	**2.2E+02**	**1.6E+02**

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TABLE 87
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN LYMAN MILL WHITE SUCKER TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL

Notes:
[a] CT and RME EPCs presented in Tables 80 and 81, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1]Analyte is not included in the HI totals.
[2] HQs for 2,3,7,8-TCDD are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

TABLE 88
INCREMENTAL RISK SUMMARY FOR WHITE SUCKER TISSUE (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Technical Chlordane	**3.5E+01**	**3.5E+01**	**2.8E+01**	**2.8E+01**	**6.4E+00**	**6.4E+00**
Selenium	**2.0E+00**	**1.6E+00**			**2.0E+00**	**1.6E+00**
Toxicity Equivalency - Fish	**2.2E+00**	**1.5E+00**	1.3E-02	8.2E-03	**2.2E+00**	**1.4E+00**
Zinc	**5.4E+00**	**4.6E+00**	**4.1E+00**	**3.6E+00**	**1.2E+00**	**1.1E+00**
Aroclor-1254	**1.6E+00**	**1.0E+00**	2.1E-01	1.3E-01	**1.4E+00**	9.0E-01

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Technical Chlordane	**1.4E+02**	**1.4E+02**	**2.8E+01**	**2.8E+01**	**1.1E+02**	**1.1E+02**
Aroclor-1254	**4.3E+00**	**2.7E+00**	2.1E-01	1.3E-01	**4.1E+00**	**2.6E+00**
Toxicity Equivalency - Fish	**3.7E+00**	**2.4E+00**	1.3E-02	8.2E-03	**3.7E+00**	**2.4E+00**
Aluminum	**4.9E+01**	**6.1E+00**	**3.0E+01**	**3.8E+00**	**1.8E+01**	**2.3E+00**
Selenium	**1.5E+00**	**1.2E+00**			**1.5E+00**	**1.2E+00**
Zinc	**5.3E+00**	**4.6E+00**	**4.1E+00**	**3.6E+00**	**1.1E+00**	9.8E-01
Barium		**2.7E+00**		**2.2E+00**		4.6E-01
4,4'-DDE	**3.1E+00**	4.5E-01	**1.0E+00**	1.5E-01	**2.1E+00**	3.0E-01
Vanadium	**6.4E+00**	3.1E-01	**5.1E+00**	2.5E-01	**1.3E+00**	6.3E-02
4,4'-DDD	**4.8E+00**	6.4E-02	**2.2E+00**	2.9E-02	**2.7E+00**	3.5E-02

Notes:
Risk estimates as calculated and presented in Tables 85 through 87.
Incremental risks calculated for all analytes with NOAEL-based HQs[1] greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

[1] LOAEL-based HQs were used when NOAEL-based values were not available.

Prepared by: NAR
Checked by: RAR

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TABLE 89
WEIGHT-OF-EVIDENCE INTEGRATION: DEMERSAL/OMNIVOROUS FISH POPULATIONS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Assessment Endpoint 2. Protection and maintenance of demersal, omnivorous fish populations as a forage base or sport fishery.

A. Do field surveys of demersal fish populations indicate presence/absence of ecological integrity?

B. Do measured and modeled concentrations of COPCs or toxic equivalencies (TEQs) in eggs and/or tissues of demersal, omnivorous fish (such as carps, suckers, other cyprinids, bullheads, turtles or American eel) exceed benchmarks for adverse effects on survival, growth, reproduction or embryo development?

Measurement Endpoints[a]

A_1. Fish length-weight relationships and condition indices relative to habitat characterization
A_2. Percent gross lesions in individual fish
A_3. Demographic structure analysis of dominant species
A_4. Species richness and relative abundance of ichthyoplankton
B_1. Comparison of measured concentrations or toxic equivalencies in fish tissue to literature derived CBRs
B_2. Comparison of modeled concentrations or toxic equivalencies in eggs and fish tissue to site-specific CBRs
B_3. Partial life cycle laboratory bioassay using channel catfish eggs, embryos, and fry

Weight-of-Evidence Integration[b]

	WEIGHT				
RISK/MAGNITUDE	Low	Low - Medium	Medium	Medium - High	High
Yes/High				B_1	
Yes/Low			A_2		
Undeterminate			A_4		
No/Low		A_1	B_2, B_3		
No/Very Low			A_3		

TABLE 89
WEIGHT-OF-EVIDENCE INTEGRATION: DEMERSAL/OMNIVOROUS FISH POPULATIONS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Risk Conclusion:

Demersal, omnivorous fish populations that occur within the study area may be at substantial risk of harm due to exposure to Site-related contaminants in surface water, sediment, and tissue residues.

Notes:
a. Measurement endpoints and assigned weights are discussed in Section 2.6.
b. WOE integration is discussed in Section 5.4.

Prepared by: NAR
Checked by: SGH

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Table 90
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Largemouth Bass

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Largemouth Bass
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
ASSAPUMPSET	**Semivolatile Organics**								
(Reference area)	1,1'-Biphenyl	MG/KG	0.00055	NC	0.00064 J	0.00055	MG/KG	Mean	(2)
	2-Methylnaphthalene	MG/KG	0.0271	NC	0.03951	0.0271	MG/KG	Mean	(2)
	Acenaphthene	MG/KG	0.00050	NC	0.00061	0.00050	MG/KG	Mean	(2)
	Acenaphthylene	MG/KG	0.00090	NC	0.00132	0.00090	MG/KG	Mean	(2)
	Anthracene	MG/KG	0.00032	NC	0.0004 J	0.00032	MG/KG	Mean	(2)
	Dibenzofuran	MG/KG	0.00049	NC	0.0007	0.00049	MG/KG	Mean	(2)
	Fluoranthene	MG/KG	0.0012	NC	0.0016	0.0012	MG/KG	Mean	(2)
	Fluorene	MG/KG	0.00091	NC	0.00106	0.00091	MG/KG	Mean	(2)
	Naphthalene	MG/KG	0.0141	NC	0.01986	0.0141	MG/KG	Mean	(2)
	Phenanthrene	MG/KG	0.00460	NC	0.00573	0.00460	MG/KG	Mean	(2)
	Total PAH	MG/KG	0.05047	NC	0.06872 J	0.05047	MG/KG	Mean	(2)
	Pesticides/PCBs								
	4,4'-DDD	MG/KG	0.00353	NC	0.0054	0.00353	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.02781	NC	0.05823 D	0.02781	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.00224	NC	0.00364	0.00224	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.0012	NC	0.00186	0.0012	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.08646	NC	0.15253	0.08646	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.07850	NC	0.13847	0.07850	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.00796	NC	0.01407	0.00796	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.00058	NC	0.00081 J	0.00058	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.00036	NC	0.00051 J	0.00036	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.00035	NC	0.00023 J	0.00023	MG/KG	Max	(3)
	Technical Chlordane	MG/KG	0.06846	NC	0.12021 J	0.06846	MG/KG	Mean	(2)
	Inorganics								
	Aluminum	MG/KG	0.808	NC	1.52	0.808	MG/KG	Mean	(2)
	Barium	MG/KG	0.776	NC	1.19	0.776	MG/KG	Mean	(2)
	Beryllium	MG/KG	0.00120	NC	0.00122 J	0.00120	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.00906	NC	0.012 J	0.00906	MG/KG	Mean	(2)
	Chromium	MG/KG	0.123	NC	0.166 J	0.123	MG/KG	Mean	(2)
	Cobalt	MG/KG	0.0239	NC	0.0281 J	0.0239	MG/KG	Mean	(2)
	Copper	MG/KG	0.43	NC	0.519	0.43	MG/KG	Mean	(2)

Table 90
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Largemouth Bass

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Largemouth Bass
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
ASSAPUMPSET (continued)	Iron	MG/KG	14.8	NC		16.7		14.8	MG/KG	Mean	(2)
(Reference area)	Lead	MG/KG	0.0158	NC		0.0204		0.0158	MG/KG	Mean	(2)
	Manganese	MG/KG	4.76	NC		9.04	J	4.76	MG/KG	Mean	(2)
	Mercury	MG/KG	0.208	NC		0.265		0.208	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.213	NC		0.247		0.213	MG/KG	Mean	(2)
	Molybdenum	MG/KG	0.124	NC		0.0155	J	0.0155	MG/KG	Max	(3)
	Nickel	MG/KG	0.0554	NC		0.06	J	0.0554	MG/KG	Mean	(2)
	Selenium	MG/KG	0.158	NC		0.218	J	0.158	MG/KG	Mean	(2)
	Silver	MG/KG	0.0106	NC		0.0154	J	0.0106	MG/KG	Mean	(2)
	Thallium	MG/KG	0.00557	NC		0.0112	J	0.00557	MG/KG	Mean	(2)
	Vanadium	MG/KG	0.00861	NC		0.0193	J	0.00861	MG/KG	Mean	(2)
	Zinc	MG/KG	12.5	NC		17.6		12.5	MG/KG	Mean	(2)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.0000046	NC		0.0000152		0.0000046	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.00000025	NC		0.00000037	J	0.00000025	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.00000518	NC		0.000016		0.00000518	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.00000561	NC		0.0000164		0.00000561	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.00000517	NC		0.000016		0.00000517	MG/KG	Mean	(2)
GREYSTONE	**Semivolatile Organics**										
(Background area)	1,1'-Biphenyl	MG/KG	0.00021	0.00028	N	0.00044	J	0.00021	MG/KG	Mean	(2)
	2-Methylnaphthalene	MG/KG	0.0045	0.017	T	0.01881		0.0045	MG/KG	Mean	(2)
	Acenaphthene	MG/KG	0.00040	0.00046	N	0.00052		0.00040	MG/KG	Mean	(2)
	Acenaphthylene	MG/KG	0.00042	0.00082	T	0.00117		0.00042	MG/KG	Mean	(2)
	Anthracene	MG/KG	0.00041	0.00048	N	0.00058		0.00041	MG/KG	Mean	(2)
	Benzo(a)anthracene	MG/KG	0.0001	0.0003	T	0.00039	J	0.0001	MG/KG	Mean	(2)
	Benzo(a)pyrene	MG/KG	0.0003	0.0004	N	0.00043		0.0003	MG/KG	Mean	(2)
	Benzo(b)fluoranthene	MG/KG	0.0003	0.0003	NP	0.00058		0.0003	MG/KG	Mean	(2)
	Benzo(g,h,i)perylene	MG/KG	0.00037	0.00041	T	0.00039	J	0.00037	MG/KG	Mean	(2)
	Benzo(k)fluoranthene	MG/KG	0.0003	0.0006	T	0.00053		0.0003	MG/KG	Mean	(2)
	Chrysene	MG/KG	0.00030	0.00030	NP	0.00074		0.00030	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.0003	0.0004	N	0.00018	J	0.00018	MG/KG	Max	(3)
	Dibenzofuran	MG/KG	0.00030	0.00030	NP	0.00042	J	0.00030	MG/KG	Mean	(2)

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Table 90
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Largemouth Bass

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Largemouth Bass
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
GREYSTONE (continued)	Fluoranthene	MG/KG	0.0017	0.0017	NP	0.00274		0.0017	MG/KG	Mean	(2)
(Background area)	Fluorene	MG/KG	0.00078	0.00095	T	0.00127		0.00078	MG/KG	Mean	(2)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.0002	0.0002	NP	0.00046		0.0002	MG/KG	Mean	(2)
	Naphthalene	MG/KG	0.00355	0.00936	T	0.01258		0.00355	MG/KG	Mean	(2)
	Phenanthrene	MG/KG	0.0027	0.0033	N	0.00423		0.0027	MG/KG	Mean	(2)
	Pyrene	MG/KG	0.0007	0.001	T	0.00157	J	0.0007	MG/KG	Mean	(2)
	Total PAH	MG/KG	0.0166	0.0277	T	0.045	J	0.0166	MG/KG	Mean	(2)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.00364	0.00419	T	0.00473		0.00364	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.0642	0.0642	NP	0.14733	D	0.0642	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.0016	0.0016	NP	0.00265		0.0016	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.00323	0.00402	N	0.00579		0.00323	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.2903	0.4070	N	0.66467		0.2903	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.2209	0.3176	N	0.53995	D	0.2209	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.06940	0.09214	N	0.13398	D	0.06940	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.00078	0.00078	NP	0.00109		0.00078	MG/KG	Mean	(2)
	gamma-BHC	MG/KG	0.0002	0.0002	NP	0.00004	J	0.00004	MG/KG	Max	(3)
	gamma-Chlordane	MG/KG	0.0013	0.0016	N	0.00236		0.0013	MG/KG	Mean	(2)
	Methoxychlor	MG/KG	0.0003	0.0003	NP	0.00004	J	0.00004	MG/KG	Max	(3)
	Technical Chlordane	MG/KG	0.04385	0.04385	NP	0.06005	J	0.04385	MG/KG	Mean	(2)
	Inorganics										
	Aluminum	MG/KG	3.53	4.64	N	6.9		3.53	MG/KG	Mean	(2)
	Barium	MG/KG	0.763	1.20	T	1.67	J	0.763	MG/KG	Mean	(2)
	Beryllium	MG/KG	0.00355	0.00455	N	0.0064		0.00355	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.0306	0.0306	NP	0.0197	J	0.0197	MG/KG	Max	(3)
	Chromium	MG/KG	0.140	0.140	NP	0.167	J	0.140	MG/KG	Mean	(2)
	Cobalt	MG/KG	0.0314	0.0343	T	0.0395	J	0.0314	MG/KG	Mean	(2)
	Copper	MG/KG	0.810	0.810	NP	2.06		0.810	MG/KG	Mean	(2)
	Iron	MG/KG	25.6	25.6	NP	83.8	J	25.6	MG/KG	Mean	(2)
	Lead	MG/KG	0.0452	0.0556	N	0.0817		0.0452	MG/KG	Mean	(2)
	Manganese	MG/KG	3.58	5.13	T	7.14	J	3.58	MG/KG	Mean	(2)
	Mercury	MG/KG	0.310	0.310	NP	0.526	J	0.310	MG/KG	Mean	(2)

Table 90
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Largemouth Bass

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Largemouth Bass
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
GREYSTONE (continued)	Mercury (methyl)	MG/KG	0.314	0.314	NP	0.564		0.314	MG/KG	Mean	(2)
(Background area)	Molybdenum	MG/KG	0.133	0.133	NP	0.0325	J	0.0325	MG/KG	Max	(3)
	Nickel	MG/KG	0.177	0.177	NP	0.556	J	0.177	MG/KG	Mean	(2)
	Selenium	MG/KG	0.235	0.235	NP	0.287	J	0.235	MG/KG	Mean	(2)
	Silver	MG/KG	0.0305	0.0305	NP	0.049		0.0305	MG/KG	Mean	(2)
	Thallium	MG/KG	0.00409	0.00493	T	0.00603	J	0.00409	MG/KG	Mean	(2)
	Vanadium	MG/KG	0.0741	0.0741	NP	0.0246	J	0.0246	MG/KG	Max	(3)
	Zinc	MG/KG	14.6	16.0	T	18.8		14.6	MG/KG	Mean	(2)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.00000023	0.00000023	NP	0.00000061	J	0.00000023	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.0000002	0.0000002	NP	0.00000031	J	0.0000002	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.000000490	0.000000610	T	0.000000832		0.000000490	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000000720	0.000000909	T	0.00000111		0.000000720	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.000000493	0.000000600	T	0.000000836		0.000000493	MG/KG	Mean	(2)
LYMAN MILL	**Semivolatile Organics**										
	1,1'-Biphenyl	MG/KG	0.00041	0.00041	NP	0.00059		0.00041	MG/KG	Mean	(2)
	2-Methylnaphthalene	MG/KG	0.00275	0.00398	T	0.00518		0.00275	MG/KG	Mean	(2)
	Acenaphthene	MG/KG	0.001	0.002	T	0.00158		0.001	MG/KG	Mean	(2)
	Acenaphthylene	MG/KG	0.00046	0.00046	NP	0.00086		0.00046	MG/KG	Mean	(2)
	Anthracene	MG/KG	0.00078	0.00078	NP	0.00125		0.00078	MG/KG	Mean	(2)
	Benzo(a)anthracene	MG/KG	0.0005	0.0005	NP	0.00348		0.0005	MG/KG	Mean	(2)
	Benzo(a)pyrene	MG/KG	0.00078	0.00078	NP	0.00513		0.00078	MG/KG	Mean	(2)
	Benzo(b)fluoranthene	MG/KG	0.0010	0.0010	NP	0.0067		0.0010	MG/KG	Mean	(2)
	Benzo(g,h,i)perylene	MG/KG	0.0010	0.0010	NP	0.00524		0.0010	MG/KG	Mean	(2)
	Benzo(k)fluoranthene	MG/KG	0.00094	0.00094	NP	0.00605		0.00094	MG/KG	Mean	(2)
	Chrysene	MG/KG	0.0012	0.0012	NP	0.0067		0.0012	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.0004	0.0004	NP	0.00139		0.0004	MG/KG	Mean	(2)
	Dibenzofuran	MG/KG	0.00091	0.00091	NP	0.00143		0.00091	MG/KG	Mean	(2)
	Fluoranthene	MG/KG	0.00288	0.00288	NP	0.01011		0.00288	MG/KG	Mean	(2)
	Fluorene	MG/KG	0.0021	0.0029	N	0.00471		0.0021	MG/KG	Mean	(2)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.0010	0.0010	NP	0.00596		0.0010	MG/KG	Mean	(2)

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Table 90
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Largemouth Bass

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Largemouth Bass
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
LYMAN MILL (continued)	Naphthalene	MG/KG	0.00215	0.00215	NP	0.00466		0.00215	MG/KG	Mean	(2)
	Phenanthrene	MG/KG	0.00425	0.00425	NP	0.00746		0.00425	MG/KG	Mean	(2)
	Pyrene	MG/KG	0.0017	0.0017	NP	0.00747		0.0017	MG/KG	Mean	(2)
	Total PAH	MG/KG	0.02591	0.04373	T	0.07799	J	0.02591	MG/KG	Mean	(2)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.00546	0.00660	T	0.00836		0.00546	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.05885	0.05885	NP	0.12507	D	0.05885	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.00261	0.00301	N	0.00335	J	0.00261	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.00640	0.00827	T	0.0101		0.00640	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	1.3696	1.3696	NP	2.36514		1.3696	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	1.3437	1.3437	NP	2.35105	D	1.3437	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.0259	0.0366	N	0.05924	J	0.0259	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.0016	0.0024	T	0.00261		0.0016	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.00252	0.00342	T	0.00415		0.00252	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.115	0.128	N	0.15067		0.115	MG/KG	Mean	(2)
	Inorganics										
	Aluminum	MG/KG	9.79	9.79	NP	67		9.79	MG/KG	Mean	(2)
	Barium	MG/KG	0.874	0.874	NP	1.63	J	0.874	MG/KG	Mean	(2)
	Beryllium	MG/KG	0.00349	0.00349	NP	0.0108		0.00349	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.01	0.02	T	0.0188	J	0.01	MG/KG	Mean	(2)
	Chromium	MG/KG	0.138	0.138	NP	0.288		0.138	MG/KG	Mean	(2)
	Cobalt	MG/KG	0.0590	0.0769	N	0.1	J	0.0590	MG/KG	Mean	(2)
	Copper	MG/KG	0.9	1	N	1.26	J	0.9	MG/KG	Mean	(2)
	Iron	MG/KG	27.4	27.4	NP	93.7		27.4	MG/KG	Mean	(2)
	Lead	MG/KG	0.0963	0.0963	NP	0.369	J	0.0963	MG/KG	Mean	(2)
	Manganese	MG/KG	4.63	8.32	T	14.7		4.63	MG/KG	Mean	(2)
	Mercury	MG/KG	0.122	0.215	T	0.338		0.122	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.180	0.299	T	0.308		0.180	MG/KG	Mean	(2)
	Molybdenum	MG/KG	0.0687	0.297	T	0.0445	J	0.0445	MG/KG	Max	(3)
	Nickel	MG/KG	0.105	0.155	T	0.177	J	0.105	MG/KG	Mean	(2)
	Selenium	MG/KG	0.186	0.186	NP	0.232	J	0.186	MG/KG	Mean	(2)

Table 90
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Largemouth Bass

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Largemouth Bass
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
LYMAN MILL (continued)	Silver	MG/KG	0.0282	0.0282	NP	0.0214	J	0.0214	MG/KG	Max	(3)
	Thallium	MG/KG	0.00447	0.00447	NP	0.00529	J	0.00447	MG/KG	Mean	(2)
	Vanadium	MG/KG	0.0578	0.0578	NP	0.11	J	0.0578	MG/KG	Mean	(2)
	Zinc	MG/KG	15.9	17.8	T	21	J	15.9	MG/KG	Mean	(2)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.0001910	0.0001910	NP	0.0002888	J	0.0001910	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.0000003	0.0000003	NP	0.00000099	J#	0.0000003	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.000191	0.000191	NP	0.000289		0.000191	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000192	0.000192	NP	0.00029		0.000192	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.000191	0.000191	NP	0.000289		0.000191	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0000193	NC		0.0000372		0.0000193	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000286	NC		0.0000546		0.0000286	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.000000883	NC		0.00000177		0.000000883	MG/KG	Mean	(2)
MANTON	**Semivolatile Organics**										
	1,1'-Biphenyl	MG/KG	0.00028	NC		0.00037	J	0.00028	MG/KG	Mean	(2)
	2-Methylnaphthalene	MG/KG	0.00461	NC		0.00582		0.00461	MG/KG	Mean	(2)
	Acenaphthene	MG/KG	0.0010	NC		0.00147		0.0010	MG/KG	Mean	(2)
	Acenaphthylene	MG/KG	0.00067	NC		0.00098		0.00067	MG/KG	Mean	(2)
	Anthracene	MG/KG	0.00091	NC		0.00171		0.00091	MG/KG	Mean	(2)
	Benzo(a)anthracene	MG/KG	0.001	NC		0.00177		0.001	MG/KG	Mean	(2)
	Benzo(a)pyrene	MG/KG	0.0011	NC		0.00226		0.0011	MG/KG	Mean	(2)
	Benzo(b)fluoranthene	MG/KG	0.00163	NC		0.00307	J	0.00163	MG/KG	Mean	(2)
	Benzo(g,h,i)perylene	MG/KG	0.00130	NC		0.00163	J	0.00130	MG/KG	Mean	(2)
	Benzo(k)fluoranthene	MG/KG	0.00151	NC		0.00286	J	0.00151	MG/KG	Mean	(2)
	Chrysene	MG/KG	0.00213	NC		0.00418		0.00213	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.0002	NC		0.0004	J	0.0002	MG/KG	Mean	(2)
	Dibenzofuran	MG/KG	0.00095	NC		0.00135		0.00095	MG/KG	Mean	(2)
	Fluoranthene	MG/KG	0.00798	NC		0.01618		0.00798	MG/KG	Mean	(2)
	Fluorene	MG/KG	0.0021	NC		0.00326		0.0021	MG/KG	Mean	(2)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.00105	NC		0.00174		0.00105	MG/KG	Mean	(2)
	Naphthalene	MG/KG	0.00414	NC		0.00492		0.00414	MG/KG	Mean	(2)
	Phenanthrene	MG/KG	0.00904	NC		0.01609		0.00904	MG/KG	Mean	(2)

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Table 90
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Largemouth Bass

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Largemouth Bass
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic (1)	Rationale
MANTON (continued)	Pyrene	MG/KG	0.0042	NC	0.00834		0.0042	MG/KG	Mean	(2)
	Total PAH	MG/KG	0.04482	NC	0.07838	J	0.04482	MG/KG	Mean	(2)
	Pesticides/PCBs									
	4,4'-DDD	MG/KG	0.00623	NC	0.00873		0.00623	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.05460	NC	0.10352	D	0.05460	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.00222	NC	0.00354		0.00222	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.00537	NC	0.00943		0.00537	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.63910	NC	0.93912		0.63910	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.51244	NC	0.89924	D	0.51244	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.1267	NC	0.29687	D	0.1267	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.0013	NC	0.00222		0.0013	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.0019	NC	0.00316		0.0019	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.0003	NC	0.00045	J	0.0003	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.1440	NC	0.23542		0.1440	MG/KG	Mean	(2)
	Inorganics									
	Aluminum	MG/KG	23.9	NC	38.8		23.9	MG/KG	Mean	(2)
	Barium	MG/KG	2.29	NC	5.53		2.29	MG/KG	Mean	(2)
	Cadmium	MG/KG	0.0109	NC	0.0166	J	0.0109	MG/KG	Mean	(2)
	Chromium	MG/KG	0.217	NC	0.278		0.217	MG/KG	Mean	(2)
	Cobalt	MG/KG	0.0340	NC	0.0423	J	0.0340	MG/KG	Mean	(2)
	Copper	MG/KG	0.461	NC	0.519		0.461	MG/KG	Mean	(2)
	Iron	MG/KG	46.6	NC	57.8		46.6	MG/KG	Mean	(2)
	Lead	MG/KG	0.150	NC	0.222		0.150	MG/KG	Mean	(2)
	Manganese	MG/KG	4.87	NC	8.13	J	4.87	MG/KG	Mean	(2)
	Mercury	MG/KG	0.153	NC	0.226		0.153	MG/KG	Mean	(2)
	Mercury (methyl)	MG/KG	0.120	NC	0.222		0.120	MG/KG	Mean	(2)
	Molybdenum	MG/KG	0.0232	NC	0.0286	J	0.0232	MG/KG	Mean	(2)
	Nickel	MG/KG	0.0520	NC	0.0611	J	0.0520	MG/KG	Mean	(2)
	Selenium	MG/KG	0.196	NC	0.141	J	0.141	MG/KG	Max	(3)
	Thallium	MG/KG	0.00489	NC	0.00577	J	0.00489	MG/KG	Mean	(2)
	Vanadium	MG/KG	0.0606	NC	0.0562	J	0.0562	MG/KG	Max	(3)

Table 90
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Largemouth Bass

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Largemouth Bass
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
MANTON (continued)	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.00008669	NC	0.00014303	0.00008669	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.00000033	NC	0.00000063 J	0.00000033	MG/KG	Mean	(2)
	Toxicity Equivalency - Mammals	MG/KG	0.0000873	NC	0.000144	0.0000873	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.0000875	NC	0.000144	0.0000875	MG/KG	Mean	(2)
	Toxicity Equivalency - Fish	MG/KG	0.0000873	NC	0.000144	0.0000873	MG/KG	Mean	(2)

(1) Chemicals of potential concern are identified in Table 11 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(2) Mean: Arithmetic Mean
(3) Max: Maximum, applied in the special case where the arithmetic mean has been selected, but because of elevated detection limits in non-detects, it is greater than the maximum detected concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:

J = Value is estimated.
D = Results from analytical dilution
# = Value is result from second column confirmation analysis.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

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Table 91
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Largemouth Bass

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Largemouth Bass
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
ASSAPUMPSET	**Semivolatile Organics**								
(Reference area)	1,1'-Biphenyl	MG/KG	0.00055	NC	0.00064 J	0.00064	MG/KG	Max	(5)
	2-Methylnaphthalene	MG/KG	0.0271	NC	0.03951	0.03951	MG/KG	Max	(5)
	Acenaphthene	MG/KG	0.00050	NC	0.00061	0.00061	MG/KG	Max	(5)
	Acenaphthylene	MG/KG	0.00090	NC	0.00132	0.00132	MG/KG	Max	(5)
	Anthracene	MG/KG	0.00032	NC	0.0004 J	0.0004	MG/KG	Max	(5)
	Dibenzofuran	MG/KG	0.00049	NC	0.0007	0.0007	MG/KG	Max	(5)
	Fluoranthene	MG/KG	0.0012	NC	0.0016	0.0016	MG/KG	Max	(5)
	Fluorene	MG/KG	0.00091	NC	0.00106	0.00106	MG/KG	Max	(5)
	Naphthalene	MG/KG	0.0141	NC	0.01986	0.01986	MG/KG	Max	(5)
	Phenanthrene	MG/KG	0.00460	NC	0.00573	0.00573	MG/KG	Max	(5)
	Total PAH	MG/KG	0.05047	NC	0.06872 J	0.06872	MG/KG	Max	(5)
	Pesticides/PCBs								
	4,4'-DDD	MG/KG	0.00353	NC	0.0054	0.0054	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.02781	NC	0.05823 D	0.05823	MG/KG	Max	(5)
	4,4'-DDT	MG/KG	0.00224	NC	0.00364	0.00364	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.0012	NC	0.00186	0.00186	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	0.08646	NC	0.15253	0.15253	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.07850	NC	0.13847	0.13847	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.00796	NC	0.01407	0.01407	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.00058	NC	0.00081 J	0.00081	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.00036	NC	0.00051 J	0.00051	MG/KG	Max	(5)
	Heptachlor Epoxide	MG/KG	0.00035	NC	0.00023 J	0.00023	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.06846	NC	0.12021 J	0.12021	MG/KG	Max	(5)
	Inorganics								
	Aluminum	MG/KG	0.808	NC	1.52	1.52	MG/KG	Max	(5)
	Barium	MG/KG	0.776	NC	1.19	1.19	MG/KG	Max	(5)
	Beryllium	MG/KG	0.00120	NC	0.00122 J	0.00122	MG/KG	Max	(5)
	Cadmium	MG/KG	0.00906	NC	0.012 J	0.012	MG/KG	Max	(5)
	Chromium	MG/KG	0.123	NC	0.166 J	0.166	MG/KG	Max	(5)
	Cobalt	MG/KG	0.02	NC	0.0281 J	0.0281	MG/KG	Max	(5)
	Copper	MG/KG	0.4335	NC	0.519	0.519	MG/KG	Max	(5)

Table 91
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Largemouth Bass

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Largemouth Bass
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
ASSAPUMPSET (continued)	Iron	MG/KG	14.8	NC	16.7	16.7	MG/KG	Max	(5)
(Reference area)	Lead	MG/KG	0.0158	NC	0.0204	0.0204	MG/KG	Max	(5)
	Manganese	MG/KG	4.7625	NC	9.04 J	9.04	MG/KG	Max	(5)
	Mercury	MG/KG	0.208	NC	0.265	0.265	MG/KG	Max	(5)
	Mercury (methyl)	MG/KG	0.213	NC	0.247	0.247	MG/KG	Max	(5)
	Molybdenum	MG/KG	0.124	NC	0.0155 J	0.0155	MG/KG	Max	(5)
	Nickel	MG/KG	0.0554	NC	0.06 J	0.06	MG/KG	Max	(5)
	Selenium	MG/KG	0.158	NC	0.218 J	0.218	MG/KG	Max	(5)
	Silver	MG/KG	0.0106	NC	0.0154 J	0.0154	MG/KG	Max	(5)
	Thallium	MG/KG	0.00557	NC	0.0112 J	0.0112	MG/KG	Max	(5)
	Vanadium	MG/KG	0.00861	NC	0.0193 J	0.0193	MG/KG	Max	(5)
	Zinc	MG/KG	12.5	NC	17.6	17.6	MG/KG	Max	(5)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.0000046	NC	0.0000152	0.0000152	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.00000025	NC	0.00000037 J	0.00000037	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.00000518	NC	0.000016	0.000016	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.00000561	NC	0.0000164	0.0000164	MG/KG	Max	(5)
	Toxicity Equivalency - Fish	MG/KG	0.00000517	NC	0.000016	0.000016	MG/KG	Max	(5)
GREYSTONE	**Semivolatile Organics**								
(Background area)	1,1'-Biphenyl	MG/KG	0.00021	0.00028 N	0.00044 J	0.00028	MG/KG	95% UCL-N	(2)
	2-Methylnaphthalene	MG/KG	0.0045	0.017 T	0.01881	0.017	MG/KG	95% UCL-T	(3)
	Acenaphthene	MG/KG	0.00040	0.00046 N	0.00052	0.00046	MG/KG	95% UCL-N	(2)
	Acenaphthylene	MG/KG	0.00042	0.00082 T	0.00117	0.00082	MG/KG	95% UCL-T	(3)
	Anthracene	MG/KG	0.00041	0.00048 N	0.00058	0.00048	MG/KG	95% UCL-N	(2)
	Benzo(a)anthracene	MG/KG	0.0001	0.0003 T	0.00039 J	0.0003	MG/KG	95% UCL-T	(3)
	Benzo(a)pyrene	MG/KG	0.0003	0.0004 N	0.00043	0.0004	MG/KG	95% UCL-N	(2)
	Benzo(b)fluoranthene	MG/KG	0.0003	0.0003 NP	0.00058	0.0003	MG/KG	95% UCL-NP	(4)
	Benzo(g,h,i)perylene	MG/KG	0.00037	0.00041 T	0.00039 J	0.00039	MG/KG	Max	(5)
	Benzo(k)fluoranthene	MG/KG	0.0003	0.0006 T	0.00053	0.00053	MG/KG	Max	(5)
	Chrysene	MG/KG	0.0003	0.0003 NP	0.00074	0.0003	MG/KG	95% UCL-NP	(4)
	Dibenzo(a,h)anthracene	MG/KG	0.0003	0.0004 N	0.00018 J	0.00018	MG/KG	Max	(5)
	Dibenzofuran	MG/KG	0.00030	0.00030 NP	0.00042 J	0.00030	MG/KG	95% UCL-NP	(4)

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Table 91
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Largemouth Bass

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Largemouth Bass
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
GREYSTONE (continued)	Fluoranthene	MG/KG	0.0017	0.0017	NP	0.00274		0.0017	MG/KG	95% UCL-NP	(4)
(Background area)	Fluorene	MG/KG	0.00078	0.00095	T	0.00127		0.00095	MG/KG	95% UCL-T	(3)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.0002	0.0002	NP	0.00046		0.0002	MG/KG	95% UCL-NP	(4)
	Naphthalene	MG/KG	0.00355	0.00936	T	0.01258		0.00936	MG/KG	95% UCL-T	(3)
	Phenanthrene	MG/KG	0.0027	0.0033	N	0.00423		0.0033	MG/KG	95% UCL-N	(2)
	Pyrene	MG/KG	0.0007	0.001	T	0.00157	J	0.001	MG/KG	95% UCL-T	(3)
	Total PAH	MG/KG	0.01657	0.02774	T	0.045	J	0.02774	MG/KG	95% UCL-T	(3)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.00364	0.00419	T	0.00473		0.00419	MG/KG	95% UCL-T	(3)
	4,4'-DDE	MG/KG	0.0642	0.0642	NP	0.14733	D	0.0642	MG/KG	95% UCL-NP	(4)
	4,4'-DDT	MG/KG	0.0016	0.0016	NP	0.00265		0.0016	MG/KG	95% UCL-NP	(4)
	alpha-Chlordane	MG/KG	0.00323	0.00402	N	0.00579		0.00402	MG/KG	95% UCL-N	(2)
	Aroclor, Total	MG/KG	0.2903	0.4070	N	0.66467		0.4070	MG/KG	95% UCL-N	(2)
	Aroclor-1254	MG/KG	0.2209	0.3176	N	0.53995	D	0.3176	MG/KG	95% UCL-N	(2)
	Aroclor-1268	MG/KG	0.06940	0.09214	N	0.13398	D	0.09214	MG/KG	95% UCL-N	(2)
	Dieldrin	MG/KG	0.00078	0.00078	NP	0.00109		0.00078	MG/KG	95% UCL-NP	(4)
	gamma-BHC	MG/KG	0.0002	0.0002	NP	0.00004	J	0.00004	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.0013	0.0016	N	0.00236		0.0016	MG/KG	95% UCL-N	(2)
	Methoxychlor	MG/KG	0.0003	0.0003	NP	0.00004	J	0.00004	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.04385	0.04385	NP	0.06005	J	0.04385	MG/KG	95% UCL-NP	(4)
	Inorganics										
	Aluminum	MG/KG	3.53	4.64	N	6.9		4.64	MG/KG	95% UCL-N	(2)
	Barium	MG/KG	0.763	1.20	T	1.67	J	1.20	MG/KG	95% UCL-T	(3)
	Beryllium	MG/KG	0.00355	0.00455	N	0.0064		0.00455	MG/KG	95% UCL-N	(2)
	Cadmium	MG/KG	0.0306	0.0306	NP	0.0197	J	0.0197	MG/KG	Max	(5)
	Chromium	MG/KG	0.140	0.140	NP	0.167	J	0.140	MG/KG	95% UCL-NP	(4)
	Cobalt	MG/KG	0.0314	0.0343	T	0.0395	J	0.0343	MG/KG	95% UCL-T	(3)
	Copper	MG/KG	0.810	0.810	NP	2.06		0.810	MG/KG	95% UCL-NP	(4)
	Iron	MG/KG	25.6	25.6	NP	83.8	J	25.6	MG/KG	95% UCL-NP	(4)
	Lead	MG/KG	0.0452	0.0556	N	0.0817		0.0556	MG/KG	95% UCL-N	(2)
	Manganese	MG/KG	3.58	5.13	T	7.14	J	5.13	MG/KG	95% UCL-T	(3)
	Mercury	MG/KG	0.3099	0.3099	NP	0.526	J	0.3099	MG/KG	95% UCL-NP	(4)

Table 91
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Largemouth Bass

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Largemouth Bass
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
GREYSTONE (continued)	Mercury (methyl)	MG/KG	0.314	0.314	NP	0.564		0.314	MG/KG	95% UCL-NP	(4)
(Background area)	Molybdenum	MG/KG	0.133	0.133	NP	0.0325	J	0.0325	MG/KG	Max	(5)
	Nickel	MG/KG	0.177	0.177	NP	0.556	J	0.177	MG/KG	95% UCL-NP	(4)
	Selenium	MG/KG	0.235	0.235	NP	0.287	J	0.235	MG/KG	95% UCL-NP	(4)
	Silver	MG/KG	0.0305	0.0305	NP	0.049		0.0305	MG/KG	95% UCL-NP	(4)
	Thallium	MG/KG	0.00409	0.00493	T	0.00603	J	0.00493	MG/KG	95% UCL-T	(3)
	Vanadium	MG/KG	0.0741	0.0741	NP	0.0246	J	0.0246	MG/KG	Max	(5)
	Zinc	MG/KG	14.6300	16.0040	T	18.8		16.0040	MG/KG	95% UCL-T	(3)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.00000023	0.00000023	NP	0.00000061	J	0.00000023	MG/KG	95% UCL-NP	(4)
	2,3,7,8-TCDF	MG/KG	0.0000002	0.0000002	NP	0.00000031	J	0.0000002	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency - Mammals	MG/KG	0.000000490	0.000000610	T	0.000000832		0.000000610	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency - Birds	MG/KG	0.000000720	0.000000909	T	0.00000111		0.000000909	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency - Fish	MG/KG	0.000000493	0.000000600	T	0.000000836		0.000000600	MG/KG	95% UCL-T	(3)
LYMAN MILL	**Semivolatile Organics**										
	1,1'-Biphenyl	MG/KG	0.00041	0.00041	NP	0.00059		0.00041	MG/KG	95% UCL-NP	(4)
	2-Methylnaphthalene	MG/KG	0.00275	0.00398	T	0.00518		0.00398	MG/KG	95% UCL-T	(3)
	Acenaphthene	MG/KG	0.001	0.002	T	0.00158		0.00158	MG/KG	Max	(5)
	Acenaphthylene	MG/KG	0.00046	0.00046	NP	0.00086		0.00046	MG/KG	95% UCL-NP	(4)
	Anthracene	MG/KG	0.00078	0.00078	NP	0.00125		0.00078	MG/KG	95% UCL-NP	(4)
	Benzo(a)anthracene	MG/KG	0.0005	0.0005	NP	0.00348		0.0005	MG/KG	95% UCL-NP	(4)
	Benzo(a)pyrene	MG/KG	0.00078	0.00078	NP	0.00513		0.00078	MG/KG	95% UCL-NP	(4)
	Benzo(b)fluoranthene	MG/KG	0.0010	0.0010	NP	0.0067		0.0010	MG/KG	95% UCL-NP	(4)
	Benzo(g,h,i)perylene	MG/KG	0.0010	0.0010	NP	0.00524		0.0010	MG/KG	95% UCL-NP	(4)
	Benzo(k)fluoranthene	MG/KG	0.00094	0.00094	NP	0.00605		0.00094	MG/KG	95% UCL-NP	(4)
	Chrysene	MG/KG	0.0012	0.0012	NP	0.0067		0.0012	MG/KG	95% UCL-NP	(4)
	Dibenzo(a,h)anthracene	MG/KG	0.0004	0.0004	NP	0.00139		0.0004	MG/KG	95% UCL-NP	(4)
	Dibenzofuran	MG/KG	0.00091	0.00091	NP	0.00143		0.00091	MG/KG	95% UCL-NP	(4)
	Fluoranthene	MG/KG	0.00288	0.00288	NP	0.01011		0.00288	MG/KG	95% UCL-NP	(4)
	Fluorene	MG/KG	0.0021	0.0029	N	0.00471		0.0029	MG/KG	95% UCL-N	(2)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.0010	0.0010	NP	0.00596		0.0010	MG/KG	95% UCL-NP	(4)

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Table 91
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Largemouth Bass

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Largemouth Bass
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
LYMAN MILL (continued)	Naphthalene	MG/KG	0.0022	0.0022	NP	0.00466		0.0022	MG/KG	95% UCL-NP	(4)
	Phenanthrene	MG/KG	0.00425	0.00425	NP	0.00746		0.00425	MG/KG	95% UCL-NP	(4)
	Pyrene	MG/KG	0.0017	0.0017	NP	0.00747		0.0017	MG/KG	95% UCL-NP	(4)
	Total PAH	MG/KG	0.02591	0.04373	T	0.07799	J	0.04373	MG/KG	95% UCL-T	(3)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.00546	0.00660	T	0.00836		0.00660	MG/KG	95% UCL-T	(3)
	4,4'-DDE	MG/KG	0.05885	0.05885	NP	0.12507	D	0.05885	MG/KG	95% UCL-NP	(4)
	4,4'-DDT	MG/KG	0.00261	0.00301	N	0.00335	J	0.00301	MG/KG	95% UCL-N	(2)
	alpha-Chlordane	MG/KG	0.00640	0.00827	T	0.0101		0.00827	MG/KG	95% UCL-T	(3)
	Aroclor, Total	MG/KG	1.3696	1.3696	NP	2.36514		1.3696	MG/KG	95% UCL-NP	(4)
	Aroclor-1254	MG/KG	1.3437	1.3437	NP	2.35105	D	1.3437	MG/KG	95% UCL-NP	(4)
	Aroclor-1268	MG/KG	0.0259	0.0366	N	0.05924	J	0.0366	MG/KG	95% UCL-N	(2)
	Dieldrin	MG/KG	0.0016	0.0024	T	0.00261		0.0024	MG/KG	95% UCL-T	(3)
	gamma-Chlordane	MG/KG	0.0025	0.0034	T	0.00415		0.0034	MG/KG	95% UCL-T	(3)
	Technical Chlordane	MG/KG	0.11539	0.12822	N	0.15067		0.12822	MG/KG	95% UCL-N	(2)
	Inorganics										
	Aluminum	MG/KG	9.79	9.79	NP	67		9.79	MG/KG	95% UCL-NP	(4)
	Barium	MG/KG	0.874	0.874	NP	1.63	J	0.874	MG/KG	95% UCL-NP	(4)
	Beryllium	MG/KG	0.00349	0.00349	NP	0.0108		0.00349	MG/KG	95% UCL-NP	(4)
	Cadmium	MG/KG	0.01	0.02	T	0.0188	J	0.02	MG/KG	95% UCL-T	(3)
	Chromium	MG/KG	0.138	0.138	NP	0.288		0.138	MG/KG	95% UCL-NP	(4)
	Cobalt	MG/KG	0.0590	0.0769	N	0.1	J	0.0769	MG/KG	95% UCL-N	(2)
	Copper	MG/KG	0.9	1	N	1.26	J	1	MG/KG	95% UCL-N	(2)
	Iron	MG/KG	27.4	27.4	NP	93.7		27.4	MG/KG	95% UCL-NP	(4)
	Lead	MG/KG	0.10	0.10	NP	0.369	J	0.10	MG/KG	95% UCL-NP	(4)
	Manganese	MG/KG	4.63	8.32	T	14.7		8.32	MG/KG	95% UCL-T	(3)
	Mercury	MG/KG	0.122	0.215	T	0.338		0.215	MG/KG	95% UCL-T	(3)
	Mercury (methyl)	MG/KG	0.18043	0.3	T	0.308		0.3	MG/KG	95% UCL-T	(3)
	Molybdenum	MG/KG	0.0687	0.297	T	0.0445	J	0.0445	MG/KG	Max	(5)
	Nickel	MG/KG	0.105	0.155	T	0.177	J	0.155	MG/KG	95% UCL-T	(3)
	Selenium	MG/KG	0.186	0.186	NP	0.232	J	0.186	MG/KG	95% UCL-NP	(4)

Table 91
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Largemouth Bass

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Largemouth Bass
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
LYMAN MILL (continued)	Silver	MG/KG	0.0282	0.0282	NP	0.0214	J	0.0214	MG/KG	Max	(5)
	Thallium	MG/KG	0.0045	0.0045	NP	0.00529	J	0.0045	MG/KG	95% UCL-NP	(4)
	Vanadium	MG/KG	0.0578	0.0578	NP	0.11	J	0.0578	MG/KG	95% UCL-NP	(4)
	Zinc	MG/KG	15.9	17.8	T	21	J	17.8	MG/KG	95% UCL-T	(3)
	Dioxins/Furans										
	2,3,7,8-TCDD	MG/KG	0.0001910	0.0001910	NP	0.0002888	J	0.0001910	MG/KG	95% UCL-NP	(4)
	2,3,7,8-TCDF	MG/KG	0.0000003	0.0000003	NP	0.00000099	J#	0.0000003	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency - Mammals	MG/KG	0.000191	0.000191	NP	0.000289		0.000191	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency - Birds	MG/KG	0.000192	0.000192	NP	0.00029		0.000192	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency - Fish	MG/KG	0.000191	0.000191	NP	0.000289		0.000191	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.0000193	NC		0.0000372		0.0000372	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000286	NC		0.0000546		0.0000546	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Fish	MG/KG	0.000000883	NC		0.00000177		0.00000177	MG/KG	Max	(5)
MANTON	**Semivolatile Organics**										
	1,1'-Biphenyl	MG/KG	0.00028	NC		0.00037	J	0.00037	MG/KG	Max	(5)
	2-Methylnaphthalene	MG/KG	0.00461	NC		0.00582		0.00582	MG/KG	Max	(5)
	Acenaphthene	MG/KG	0.0010	NC		0.00147		0.00147	MG/KG	Max	(5)
	Acenaphthylene	MG/KG	0.00067	NC		0.00098		0.00098	MG/KG	Max	(5)
	Anthracene	MG/KG	0.00091	NC		0.00171		0.00171	MG/KG	Max	(5)
	Benzo(a)anthracene	MG/KG	0.001	NC		0.00177		0.00177	MG/KG	Max	(5)
	Benzo(a)pyrene	MG/KG	0.0011	NC		0.00226		0.00226	MG/KG	Max	(5)
	Benzo(b)fluoranthene	MG/KG	0.002	NC		0.00307	J	0.00307	MG/KG	Max	(5)
	Benzo(g,h,i)perylene	MG/KG	0.00130	NC		0.00163	J	0.00163	MG/KG	Max	(5)
	Benzo(k)fluoranthene	MG/KG	0.00151	NC		0.00286	J	0.00286	MG/KG	Max	(5)
	Chrysene	MG/KG	0.00213	NC		0.00418		0.00418	MG/KG	Max	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.0002	NC		0.0004	J	0.0004	MG/KG	Max	(5)
	Dibenzofuran	MG/KG	0.00095	NC		0.00135		0.00135	MG/KG	Max	(5)
	Fluoranthene	MG/KG	0.00798	NC		0.01618		0.01618	MG/KG	Max	(5)
	Fluorene	MG/KG	0.0021	NC		0.00326		0.00326	MG/KG	Max	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.00105	NC		0.00174		0.00174	MG/KG	Max	(5)
	Naphthalene	MG/KG	0.00414	NC		0.00492		0.00492	MG/KG	Max	(5)
	Phenanthrene	MG/KG	0.00904	NC		0.01609		0.01609	MG/KG	Max	(5)

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Table 91
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Largemouth Bass

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Largemouth Bass
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic (1)	Rationale
MANTON (continued)	Pyrene	MG/KG	0.0042	NC	0.00834		0.00834	MG/KG	Max	(5)
	Total PAH	MG/KG	0.0448	NC	0.07838	J	0.07838	MG/KG	Max	(5)
	Pesticides/PCBs									
	4,4'-DDD	MG/KG	0.00623	NC	0.00873		0.00873	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.05460	NC	0.10352	D	0.10352	MG/KG	Max	(5)
	4,4'-DDT	MG/KG	0.00222	NC	0.00354		0.00354	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.00537	NC	0.00943		0.00943	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	0.63910	NC	0.93912		0.93912	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.51244	NC	0.89924	D	0.89924	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.1267	NC	0.29687	D	0.29687	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.0013	NC	0.00222		0.00222	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.0019	NC	0.00316		0.00316	MG/KG	Max	(5)
	Heptachlor Epoxide	MG/KG	0.0003	NC	0.00045	J	0.00045	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.1440	NC	0.23542		0.23542	MG/KG	Max	(5)
	Inorganics									
	Aluminum	MG/KG	23.9	NC	38.8		38.8	MG/KG	Max	(5)
	Barium	MG/KG	2.29	NC	5.53		5.53	MG/KG	Max	(5)
	Cadmium	MG/KG	0.0109	NC	0.0166	J	0.0166	MG/KG	Max	(5)
	Chromium	MG/KG	0.217	NC	0.278		0.278	MG/KG	Max	(5)
	Cobalt	MG/KG	0.0340	NC	0.0423	J	0.0423	MG/KG	Max	(5)
	Copper	MG/KG	0.461	NC	0.519		0.519	MG/KG	Max	(5)
	Iron	MG/KG	46.6	NC	57.8		57.8	MG/KG	Max	(5)
	Lead	MG/KG	0.150	NC	0.222		0.222	MG/KG	Max	(5)
	Manganese	MG/KG	4.87	NC	8.13	J	8.13	MG/KG	Max	(5)
	Mercury	MG/KG	0.153	NC	0.226		0.226	MG/KG	Max	(5)
	Mercury (methyl)	MG/KG	0.120	NC	0.222		0.222	MG/KG	Max	(5)
	Molybdenum	MG/KG	0.0232	NC	0.0286	J	0.0286	MG/KG	Max	(5)
	Nickel	MG/KG	0.0520	NC	0.0611	J	0.0611	MG/KG	Max	(5)
	Selenium	MG/KG	0.196	NC	0.141	J	0.141	MG/KG	Max	(5)
	Thallium	MG/KG	0.00489	NC	0.00577	J	0.00577	MG/KG	Max	(5)
	Vanadium	MG/KG	0.0606	NC	0.0562	J	0.0562	MG/KG	Max	(5)

Table 91
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Largemouth Bass

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Largemouth Bass
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern/ Chemical of Interest (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
MANTON (continued)	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.00008669	NC	0.00014303	0.00014303	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.00000033	NC	0.00000063 J	0.00000063	MG/KG	Max	(5)
	Toxicity Equivalency - Mammals	MG/KG	0.0000873	NC	0.000144	0.000144	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.0000875	NC	0.000144	0.000144	MG/KG	Max	(5)
	Toxicity Equivalency - Fish	MG/KG	0.0000873	NC	0.000144	0.000144	MG/KG	Max	(5)

(1) Chemicals of potential concern are identified in Table 11 and apply to the site exposure areas.
When detected in the reference or background areas, these chemicals are referred to as chemicals of interest.
(2) 95% UCL-N: 95% Upper Concentration Limit on the mean, normal distribution
(3) 95% UCL-T: 95% Upper Concentration Limit on the mean, lognormal distribution
(4) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(5) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:
J = Value is estimated.
D = Results from analytical dilution
# = Value is result from second column confirmation analysis.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

US EPA ARCHIVE DOCUMENT

TABLE 92
CBR-BASED HAZARD QUOTIENTS FOR COIs IN ASSAPUMPSET LARGEMOUTH BASS TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Semivolatile Organics								
1,1'-Biphenyl	3 / 4	MG/KG	0.00064	0.00055				
2-Methylnaphthalene	4 / 4	MG/KG	0.03951	0.0271	1.79	15.96	1.5E-02	1.7E-03
Acenaphthene	4 / 4	MG/KG	0.00061	0.00050	3.5		1.4E-04	
Acenaphthylene	4 / 4	MG/KG	0.00132	0.00090				
Anthracene	4 / 4	MG/KG	0.0004	0.00032	3.4	6.3	9.4E-05	5.1E-05
Dibenzofuran	4 / 4	MG/KG	0.0007	0.00049				
Fluoranthene	3 / 4	MG/KG	0.0016	0.0012		0.22		5.3E-03
Fluorene	4 / 4	MG/KG	0.00106	0.00091	189		4.8E-06	
Naphthalene	4 / 4	MG/KG	0.01986	0.0141		17		8.3E-04
Phenanthrene	4 / 4	MG/KG	0.00573	0.00460	0.78	0.78	5.9E-03	5.9E-03
Total PAH[1]	4 / 4	MG/KG	0.06872	0.05047				
						Total Semivolatile Organics	2.1E-02	1.4E-02
Pesticides								
4,4'-DDD	4 / 4	MG/KG	0.00540	0.00353	0.008	0.6	4.4E-01	5.9E-03
4,4'-DDE	4 / 4	MG/KG	0.05823	0.02781	0.042	0.29	6.6E-01	9.6E-02
4,4'-DDT	4 / 4	MG/KG	0.00364	0.00224	0.26	0.464	8.6E-03	4.8E-03
alpha-Chlordane	4 / 4	MG/KG	0.00186	0.0012				
Dieldrin	3 / 4	MG/KG	0.00081	0.00058	1	1.21	5.8E-04	4.8E-04
gamma-Chlordane	4 / 4	MG/KG	0.00051	0.00036				
Heptachlor Epoxide	2 / 4	MG/KG	0.00023	0.00023	0.016	0.02	1.4E-02	1.2E-02
Technical Chlordane	4 / 4	MG/KG	0.12021	0.06846	0.01	0.01	**6.8E+00**	**6.8E+00**
						Total Pesticides	**8.0E+00**	**7.0E+00**
PCBs								
Aroclor, Total	4 / 4	MG/KG	0.15253	0.08646				
Aroclor-1254	4 / 4	MG/KG	0.13847	0.07850	0.98	1.53	8.0E-02	5.1E-02
Aroclor-1268	4 / 4	MG/KG	0.01407	0.00796		0.45		1.8E-02
						Total PCBs	8.0E-02	6.9E-02
Inorganics/Metals								
Aluminum	2 / 4	MG/KG	1.52	0.808	1	8	8.1E-01	1.0E-01
Barium	4 / 4	MG/KG	1.19	0.776		0.41		**1.9E+00**
Beryllium	3 / 4	MG/KG	0.00122	0.00120	5.13		2.3E-04	
Cadmium	4 / 4	MG/KG	0.012	0.00906	0.06	0.12	1.5E-01	7.6E-02
Chromium	4 / 4	MG/KG	0.166	0.123				

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TABLE 92
CBR-BASED HAZARD QUOTIENTS FOR COIs IN ASSAPUMPSET LARGEMOUTH BASS TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Cobalt	4 / 4	MG/KG	0.0281	0.0239				
Copper	4 / 4	MG/KG	0.519	0.43		1.6		2.7E-01
Iron	4 / 4	MG/KG	16.7	14.8				
Lead	3 / 4	MG/KG	0.0204	0.0158	2.55	4.02	6.2E-03	3.9E-03
Manganese	4 / 4	MG/KG	9.04	4.76	18.4		2.6E-01	
Mercury	4 / 4	MG/KG	0.265	0.208		0.04		**5.2E+00**
Mercury (methyl)	4 / 4	MG/KG	0.247	0.213	1.91	2	1.1E-01	1.1E-01
Molybdenum	1 / 4	MG/KG	0.0155	0.0155				
Nickel	4 / 4	MG/KG	0.06	0.0554	0.59	0.59	9.4E-02	9.4E-02
Selenium	3 / 4	MG/KG	0.218	0.158	0.14	0.18	**1.1E+00**	8.8E-01
Silver	3 / 4	MG/KG	0.0154	0.0106	5.36	1650	2.0E-03	6.4E-06
Thallium	4 / 4	MG/KG	0.0112	0.00557	2.72		2.0E-03	
Vanadium	4 / 4	MG/KG	0.0193	0.00861	0.02	0.41	4.3E-01	2.1E-02
Zinc	3 / 4	MG/KG	17.6	12.5	3.9	4.5	**3.2E+00**	**2.8E+00**
						Total Inorganics/Metals	**6.2E+00**	**1.1E+01**
Dioxins								
2,3,7,8-TCDD[1,2]	4 / 4	MG/KG	0.0000152	0.0000046	0.00015	0.00023	3.0E-02	2.0E-02
Toxicity Equivalency - Fish	4 / 4	MG/KG	0.000016	0.00000517	0.00015	0.00023	3.4E-02	2.2E-02
						Total TCDD TEQ	3.4E-02	2.2E-02
						Total	**1.4E+01**	**1.8E+01**

Notes:
[a] CT and RME EPCs presented in Tables 90 and 91, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1]Analyte is not included in the HI totals.
[2] HQs for 2,3,7,8-TCDD are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 93
CBR-BASED HAZARD QUOTIENTS FOR COIs IN GREYSTONE LARGEMOUTH BASS TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Semivolatile Organics								
1,1'-Biphenyl	9 / 10	MG/KG	0.00028	0.00021				
2-Methylnaphthalene	9 / 10	MG/KG	0.017	0.0045	1.79	15.96	2.5E-03	2.8E-04
Acenaphthene	10 / 10	MG/KG	0.00046	0.00040	3.5		1.1E-04	
Acenaphthylene	10 / 10	MG/KG	0.00082	0.00042				
Anthracene	10 / 10	MG/KG	0.00048	0.00041	3.4	6.3	1.2E-04	6.6E-05
Benzo(a)anthracene	10 / 10	MG/KG	0.0003	0.0001	17.5		8.2E-06	
Benzo(a)pyrene	5 / 10	MG/KG	0.0004	0.0003	1.93	2.1	1.5E-04	1.4E-04
Benzo(b)fluoranthene	6 / 10	MG/KG	0.0003	0.0003				
Benzo(g,h,i)perylene	2 / 10	MG/KG	0.00039	0.00037				
Benzo(k)fluoranthene	6 / 10	MG/KG	0.0005	0.0003				
Chrysene	9 / 10	MG/KG	0.00030	0.00030	2.6		1.2E-04	
Dibenzo(a,h)anthracene	2 / 10	MG/KG	0.00018	0.00018				
Dibenzofuran	10 / 10	MG/KG	0.00030	0.00030				
Fluoranthene	10 / 10	MG/KG	0.0017	0.0017		0.22		7.8E-03
Fluorene	10 / 10	MG/KG	0.00095	0.00078	189		4.1E-06	
Indeno(1,2,3-cd)pyrene	8 / 10	MG/KG	0.0002	0.0002				
Naphthalene	9 / 10	MG/KG	0.00936	0.00355		17		2.1E-04
Phenanthrene	10 / 10	MG/KG	0.0033	0.0027	0.78	0.78	3.4E-03	3.4E-03
Pyrene	7 / 10	MG/KG	0.001	0.0007	1.08	10	6.7E-04	7.3E-05
Total PAH[1]	10 / 10	MG/KG	0.0277	0.0166				
						Total Semivolatile Organics	7.1E-03	1.2E-02
Pesticides								
4,4'-DDD	10 / 10	MG/KG	0.00419	0.00364	0.008	0.6	4.5E-01	6.1E-03
4,4'-DDE	10 / 10	MG/KG	0.0642	0.0642	0.042	0.29	**1.5E+00**	2.2E-01
4,4'-DDT	10 / 10	MG/KG	0.0016	0.0016	0.26	0.464	6.3E-03	3.5E-03
alpha-Chlordane	10 / 10	MG/KG	0.00402	0.00323				
Dieldrin	10 / 10	MG/KG	0.00078	0.00078	1	1.21	7.8E-04	6.5E-04
gamma-BHC	4 / 10	MG/KG	0.00004	0.00004	6.13	79	6.5E-06	5.1E-07
gamma-Chlordane	10 / 10	MG/KG	0.0016	0.0013				
Methoxychlor	1 / 10	MG/KG	0.00004	0.00004		0.1		4.0E-04
Technical Chlordane	10 / 10	MG/KG	0.04385	0.04385	0.01	0.01	**4.4E+00**	**4.4E+00**
						Total Pesticides	**6.4E+00**	**4.6E+00**
PCBs								
Aroclor, Total	10 / 10	MG/KG	0.4070	0.2903				
Aroclor-1254	10 / 10	MG/KG	0.3176	0.2209	0.98	1.53	2.3E-01	1.4E-01
Aroclor-1268	10 / 10	MG/KG	0.09214	0.06940		0.45		1.5E-01

US EPA ARCHIVE DOCUMENT

TABLE 93
CBR-BASED HAZARD QUOTIENTS FOR COIs IN GREYSTONE LARGEMOUTH BASS TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
						Total PCBs	2.3E-01	3.0E-01
Inorganics/Metals								
Aluminum	10 / 10	MG/KG	4.64	3.53	1	8	**3.5E+00**	4.4E-01
Barium	10 / 10	MG/KG	1.20	0.763		0.41		**1.9E+00**
Beryllium	10 / 10	MG/KG	0.00455	0.00355	5.13		6.9E-04	
Cadmium	8 / 10	MG/KG	0.0197	0.0197	0.06	0.12	3.3E-01	1.6E-01
Chromium	4 / 10	MG/KG	0.140	0.140				
Cobalt	10 / 10	MG/KG	0.0343	0.0314				
Copper	10 / 10	MG/KG	0.810	0.810		1.6		5.1E-01
Iron	10 / 10	MG/KG	25.6	25.6				
Lead	10 / 10	MG/KG	0.0556	0.0452	2.55	4.02	1.8E-02	1.1E-02
Manganese	10 / 10	MG/KG	5.13	3.58	18.4		1.9E-01	
Mercury	10 / 10	MG/KG	0.310	0.310	0.093	0.04	**3.3E+00**	**7.7E+00**
Mercury (methyl)	10 / 10	MG/KG	0.314	0.314	1.91	2	1.6E-01	1.6E-01
Molybdenum	2 / 10	MG/KG	0.0325	0.0325				
Nickel	3 / 10	MG/KG	0.177	0.177	0.59	0.59	3.0E-01	3.0E-01
Selenium	10 / 10	MG/KG	0.235	0.235	0.14	0.18	**1.7E+00**	**1.3E+00**
Silver	2 / 10	MG/KG	0.0305	0.0305	5.36	1650	5.7E-03	1.8E-05
Thallium	10 / 10	MG/KG	0.00493	0.00409	2.72		1.5E-03	
Vanadium	2 / 10	MG/KG	0.0246	0.0246	0.02	0.41	**1.2E+00**	6.0E-02
Zinc	10 / 10	MG/KG	16.0	14.6	3.9	4.5	**3.8E+00**	**3.3E+00**
						Total Inorganics/Metals	**1.5E+01**	**1.6E+01**
Dioxins								
2,3,7,8-TCDD[1,2]	10 / 10	MG/KG	0.00000023	0.00000023	0.00015	0.00023	1.5E-03	9.8E-04
Toxicity Equivalency - Fish	10 / 10	MG/KG	0.000000600	0.000000493	0.00015	0.00023	3.3E-03	2.1E-03
						Total TCDD TEQ	3.3E-03	2.1E-03
						Total	**2.1E+01**	**2.1E+01**

Notes:
[a] CT and RME EPCs presented in Tables 90 and 91, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1] Analyte is not included in the HI totals.
[2] HQs for 2,3,7,8-TCDD are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 94
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN LYMAN MILL LARGEMOUTH BASS TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Semivolatile Organics								
1,1'-Biphenyl	10 / 10	MG/KG	0.00041	0.00041				
2-Methylnaphthalene	10 / 10	MG/KG	0.00398	0.00275	1.79	15.96	1.5E-03	1.7E-04
Acenaphthene	9 / 10	MG/KG	0.002	0.001	3.5		3.0E-04	
Acenaphthylene	10 / 10	MG/KG	0.00046	0.00046				
Anthracene	10 / 10	MG/KG	0.00078	0.00078	3.4	6.3	2.3E-04	1.2E-04
Benzo(a)anthracene	10 / 10	MG/KG	0.0005	0.0005	17.5		3.1E-05	
Benzo(a)pyrene	8 / 10	MG/KG	0.00078	0.00078	1.93	2.1	4.1E-04	3.7E-04
Benzo(b)fluoranthene	9 / 10	MG/KG	0.0010	0.0010				
Benzo(g,h,i)perylene	7 / 10	MG/KG	0.0010	0.0010				
Benzo(k)fluoranthene	8 / 10	MG/KG	0.00094	0.00094				
Chrysene	10 / 10	MG/KG	0.0012	0.0012	2.6		4.7E-04	
Dibenzo(a,h)anthracene	5 / 10	MG/KG	0.0004	0.0004				
Dibenzofuran	10 / 10	MG/KG	0.00091	0.00091				
Fluoranthene	10 / 10	MG/KG	0.00288	0.00288		0.22		1.3E-02
Fluorene	10 / 10	MG/KG	0.0029	0.0021	189		1.1E-05	
Indeno(1,2,3-cd)pyrene	10 / 10	MG/KG	0.0010	0.0010				
Naphthalene	10 / 10	MG/KG	0.00215	0.00215		17		1.3E-04
Phenanthrene	10 / 10	MG/KG	0.00425	0.00425	0.78	0.78	5.5E-03	5.5E-03
Pyrene	10 / 10	MG/KG	0.0017	0.0017	1.08	10	1.6E-03	1.7E-04
Total PAH[1]	10 / 10	MG/KG	0.04373	0.02591				
						Total Semivolatile Organics	1.0E-02	2.0E-02
Pesticides								
4,4'-DDD	10 / 10	MG/KG	0.00660	0.00546	0.008	0.6	6.8E-01	9.1E-03
4,4'-DDE	10 / 10	MG/KG	0.05885	0.05885	0.042	0.29	**1.4E+00**	2.0E-01
4,4'-DDT	10 / 10	MG/KG	0.00301	0.00261	0.26	0.464	1.0E-02	5.6E-03
alpha-Chlordane	10 / 10	MG/KG	0.00827	0.00640				
Dieldrin	10 / 10	MG/KG	0.0024	0.0016	1	1.21	1.6E-03	1.4E-03
gamma-Chlordane	10 / 10	MG/KG	0.00342	0.00252				
Technical Chlordane	10 / 10	MG/KG	0.128	0.115	0.01	0.01	**1.2E+01**	**1.2E+01**
						Total Pesticides	**1.4E+01**	**1.2E+01**
PCBs								
Aroclor, Total	10 / 10	MG/KG	1.3696	1.3696				
Aroclor-1254	10 / 10	MG/KG	1.3437	1.3437	0.98	1.53	**1.4E+00**	8.8E-01

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CBR-BASED HAZARD QUOTIENTS FOR COPCs IN LYMAN MILL LARGEMOUTH BASS TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Aroclor-1268	10 / 10	MG/KG	0.0366	0.0259		0.45		5.8E-02
						Total PCBs	**1.4E+00**	9.4E-01
Inorganics/Metals								
Aluminum	10 / 10	MG/KG	9.79	9.79	1	8	**9.8E+00**	**1.2E+00**
Barium	10 / 10	MG/KG	0.874	0.874		0.41		**2.1E+00**
Beryllium	4 / 10	MG/KG	0.00349	0.00349	5.13		6.8E-04	
Cadmium	10 / 10	MG/KG	0.02	0.01	0.06	0.12	1.9E-01	9.5E-02
Chromium	4 / 10	MG/KG	0.138	0.138				
Cobalt	9 / 10	MG/KG	0.0769	0.0590				
Copper	10 / 10	MG/KG	1	0.9		1.6		5.7E-01
Iron	10 / 10	MG/KG	27.4	27.4				
Lead	10 / 10	MG/KG	0.0963	0.0963	2.55	4.02	3.8E-02	2.4E-02
Manganese	10 / 10	MG/KG	8.32	4.63	18.4		2.5E-01	
Mercury	3 / 10	MG/KG	0.215	0.122		0.04		**3.1E+00**
Mercury (methyl)	10 / 10	MG/KG	0.299	0.180	1.91	2	9.4E-02	9.0E-02
Molybdenum	6 / 10	MG/KG	0.0445	0.0445				
Nickel	10 / 10	MG/KG	0.155	0.105	0.59	0.59	1.8E-01	1.8E-01
Selenium	8 / 10	MG/KG	0.186	0.186	0.14	0.18	**1.3E+00**	**1.0E+00**
Silver	2 / 10	MG/KG	0.0214	0.0214	5.36	1650	4.0E-03	1.3E-05
Thallium	10 / 10	MG/KG	0.00447	0.00447	2.72		1.6E-03	
Vanadium	7 / 10	MG/KG	0.0578	0.0578	0.02	0.41	**2.9E+00**	1.4E-01
Zinc	10 / 10	MG/KG	17.8	15.9	3.9	4.5	**4.1E+00**	**3.5E+00**
						Total Inorganics/Metals	**1.9E+01**	**1.2E+01**
Dioxins								
2,3,7,8-TCDD[1,2]	10 / 10	MG/KG	0.0001910	0.0001910	0.00015	0.00023	**1.3E+00**	8.3E-01
Toxicity Equivalency - Fish	10 / 10	MG/KG	0.000191	0.000191	0.00015	0.00023	**1.3E+00**	8.3E-01
Toxicity Equivalency (PCB) - Fish	5 / 5	MG/KG	0.00000177	0.000000883	0.00015	0.00023	5.9E-03	3.8E-03
						Total TCDD TEQ	**1.3E+00**	8.4E-01
						Total	**3.5E+01**	**2.6E+01**

Notes:
[a] CT and RME EPCs presented in Tables 90 and 91, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1] Analyte is not included in the HI totals.
[2] HQs for 2,3,7,8-TCDD are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

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TABLE 95
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN MANTON LARGEMOUTH BASS TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Semivolatile Organics								
1,1'-Biphenyl	3 / 3	MG/KG	0.00037	0.00028				
2-Methylnaphthalene	3 / 3	MG/KG	0.00582	0.00461	1.79	15.96	2.6E-03	2.9E-04
Acenaphthene	3 / 3	MG/KG	0.00147	0.0010	3.5		2.9E-04	
Acenaphthylene	3 / 3	MG/KG	0.00098	0.00067				
Anthracene	3 / 3	MG/KG	0.00171	0.00091	3.4	6.3	2.7E-04	1.4E-04
Benzo(a)anthracene	2 / 3	MG/KG	0.00177	0.001	17.5		5.7E-05	
Benzo(a)pyrene	2 / 3	MG/KG	0.00226	0.0011	1.93	2.1	5.8E-04	5.3E-04
Benzo(b)fluoranthene	2 / 3	MG/KG	0.00307	0.00163				
Benzo(g,h,i)perylene	2 / 3	MG/KG	0.00163	0.00130				
Benzo(k)fluoranthene	2 / 3	MG/KG	0.00286	0.00151				
Chrysene	2 / 3	MG/KG	0.00418	0.00213	2.6		8.2E-04	
Dibenzo(a,h)anthracene	3 / 3	MG/KG	0.0004	0.0002				
Dibenzofuran	3 / 3	MG/KG	0.00135	0.00095				
Fluoranthene	3 / 3	MG/KG	0.01618	0.00798		0.22		3.6E-02
Fluorene	3 / 3	MG/KG	0.00326	0.0021	189		1.1E-05	
Indeno(1,2,3-cd)pyrene	2 / 3	MG/KG	0.00174	0.00105				
Naphthalene	3 / 3	MG/KG	0.00492	0.00414		17		2.4E-04
Phenanthrene	3 / 3	MG/KG	0.01609	0.00904	0.78	0.78	1.2E-02	1.2E-02
Pyrene	3 / 3	MG/KG	0.00834	0.0042	1.08	10	3.9E-03	4.2E-04
Total PAH[1]	3 / 3	MG/KG	0.07838	0.04482				
						Total Semivolatile Organics	2.0E-02	4.9E-02
Pesticides								
4,4'-DDD	3 / 3	MG/KG	0.00873	0.00623	0.008	0.6	7.8E-01	1.0E-02
4,4'-DDE	3 / 3	MG/KG	0.10352	0.05460	0.042	0.29	**1.3E+00**	1.9E-01
4,4'-DDT	3 / 3	MG/KG	0.00354	0.00222	0.26	0.464	8.6E-03	4.8E-03
alpha-Chlordane	3 / 3	MG/KG	0.00943	0.00537				
Dieldrin	3 / 3	MG/KG	0.00222	0.0013	1	1.21	1.3E-03	1.1E-03
gamma-Chlordane	3 / 3	MG/KG	0.00316	0.0019				
Heptachlor Epoxide	3 / 3	MG/KG	0.00045	0.0003	0.016	0.02	1.6E-02	1.3E-02
Technical Chlordane	3 / 3	MG/KG	0.23542	0.1440	0.01	0.01	**1.4E+01**	**1.4E+01**
						Total Pesticides	**1.7E+01**	**1.5E+01**
PCBs								
Aroclor, Total	3 / 3	MG/KG	0.93912	0.63910				

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TABLE 95
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN MANTON LARGEMOUTH BASS TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Aroclor-1254	3 / 3	MG/KG	0.89924	0.51244	0.98	1.53	5.2E-01	3.3E-01
Aroclor-1268	3 / 3	MG/KG	0.29687	0.1267		0.45		2.8E-01
						Total PCBs	5.2E-01	6.2E-01
Inorganics/Metals								
Aluminum	3 / 3	MG/KG	38.8	23.9	1	8	**2.4E+01**	**3.0E+00**
Barium	3 / 3	MG/KG	5.53	2.29		0.41		**5.6E+00**
Cadmium	3 / 3	MG/KG	0.0166	0.0109	0.06	0.12	1.8E-01	9.0E-02
Chromium	3 / 3	MG/KG	0.278	0.217				
Cobalt	3 / 3	MG/KG	0.0423	0.0340				
Copper	3 / 3	MG/KG	0.519	0.461		1.6		2.9E-01
Iron	3 / 3	MG/KG	57.8	46.6				
Lead	3 / 3	MG/KG	0.222	0.150	2.55	4.02	5.9E-02	3.7E-02
Manganese	3 / 3	MG/KG	8.13	4.87	18.4		2.6E-01	
Mercury	3 / 3	MG/KG	0.226	0.153	0.093	0.04	**1.6E+00**	**3.8E+00**
Mercury (methyl)	3 / 3	MG/KG	0.222	0.120	1.91	2	6.3E-02	6.0E-02
Molybdenum	3 / 3	MG/KG	0.0286	0.0232				
Nickel	3 / 3	MG/KG	0.0611	0.0520	0.59	0.59	8.8E-02	8.8E-02
Selenium	1 / 3	MG/KG	0.141	0.141	0.14	0.18	**1.0E+00**	7.8E-01
Thallium	3 / 3	MG/KG	0.00577	0.00489	2.72		1.8E-03	
Vanadium	2 / 3	MG/KG	0.0562	0.0562	0.02	0.41	**2.8E+00**	1.4E-01
						Total Inorganics/Metals	**3.0E+01**	**1.4E+01**
Dioxins								
2,3,7,8-TCDD[1,2]	3 / 3	MG/KG	0.00014303	0.00008669	0.00015	0.00023	5.8E-01	3.8E-01
Toxicity Equivalency - Fish	3 / 3	MG/KG	0.000144	0.0000873	0.00015	0.00023	5.8E-01	3.8E-01
						Total TCDD TEQ	5.8E-01	3.8E-01
						Total	**4.8E+01**	**3.0E+01**

Notes:
[a] CT and RME EPCs presented in Tables 90 and 91, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL or LOAEL CBR.
[1] Analyte is not included in the HI totals.
[2] HQs for 2,3,7,8-TCDD are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: SGD
Checked by: RAR

TABLE 96
INCREMENTAL RISK SUMMARY FOR LARGEMOUTH BASS TISSUE (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Technical Chlordane	**1.2E+01**	**1.2E+01**	**4.4E+00**	**4.4E+00**	**7.2E+00**	**7.2E+00**
Toxicity Equivalency - Fish	**1.3E+00**	8.3E-01	3.3E-03	2.1E-03	**1.3E+00**	8.3E-01
Aluminum	**9.8E+00**	**1.2E+00**	**3.5E+00**	4.4E-01	**6.3E+00**	7.8E-01
Zinc	**4.1E+00**	**3.5E+00**	**3.8E+00**	**3.3E+00**	3.2E-01	2.7E-01
Barium		**2.1E+00**		**1.9E+00**		2.7E-01
Vanadium	**2.9E+00**	1.4E-01	**1.2E+00**	6.0E-02	**1.7E+00**	8.1E-02

Manton Pond Reach	Risk Summary				Incremental Risk	
	Manton		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Technical Chlordane	**1.4E+01**	**1.4E+01**	**4.4E+00**	**4.4E+00**	**1.0E+01**	**1.0E+01**
Barium		**5.6E+00**		**1.9E+00**		**3.7E+00**
Aluminum	**2.4E+01**	**3.0E+00**	**3.5E+00**	4.4E-01	**2.0E+01**	**2.5E+00**
Vanadium	**2.8E+00**	1.4E-01	**1.2E+00**	6.0E-02	**1.6E+00**	7.7E-02

Notes:
Risk estimates as calculated and presented in Tables 93 through 95.
Incremental risks calculated for all analytes with NOAEL-based HQs[1] greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

[1] LOAEL-based HQs were used when NOAEL-based values were not available.

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Checked by: RAR

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TABLE 97
INCREMENTAL RISK SUMMARY FOR LARGEMOUTH BASS TISSUE (Assapumpset)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Technical Chlordane	**1.2E+01**	**1.2E+01**	**6.8E+00**	**6.8E+00**	**4.7E+00**	**4.7E+00**
Aluminum	**9.8E+00**	**1.2E+00**	8.1E-01	1.0E-01	**9.0E+00**	**1.1E+00**
Toxicity Equivalency - Fish	**1.3E+00**	8.3E-01	3.4E-02	2.2E-02	**1.2E+00**	8.1E-01
Zinc	**4.1E+00**	**3.5E+00**	**3.2E+00**	**2.8E+00**	8.6E-01	7.5E-01
Barium		**2.1E+00**		**1.9E+00**		2.4E-01
Selenium	**1.3E+00**	**1.0E+00**	**1.1E+00**	8.8E-01	2.0E-01	1.5E-01
Vanadium	**2.9E+00**	1.4E-01	4.3E-01	2.1E-02	**2.5E+00**	1.2E-01
4,4'-DDE	**1.4E+00**	2.0E-01	6.6E-01	9.6E-02	7.4E-01	1.1E-01

Manton Pond Reach	Risk Summary				Incremental Risk	
	Manton		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Technical Chlordane	**1.4E+01**	**1.4E+01**	**6.8E+00**	**6.8E+00**	**7.6E+00**	**7.6E+00**
Barium		**5.6E+00**		**1.9E+00**		**3.7E+00**
Aluminum	**2.4E+01**	**3.0E+00**	8.1E-01	1.0E-01	**2.3E+01**	**2.9E+00**
Vanadium	**2.8E+00**	1.4E-01	4.3E-01	2.1E-02	**2.4E+00**	1.2E-01
4,4'-DDE	**1.3E+00**	1.9E-01	6.6E-01	9.6E-02	6.4E-01	9.2E-02
Mercury	**1.6E+00**	**3.8E+00**		**5.2E+00**	**1.6E+00**	

Notes:
Risk estimates as calculated and presented in Tables 92, 94, and 95.
Incremental risks calculated for all analytes with NOAEL-based HQs[1] greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

[1] LOAEL-based HQs were used when NOAEL-based values were not available.

Prepared by: NAR
Checked by: RAR

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TABLE 98
WEIGHT-OF-EVIDENCE INTEGRATION: PELAGIC/PISCIVOROUS FISH POPULATIONS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Superfund Site
North Providence, Rhode Island

Assessment Endpoint 3. Protection and maintenance of pelagic, piscivorous or semi-piscivorous fish species as a forage base or sport fishery.

A. Do field surveys of pelagic piscivorous fish populations indicate presence/absence of ecological integrity?
B. Do measured and modeled concentrations of COPCs or toxic equivalencies (TEQs) in eggs and/or tissues of pelagic, piscivorous or semi-piscivorous fish (such as sunfishes, other centrarchids, or yellow perch) exceed benchmarks for adverse effects on survival, growth, reproduction or embryo development?

Measurement Endpoints[a]

A_1. Fish length-weight relationships and condition indices relative to habitat characterization
A_2. Percent gross lesions in individual fish
A_3. Demographic structure analysis of dominant species
A_4. Species richness and relative abundance of ichthyoplankton
B_1. Comparison of measured concentrations or toxic equivalencies in fish tissue to literature derived CBRs
B_2. Comparison of modeled concentrations or toxic equivalencies in eggs and fish tissue to site-specific CBRs

Weight-of-Evidence Integration[b]

	WEIGHT				
RISK/MAGNITUDE	Low	Low - Medium	Medium	Medium - High	High
Yes/High				B_1	
Yes/Low			A_2		
Undeterminate			A_4		
No/Low		A_1	B_2		
No/Very Low			A_3		

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TABLE 98
WEIGHT-OF-EVIDENCE INTEGRATION: PELAGIC/PISCIVOROUS FISH POPULATIONS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Superfund Site
North Providence, Rhode Island

Risk Conclusion:

Pelagic, piscivorous or semi-piscivorous fish populations that occur within the study area may be at substantial risk of harm due to exposure to Site-related contaminants in surface water, sediment, and tissue residues.

Notes:
a. Measurement endpoints and assigned weights are discussed in Section 2.6.
b. WOE integration is discussed in Section 6.4.

Prepared by: NAR
Checked by: SGH

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TABLE 99
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS BIRD EGG TISSUE - ASSAPUMPSET BROWN BULLHEAD

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, RI

Chemical	Fish Central Tendency [a]	Units	Avian BMF [b] (lipid basis)	TEF	Estimated [c] Egg Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Pesticides									
4,4'-DDE	0.0127	MG/KG	13.32	na	4.9E-01		0.1		**4.9E+00**
							Total Pesticides/PCBs		**4.9E+00**
Dioxins					**TEQ**				
2,3,7,8-TCDD	6.1E-07	MG/KG	6.99	1	1.2E-05				
1,2,3,7,8-PeCDD	1.2E-06	MG/KG	3.35	1	1.2E-05				
2,3,4,7,8-PeCDF	1.7E-07	MG/KG	1.57	1	8.0E-07				
Total					2.5E-05	7.0E-05	1.2E-03	3.6E-01	2.1E-02
							TEQ (D/F)	3.6E-01	2.1E-02
							Total TCDD TEQ	3.6E-01	2.1E-02
							Total	3.6E-01	**5.0E+00**

Notes:
[a] CT EPCs for fish tissue derived from the Site database; only analytes with BMFs presented.
[b] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % gull egg) presented in Table J-12.
[c] Egg concentration for avian piscivore receptor (mg/kg wet weight) estimated by multiplying the fish tissue concentration by the BMF and the ratio of the egg to fish percent lipid. The following lipid contents were assumed:

2.64 Average brown bullhead lipid percent in Assapumpset Pond.
7.7 Average gull egg lipid percentage (Braune and Norstrom, 1989)

[d] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[e] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 100
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS BIRD EGG TISSUE - GREYSTONE WHITE SUCKER

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Avian BMF [b] (lipid basis)	TEF	Estimated [c] Egg Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Pesticides									
4,4'-DDE	0.043062	MG/KG	13.32	na	4.3E-01		0.1		**4.3E+00**
4,4'-DDT	0.006261	MG/KG	0.69	na	3.2E-03				
Aroclor, Total	0.257483	MG/KG	11.89	na	2.3E+00				
Dieldrin	0.0041655	MG/KG	2.82	na	8.7E-03		0.059		1.5E-01
							Total Pesticides/PCBs	0.0E+00	**4.4E+00**
Dioxins					**TEQ**				
2,3,7,8-TCDD	7.0E-07	MG/KG	6.99	1	3.6E-06				
1,2,3,7,8-PeCDD	5.0E-07	MG/KG	3.35	1	1.2E-06				
2,3,4,7,8-PeCDF	4.2E-07	MG/KG	1.57	1	4.9E-07				
1,2,3,6,7,8-HxCDD	4.1E-07	MG/KG	5.98	0.01	1.8E-08				
Total					5.4E-06	7.0E-05	1.2E-03	7.7E-02	4.5E-03
							TEQ (D/F)	7.7E-02	4.5E-03
PCBs					**TEQ**				
3,4,4',5-Tetrachlorobiphenyl (81)	2.6E-04	MG/KG	5.29	0.1	1.0E-04				
3,3',4,4'-Tetrachlorobiphenyl (77)	4.0E-04	MG/KG	5.29	0.05	7.9E-05				
3,3',4,4',5-Pentachlorobiphenyl (126)	3.4E-05	MG/KG	7.82	0.1	2.0E-05				
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	3.7E-04	MG/KG	13.60	0.001	3.8E-06				
2,3,3',4,4'-Pentachlorobiphenyl (105)	6.3E-03	MG/KG	6.10	0.0001	2.9E-06				
2,3,3',4,4',5-Hexachlorobiphenyl (156)	2.5E-03	MG/KG	13.60	0.0001	2.5E-06				
2,3',4,4',5-Pentachlorobiphenyl (118)	2.2E-02	MG/KG	11.22	0.00001	1.8E-06				
2,3,4,4',5-Pentachlorobiphenyl (114)	6.1E-04	MG/KG	7.82	0.0001	3.6E-07				
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	9.8E-04	MG/KG	13.60	0.00001	9.9E-08				
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	1.7E-04	MG/KG	14.97	0.00001	1.9E-08				
2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	3.2E-03	MG/KG	2.17						
2,3,3',4',6-Pentachlorobiphenyl (110)	1.2E-02	MG/KG	2.45						
2,2',3,4,5,5'-Hexachlorobiphenyl (141)	2.9E-03	MG/KG	2.88						
2,3,3',4'-Tetrachlorobiphenyl (56)	2.1E-03	MG/KG	3.00						
2,3,4,4'-Tetrachlorobiphenyl (60)	2.1E-03	MG/KG	3.00						
2,3',4,4'-Tetrachlorobiphenyl (66)	8.9E-03	MG/KG	5.91						
2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	2.0E-03	MG/KG	9.04						
2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	2.2E-03	MG/KG	10.65						
2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	3.4E-04	MG/KG	10.77						

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TABLE 100
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS BIRD EGG TISSUE - GREYSTONE WHITE SUCKER

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Avian BMF [b] (lipid basis)	TEF	Estimated [c] Egg Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
2,2',3,3',4,4'-Hexachlorobiphenyl (128)	4.1E-03	MG/KG	11.71						
2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	1.9E-03	MG/KG	12.43						
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	1.6E-03	MG/KG	14.18						
2,2',3,4',5,5'-Hexachlorobiphenyl (146)	3.4E-03	MG/KG	15.22						
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	3.7E-03	MG/KG	15.37						
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	8.7E-03	MG/KG	16.52						
2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	2.8E-03	MG/KG	16.61						
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	3.4E-03	MG/KG	17.45						
2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	1.2E-02	MG/KG	17.45						
2,2',3,3',4,4',6-Heptachlorobiphenyl (171)	1.0E-03	MG/KG	17.82						
2,2',3,3',4,6'-Hexachlorobiphenyl (132)	4.8E-03	MG/KG	18.23						
2,2',4,4',5,5'-Hexachlorobiphenyl (153)	2.3E-02	MG/KG	18.23						
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	3.7E-03	MG/KG	19.74						
2,2',3,4,4',5-Hexachlorobiphenyl (137)	2.6E-03	MG/KG	20.85						
2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	9.5E-03	MG/KG	21.07						
2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	1.6E-03	MG/KG	22.13						
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	2.4E-04	MG/KG	22.13						
Total					2.1E-04	7.0E-05	1.2E-03	**3.0E+00**	1.8E-01
							TEQ (PCBs)	**3.0E+00**	1.8E-01
							Total TCDD TEQ	**3.1E+00**	1.8E-01
							Total	**3.1E+00**	**4.6E+00**

Notes:
[a] CT EPCs for fish tissue derived from the Site database; only analytes with BMFs presented.
[b] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % gull egg) presented in Table J-12.
[c] Egg concentration for avian piscivore receptor (mg/kg wet weight) estimated by multiplying the fish tissue concentration by the BMF and the ratio of the egg to fish percent lipid. The following lipid contents were assumed:

10.36 Average white sucker lipid percent in Greystone Mill Pond.
7.7 Average gull egg lipid percentage (Braune and Norstrom, 1989)

[d] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[e] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 101
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS BIRD EGG TISSUE - ALLENDALE WHITE SUCKER

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Avian BMF [b] (lipid basis)	TEF	Estimated [c] Egg Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Pesticides									
4,4'-DDT	0.006863	MG/KG	0.69	na	7.2E-03				
Dieldrin	0.005367	MG/KG	2.82	na	2.3E-02		0.059		3.9E-01
Heptachlor Epoxide	0.00061	MG/KG	10.67	na	9.9E-03				
Aroclor, Total	1.612714	MG/KG	11.89	na	2.9E+01				
4,4'-DDE	0.028685	MG/KG	13.32	na	5.8E-01		0.1		**5.8E+00**
							Total Pesticides/PCBs	0.0E+00	**6.2E+00**
Dioxins					**TEQ**				
2,3,7,8-TCDD	3.3E-04	MG/KG	6.99	1	3.5E-03				
1,2,3,7,8-PeCDD	3.3E-07	MG/KG	3.35	1	1.7E-06				
2,3,4,7,8-PeCDF	5.0E-07	MG/KG	1.57	1	1.2E-06				
1,2,3,6,7,8-HxCDD	3.4E-07	MG/KG	5.98	0.01	3.0E-08				
Total					3.5E-03	7.0E-05	1.2E-03	**5.1E+01**	**2.9E+00**
							TEQ (D/F)	**5.1E+01**	**2.9E+00**
PCBs					**TEQ**				
3,3',4,4',5-Pentachlorobiphenyl (126)	3.6E-04	MG/KG	7.82	0.1	4.3E-04				
3,4,4',5-Tetrachlorobiphenyl (81)	1.8E-04	MG/KG	5.29	0.1	1.5E-04				
3,3',4,4'-Tetrachlorobiphenyl (77)	3.5E-04	MG/KG	5.29	0.05	1.4E-04				
2,3,3',4,4'-Pentachlorobiphenyl (105)	1.4E-02	MG/KG	6.10	0.0001	1.3E-05				
2,3',4,4',5-Pentachlorobiphenyl (118)	5.9E-02	MG/KG	11.22	0.00001	1.0E-05				
2,3,3',4,4',5-Hexachlorobiphenyl (156)	4.9E-03	MG/KG	13.60	0.0001	1.0E-05				
2,3,3',4,4',5'-Hexachlorobiphenyl (157)	4.2E-03	MG/KG	7.77	0.0001	5.0E-06				
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	7.6E-05	MG/KG	13.60	0.001	1.6E-06				
2,3,4,4',5-Pentachlorobiphenyl (114)	8.6E-04	MG/KG	7.82	0.0001	1.0E-06				
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	2.8E-03	MG/KG	13.60	0.00001	5.8E-07				
2,3',4,4',5'-Pentachlorobiphenyl (123)	1.2E-03	MG/KG	7.82	0.00001	1.4E-07				
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	2.3E-04	MG/KG	14.97	0.00001	5.2E-08				
2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	4.7E-03	MG/KG	2.17						
2,3,3',4',6-Pentachlorobiphenyl (110)	5.2E-02	MG/KG	2.45						
2,2',3,4,5,5'-Hexachlorobiphenyl (141)	5.4E-03	MG/KG	2.88						
2,3,3',4'-Tetrachlorobiphenyl (56)	2.7E-03	MG/KG	3.00						
2,3,4,4'-Tetrachlorobiphenyl (60)	1.8E-03	MG/KG	3.00						
2,3',4,4'-Tetrachlorobiphenyl (66)	1.4E-02	MG/KG	5.91						
2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	1.9E-03	MG/KG	9.04						

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TABLE 101
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS BIRD EGG TISSUE - ALLENDALE WHITE SUCKER

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Avian BMF [b] (lipid basis)	TEF	Estimated [c] Egg Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	3.6E-03	MG/KG	10.65						
2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	1.8E-04	MG/KG	10.77						
2,2',3,3',4,4'-Hexachlorobiphenyl (128)	1.2E-02	MG/KG	11.71						
2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	1.3E-03	MG/KG	12.43						
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	4.0E-04	MG/KG	14.18						
2,2',3,4',5,5'-Hexachlorobiphenyl (146)	7.2E-03	MG/KG	15.22						
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	7.7E-03	MG/KG	15.37						
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	1.6E-02	MG/KG	16.52						
2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	2.5E-03	MG/KG	16.61						
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	9.8E-04	MG/KG	17.45						
2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	3.2E-03	MG/KG	17.45						
2,2',3,3',4,4',6-Heptachlorobiphenyl (171)	2.3E-03	MG/KG	17.82						
2,2',3,3',4,6'-Hexachlorobiphenyl (132)	1.7E-02	MG/KG	18.23						
2,2',4,4',5,5'-Hexachlorobiphenyl (153)	4.0E-02	MG/KG	18.23						
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	1.8E-03	MG/KG	19.74						
2,2',3,4,4',5-Hexachlorobiphenyl (137)	8.8E-03	MG/KG	20.85						
2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	1.1E-02	MG/KG	21.07						
2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	1.2E-03	MG/KG	22.13						
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	7.3E-05	MG/KG	22.13						
Total					7.6E-04	7.0E-05	1.2E-03	**1.1E+01**	6.3E-01
							TEQ (PCBs)	**1.1E+01**	6.3E-01
							Total TCDD TEQ	**6.1E+01**	**3.6E+00**
							Total	**6.1E+01**	**9.8E+00**

Notes:
[a] CT EPCs for fish tissue derived from the Site database; only analytes with BMFs presented.
[b] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % gull egg) presented in Table J-12.
[c] Egg concentration for avian piscivore receptor (mg/kg wet weight) estimated by multiplying the fish tissue concentration by the BMF and the ratio of the egg to fish percent lipid. The following lipid contents were assumed:
5.07 Average white sucker lipid percent in Allendale Mill Pond.
7.7 Average gull egg lipid percentage (Braune and Norstrom, 1989)
[d] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[e] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 102
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS BIRD EGG TISSUE - LYMAN MILL WHITE SUCKER

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Avian BMF [b] (lipid basis)	TEF	Estimated [c] Egg Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Pesticides									
4,4'-DDT	0.003743	MG/KG	0.69	na	2.9E-03				
Heptachlor Epoxide	0.001359	MG/KG	10.67	na	1.6E-02				
Dieldrin	0.005559	MG/KG	2.82	na	1.8E-02		0.059		3.0E-01
4,4'-DDE	0.130869	MG/KG	13.32	na	2.0E+00		0.1		**2.0E+01**
Aroclor, Total	4.229487	MG/KG	11.89	na	5.7E+01				
							Total Pesticides/PCBs	0.0E+00	**2.0E+01**
Dioxins					**TEQ**				
2,3,7,8-TCDD	5.5E-04	MG/KG	6.99	1	4.4E-03				
1,2,3,7,8-PeCDD	7.3E-07	MG/KG	3.35	1	2.7E-06				
2,3,4,7,8-PeCDF	4.8E-07	MG/KG	1.57	1	8.5E-07				
1,2,3,6,7,8-HxCDD	4.6E-07	MG/KG	5.98	0.01	3.1E-08				
1,2,3,4,6,7,8-HpCDD	1.7E-06	MG/KG		0.001					
OCDD	6.2E-06	MG/KG		0.0001					
1,2,3,4,7,8-HxCDF	1.7E-07	MG/KG		0.1					
1,2,3,6,7,8-HxCDF	1.0E-07	MG/KG		0.1					
2,3,7,8-TCDF	3.4E-06	MG/KG	-	1					
Total					4.4E-03	7.0E-05	1.2E-03	**6.2E+01**	**3.6E+00**
							TEQ (D/F)	**6.2E+01**	**3.6E+00**
PCBs					**TEQ**				
3,3',4,4',5-Pentachlorobiphenyl (126)	2.1E-03	MG/KG	7.82	0.1	1.8E-03				
3,3',4,4'-Tetrachlorobiphenyl (77)	2.3E-03	MG/KG	5.29	0.05	6.8E-04				
3,4,4',5-Tetrachlorobiphenyl (81)	7.1E-04	MG/KG	5.29	0.1	4.2E-04				
2,3,3',4,4'-Pentachlorobiphenyl (105)	4.4E-02	MG/KG	6.10	0.0001	3.0E-05				
2,3,3',4,4',5-Hexachlorobiphenyl (156)	1.7E-02	MG/KG	13.60	0.0001	2.6E-05				
2,3',4,4',5-Pentachlorobiphenyl (118)	2.0E-01	MG/KG	11.22	0.00001	2.5E-05				
2,3,3',4,4',5'-Hexachlorobiphenyl (157)	2.5E-02	MG/KG	7.77	0.0001	2.2E-05				
2,3,4,4',5-Pentachlorobiphenyl (114)	2.7E-03	MG/KG	7.82	0.0001	2.4E-06				
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	1.1E-02	MG/KG	13.60	0.00001	1.7E-06				
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	1.0E-04	MG/KG	13.60	0.001	1.6E-06				
2,3',4,4',5'-Pentachlorobiphenyl (123)	5.9E-03	MG/KG	7.82	0.00001	5.2E-07				
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	1.7E-03	MG/KG	14.97	0.00001	2.9E-07				
2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	8.0E-03	MG/KG	2.17						
2,3,3',4',6-Pentachlorobiphenyl (110)	9.9E-02	MG/KG	2.45						

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TABLE 102
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS BIRD EGG TISSUE - LYMAN MILL WHITE SUCKER

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Avian BMF [b] (lipid basis)	TEF	Estimated [c] Egg Tissue Concentration	CBR [d]		Hazard Quotients [e]	
						NOAEL	LOAEL	NOAEL	LOAEL
2,2',3,4,5,5'-Hexachlorobiphenyl (141)	1.3E-02	MG/KG	2.88						
2,3,3',4'-Tetrachlorobiphenyl (56)	5.8E-03	MG/KG	3.00						
2,3,4,4'-Tetrachlorobiphenyl (60)	3.5E-03	MG/KG	3.00						
2,3',4,4'-Tetrachlorobiphenyl (66)	4.1E-02	MG/KG	5.91						
2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	3.1E-03	MG/KG	9.04						
2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	7.7E-03	MG/KG	10.65						
2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	4.3E-04	MG/KG	10.77						
2,2',3,3',4,4'-Hexachlorobiphenyl (128)	2.7E-02	MG/KG	11.71						
2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	2.2E-03	MG/KG	12.43						
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	8.3E-04	MG/KG	14.18						
2,2',3,4',5,5'-Hexachlorobiphenyl (146)	1.3E-02	MG/KG	15.22						
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	1.9E-02	MG/KG	15.37						
2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	9.9E-05	MG/KG	16.52						
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	1.5E-02	MG/KG	16.52						
2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	5.5E-03	MG/KG	16.61						
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	2.1E-03	MG/KG	17.45						
2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	5.2E-03	MG/KG	17.45						
2,2',3,3',4,4',6-Heptachlorobiphenyl (171)	5.5E-03	MG/KG	17.82						
2,2',3,3',4,6'-Hexachlorobiphenyl (132)	3.8E-02	MG/KG	18.23						
2,2',4,4',5,5'-Hexachlorobiphenyl (153)	8.3E-02	MG/KG	18.23						
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	3.5E-03	MG/KG	19.74						
2,2',3,4,4',5-Hexachlorobiphenyl (137)	1.6E-02	MG/KG	20.85						
2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	2.3E-02	MG/KG	21.07						
2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	2.4E-03	MG/KG	22.13						
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	1.3E-04	MG/KG	22.13						
Total					3.0E-03	7.0E-05	1.2E-03	4.3E+01	2.5E+00
							TEQ (PCBs)	4.3E+01	2.5E+00
							Total TCDD TEQ	1.1E+02	6.2E+00
							Total	1.1E+02	2.6E+01

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TABLE 102
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS BIRD EGG TISSUE - LYMAN MILL WHITE SUCKER

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Avian BMF [b] (lipid basis)	TEF	Estimated [c] Egg Tissue Concentration	CBR [d]		Hazard Quotients [e]	
						NOAEL	LOAEL	NOAEL	LOAEL

Notes:
[a] CT EPCs for fish tissue derived from the Site database; only analytes with BMFs presented.
[b] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % gull egg) presented in Table J-12.
[c] Egg concentration for avian piscivore receptor (mg/kg wet weight) estimated by multiplying the fish tissue concentration by the BMF and the ratio of the egg to fish percent lipid. The following lipid contents were assumed:
6.84 Average white sucker lipid percent in Lyman Mill Pond.
7.7 Average gull egg lipid percentage (Braune and Norstrom, 1989)
[d] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[e] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 103
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS BIRD EGG TISSUE - MANTON LARGEMOUTH BASS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Avian BMF [b] (lipid basis)	TEF	Estimated [c] Egg Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Pesticides									
4,4'-DDT	0.002223333	MG/KG	0.69	na	6.7E-03				
Heptachlor Epoxide	0.000263333	MG/KG	10.67	na	1.2E-02				
Dieldrin	0.001296667	MG/KG	2.82	na	1.6E-02		0.059		2.7E-01
4,4'-DDE	0.0546	MG/KG	13.32	na	3.2E+00		0.1		**3.2E+01**
Aroclor, Total	0.6391	MG/KG	11.89	na	3.3E+01				
							Total Pesticides/PCBs	0.0E+00	**3.2E+01**
Dioxins					**TEQ**				
2,3,7,8-TCDD	8.7E-05	MG/KG	6.99	1	2.7E-03				
1,2,3,7,8-PeCDD	3.0E-07	MG/KG	3.35	1	4.3E-06				
2,3,4,7,8-PeCDF	2.6E-07	MG/KG	1.57	1	1.8E-06				
TEQ - Birds (D/F)					2.7E-03	7.0E-05	1.2E-03	**3.8E+01**	**2.2E+00**
							TEQ (D/F)	**3.8E+01**	**2.2E+00**
PCBs					**TEQ**				
TEQ - Birds (PCBs)					0.0E+00	7.0E-05	1.2E-03	0.0E+00	0.0E+00
							TEQ (PCBs)	0.0E+00	0.0E+00
							Total TCDD TEQ	**3.8E+01**	**2.2E+00**
							Total	**1.5E+02**	**1.9E+02**

Notes:
[a] CT EPCs for fish tissue derived from the Site database; only analytes with BMFs presented.
[b] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % gull egg) presented in Table J-12.
[c] Egg concentration for avian piscivore receptor (mg/kg wet weight) estimated by multiplying the fish tissue concentration by the BMF and the ratio of the egg to fish percent lipid. The following lipid contents were assumed:
1.76 Average largemouth bass lipid percent in Manton Mill Pond.
7.7 Average gull egg lipid percentage (Braune and Norstrom, 1989)
[d] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[e] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 104

CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS BIRD EGG TISSUE - DYERVILLE AMERICAN EEL

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Avian BMF [b] (lipid basis)	TEF	Estimated [c] Egg Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Pesticides									
Aroclor, Total	0.370256667	MG/KG	11.89	na	2.8E+00				
4,4'-DDE	0.011036667	MG/KG	13.32	na	9.3E-02		0.1		9.3E-01
Dieldrin	0.008516667	MG/KG	2.82	na	1.5E-02		0.059		2.6E-01
Heptachlor Epoxide	0.00184	MG/KG	10.67	na	1.2E-02				
4,4'-DDT	0.01188	MG/KG	0.69	na	5.2E-03				
							Total Pesticides/PCBs	0.0E+00	**1.2E+00**
Dioxins					**TEQ**				
2,3,7,8-TCDD	5.2E-05	MG/KG	6.99	1	2.3E-04				
1,2,3,6,7,8-HxCDD	1.4E-06	MG/KG	5.98	0.01	5.2E-08				
Total					2.3E-04	7.0E-05	1.2E-03	**3.3E+00**	1.9E-01
							TEQ (D/F)	**3.3E+00**	1.9E-01
PCBs					**TEQ**				
3,3',4,4',5-Pentachlorobiphenyl (126)	9.7E-05	MG/KG	7.82	0.1	4.8E-05				
2,3,3',4,4',5-Hexachlorobiphenyl (156)	8.7E-03	MG/KG	13.60	0.0001	7.5E-06				
2,3,3',4,4'-Pentachlorobiphenyl (105)	1.8E-02	MG/KG	6.10	0.0001	6.9E-06				
2,3',4,4',5-Pentachlorobiphenyl (118)	7.5E-02	MG/KG	11.22	0.00001	5.4E-06				
3,3',4,4'-Tetrachlorobiphenyl (77)	2.8E-05	MG/KG	5.29	0.05	4.7E-06				
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	1.1E-04	MG/KG	13.60	0.001	9.5E-07				
2,3,4,4',5-Pentachlorobiphenyl (114)	1.1E-03	MG/KG	7.82	0.0001	5.4E-07				
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	4.2E-03	MG/KG	13.60	0.00001	3.7E-07				
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	3.7E-04	MG/KG	14.97	0.00001	3.5E-08				
2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	4.4E-03	MG/KG	2.17						
2,3,3',4',6-Pentachlorobiphenyl (110)	6.7E-02	MG/KG	2.45						
2,2',3,4,5,5'-Hexachlorobiphenyl (141)	9.5E-03	MG/KG	2.88						
2,3,3',4'-Tetrachlorobiphenyl (56)	1.8E-04	MG/KG	3.00						
2,3,4,4'-Tetrachlorobiphenyl (60)	1.4E-03	MG/KG	3.00						
2,3',4,4'-Tetrachlorobiphenyl (66)	1.2E-02	MG/KG	5.91						
2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	2.7E-03	MG/KG	9.04						
2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	7.8E-03	MG/KG	10.65						
2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	9.0E-05	MG/KG	10.77						
2,2',3,3',4,4'-Hexachlorobiphenyl (128)	2.1E-02	MG/KG	11.71						
2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	1.8E-03	MG/KG	12.43						
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	4.4E-04	MG/KG	14.18						

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TABLE 104
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS BIRD EGG TISSUE - DYERVILLE AMERICAN EEL

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Avian BMF [b] (lipid basis)	TEF	Estimated [c] Egg Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
2,2',3,4',5,5'-Hexachlorobiphenyl (146)	8.9E-03	MG/KG	15.22						
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	1.8E-02	MG/KG	15.37						
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	1.6E-02	MG/KG	16.52						
2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	3.9E-03	MG/KG	16.61						
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	1.8E-03	MG/KG	17.45						
2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	4.3E-03	MG/KG	17.45						
2,2',3,3',4,4',6-Heptachlorobiphenyl (171)	4.3E-03	MG/KG	17.82						
2,2',3,3',4,6'-Hexachlorobiphenyl (132)	8.4E-03	MG/KG	18.23						
2,2',4,4',5,5'-Hexachlorobiphenyl (153)	5.4E-02	MG/KG	18.23						
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	4.2E-03	MG/KG	19.74						
2,2',3,4,4',5-Hexachlorobiphenyl (137)	9.4E-03	MG/KG	20.85						
2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	2.1E-02	MG/KG	21.07						
2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	2.2E-03	MG/KG	22.13						
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	7.6E-05	MG/KG	22.13						
Total					7.5E-05	7.0E-05	1.2E-03	**1.1E+00**	6.2E-02
							TEQ (PCBs)	**1.1E+00**	6.2E-02
							Total TCDD TEQ	**4.3E+00**	2.5E-01
							Total	**4.3E+00**	**1.4E+00**

Notes:
[a] CT EPCs for fish tissue derived from the Site database; only analytes with BMFs presented.
[b] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % gull egg) presented in Table J-12.
[c] Egg concentration for avian piscivore receptor (mg/kg wet weight) estimated by multiplying the fish tissue concentration by the BMF and the ratio of the egg to fish percent lipid. The following lipid contents were assumed:
12.13 Average American eel lipid percent in Dyerville Reach.
7.7 Average gull egg lipid percentage (Braune and Norstrom, 1989)
[d] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[e] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 105
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS MAMMAL TISSUE - ASSAPUMPSET BROWN BULLHEAD

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, RI

Chemical	Fish Central Tendency [a]	Units	Mammal BMF [b] (lipid basis)	TEF	Estimated [c] Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Pesticides									
4,4'-DDE	0.0127	MG/KG	na	na			0.1		
							Total Pesticides/PCBs		
Dioxins					**TEQ**				
2,3,7,8-TCDD	6.1E-07	MG/KG	11	1	1.1E-05				
2,3,4,7,8-PeCDF	1.7E-07	MG/KG	54	0.5	7.8E-06				
2,3,7,8-TCDF	2.0E-07	MG/KG	0.40	0.1	1.3E-08				
Total					1.9E-05	1.5E-04	2.3E-04	1.3E-01	8.3E-02
							TEQ (D/F)	1.3E-01	8.3E-02
							Total TCDD TEQ	1.3E-01	8.3E-02
							Total	1.3E-01	8.3E-02

Notes:
[a] CT EPCs for fish tissue derived from the Site database; only analytes with BMFs presented.
[b] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % otter) presented in Table J-13.
[c] Whole body concentration for mammalian piscivore receptor (mg/kg wet weight) estimated by multiplying the fish tissue concentration by the BMF and the ratio of the mammal to fish percent lipid. The following lipid contents were assumed:
2.64 Average brown bullhead lipid percent in Assapumpset Pond.
4.42 Average lipid percentage in 5 otter liver samples (Leonards et al., 1997).
[d] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[e] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 106
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS MAMMAL TISSUE - GREYSTONE WHITE SUCKER

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Mammal BMF [b] (lipid basis)	TEF	Estimated [c] Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Dioxins					**TEQ**				
2,3,4,7,8-PeCDF	4.2E-07	MG/KG	54	0.5	4.8E-06				
2,3,7,8-TCDD	7.0E-07	MG/KG	11	1	3.3E-06				
1,2,3,6,7,8-HxCDD	4.1E-07	MG/KG	30	0.1	5.2E-07				
1,2,3,4,7,8-HxCDF	2.1E-07	MG/KG	57	0.1	5.0E-07				
1,2,3,4,7,8-HxCDD	2.5E-07	MG/KG	9.3	0.1	9.8E-08				
2,3,7,8-TCDF	5.1E-06	MG/KG	0.4	0.1	8.7E-08				
Total					9.3E-06	1.5E-04	2.3E-04	6.2E-02	4.1E-02
							TEQ (D/F)	6.2E-02	4.1E-02
PCBs					**TEQ**				
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	3.7E-04	MG/KG	350	0.01	5.6E-04				
3,3',4,4',5-Pentachlorobiphenyl (126)	3.4E-05	MG/KG	70	0.1	1.0E-04				
2,3,3',4,4',5-Hexachlorobiphenyl (156)	2.5E-03	MG/KG	30	0.0005	1.6E-05				
2,3',4,4',5-Pentachlorobiphenyl (118)	2.2E-02	MG/KG	15	0.0001	1.4E-05				
2,3,3',4,4'-Pentachlorobiphenyl (105)	6.3E-03	MG/KG	12	0.0001	3.2E-06				
2,3,4,4',5-Pentachlorobiphenyl (114)	6.1E-04	MG/KG	24	0.0005	3.1E-06				
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	1.7E-04	MG/KG	50	0.0001	3.6E-07				
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	9.8E-04	MG/KG	6	0.00001	2.5E-08				
3,3',4,4'-Tetrachlorobiphenyl (77)	4.0E-04	MG/KG	1.4	0.0001	2.4E-08				
3,4,4',5-Tetrachlorobiphenyl (81)	2.6E-04	MG/KG	0.36	0.0001	4.0E-09				
2,2',3,5'-Tetrachlorobiphenyl (44)	2.0E-03	MG/KG	0.01						
2,2',4,5'-Tetrachlorobiphenyl (49)	4.5E-03	MG/KG	0.02						
2,4',5-Trichlorobiphenyl (31)	2.3E-03	MG/KG	0.05						
2,3,3',4,4',6-Hexachlorobiphenyl (158)	2.5E-03	MG/KG	4						
2,2',3,3',4,4'-Hexachlorobiphenyl (128)	4.1E-03	MG/KG	9						
2,2',4,4',5,5'-Hexachlorobiphenyl (153)	2.3E-02	MG/KG	15						
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	3.7E-03	MG/KG	15						
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	3.7E-03	MG/KG	21						
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	8.7E-03	MG/KG	23						
2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	9.5E-03	MG/KG	120						
Total					6.9E-04	1.5E-04	2.3E-04	**4.6E+00**	**3.0E+00**
							TEQ (PCBs)	**4.6E+00**	**3.0E+00**
							Total TCDD TEQ	**4.7E+00**	**3.1E+00**

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TABLE 106
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS MAMMAL TISSUE - GREYSTONE WHITE SUCKER

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Mammal BMF [b] (lipid basis)	TEF	Estimated [c] Tissue Concentration	CBR [d]		Hazard Quotients [e]	
						NOAEL	LOAEL	NOAEL	LOAEL
							Total	4.7E+00	3.1E+00

Notes:
[a] CT EPCs for fish tissue derived from the Site database; only analytes with BMFs presented.
[b] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % otter) presented in Table J-13.
[c] Whole body concentration for mammalian piscivore receptor (mg/kg wet weight) estimated by multiplying the fish tissue concentration by the BMF and the ratio of the mammal to fish percent lipid. The following lipid contents were assumed:
10.36 Average white sucker lipid percent in Greystone Mill Pond.
4.42 Average lipid percentage in 5 otter liver samples (Leonards et al., 1997).
[d] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[e] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 107
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS MAMMAL TISSUE - ALLENDALE WHITE SUCKER

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Mammal BMF [b] (lipid basis)	TEF	Estimated [c] Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Dioxins					**TEQ**				
2,3,7,8-TCDD	3.3E-04	MG/KG	11	1	3.2E-03				
2,3,4,7,8-PeCDF	5.0E-07	MG/KG	54	0.5	1.2E-05				
1,2,3,6,7,8-HxCDD	3.4E-07	MG/KG	30	0.1	8.8E-07				
1,2,3,4,6,7,8-HpCDD	7.5E-07	MG/KG	36	0.01	2.3E-07				
1,2,3,4,7,8-HxCDD	2.4E-07	MG/KG	9.3	0.1	2.0E-07				
2,3,7,8-TCDF	1.5E-06	MG/KG	0.4	0.1	5.3E-08				
HCX	3.6E-05	MG/KG		0.0002					
1,2,3,7,8-PeCDD	3.3E-07	MG/KG		1					
1,2,3,7,8-PeCDF	2.1E-07	MG/KG		0.05					
2,3,4,6,7,8-HxCDF	8.0E-08	MG/KG		0.1					
OCDF	4.1E-07	MG/KG		0.0001					
Total					3.2E-03	1.5E-04	2.3E-04	**2.1E+01**	**1.4E+01**
							TEQ (D/F)	**2.1E+01**	**1.4E+01**
PCBs					**TEQ**				
3,3',4,4',5-Pentachlorobiphenyl (126)	3.6E-04	MG/KG	70	0.1	2.2E-03				
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	7.6E-05	MG/KG	350	0.01	2.3E-04				
2,3',4,4',5-Pentachlorobiphenyl (118)	5.9E-02	MG/KG	15	0.0001	7.7E-05				
2,3,3',4,4',5-Hexachlorobiphenyl (156)	4.9E-03	MG/KG	30	0.0005	6.4E-05				
2,3,3',4,4',5'-Hexachlorobiphenyl (157)	4.2E-03	MG/KG	19	0.0005	3.5E-05				
2,3,3',4,4'-Pentachlorobiphenyl (105)	1.4E-02	MG/KG	12	0.0001	1.4E-05				
2,3,4,4',5-Pentachlorobiphenyl (114)	8.6E-04	MG/KG	24	0.0005	9.0E-06				
2,3',4,4',5'-Pentachlorobiphenyl (123)	1.2E-03	MG/KG	24	0.0001	2.5E-06				
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	2.3E-04	MG/KG	50	0.0001	1.0E-06				
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	2.8E-03	MG/KG	6	0.00001	1.5E-07				
3,3',4,4'-Tetrachlorobiphenyl (77)	3.5E-04	MG/KG	1.4	0.0001	4.3E-08				
3,4,4',5-Tetrachlorobiphenyl (81)	1.8E-04	MG/KG	0.36	0.0001	5.8E-09				
2,2',3,5'-Tetrachlorobiphenyl (44)	8.7E-03	MG/KG	0.01						
2,2',4,5'-Tetrachlorobiphenyl (49)	9.2E-03	MG/KG	0.02						
2,4',5-Trichlorobiphenyl (31)	3.4E-03	MG/KG	0.05						
2,3,3',4,4',6-Hexachlorobiphenyl (158)	6.3E-03	MG/KG	4						
2,2',3,3',4,4'-Hexachlorobiphenyl (128)	1.2E-02	MG/KG	9						
2,2',4,4',5,5'-Hexachlorobiphenyl (153)	4.0E-02	MG/KG	15						

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TABLE 107
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS MAMMAL TISSUE - ALLENDALE WHITE SUCKER

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Mammal BMF [b] (lipid basis)	TEF	Estimated [c] Tissue Concentration	CBR [d]		Hazard Quotients [e]	
						NOAEL	LOAEL	NOAEL	LOAEL
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	7.7E-03	MG/KG	15						
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	1.8E-03	MG/KG	21						
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	1.6E-02	MG/KG	23						
2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	1.1E-02	MG/KG	120						
Total					2.6E-03	1.5E-04	2.3E-04	**1.8E+01**	**1.2E+01**
							TEQ (PCBs)	**1.8E+01**	**1.2E+01**
							Total TCDD TEQ	**3.9E+01**	**2.5E+01**
							Total	**3.9E+01**	**2.5E+01**

Notes:
[a] CT EPCs for fish tissue derived from the Site database; only analytes with BMFs presented.
[b] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % otter) presented in Table J-13.
[c] Whole body concentration for mammalian piscivore receptor (mg/kg wet weight) estimated by multiplying the fish tissue concentration by the BMF and the ratio of the mammal to fish percent lipid. The following lipid contents were assumed:
5.07 Average white sucker lipid percent in Allendale Mill Pond.
4.42 Average lipid percentage in 5 otter liver samples (Leonards et al., 1997).
[d] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[e] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 108

CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS MAMMAL TISSUE - LYMAN MILL WHITE SUCKER

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Mammal BMF [b] (lipid basis)	TEF	Estimated [c] Tissue Concentration	CBR [d]		Hazard Quotients [e]	
						NOAEL	LOAEL	NOAEL	LOAEL
Dioxins					**TEQ**				
2,3,7,8-TCDD	5.5E-04	MG/KG	11	1	3.9E-03				
2,3,4,7,8-PeCDF	4.8E-07	MG/KG	54	0.5	8.3E-06				
1,2,3,6,7,8-HxCDD	4.6E-07	MG/KG	30	0.1	9.0E-07				
1,2,3,4,7,8-HxCDF	1.7E-07	MG/KG	57	0.1	6.3E-07				
1,2,3,4,6,7,8-HpCDD	1.7E-06	MG/KG	36	0.01	3.9E-07				
1,2,3,4,7,8-HxCDD	2.7E-07	MG/KG	9.3	0.1	1.6E-07				
2,3,7,8-TCDF	3.4E-06	MG/KG	0.4	0.1	8.9E-08				
Total					4.0E-03	1.5E-04	2.3E-04	**2.6E+01**	**1.7E+01**
							TEQ (D/F)	**2.6E+01**	**1.7E+01**
PCBs					**TEQ**				
3,3',4,4',5-Pentachlorobiphenyl (126)	2.1E-03	MG/KG	70	0.1	9.3E-03				
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	1.0E-04	MG/KG	350	0.01	2.3E-04				
2,3',4,4',5-Pentachlorobiphenyl (118)	2.0E-01	MG/KG	15	0.0001	1.9E-04				
2,3,3',4,4',5-Hexachlorobiphenyl (156)	1.7E-02	MG/KG	30	0.0005	1.6E-04				
2,3,3',4,4',5'-Hexachlorobiphenyl (157)	2.5E-02	MG/KG	19	0.0005	1.5E-04				
2,3,3',4,4'-Pentachlorobiphenyl (105)	4.4E-02	MG/KG	12	0.0001	3.4E-05				
2,3,4,4',5-Pentachlorobiphenyl (114)	2.7E-03	MG/KG	24	0.0005	2.1E-05				
2,3',4,4',5'-Pentachlorobiphenyl (123)	5.9E-03	MG/KG	24	0.0001	9.2E-06				
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	1.7E-03	MG/KG	50	0.0001	5.5E-06				
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	1.1E-02	MG/KG	6	0.00001	4.3E-07				
3,3',4,4'-Tetrachlorobiphenyl (77)	2.3E-03	MG/KG	1.4	0.0001	2.1E-07				
3,4,4',5-Tetrachlorobiphenyl (81)	7.1E-04	MG/KG	0.36	0.0001	1.7E-08				
2,2',3,5'-Tetrachlorobiphenyl (44)	2.1E-02	MG/KG	0.01						
2,2',4,5'-Tetrachlorobiphenyl (49)	2.0E-02	MG/KG	0.02						
2,4',5-Trichlorobiphenyl (31)	4.3E-03	MG/KG	0.05						
2,3,3',4,4',6-Hexachlorobiphenyl (158)	1.4E-02	MG/KG	4						
2,2',3,3',4,4'-Hexachlorobiphenyl (128)	2.7E-02	MG/KG	9						
2,2',4,4',5,5'-Hexachlorobiphenyl (153)	8.3E-02	MG/KG	15						
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	1.9E-02	MG/KG	15						
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	3.5E-03	MG/KG	21						
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	1.5E-02	MG/KG	23						
2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	2.3E-02	MG/KG	120						

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TABLE 108
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS MAMMAL TISSUE - LYMAN MILL WHITE SUCKER

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Mammal BMF [b] (lipid basis)	TEF	Estimated [c] Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Total					1.0E-02	1.5E-04	2.3E-04	**6.8E+01**	**4.4E+01**
							TEQ (PCBs)	**6.8E+01**	**4.4E+01**
							Total TCDD TEQ	**9.4E+01**	**6.1E+01**
							Total	**9.4E+01**	**6.1E+01**

Notes:
[a] CT EPCs for fish tissue derived from the Site database; only analytes with BMFs presented.
[b] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % otter) presented in Table J-13.
[c] Whole body concentration for mammalian piscivore receptor (mg/kg wet weight) estimated by multiplying the fish tissue concentration by the BMF and the ratio of the mammal to fish percent lipid. The following lipid contents were assumed:
6.84 Average white sucker lipid percent in Lyman Mill Pond.
4.42 Average lipid percentage in 5 otter liver samples (Leonards et al., 1997).
[d] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[e] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 109
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS MAMMAL TISSUE - MANTON LARGEMOUTH BASS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Mammal BMF [b] (lipid basis)	TEF	Estimated [c] Tissue Concentration	CBR [d]		Hazard Quotients [e]	
						NOAEL	LOAEL	NOAEL	LOAEL
Dioxins					**TEQ**				
2,3,7,8-TCDF	3.3E-07	MG/KG	0.4	0.1	3.3E-08				
2,3,7,8-TCDD	8.7E-05	MG/KG	11	1	2.4E-03				
2,3,4,7,8-PeCDF	2.6E-07	MG/KG	54	0.5	1.8E-05				
Total					2.4E-03	1.5E-04	2.3E-04	**1.6E+01**	**1.0E+01**
							TEQ (D/F)	**1.6E+01**	**1.0E+01**
PCBs					**TEQ**				
TEQ - Mammals (PCBs)					0.0E+00	1.5E-04	2.3E-04	0.0E+00	0.0E+00
							TEQ (PCBs)	0.0E+00	0.0E+00
							Total TCDD TEQ	**1.6E+01**	**1.0E+01**
							Total	**1.6E+01**	**1.0E+01**

Notes:
[a] CT EPCs for fish tissue derived from the Site database; only analytes with BMFs presented.
[b] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % otter) presented in Table J-13.
[c] Whole body concentration for mammalian piscivore receptor (mg/kg wet weight) estimated by multiplying the fish tissue concentration by the BMF and the ratio of the mammal to fish percent lipid. The following lipid contents were assumed:
1.76 Average largemouth bass lipid percent in Manton Mill Pond.
4.42 Average lipid percentage in 5 otter liver samples (Leonards et al., 1997).
[d] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[e] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 110
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS MAMMAL TISSUE - DYERVILLE AMERICAN EEL

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Mammal BMF [b] (lipid basis)	TEF	Estimated [c] Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Dioxins					**TEQ**				
2,3,7,8-TCDD	5.2E-05	MG/KG	11	1	2.1E-04				
1,2,3,6,7,8-HxCDD	1.4E-06	MG/KG	30	0.1	1.5E-06				
1,2,3,4,6,7,8-HpCDD	1.4E-06	MG/KG	36	0.01	1.8E-07				
1,2,3,4,7,8-HxCDD	2.2E-07	MG/KG	9.3	0.1	7.4E-08				
Total					2.1E-04	1.5E-04	2.3E-04	**1.4E+00**	9.1E-01
							TEQ (D/F)	**1.4E+00**	9.1E-01
PCBs					**TEQ**				
3,3',4,4',5-Pentachlorobiphenyl (126)	9.7E-05	MG/KG	70	0.1	2.5E-04				
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	1.1E-04	MG/KG	350	0.01	1.4E-04				
2,3,3',4,4',5-Hexachlorobiphenyl (156)	8.7E-03	MG/KG	30	0.0005	4.7E-05				
2,3',4,4',5-Pentachlorobiphenyl (118)	7.5E-02	MG/KG	15	0.0001	4.1E-05				
2,3,3',4,4'-Pentachlorobiphenyl (105)	1.8E-02	MG/KG	12	0.0001	7.8E-06				
2,3,4,4',5-Pentachlorobiphenyl (114)	1.1E-03	MG/KG	24	0.0005	4.8E-06				
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	3.7E-04	MG/KG	50	0.0001	6.7E-07				
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	4.2E-03	MG/KG	6	0.00001	9.2E-08				
3,3',4,4'-Tetrachlorobiphenyl (77)	2.8E-05	MG/KG	1.4	0.0001	1.4E-09				
2,2',3,5'-Tetrachlorobiphenyl (44)	4.2E-03	MG/KG	0.01						
2,2',4,5'-Tetrachlorobiphenyl (49)	2.1E-03	MG/KG	0.02						
2,4',5-Trichlorobiphenyl (31)	1.4E-03	MG/KG	0.05						
2,3,3',4,4',6-Hexachlorobiphenyl (158)	8.8E-03	MG/KG	4						
2,2',3,3',4,4'-Hexachlorobiphenyl (128)	2.1E-02	MG/KG	9						
2,2',4,4',5,5'-Hexachlorobiphenyl (153)	5.4E-02	MG/KG	15						
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	1.8E-02	MG/KG	15						
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	4.2E-03	MG/KG	21						
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	1.6E-02	MG/KG	23						
2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	2.1E-02	MG/KG	120						
Total					4.9E-04	1.5E-04	2.3E-04	**3.3E+00**	**2.1E+00**
							TEQ (PCBs)	**3.3E+00**	**2.1E+00**
							Total TCDD TEQ	**4.7E+00**	**3.0E+00**
							Total	**4.7E+00**	**3.0E+00**

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TABLE 110
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED PISCIVOROUS MAMMAL TISSUE - DYERVILLE AMERICAN EEL

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Fish Central Tendency [a]	Units	Mammal BMF [b] (lipid basis)	TEF	Estimated [c] Tissue Concentration	CBR [d]		Hazard Quotients [e]	
						NOAEL	LOAEL	NOAEL	LOAEL

Notes:
[a] CT EPCs for fish tissue derived from the Site database; only analytes with BMFs presented.
[b] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % otter) presented in Table J-13.
[c] Whole body concentration for mammalian piscivore receptor (mg/kg wet weight) estimated by multiplying the fish tissue concentration by the BMF and the ratio of the mammal to fish percent lipid. The following lipid contents were assumed:
12.13 Average American eel lipid percent in Dyerville Reach.
4.42 Average lipid percentage in 5 otter liver samples (Leonards et al., 1997).
[d] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[e] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

TABLE 111
INCREMENTAL RISK SUMMARY FOR WILDLIFE RECEPTORS - Great Blue Heron (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	**2.6E+00**	**1.0E+00**	4.1E-01	1.6E-01	**2.2E+00**	8.6E-01
Toxicity Equivalency - Birds	**7.8E+00**	7.8E-01	1.1E-01	1.1E-02	**7.6E+00**	7.6E-01
Aroclor-1254	**1.6E+00**	1.6E-01	2.0E-01	2.0E-02	**1.4E+00**	1.4E-01
Chromium	**1.3E+00**	2.5E-01	9.0E-01	1.8E-01	3.7E-01	7.5E-02

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	**6.4E+00**	**2.6E+00**	4.1E-01	1.6E-01	**6.0E+00**	**2.4E+00**
Toxicity Equivalency - Birds	**7.9E+00**	7.9E-01	1.1E-01	1.1E-02	**7.8E+00**	7.8E-01
4,4'-DDE	**7.9E+00**	7.9E-01	**2.6E+00**	2.6E-01	**5.3E+00**	5.3E-01
Toxicity Equivalency (PCB) - Birds	**4.9E+00**	4.9E-01	6.3E-01	6.3E-02	**4.3E+00**	4.3E-01
Aroclor-1254	**3.9E+00**	3.9E-01	2.0E-01	2.0E-02	**3.7E+00**	3.7E-01
4,4'-DDD	**2.3E+00**	2.3E-01	**1.1E+00**	1.1E-01	**1.3E+00**	1.3E-01

Manton Pond Reach	Risk Summary				Incremental Risk	
	Manton		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	9.7E-01	3.9E-01	4.1E-01	1.6E-01	5.6E-01	2.2E-01
Toxicity Equivalency - Birds	**1.5E+00**	1.5E-01	1.1E-01	1.1E-02	**1.4E+00**	1.4E-01
4,4'-DDE	**3.3E+00**	3.3E-01	**2.6E+00**	2.6E-01	6.6E-01	6.6E-02

Dyerville Reach	Risk Summary				Incremental Risk	
	Dyerville		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	**2.8E+01**	**1.1E+01**	4.1E-01	1.6E-01	**2.8E+01**	**1.1E+01**
Aroclor-1254	**7.0E+00**	7.0E-01	2.0E-01	2.0E-02	**6.9E+00**	6.9E-01
Zinc	**2.3E+00**	2.5E-01	3.3E-01	3.7E-02	**2.0E+00**	2.2E-01
4,4'-DDE	**4.4E+00**	4.4E-01	**2.6E+00**	2.6E-01	**1.7E+00**	1.7E-01
Chromium	**1.5E+00**	3.0E-01	9.0E-01	1.8E-01	6.2E-01	1.2E-01
4,4'-DDD	**1.9E+00**	1.9E-01	**1.1E+00**	1.1E-01	8.5E-01	8.5E-02

Notes:
Risk estimates as calculated and presented in Appendix K.
Incremental risks calculated for all analytes with NOAEL-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

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TABLE 112
INCREMENTAL RISK SUMMARY FOR WILDLIFE RECEPTORS - Great Blue Heron (Assapumpset)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	**2.6E+00**	**1.0E+00**	5.5E-03	2.2E-03	**2.6E+00**	**1.0E+00**
Toxicity Equivalency - Birds	**7.8E+00**	7.8E-01	3.4E-02	3.4E-03	**7.7E+00**	7.7E-01
Chromium	**1.3E+00**	2.5E-01	1.1E-01	2.1E-02	**1.2E+00**	2.3E-01
Mercury (methyl)	**3.9E+00**	3.9E-01	**2.1E+00**	2.1E-01	**1.8E+00**	1.8E-01
Aroclor-1254	**1.6E+00**	1.6E-01	2.1E-03	2.1E-04	**1.5E+00**	1.5E-01
4,4'-DDE	**1.8E+00**	1.8E-01	7.8E-01	7.8E-02	9.9E-01	9.9E-02

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	**6.4E+00**	**2.6E+00**	5.5E-03	2.2E-03	**6.4E+00**	**2.6E+00**
Toxicity Equivalency - Birds	**7.9E+00**	7.9E-01	3.4E-02	3.4E-03	**7.9E+00**	7.9E-01
4,4'-DDE	**7.9E+00**	7.9E-01	7.8E-01	7.8E-02	**7.1E+00**	7.1E-01
Toxicity Equivalency (PCB) - Birds	**4.9E+00**	4.9E-01			**4.9E+00**	4.9E-01
Aroclor-1254	**3.9E+00**	3.9E-01	2.1E-03	2.1E-04	**3.9E+00**	3.9E-01
4,4'-DDD	**2.3E+00**	2.3E-01	1.5E-01	1.5E-02	**2.2E+00**	2.2E-01
Mercury (methyl)	**2.4E+00**	2.4E-01	**2.1E+00**	2.1E-01	3.7E-01	3.7E-02

Manton Pond Reach	Risk Summary				Incremental Risk	
	Manton		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
4,4'-DDE	**3.3E+00**	3.3E-01	7.8E-01	7.8E-02	**2.5E+00**	2.5E-01
Mercury (methyl)	**3.2E+00**	3.2E-01	**2.1E+00**	2.1E-01	**1.1E+00**	1.1E-01
Toxicity Equivalency - Birds	**1.5E+00**	1.5E-01	3.4E-02	3.4E-03	**1.5E+00**	1.5E-01

Dyerville Reach	Risk Summary				Incremental Risk	
	Dyerville		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	**2.8E+01**	**1.1E+01**	5.5E-03	2.2E-03	**2.8E+01**	**1.1E+01**
Aroclor-1254	**7.0E+00**	7.0E-01	2.1E-03	2.1E-04	**7.0E+00**	7.0E-01
4,4'-DDE	**4.4E+00**	4.4E-01	7.8E-01	7.8E-02	**3.6E+00**	3.6E-01
Zinc	**2.3E+00**	2.5E-01	1.9E-01	2.1E-02	**2.1E+00**	2.3E-01
4,4'-DDD	**1.9E+00**	1.9E-01	1.5E-01	1.5E-02	**1.8E+00**	1.8E-01
Chromium	**1.5E+00**	3.0E-01	1.1E-01	2.1E-02	**1.4E+00**	2.8E-01

Notes:
Risk estimates as calculated and presented in Appendix K.
Incremental risks calculated for all analytes with NOAEL-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

TABLE 113
INCREMENTAL RISK SUMMARY FOR WILDLIFE RECEPTORS - Belted Kingfisher (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	**4.7E+00**	**1.9E+00**	7.5E-01	3.0E-01	**3.9E+00**	**1.6E+00**
Toxicity Equivalency - Birds	**7.7E+00**	7.7E-01	1.6E-01	1.6E-02	**7.6E+00**	7.6E-01
Aroclor-1254	**2.8E+00**	2.8E-01	3.6E-01	3.6E-02	**2.5E+00**	2.5E-01
Toxicity Equivalency (PCB) - Birds	1.7E+00	1.7E-01	**1.2E+00**	1.2E-01	5.5E-01	5.5E-02

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	**1.2E+01**	**4.9E+00**	7.5E-01	3.0E-01	**1.2E+01**	**4.6E+00**
Toxicity Equivalency - Birds	**1.3E+01**	**1.3E+00**	1.6E-01	1.6E-02	**1.3E+01**	**1.3E+00**
4,4'-DDE	**1.5E+01**	**1.5E+00**	**4.9E+00**	4.9E-01	**1.0E+01**	**1.0E+00**
Toxicity Equivalency (PCB) - Birds	**9.2E+00**	9.2E-01	**1.2E+00**	1.2E-01	**8.1E+00**	8.1E-01
Aroclor-1254	**7.5E+00**	7.5E-01	3.6E-01	3.6E-02	**7.1E+00**	7.1E-01
4,4'-DDD	**4.4E+00**	4.4E-01	**2.0E+00**	2.0E-01	**2.4E+00**	2.4E-01
Technical Chlordane	**1.6E+00**	1.6E-01	3.2E-01	3.2E-02	**1.2E+00**	1.2E-01

Manton Pond Reach	Risk Summary				Incremental Risk	
	Manton		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	**1.9E+00**	7.4E-01	7.5E-01	3.0E-01	**1.1E+00**	4.4E-01
Toxicity Equivalency - Birds	**2.0E+00**	2.0E-01	1.6E-01	1.6E-02	**1.9E+00**	1.9E-01
4,4'-DDE	**6.3E+00**	6.3E-01	**4.9E+00**	4.9E-01	**1.3E+00**	1.3E-01

Dyerville Reach	Risk Summary				Incremental Risk	
	Dyerville		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	**5.4E+01**	**2.2E+01**	7.5E-01	3.0E-01	**5.3E+01**	**2.1E+01**
Aroclor-1254	**1.3E+01**	**1.3E+00**	3.6E-01	3.6E-02	**1.3E+01**	**1.3E+00**
Zinc	**3.5E+00**	3.8E-01	3.6E-01	4.0E-02	**3.1E+00**	3.4E-01
4,4'-DDE	**8.3E+00**	8.3E-01	**4.9E+00**	4.9E-01	**3.4E+00**	3.4E-01
4,4'-DDD	**3.5E+00**	3.5E-01	**2.0E+00**	2.0E-01	**1.5E+00**	1.5E-01
Toxicity Equivalency - Birds	**1.1E+00**	1.1E-01	1.6E-01	1.6E-02	9.0E-01	9.0E-02

Notes:
Risk estimates as calculated and presented in Appendix K.
Incremental risks calculated for all analytes with NOAEL-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

US EPA ARCHIVE DOCUMENT

TABLE 114
INCREMENTAL RISK SUMMARY FOR WILDLIFE RECEPTORS - Belted Kingfisher (Assapumpset)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		RABeystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	**4.7E+00**	**1.9E+00**			**4.7E+00**	**1.9E+00**
Toxicity Equivalency - Birds	**7.7E+00**	7.7E-01	5.5E-02	5.5E-03	**7.7E+00**	7.7E-01
Mercury (methyl)	**7.4E+00**	7.4E-01	**3.9E+00**	3.9E-01	**3.5E+00**	3.5E-01
Aroclor-1254	**2.8E+00**	2.8E-01			**2.8E+00**	2.8E-01
4,4'-DDE	**3.3E+00**	3.3E-01	**1.5E+00**	1.5E-01	**1.8E+00**	1.8E-01
Toxicity Equivalency (PCB) - Birds	**1.7E+00**	1.7E-01			**1.7E+00**	1.7E-01
4,4'-DDD	**1.4E+00**	1.4E-01	2.7E-01	2.7E-02	**1.2E+00**	1.2E-01

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		RABeystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	**1.2E+01**	**4.9E+00**			**1.2E+01**	**4.9E+00**
4,4'-DDE	**1.5E+01**	**1.5E+00**	**1.5E+00**	1.5E-01	**1.4E+01**	**1.4E+00**
Toxicity Equivalency - Birds	**1.3E+01**	**1.3E+00**	5.5E-02	5.5E-03	**1.3E+01**	**1.3E+00**
Toxicity Equivalency (PCB) - Birds	**9.2E+00**	9.2E-01			**9.2E+00**	9.2E-01
Aroclor-1254	**7.5E+00**	7.5E-01			**7.5E+00**	7.5E-01
4,4'-DDD	**4.4E+00**	4.4E-01	2.7E-01	2.7E-02	**4.2E+00**	4.2E-01
Technical Chlordane	**1.6E+00**	1.6E-01			**1.6E+00**	1.6E-01
Mercury (methyl)	**4.7E+00**	4.7E-01	**3.9E+00**	3.9E-01	7.7E-01	7.7E-02

Manton Pond Reach	Risk Summary				Incremental Risk	
	Manton		RABeystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	**1.9E+00**	7.4E-01			**1.9E+00**	7.4E-01
4,4'-DDE	**6.3E+00**	6.3E-01	**1.5E+00**	1.5E-01	**4.8E+00**	4.8E-01
Mercury (methyl)	**6.1E+00**	6.1E-01	**3.9E+00**	3.9E-01	**2.2E+00**	2.2E-01
Toxicity Equivalency - Birds	**2.0E+00**	2.0E-01	5.5E-02	5.5E-03	**2.0E+00**	2.0E-01

Dyerville Reach	Risk Summary				Incremental Risk	
	Dyerville		RABeystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	**5.4E+01**	**2.2E+01**			**5.4E+01**	**2.2E+01**
Aroclor-1254	**1.3E+01**	**1.3E+00**			**1.3E+01**	**1.3E+00**
4,4'-DDE	**8.3E+00**	8.3E-01	**1.5E+00**	1.5E-01	**6.8E+00**	6.8E-01
Zinc	**3.5E+00**	3.8E-01	2.2E-01	2.4E-02	**3.2E+00**	3.6E-01
4,4'-DDD	**3.5E+00**	3.5E-01	2.7E-01	2.7E-02	**3.2E+00**	3.2E-01
Toxicity Equivalency - Birds	**1.1E+00**	1.1E-01	5.5E-02	5.5E-03	**1.0E+00**	1.0E-01

Notes:
Risk estimates as calculated and presented in Appendix K.
Incremental risks calculated for all analytes with NOAEL-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

TABLE 115
INCREMENTAL RISK SUMMARY FOR WILDLIFE RECEPTORS - River Otter (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Mammals	**6.2E+00**	6.2E-01	5.5E-01	5.5E-02	**5.6E+00**	5.6E-01

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Mammals	**7.6E+00**	7.6E-01	5.5E-01	5.5E-02	**7.0E+00**	7.0E-01
Aroclor-1254	**3.5E+00**	3.5E-01	**2.2E+00**	2.2E-01	**1.2E+00**	1.2E-01
Toxicity Equivalency (PCB) - Mammals	**3.1E+00**	3.1E-01	**2.0E+00**	2.0E-01	**1.1E+00**	1.1E-01
Aroclor, Total	**3.5E+00**	3.5E-01	**2.9E+00**	2.9E-01	6.3E-01	6.3E-02

Manton Pond Reach	Risk Summary				Incremental Risk	
	Manton		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Mammals	**1.8E+00**	1.8E-01	5.5E-01	5.5E-02	**1.3E+00**	1.3E-01

Dyerville Reach	Risk Summary				Incremental Risk	
	Dyerville		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	**1.5E+01**	**1.5E+00**	**2.9E+00**	2.9E-01	**1.3E+01**	**1.3E+00**
Aroclor-1254	**6.2E+00**	6.2E-01	**2.2E+00**	2.2E-01	**4.0E+00**	4.0E-01

Notes:
Risk estimates as calculated and presented in Appendix K.
Incremental risks calculated for all analytes with NOAEL-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

TABLE 116
INCREMENTAL RISK SUMMARY FOR WILDLIFE RECEPTORS - River Otter (Assapumpset)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Mammals	**6.2E+00**	6.2E-01	4.4E-01	4.4E-02	**5.7E+00**	5.7E-01
Aroclor, Total	**1.4E+00**	1.4E-01	3.5E-02	3.5E-03	**1.3E+00**	1.3E-01
Aroclor-1254	**1.3E+00**	1.3E-01	2.7E-02	2.7E-03	**1.3E+00**	1.3E-01

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Mammals	**7.6E+00**	7.6E-01	4.4E-01	4.4E-02	**7.2E+00**	7.2E-01
Aroclor, Total	**3.5E+00**	3.5E-01	3.5E-02	3.5E-03	**3.5E+00**	3.5E-01
Aroclor-1254	**3.5E+00**	3.5E-01	2.7E-02	2.7E-03	**3.4E+00**	3.4E-01
Toxicity Equivalency (PCB) - Mammals	**3.1E+00**	3.1E-01			**3.1E+00**	3.1E-01

Manton Pond Reach	Risk Summary				Incremental Risk	
	Manton		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Mammals	**1.8E+00**	1.8E-01	4.4E-01	4.4E-02	**1.4E+00**	1.4E-01

Dyerville Reach	Risk Summary				Incremental Risk	
	Dyerville		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	**1.5E+01**	**1.5E+00**	3.5E-02	3.5E-03	**1.5E+01**	**1.5E+00**
Aroclor-1254	**6.2E+00**	6.2E-01	2.7E-02	2.7E-03	**6.2E+00**	6.2E-01

Notes:
Risk estimates as calculated and presented in Appendix K.
Incremental risks calculated for all analytes with NOAEL-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

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TABLE 117
WEIGHT-OF-EVIDENCE INTEGRATION: PISCIVOROUS WILDLIFE POPULATIONS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Assessment Endpoint 4. Protection and maintenance of piscivorous mammal and bird populations.

A. Do ingestion doses of COPCs in piscivorous wildlife (such as mink, river otter, kingfisher, great blue heron, or American bald eagle) exceed Toxic Reference Values (TRVs) or Toxic Equivalencies (TEQs) for adverse effects on survival, growth or reproduction?
B. Do residues of COPCs in tissues of piscivorous wildlife (such as mink, river otter, kingfisher, great blue heron, or American bald eagle) exceed benchmarks for adverse effects on survival, growth, or reproduction?

Measurement Endpoints[a]

A. Comparison of estimated ingestion doses in piscivorous wildlife with TRVs and toxic equivalencies
B. Comparison of estimated piscivorous wildlife residues with CBRs

Weight-of-Evidence Integration[b]

	WEIGHT				
RISK/MAGNITUDE	Low	Low - Medium	Medium	Medium - High	High
Yes/High		B			
Yes/Low			A		
Undeterminate					
No/Low					
No/Very Low					

Risk Conclusion:

Piscivorous mammal and bird populations that occur within the study area may be at substantial risk of harm due to direct exposure to Site-related contaminants in surface water, sediment, and prey. In addition, consumption of contaminated fish may result in elevated tissue residues in these receptors resulting in adverse reproductive effects (i.e., bioaccumulation hazard).

Notes:
a. Measurement endpoints and assigned weights are discussed in Section 2.6.
b. WOE integration is discussed in Section 7.4.

Prepared by: NAR
Checked by: SGH

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Table 118
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Tree Swallow - Egg

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Tree Swallow
Exposure Medium: Egg

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
GREYSTONE	**Pesticides/PCBs**								
(Background area)	4,4'-DDD	MG/KG	0.0068	NC	0.00956	0.0068	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.50455	NC	0.65315	0.50	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.00543	NC	0.00628 J	0.0054	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.0150	NC	0.0223	0.015	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	1.3509	NC	1.87218	1.4	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	1.0794	NC	1.51226	1.1	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.271	NC	0.35993	0.27	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.0230	NC	0.02859	0.023	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.0287	NC	0.04076 J	0.029	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.61770	NC	0.91843 J	0.62	MG/KG	Mean	(2)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.0000552	0.00022 T	0.00028487 J	0.000055	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.0000098	0.000013 N	0.00001889 J	0.0000098	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.0000775	0.00017 T	0.000311	0.000078	MG/KG	Mean	(2)
ALLENDALE	**Pesticides/PCBs**								
	4,4'-DDD	MG/KG	0.0078	NC	0.01268	0.0078	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.29864	NC	0.48085	0.30	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.00349	NC	0.00449 J	0.0035	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.0165	NC	0.03292	0.017	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	1.3199	NC	1.68113	1.3	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	1.1057	NC	1.30813	1.1	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.214	NC	0.373	0.21	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.0181	NC	0.02441	0.018	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.0301	NC	0.04061 J	0.030	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.46928	NC	0.68141 J	0.47	MG/KG	Mean	(2)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.000720	0.00072 NP	0.00300354 J	0.00072	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.0000126	0.000 N	0.00002664 J	0.000013	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000756	0.00116 T	0.00305	0.00076	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.000221	NC	0.000329	0.00022	MG/KG	Mean	(2)

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Table 118
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Tree Swallow - Egg

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Tree Swallow
Exposure Medium: Egg

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
LYMAN MILL	**Pesticides/PCBs**									
	4,4'-DDD	MG/KG	0.0052	NC	0.00664	J	0.0052	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.22295	NC	0.29413		0.22	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.00477	NC	0.00693	J	0.0048	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.0107	NC	0.0185		0.011	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	1.3097	NC	1.55881		1.3	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	1.1498	NC	1.3629		1.1	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.160	NC	0.19591		0.16	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.0115	NC	0.01345		0.012	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.0195	NC	0.03008	J	0.020	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.47632	NC	0.72049	J	0.48	MG/KG	Mean	(2)
	Dioxins/Furans									
	2,3,7,8-TCDD	MG/KG	0.00109	NC	0.00194943	J	0.0011	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.0000096	NC	0.00001789	JS	0.0000096	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.00112	NC	0.00198		0.0011	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.000197	NC	0.000269		0.00020	MG/KG	Mean	(2)
MANTON	**Dioxins/Furans**									
	2,3,7,8-TCDD	MG/KG	0.000530	NC	0.00070649		0.00053	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.0000133	NC	0.00001657	#	0.000013	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000544	NC	0.00072336		0.00054	MG/KG	Mean	(2)
FIRE STATION	**Dioxins/Furans**									
(Reference area)	2,3,7,8-TCDD	MG/KG	0.000009	NC	0.00001367		0.0000086	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.0000265	NC	0.00003389	#	0.000027	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000093	NC	0.000105154		0.000093	MG/KG	Mean	(2)

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Table 118
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Tree Swallow - Egg

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Tree Swallow
Exposure Medium: Egg

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

(1) Chemicals of potential concern are identified in Table 12.
(2) Mean: Arithmetic Mean
(3) Max: Maximum, applied in the special case where the arithmetic mean has been selected, but because of elevated detection limits in non-detects, it is greater than the maximum detected concentration.
(4) Central tendency will be evaluated using average concentrations.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:

J = Value is estimated.
# = Value is result from second column confirmation analysis.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: RAR
Checked by:

Table 119
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Tree Swallow - Egg

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Tree Swallow
Exposure Medium: Egg

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
GREYSTONE	**Pesticides/PCBs**								
(Background area)	4,4'-DDD	MG/KG	0.0068	NC	0.00956	0.0096	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.50455	NC	0.65315	0.65	MG/KG	Max	(5)
	4,4'-DDT	MG/KG	0.00543	NC	0.00628 J	0.0063	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.0150	NC	0.0223	0.022	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	1.3509	NC	1.87218	1.9	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	1.0794	NC	1.51226	1.5	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.271	NC	0.35993	0.36	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.0230	NC	0.02859	0.029	MG/KG	Max	(5)
	Heptachlor Epoxide	MG/KG	0.0287	NC	0.04076 J	0.041	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.61770	NC	0.91843 J	0.92	MG/KG	Max	(5)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.0000552	0.000218 T	0.00028487 J	0.00022	MG/KG	95% UCL-T	(3)
	2,3,7,8-TCDF	MG/KG	0.0000098	0.0000126 N	0.00001889 J	0.000013	MG/KG	95% UCL-N	(2)
	Toxicity Equivalency - Birds	MG/KG	0.0000775	0.000171 T	0.000311	0.00017	MG/KG	95% UCL-T	(3)
ALLENDALE	**Pesticides/PCBs**								
	4,4'-DDD	MG/KG	0.0078	NC	0.01268	0.013	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.29864	NC	0.48085	0.48	MG/KG	Max	(5)
	4,4'-DDT	MG/KG	0.00349	NC	0.00449 J	0.0045	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.0165	NC	0.03292	0.033	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	1.3199	NC	1.68113	1.7	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	1.1057	NC	1.30813	1.3	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.214	NC	0.373	0.37	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.0181	NC	0.02441	0.024	MG/KG	Max	(5)
	Heptachlor Epoxide	MG/KG	0.0301	NC	0.04061 J	0.041	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.46928	NC	0.68141 J	0.68	MG/KG	Max	(5)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.000720	0.0007200 NP	0.00300354 J	0.00072	MG/KG	95% UCL-NP	(4)
	2,3,7,8-TCDF	MG/KG	0.0000126	0.00001451 N	0.00002664 J	0.000015	MG/KG	95% UCL-N	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000756	0.00116 T	0.00305	0.0012	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.000221	NC	0.000329	0.00033	MG/KG	Max	(5)

Table 119
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Tree Swallow - Egg

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Tree Swallow
Exposure Medium: Egg

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
LYMAN MILL	**Pesticides/PCBs**								
	4,4'-DDD	MG/KG	0.0052	NC	0.00664 J	0.0066	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.22295	NC	0.29413	0.29	MG/KG	Max	(5)
	4,4'-DDT	MG/KG	0.00477	NC	0.00693 J	0.0069	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.0107	NC	0.0185	0.019	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	1.3097	NC	1.55881	1.6	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	1.1498	NC	1.3629	1.4	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.160	NC	0.19591	0.20	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.0115	NC	0.01345	0.013	MG/KG	Max	(5)
	Heptachlor Epoxide	MG/KG	0.0195	NC	0.03008 J	0.030	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.47632	NC	0.72049 J	0.72	MG/KG	Max	(5)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.00109	NC	0.00195 J	0.0019	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.0000096	NC	0.0000179 JS	0.000018	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.00112	NC	0.00198	0.0020	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.000197	NC	0.000269	0.00027	MG/KG	Max	(5)
MANTON	**Dioxins/Furans**								
	2,3,7,8-TCDD	MG/KG	0.000530	NC	0.00070649	0.00071	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.0000133	NC	0.00001657 #	0.000017	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.000544	NC	0.00072336	0.00072	MG/KG	Max	(5)
FIRE STATION	**Dioxins/Furans**								
(Reference area)	2,3,7,8-TCDD	MG/KG	0.000009	NC	0.00001367	0.000014	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.0000265	NC	0.00003389 #	0.000034	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.000093	NC	0.000105154	0.00011	MG/KG	Max	(5)

Table 119
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Tree Swallow - Egg

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Tree Swallow
Exposure Medium: Egg

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

(1) Chemicals of potential concern are identified in Table 12.
(2) 95% UCL-N: 95% Upper Concentration Limit on the mean, normal distribution
(3) 95% UCL-T: 95% Upper Concentration Limit on the mean, lognormal distribution
(4) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(5) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:

J = Value is estimated.
# = Value is result from second column confirmation analysis.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

Table 120
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Tree Swallow - Nestling

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Tree Swallow
Exposure Medium: Nestling

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
GREYSTONE	**Pesticides/PCBs**								
(Background area)	4,4'-DDD	MG/KG	0.00607	NC	0.01973	0.00607	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.0159	NC	0.02458 J	0.0159	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.0021	NC	0.004 J	0.0021	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.0117	NC	0.02304	0.0117	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.1865	NC	0.28397 J	0.1865	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.14968	NC	0.23586 J	0.14968	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.03678	NC	0.04811 J	0.03678	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.00508	NC	0.00741 J	0.00508	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.0012	NC	0.00101 J	0.00101	MG/KG	Max	(3)
	Heptachlor Epoxide	MG/KG	0.00776	NC	0.01587	0.00776	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.34259	NC	0.7555	0.34259	MG/KG	Mean	(2)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.000008	0.00001 NP	0.00002311 J	0.000008	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.00000452	0.000005 NP	0.00000843 #	0.00000452	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.000016	0.00002 NP	0.0000311	0.000016	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.0000278	NC	0.0000317	0.0000278	MG/KG	Mean	(2)
ALLENDALE	**Pesticides/PCBs**								
	4,4'-DDD	MG/KG	0.0195	NC	0.06395	0.0195	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.0287	NC	0.06395	0.0287	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.00363	NC	0.00607	0.00363	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.0196	NC	0.0706	0.0196	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.56864	NC	1.02141	0.56864	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.53889	NC	0.98496	0.53889	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.02975	NC	0.03645	0.02975	MG/KG	Mean	(2)

Table 120
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Tree Swallow - Nestling

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Tree Swallow
Exposure Medium: Nestling

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
	Dieldrin	MG/KG	0.00976	NC	0.01642	0.00976	MG/KG	Mean	(2)
	Endosulfan Sulfate	MG/KG	0.003368	NC	0.01312	0.003368	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.00543	NC	0.0186	0.00543	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.0185	NC	0.04218	0.0185	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.52285	NC	0.83588 J	0.52285	MG/KG	Mean	(2)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.0007581	0.00076 NP	0.00170268 J	0.0007581	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.00000566	0.000 N	0.00000928 J	0.00000566	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.00077	0.00077 NP	0.00172	0.00077	MG/KG	Mean	(2)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.000125	NC	0.000268	0.000125	MG/KG	Mean	(2)
LYMAN MILL	**Pesticides/PCBs**								
	4,4'-DDD	MG/KG	0.0115	NC	0.04458	0.0115	MG/KG	Mean	(2)
	4,4'-DDE	MG/KG	0.0330	NC	0.06728 J	0.0330	MG/KG	Mean	(2)
	4,4'-DDT	MG/KG	0.0014	NC	0.00403	0.0014	MG/KG	Mean	(2)
	alpha-Chlordane	MG/KG	0.00435	NC	0.00982	0.00435	MG/KG	Mean	(2)
	Aroclor, Total	MG/KG	0.7245	NC	0.91428	0.7245	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.67820	NC	0.87067	0.67820	MG/KG	Mean	(2)
	Aroclor-1268	MG/KG	0.04630	NC	0.06412 J	0.04630	MG/KG	Mean	(2)
	Dieldrin	MG/KG	0.00771	NC	0.01396 J	0.00771	MG/KG	Mean	(2)
	Endosulfan Sulfate	MG/KG	0.00313	NC	0.01022	0.00313	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.001971	NC	0.00329	0.001971	MG/KG	Mean	(2)
	Heptachlor Epoxide	MG/KG	0.00466	NC	0.00797 J	0.00466	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.2387	NC	0.31412 J	0.2387	MG/KG	Mean	(2)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.0010545	NC	0.00160987 J	0.0010545	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.00000768	NC	0.00000921 J	0.00000768	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.0011	NC	0.00163	0.0011	MG/KG	Mean	(2)
MANTON	**Dioxins/Furans**								
	2,3,7,8-TCDD	MG/KG	0.0004	NC	0.00051753	0.00044749	MG/KG	Mean	(2)
	2,3,7,8-TCDF	MG/KG	0.0000061	NC	0.00000708 #	0.00000611	MG/KG	Mean	(2)
	Toxicity Equivalency - Birds	MG/KG	0.0005	NC	0.000525008	0.00045386	MG/KG	Mean	(2)

Table 120
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Tree Swallow - Nestling

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Tree Swallow
Exposure Medium: Nestling

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale

(1) Chemicals of potential concern are identified in Table 13.
(2) Mean: Arithmetic Mean

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:

J = Value is estimated.
# = Value is result from second column confirmation analysis.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

Table 121
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Tree Swallow - Nestling

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Tree Swallow
Exposure Medium: Nestling

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
GREYSTONE	**Pesticides/PCBs**								
(Background Area)	4,4'-DDD	MG/KG	0.0061	NC	0.01973	0.01973	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.016	NC	0.02458 J	0.02458	MG/KG	Max	(5)
	4,4'-DDT	MG/KG	0.0021	NC	0.004 J	0.004	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.012	NC	0.02304	0.02304	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	0.19	NC	0.28397 J	0.28397	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.15	NC	0.23586 J	0.23586	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.037	NC	0.04811 J	0.04811	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.0051	NC	0.00741 J	0.00741	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.0012	NC	0.00101 J	0.00101	MG/KG	Max	(5)
	Heptachlor Epoxide	MG/KG	0.0078	NC	0.01587	0.01587	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.34	NC	0.7555	0.7555	MG/KG	Max	(5)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.000008	0.000008 NP	0.00002311 J	0.000008	MG/KG	95% UCL-NP	(4)
	2,3,7,8-TCDF	MG/KG	0.00000452	0.00000452 NP	0.00000843 #	0.00000452	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency - Birds	MG/KG	0.000016	0.000016 NP	0.0000311	0.000016	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.000028	NC	0.0000317	0.0000317	MG/KG	Max	(5)
ALLENDALE	**Pesticides/PCBs**								
	4,4'-DDD	MG/KG	0.019	NC	0.06395	0.06395	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.029	NC	0.06395	0.06395	MG/KG	Max	(5)
	4,4'-DDT	MG/KG	0.0036	NC	0.00607	0.00607	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.020	NC	0.0706	0.0706	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	0.57	NC	1.02141	1.02141	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.54	NC	0.98496	0.98496	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.030	NC	0.03645	0.03645	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.0098	NC	0.01642	0.01642	MG/KG	Max	(5)
	Endosulfan Sulfate	MG/KG	0.0034	NC	0.01312	0.01312	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.0054	NC	0.0186	0.0186	MG/KG	Max	(5)
	Heptachlor Epoxide	MG/KG	0.018	NC	0.04218	0.04218	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.52	NC	0.83588 J	0.83588	MG/KG	Max	(5)

Table 121
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Tree Swallow - Nestling

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Tree Swallow
Exposure Medium: Nestling

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
ALLENDALE (continued)	**Dioxins/Furans**								
	2,3,7,8-TCDD	MG/KG	0.0007581	0.0007581 NP	0.00170268 J	0.0007581	MG/KG	95% UCL-NP	(4)
	2,3,7,8-TCDF	MG/KG	0.00000566	0.00000692 N	0.00000928 J	0.00000692	MG/KG	95% UCL-N	(2)
	Toxicity Equivalency - Birds	MG/KG	0.00077	0.00077 NP	0.00172	0.00077	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency (PCB) - Birds	MG/KG	0.00012	NC	0.000268	0.000268	MG/KG	Max	(5)
LYMAN MILL	**Pesticides/PCBs**								
	4,4'-DDD	MG/KG	0.012	NC	0.04458	0.04458	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.033	NC	0.06728 J	0.06728	MG/KG	Max	(5)
	4,4'-DDT	MG/KG	0.0014	NC	0.00403	0.00403	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.0044	NC	0.00982	0.00982	MG/KG	Max	(5)
	Aroclor, Total	MG/KG	0.72	NC	0.91428	0.91428	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.68	NC	0.87067	0.87067	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.046	NC	0.06412 J	0.06412	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.0077	NC	0.01396 J	0.01396	MG/KG	Max	(5)
	Endosulfan Sulfate	MG/KG	0.0031	NC	0.01022	0.01022	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.0020	NC	0.00329	0.00329	MG/KG	Max	(5)
	Heptachlor Epoxide	MG/KG	0.0047	NC	0.00797 J	0.00797	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.24	NC	0.31412 J	0.31412	MG/KG	Max	(5)
	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.0011	NC	0.00160987 J	0.00160987	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.0000077	NC	0.00000921 J	0.00000921	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.0011	NC	0.00163	0.00163	MG/KG	Max	(5)
MANTON	**Dioxins/Furans**								
	2,3,7,8-TCDD	MG/KG	0.0004	NC	0.00051753	0.00051753	MG/KG	Max	(5)
	2,3,7,8-TCDF	MG/KG	0.0000061	NC	0.00000708 #	0.00000708	MG/KG	Max	(5)
	Toxicity Equivalency - Birds	MG/KG	0.0005	NC	0.000525008	0.000525008	MG/KG	Max	(5)

Table 121
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Tree Swallow - Nestling

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future Land Use
Medium: Tree Swallow
Exposure Medium: Nestling

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale

(1) Chemicals of potential concern are identified in Table 13.
(4) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(5) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:

J = Value is estimated.
# = Value is result from second column confirmation analysis.

mg/Kg = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

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TABLE 122
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED INSECTIVOROUS MAMMAL TISSUE - ASSAPUMPSET EMERGING INSECTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, RI

Chemical	Sediment Central Tendency [a]	Units	Insect BSAF [b] (oc/lipid)	Mammal BMF [c] (lipid basis)	TEF	Estimated [d] Tissue Concentration	CBR [e] NOAEL	CBR [e] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Pesticides/PCBs										
Aroclor, Total	0.06	MG/KG		14	na	nc				
								Total Pesticides/PCBs		
Dioxins						**TEQ**				
2,3,4,7,8-PeCDF	6.6E-07	MG/KG	1.4	54	0.5	3.5E-05				
2,3,7,8-TCDD	1.9E-06	MG/KG	0.30	11	1	8.5E-06				
1,2,3,6,7,8-HxCDD	1.6E-06	MG/KG	0.19	30	0.1	1.3E-06				
1,2,3,4,6,7,8-HpCDD	2.7E-05	MG/KG	0.085	36	0.01	1.1E-06				
1,2,3,4,7,8-HxCDD	4.9E-07	MG/KG	1.1	9.3	0.1	7.0E-07				
2,3,7,8-TCDF	1.5E-06	MG/KG	0.12	0.4	0.1	1.0E-08				
Total						4.7E-05	1.5E-04	2.3E-04	3.1E-01	2.0E-01
								TEQ (D/F)	3.1E-01	2.0E-01
PCBs						**TEQ**				
TEQ - Mammals (PCBs)						0.0E+00	1.5E-04	2.3E-04	0.0E+00	0.0E+00
								TEQ (PCBs)	0.0E+00	0.0E+00
								Total TCDD TEQ	3.1E-01	2.0E-01
								Total	3.1E-01	2.0E-01

Notes:
[a] CT EPCs for sediment (Table 27) derived from the Site database; only analytes with BMFs presented.
[b] Biota-Sediment Accumulation Factors (BSAFs - expressed in units of g (organic carbon % sediment)/g (lipid % insect) presented in Table J-6.
[c] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % otter whole body) presented in Table J-13.
[d] Whole body concentration for mammalian insectivore receptor (mg/kg wet weight) estimated by multiplying the invertebrate tissue concentration by the BMF and the ratio of the mammal to invertebrate percent lipid. The following lipid contents were assumed:
3.2 Average organic carbon percent in Assapumset Pond sediment.
4.42 Average lipid percentage in 5 otter liver samples (Leonards et al., 1997).
[e] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[f] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 123

CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED INSECTIVOROUS MAMMAL TISSUE - GREYSTONE EMERGING INSECTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, RI

Chemical	Sediment Central Tendency [a]	Units	Insect BSAF [b] (oc/lipid)	Mammal BMF [c] (lipid basis)	TEF	Estimated [d] Tissue Concentration	CBR [e] NOAEL	CBR [e] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Pesticides/PCBs										
Aroclor, Total	0.21	MG/KG		14	na	nc				
								Total Pesticides/PCBs		
Dioxins						**TEQ**				
2,3,4,7,8-PeCDF	8.8E-06	MG/KG	1.4	54	0.5	2.0E-04				
2,3,7,8-TCDD	1.5E-05	MG/KG	0.30	11	1	2.9E-05				
1,2,3,4,6,7,8-HpCDD	3.3E-04	MG/KG	0.085	36	0.01	6.1E-06				
1,2,3,6,7,8-HxCDD	1.7E-05	MG/KG	0.19	30	0.1	5.8E-06				
1,2,3,4,7,8-HxCDD	4.9E-06	MG/KG	1.1	9.3	0.1	3.1E-06				
2,3,7,8-TCDF	1.3E-05	MG/KG	0.12	0.4	0.1	3.8E-08				
Total						2.5E-04	1.5E-04	2.3E-04	**1.6E+00**	**1.1E+00**
								TEQ (D/F)	**1.6E+00**	**1.1E+00**
PCBs						**TEQ**				
3,3',4,4',5-Pentachlorobiphenyl (126)	2.2E-04	MG/KG	0.29	70	0.1	2.7E-04				
2,3,3',4,4',5-Hexachlorobiphenyl (156)	1.9E-03	MG/KG	0.83	30	0.0005	1.4E-05				
2,3',4,4',5-Pentachlorobiphenyl (118)	1.3E-02	MG/KG	0.25	15	0.0001	3.0E-06				
2,3,3',4,4'-Pentachlorobiphenyl (105)	4.2E-03	MG/KG	0.31	12	0.0001	9.3E-07				
2,3,4,4',5-Pentachlorobiphenyl (114)	1.9E-04	MG/KG	0.41	24	0.0005	5.7E-07				
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	7.3E-05	MG/KG	1.0	50	0.0001	2.3E-07				
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	7.8E-04	MG/KG	0.28	6	0.00001	7.8E-09				
3,3',4,4'-Tetrachlorobiphenyl (77)	1.5E-04	MG/KG	0.38	1.4	0.0001	4.9E-09				
2,2',3,5'-Tetrachlorobiphenyl (44)	2.4E-03	MG/KG	0.084	0.01						
2,2',4,5'-Tetrachlorobiphenyl (49)	1.3E-03	MG/KG	0.14	0.02						
2,4',5-Trichlorobiphenyl (31)	1.1E-03	MG/KG	0.090	0.05						
2,3,3',4,4',6-Hexachlorobiphenyl (158)	1.7E-03	MG/KG	1.0	4						
2,2',3,3',4,4'-Hexachlorobiphenyl (128)	4.4E-03	MG/KG	0.32	9						
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	3.2E-03	MG/KG	0.38	15						
2,2',4,4',5,5'-Hexachlorobiphenyl (153)	5.2E-03	MG/KG	1.2	15						
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	3.7E-04	MG/KG	0.88	21						
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	1.1E-03	MG/KG	1.0	23						
2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	2.1E-03	MG/KG	0.70	120						
Total						2.9E-04	1.5E-04	2.3E-04	**1.9E+00**	**1.2E+00**
									TEQ (PCBs)	**1.9E+00**	**1.2E+00**
									Total TCDD TEQ	**3.6E+00**	**2.3E+00**

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TABLE 123
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED INSECTIVOROUS MAMMAL TISSUE - GREYSTONE EMERGING INSECTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, RI

Chemical	Sediment Central Tendency [a]	Units	Insect BSAF [b] (oc/lipid)	Mammal BMF [c] (lipid basis)	TEF	Estimated [d] Tissue Concentration	CBR [e]		Hazard Quotients [e]	
							NOAEL	LOAEL	NOAEL	LOAEL
						Total			3.6E+00	2.3E+00

Notes:
[a] CT EPCs for sediment (Table 27) derived from the Site database; only analytes with BMFs presented.
[b] Biota-Sediment Accumulation Factors (BSAFs - expressed in units of g (organic carbon % sediment)/g (lipid % insect) presented in Table J-6.
[c] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % otter whole body) presented in Table J-13.
[d] Whole body concentration for mammalian insectivore receptor (mg/kg wet weight) estimated by multiplying the invertebrate tissue concentration by the BMF and the ratio of the mammal to invertebrate percent lipid. The following lipid contents were assumed:
7.36 Average organic carbon percent in Greystone Mill Pond sediment.
4.42 Average lipid percentage in 5 otter liver samples (Leonards et al., 1997).
[e] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[f] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 124
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED INSECTIVOROUS MAMMAL TISSUE - ALLENDALE EMERGING INSECTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, RI

Chemical	Sediment Central Tendency [a]	Units	Insect BSAF [b] (oc/lipid)	Mammal BMF [c] (lipid basis)	TEF	Estimated [d] Tissue Concentration	CBR [e] NOAEL	CBR [e] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Pesticides/PCBs										
Aroclor, Total	1.53	MG/KG		14	na	nc				
								Total Pesticides/PCBs		
Dioxins						**TEQ**				
2,3,7,8-TCDD	5.8E-03	MG/KG	0.30	11	1	1.3E-02				
2,3,4,7,8-PeCDF	1.8E-05	MG/KG	1.4	54	0.5	4.6E-04				
1,2,3,6,7,8-HxCDD	4.3E-05	MG/KG	0.19	30	0.1	1.7E-05				
1,2,3,4,6,7,8-HpCDD	7.8E-04	MG/KG	0.085	36	0.01	1.6E-05				
1,2,3,4,7,8-HxCDD	1.5E-05	MG/KG	1.1	9.3	0.1	1.1E-05				
2,3,7,8-TCDF	3.0E-05	MG/KG	0.12	0.4	0.1	1.0E-07				
Total						1.3E-02	1.5E-04	2.3E-04	**8.9E+01**	**5.8E+01**
								TEQ (D/F)	**8.9E+01**	**5.8E+01**
PCBs						**TEQ**				
3,3',4,4'-Tetrachlorobiphenyl (77)	1.1E-03	MG/KG	0.38	1.4	0.0001	4.0E-08				
TEQ - Mammals (PCBs)						4.0E-08	1.5E-04	2.3E-04	2.7E-04	1.8E-04
								TEQ (PCBs)	2.7E-04	1.8E-04
								Total TCDD TEQ	**8.9E+01**	**5.8E+01**
								Total	**8.9E+01**	**5.8E+01**

Notes:
[a] CT EPCs for sediment (Table 27) derived from the Site database; only analytes with BMFs presented.
[b] Biota-Sediment Accumulation Factors (BSAFs - expressed in units of g (organic carbon % sediment)/g (lipid % insect) presented in Table J-6.
[c] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % otter whole body) presented in Table J-13.
[d] Whole body concentration for mammalian insectivore receptor (mg/kg wet weight) estimated by multiplying the invertebrate tissue concentration by the BMF and the ratio of the mammal to invertebrate percent lipid. The following lipid contents were assumed:
6.53 Average organic carbon percent in Allendale Mill Pond sediment.
4.42 Average lipid percentage in 5 otter liver samples (Leonards et al., 1997).
[e] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[f] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 125
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED INSECTIVOROUS MAMMAL TISSUE - LYMAN MILL EMERGING INSECT

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, RI

Chemical	Sediment Central Tendency [a]	Units	Insect BSAF [b] (oc/lipid)	Mammal BMF [c] (lipid basis)	TEF	Estimated [d] Tissue Concentration	CBR [e] NOAEL	CBR [e] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Pesticides/PCBs										
Aroclor, Total	0.263	MG/KG		14	na					
								Total Pesticides/PCBs		
Dioxins						**TEQ**				
2,3,7,8-TCDD	1.8E-03	MG/KG	0.30	11	1	3.6E-03				
2,3,4,7,8-PeCDF	7.1E-06	MG/KG	1.4	54	0.5	1.7E-04				
1,2,3,4,6,7,8-HpCDD	4.2E-04	MG/KG	0.085	36	0.01	8.0E-06				
1,2,3,6,7,8-HxCDD	2.1E-05	MG/KG	0.19	30	0.1	7.4E-06				
1,2,3,4,7,8-HxCDD	6.7E-06	MG/KG	1.1	9.3	0.1	4.4E-06				
2,3,7,8-TCDF	1.7E-05	MG/KG	0.12	0.4	0.1	5.1E-08				
TEQ - Mammals (D/F)						3.8E-03	1.5E-04	2.3E-04	**2.5E+01**	**1.7E+01**
								TEQ (D/F)	**2.5E+01**	**1.7E+01**
PCBs						**TEQ**				
3,3',4,4',5-Pentachlorobiphenyl (126)	3.7E-04	MG/KG	0.29	70	0.1	4.7E-04				
2,3,3',4,4',5-Hexachlorobiphenyl (156)	6.9E-03	MG/KG	0.83	30	0.0005	5.4E-05				
2,3',4,4',5-Pentachlorobiphenyl (118)	6.6E-02	MG/KG	0.25	15	0.0001	1.5E-05				
2,3,3',4,4'-Pentachlorobiphenyl (105)	1.6E-02	MG/KG	0.31	12	0.0001	3.7E-06				
2,3,4,4',5-Pentachlorobiphenyl (114)	1.1E-03	MG/KG	0.41	24	0.0005	3.5E-06				
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	3.1E-04	MG/KG	1.0	50	0.0001	9.8E-07				
3,3',4,4'-Tetrachlorobiphenyl (77)	2.4E-03	MG/KG	0.38	1.4	0.0001	7.8E-08				
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	2.7E-03	MG/KG	0.28	6	0.00001	2.8E-08				
2,2',3,5'-Tetrachlorobiphenyl (44)	2.6E-02	MG/KG	0.084	0.01						
2,2',4,5'-Tetrachlorobiphenyl (49)	1.5E-02	MG/KG	0.14	0.02						
2,4',5-Trichlorobiphenyl (31)	1.2E-02	MG/KG	0.090	0.05						
2,3,3',4,4',6-Hexachlorobiphenyl (158)	1.5E-03	MG/KG	1.0	4						
2,2',3,3',4,4'-Hexachlorobiphenyl (128)	1.7E-02	MG/KG	0.32	9						
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	1.4E-02	MG/KG	0.38	15						
2,2',4,4',5,5'-Hexachlorobiphenyl (153)	2.6E-02	MG/KG	1.2	15						
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	2.9E-03	MG/KG	0.88	21						
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	6.8E-03	MG/KG	1.0	23						
2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	1.0E-02	MG/KG	0.70	120						
TEQ - Mammals (PCBs)						5.5E-04	1.5E-04	2.3E-04	**3.7E+00**	**2.4E+00**
								TEQ (PCBs)	**3.7E+00**	**2.4E+00**

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TABLE 125
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED INSECTIVOROUS MAMMAL TISSUE - LYMAN MILL EMERGING INSECT

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, RI

Chemical	Sediment Central Tendency [a]	Units	Insect BSAF [b] (oc/lipid)	Mammal BMF [c] (lipid basis)	TEF	Estimated [d] Tissue Concentration	CBR [e]		Hazard Quotients [e]	
							NOAEL	LOAEL	NOAEL	LOAEL
								Total TCDD TEQ	2.9E+01	1.9E+01
								Total	2.9E+01	1.9E+01

Notes:
[a] CT EPCs for sediment (Table 27) derived from the Site database; only analytes with BMFs presented.
[b] Biota-Sediment Accumulation Factors (BSAFs - expressed in units of g (organic carbon % sediment)/g (lipid % insect) presented in Table J-6.
[c] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % otter whole body) presented in Table J-13.
[d] Whole body concentration for mammalian insectivore receptor (mg/kg wet weight) estimated by multiplying the invertebrate tissue concentration by the BMF and the ratio of the mammal to invertebrate percent lipid. The following lipid contents were assumed:
7.1 Average organic carbon percent in Lyman Mill Pond sediment.
4.42 Average lipid percentage in 5 otter liver samples (Leonards et al., 1997).
[e] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[f] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 126

CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED INSECTIVOROUS MAMMAL TISSUE - MANTON EMERGING INSECTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Sediment Central Tendency [a]	Units	Insect BSAF [b] (oc/lipid)	Mammal BMF [c] (lipid basis)	TEF	Estimated [d] Tissue Concentration	CBR [e] NOAEL	CBR [e] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Dioxins						**TEQ**				
2,3,7,8-TCDD	4.3E-04	MG/KG	0.30	11	1	2.3E-03				
2,3,4,7,8-PeCDF	1.0E-06	MG/KG	1.4	54	0.5	6.5E-05				
1,2,3,4,6,7,8-HpCDD	2.2E-04	MG/KG	0.085	36	0.01	1.1E-05				
1,2,3,6,7,8-HxCDD	4.3E-06	MG/KG	0.19	30	0.1	4.0E-06				
1,2,3,4,7,8-HxCDD	3.9E-07	MG/KG	1.1	9.3	0.1	6.6E-07				
2,3,7,8-TCDF	4.5E-06	MG/KG	0.12	0.4	0.1	3.6E-08				
OCDF	4.5E-04	MG/KG	0.0058		0.0001					
OCDD	4.2E-03	MG/KG	0.031		0.0001					
1,2,3,4,6,7,8-HpCDF	8.2E-05	MG/KG	0.037		0.01					
1,2,3,7,8,9-HxCDD	2.3E-06	MG/KG	0.34		0.1					
HCX	1.2E-04	MG/KG	0.65		0.0002					
1,2,3,6,7,8-HxCDF	1.5E-06	MG/KG	0.64		0.1					
1,2,3,7,8-PeCDF	4.2E-07	MG/KG	1.9		0.05					
1,2,3,7,8,9-HxCDF	2.0E-07	MG/KG	5.4		0.1					
Total						2.4E-03	1.5E-04	2.3E-04	**1.6E+01**	**1.0E+01**
								TEQ (D/F)	**1.6E+01**	**1.0E+01**
PCBs						**TEQ**				
TEQ - Mammals (PCBs)						0.0E+00	1.5E-04	2.3E-04	0.0E+00	0.0E+00
								TEQ (PCBs)	0.0E+00	0.0E+00
								Total TCDD TEQ	**1.6E+01**	**1.0E+01**
								Total	**1.6E+01**	**1.0E+01**

Notes:
[a] CT EPCs for sediment (Table 27) derived from the Site database; only analytes with BMFs presented.
[b] Biota-Sediment Accumulation Factors (BSAFs - expressed in units of g (organic carbon % sediment)/g (lipid % insect) presented in Table J-6.
[c] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % otter whole body) presented in Table J-13.
[d] Whole body concentration for mammalian insectivore receptor (mg/kg wet weight) estimated by multiplying the invertebrate tissue concentration by the BMF and the ratio of the mammal to invertebrate percent lipid. The following lipid contents were assumed:
2.7 Average organic carbon percent in Manton Mill Pond sediment.
4.42 Average lipid percentage in 5 otter liver samples (Leonards et al., 1997).
[e] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[f] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 127
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED INSECTIVOROUS MAMMAL TISSUE - DYERVILLE EMERGING INSECTS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, RI

Chemical	Sediment Central Tendency [a]	Units	Insect BSAF [b] (oc/lipid)	Mammal BMF [c] (lipid basis)	TEF	Estimated [d] Tissue Concentration	CBR [e] NOAEL	CBR [e] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Pesticides/PCBs										
Aroclor, Total	1.42	MG/KG		14	na	nc				
								Total Pesticides/PCBs		
Dioxins						**TEQ**				
2,3,4,7,8-PeCDF	9.2E-06	MG/KG	1.4	54	0.5	6.9E-04				
2,3,7,8-TCDD	9.1E-05	MG/KG	0.30	11	1	5.9E-04				
1,2,3,6,7,8-HxCDD	1.5E-05	MG/KG	0.19	30	0.1	1.7E-05				
1,2,3,4,6,7,8-HpCDD	2.0E-04	MG/KG	0.085	36	0.01	1.2E-05				
1,2,3,4,7,8-HxCDD	1.8E-06	MG/KG	1.1	9.3	0.1	3.7E-06				
2,3,7,8-TCDF	2.2E-05	MG/KG	0.12	0.4	0.1	2.1E-07				
Total						1.3E-03	1.5E-04	2.3E-04	**8.7E+00**	**5.7E+00**
								TEQ (D/F)	**8.7E+00**	**5.7E+00**
PCBs						**TEQ**				
3,3',4,4'-Tetrachlorobiphenyl (77)	2.5E-04	MG/KG	0.38	1.4	0.0001	2.6E-08				
TEQ - Mammals (PCBs)						2.6E-08	1.5E-04	2.3E-04	1.8E-04	1.1E-04
								TEQ (PCBs)	1.8E-04	1.1E-04
								Total TCDD TEQ	**8.7E+00**	**5.7E+00**
								Total	**8.7E+00**	**5.7E+00**

Notes:
[a] CT EPCs for sediment (Table 27) derived from the Site database; only analytes with BMFs presented.
[b] Biota-Sediment Accumulation Factors (BSAFs - expressed in units of g (organic carbon % sediment)/g (lipid % insect) presented in Table J-6.
[c] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % otter whole body) presented in Table J-13.
[d] Whole body concentration for mammalian insectivore receptor (mg/kg wet weight) estimated by multiplying the invertebrate tissue concentration by the BMF and the ratio of the mammal to invertebrate percent lipid. The following lipid contents were assumed:
2.26 Average organic carbon percent in Dyerville Reach sediment.
4.42 Average lipid percentage in 5 otter liver samples (Leonards et al., 1997).
[e] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[f] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 128

CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED VERMIVOROUS BIRD EGG TISSUE - GREYSTONE EARTHWORMS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Earthworm Central Tendency [a]	Units	Avian BMF [b] (lipid basis)	TEF	Estimated [c] Egg Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Pesticides/PCBs									
Aroclor, Total	0.0502925	MG/KG	11.89	na	1.3E+00				
4,4'-DDE	0.0017125	MG/KG	13.32	na	4.9E-02		0.1		4.9E-01
Heptachlor Epoxide	0.00031	MG/KG	10.67	na	7.1E-03				
Dieldrin	0.0008075	MG/KG	2.82	na	4.9E-03		0.059		8.3E-02
4,4'-DDT	0.00096125	MG/KG	0.69	na	1.4E-03				
							Total Pesticides/PCBs	0.0E+00	5.7E-01
Dioxins					**TEQ**				
2,3,7,8-TCDD	3.6E-07	MG/KG	6.99	1	5.4E-06				
1,2,3,7,8-PeCDD	4.5E-07	MG/KG	3.35	1	3.2E-06				
2,3,4,7,8-PeCDF	5.9E-07	MG/KG	1.57	1	2.0E-06				
1,2,3,6,7,8-HxCDD	2.0E-06	MG/KG	5.98	0.01	2.5E-07				
Total					1.1E-05	7.0E-05	1.2E-03	1.6E-01	9.1E-03
							TEQ (D/F)	1.6E-01	9.1E-03
PCBs					**TEQ**				
3,3',4,4'-Tetrachlorobiphenyl (77)	3.9E-05	MG/KG	5.29	0.05	2.2E-05				
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	5.3E-05	MG/KG	13.60	0.001	1.5E-06				
2,3,3',4,4',5-Hexachlorobiphenyl (156)	3.7E-04	MG/KG	13.60	0.0001	1.1E-06				
2,3,3',4,4'-Pentachlorobiphenyl (105)	7.6E-04	MG/KG	6.10	0.0001	9.9E-07				
2,3',4,4',5-Pentachlorobiphenyl (118)	2.3E-03	MG/KG	11.22	0.00001	5.5E-07				
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	1.7E-04	MG/KG	13.60	0.00001	4.8E-08				
2,3,4,4',5-Pentachlorobiphenyl (114)	1.8E-05	MG/KG	7.82	0.0001	2.9E-08				
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	2.4E-05	MG/KG	14.97	0.00001	7.6E-09				
2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	7.6E-04	MG/KG	2.17						
2,3,3',4',6-Pentachlorobiphenyl (110)	4.5E-03	MG/KG	2.45						
2,2',3,4,5,5'-Hexachlorobiphenyl (141)	5.3E-04	MG/KG	2.88						
2,3,3',4'-Tetrachlorobiphenyl (56)	1.7E-04	MG/KG	3.00						
2,3,4,4'-Tetrachlorobiphenyl (60)	5.7E-05	MG/KG	3.00						
2,3',4,4'-Tetrachlorobiphenyl (66)	6.4E-04	MG/KG	5.91						
2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	4.1E-05	MG/KG	9.04						
2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	2.9E-04	MG/KG	10.65						
2,2',3,3',4,4'-Hexachlorobiphenyl (128)	7.6E-04	MG/KG	11.71						
2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	2.3E-04	MG/KG	12.43						
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	1.1E-04	MG/KG	14.18						

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TABLE 128
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED VERMIVOROUS BIRD EGG TISSUE - GREYSTONE EARTHWORMS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Earthworm Central Tendency [a]	Units	Avian BMF [b] (lipid basis)	TEF	Estimated [c] Egg Tissue Concentration	CBR [d]		Hazard Quotients [e]	
						NOAEL	LOAEL	NOAEL	LOAEL
2,2',3,4',5,5'-Hexachlorobiphenyl (146)	1.0E-03	MG/KG	15.22						
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	4.0E-04	MG/KG	15.37						
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	3.4E-03	MG/KG	16.52						
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	1.6E-04	MG/KG	17.45						
2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	5.5E-04	MG/KG	17.45						
2,2',3,3',4,4',6-Heptachlorobiphenyl (171)	1.2E-04	MG/KG	17.82						
2,2',3,3',4,6'-Hexachlorobiphenyl (132)	1.3E-03	MG/KG	18.23						
2,2',4,4',5,5'-Hexachlorobiphenyl (153)	2.5E-03	MG/KG	18.23						
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	2.0E-04	MG/KG	19.74						
2,2',3,4,4',5-Hexachlorobiphenyl (137)	6.8E-04	MG/KG	20.85						
2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	9.3E-04	MG/KG	21.07						
2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	1.3E-04	MG/KG	22.13						
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	6.2E-05	MG/KG	22.13						
Total					2.6E-05	7.0E-05	1.2E-03	3.8E-01	2.2E-02
							TEQ (PCBs)	3.8E-01	2.2E-02
							Total TCDD TEQ	5.3E-01	3.1E-02
							Total	5.3E-01	6.0E-01

Notes:
[a] CT EPCs for earthworm tissue (Table 69 derived from the Site database; only analytes with BMFs presented.
[b] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % gull egg) presented in Table J-12.
[c] Egg concentration for avian insectivore receptor (mg/kg wet weight) estimated by multiplying the earthworm tissue concentration by the BMF and the ratio of the egg to earthworm percent lipid. The following lipid contents were assumed:

3.6 Average earthworm lipid percent in Greystone Mill Pond.
7.7 Average gull egg lipid percentage (Braune and Norstrom, 1989)

[d] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[e] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 129
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED VERMIVOROUS BIRD EGG TISSUE - ALLENDALE EARTHWORMS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Earthworm Central Tendency [a]	Units	Avian BMF [b] (lipid basis)	TEF	Estimated [c] Egg Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Pesticides/PCBs									
Dieldrin	0.0028575	MG/KG	2.82	na	2.2E-02		0.059		3.7E-01
Heptachlor Epoxide	0.0005475	MG/KG	10.67	na	1.6E-02				
Aroclor, Total	0.0884875	MG/KG	11.89	na	2.9E+00				
							Total Pesticides/PCBs	0.0E+00	3.7E-01
Dioxins					**TEQ**				
2,3,7,8-TCDD	1.6E-04	MG/KG	6.99	1	3.1E-03				
1,2,3,7,8-PeCDD	6.5E-07	MG/KG	3.35	1	5.9E-06				
2,3,4,7,8-PeCDF	3.4E-07	MG/KG	1.57	1	1.5E-06				
1,2,3,6,7,8-HxCDD	3.5E-06	MG/KG	5.98	0.01	5.7E-07				
Total					3.1E-03	7.0E-05	1.2E-03	**4.5E+01**	**2.6E+00**
							TEQ (D/F)	**4.5E+01**	**2.6E+00**
PCBs					**TEQ**				
TEQ - Birds (PCBs)					0.0E+00	7.0E-05	1.2E-03	0.0E+00	0.0E+00
							TEQ (PCBs)	0.0E+00	0.0E+00
							Total TCDD TEQ	**4.5E+01**	**2.6E+00**
							Total	**4.5E+01**	**3.0E+00**

Notes:
[a] CT EPCs for earthworm tissue (Table 69 derived from the Site database; only analytes with BMFs presented.
[b] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % gull egg) presented in Table J-12.
[c] Egg concentration for avian insectivore receptor (mg/kg wet weight) estimated by multiplying the earthworm tissue concentration by the BMF and the ratio of the egg to earthworm percent lipid. The following lipid contents were assumed:

2.83 Average earthworm lipid percent in Allendale Mill Pond.
7.7 Average gull egg lipid percentage (Braune and Norstrom, 1989)

[d] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[e] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 130
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED VERMIVOROUS BIRD EGG TISSUE - LYMAN MILL EARTHWORMS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Earthworm Central Tendency [a]	Units	Avian BMF [b] (lipid basis)	TEF	Estimated [c] Egg Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Pesticides/PCBs									
4,4'-DDT	0.002796667	MG/KG	0.69	na	5.6E-03				
Dieldrin	0.00082	MG/KG	2.82	na	6.7E-03		0.059		1.1E-01
Heptachlor Epoxide	0.000536667	MG/KG	10.67	na	1.7E-02				
Aroclor, Total	0.041973333	MG/KG	11.89	na	1.4E+00				
4,4'-DDE	0.00322	MG/KG	13.32	na	1.2E-01		0.1		**1.2E+00**
							Total Pesticides/PCBs	0.0E+00	**1.4E+00**
Dioxins					**TEQ**				
2,3,7,8-TCDD	2.9E-05	MG/KG	6.99	1	5.9E-04				
1,2,3,7,8-PeCDD	1.3E-06	MG/KG	3.35	1	1.3E-05				
2,3,4,7,8-PeCDF	2.8E-07	MG/KG	1.57	1	1.3E-06				
1,2,3,6,7,8-HxCDD	3.4E-06	MG/KG	5.98	0.01	5.8E-07				
Total					6.0E-04	7.0E-05	1.2E-03	**8.6E+00**	5.0E-01
							TEQ (D/F)	**8.6E+00**	5.0E-01
PCBs					**TEQ**				
3,3',4,4'-Tetrachlorobiphenyl (77)	7.8E-05	MG/KG	5.29	0.05	6.0E-05				
3,3',4,4',5-Pentachlorobiphenyl (126)	1.2E-05	MG/KG	7.82	0.1	2.7E-05				
2,3,3',4,4',5-Hexachlorobiphenyl (156)	5.9E-04	MG/KG	13.60	0.0001	2.3E-06				
2,3,3',4,4'-Pentachlorobiphenyl (105)	1.1E-03	MG/KG	6.10	0.0001	2.0E-06				
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	4.3E-05	MG/KG	13.60	0.001	1.7E-06				
2,3',4,4',5-Pentachlorobiphenyl (118)	3.7E-03	MG/KG	11.22	0.00001	1.2E-06				
2,3,4,4',5-Pentachlorobiphenyl (114)	5.1E-05	MG/KG	7.82	0.0001	1.2E-07				
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	2.4E-04	MG/KG	13.60	0.00001	9.4E-08				
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	2.8E-05	MG/KG	14.97	0.00001	1.2E-08				
2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	1.1E-03	MG/KG	2.17						
2,3,3',4',6-Pentachlorobiphenyl (110)	6.5E-03	MG/KG	2.45						
2,2',3,4,5,5'-Hexachlorobiphenyl (141)	8.4E-04	MG/KG	2.88						
2,3,3',4'-Tetrachlorobiphenyl (56)	3.0E-04	MG/KG	3.00						
2,3,4,4'-Tetrachlorobiphenyl (60)	9.9E-05	MG/KG	3.00						
2,3',4,4'-Tetrachlorobiphenyl (66)	1.0E-03	MG/KG	5.91						
2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	7.2E-05	MG/KG	9.04						
2,2',3,3',4,5',6'-Heptachlorobiphenyl (177)	4.4E-04	MG/KG	10.65						
2,2',3,3',4,4'-Hexachlorobiphenyl (128)	1.1E-03	MG/KG	11.71						
2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	2.1E-04	MG/KG	12.43						

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TABLE 130
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED VERMIVOROUS BIRD EGG TISSUE - LYMAN MILL EARTHWORMS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Earthworm Central Tendency [a]	Units	Avian BMF [b] (lipid basis)	TEF	Estimated [c] Egg Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	8.7E-05	MG/KG	14.18						
2,2',3,4',5,5'-Hexachlorobiphenyl (146)	1.5E-03	MG/KG	15.22						
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	5.9E-04	MG/KG	15.37						
2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	6.4E-06	MG/KG	16.52						
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	4.8E-03	MG/KG	16.52						
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	1.3E-04	MG/KG	17.45						
2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	4.3E-04	MG/KG	17.45						
2,2',3,3',4,4',6-Heptachlorobiphenyl (171)	2.0E-04	MG/KG	17.82						
2,2',3,3',4,6'-Hexachlorobiphenyl (132)	1.8E-03	MG/KG	18.23						
2,2',4,4',5,5'-Hexachlorobiphenyl (153)	4.7E-03	MG/KG	18.23						
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	1.8E-04	MG/KG	19.74						
2,2',3,4,4',5-Hexachlorobiphenyl (137)	9.8E-04	MG/KG	20.85						
2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	1.3E-03	MG/KG	21.07						
2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	1.6E-04	MG/KG	22.13						
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	5.2E-05	MG/KG	22.13						
Total					9.5E-05	7.0E-05	1.2E-03	**1.4E+00**	7.9E-02
							TEQ (PCBs)	**1.4E+00**	7.9E-02
							Total TCDD TEQ	**1.0E+01**	5.8E-01
							Total	**1.0E+01**	**1.9E+00**

Notes:
[a] CT EPCs for earthworm tissue (Table 69 derived from the Site database; only analytes with BMFs presented.
[b] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % gull egg) presented in Table J-12.
[c] Egg concentration for avian insectivore receptor (mg/kg wet weight) estimated by multiplying the earthworm tissue concentration by the BMF and the ratio of the egg to earthworm percent lipid. The following lipid contents were assumed:
2.66 Average earthworm lipid percent in Lyman Mill Pond.
7.7 Average gull egg lipid percentage (Braune and Norstrom, 1989)
[d] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[e] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 131
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED VERMIVOROUS MAMMAL TISSUE - GREYSTONE EARTHWORMS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Earthworm Central Tendency [a]	Units	Mammal BMF [b] (lipid basis)	TEF	Estimated [c] Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Pesticides/PCBs									
Aroclor, Total	0.0502925	MG/KG	14	na	8.6E-01				
							Total Pesticides/PCBs		
Dioxins					**TEQ**				
2,3,7,8-TCDF	7.1E-07	MG/KG	0.4	0.1	3.5E-08				
1,2,3,4,7,8-HxCDD	5.8E-07	MG/KG	9.3	0.1	6.6E-07				
2,3,7,8-TCDD	3.6E-07	MG/KG	11	1	4.9E-06				
1,2,3,6,7,8-HxCDD	2.0E-06	MG/KG	30	0.1	7.3E-06				
1,2,3,4,6,7,8-HpCDD	3.6E-05	MG/KG	36	0.01	1.6E-05				
2,3,4,7,8-PeCDF	5.9E-07	MG/KG	54	0.5	2.0E-05				
1,2,3,4,7,8-HxCDF	1.7E-06	MG/KG	57	0.1	1.2E-05				
Total					6.0E-05	1.5E-04	2.3E-04	4.0E-01	2.6E-01
							TEQ (D/F)	4.0E-01	2.6E-01
PCBs					**TEQ**				
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	5.3E-05	MG/KG	350	0.01	2.3E-04				
2,3,3',4,4',5-Hexachlorobiphenyl (156)	3.7E-04	MG/KG	30	0.0005	6.8E-06				
2,3',4,4',5-Pentachlorobiphenyl (118)	2.3E-03	MG/KG	15	0.0001	4.2E-06				
2,3,3',4,4'-Pentachlorobiphenyl (105)	7.6E-04	MG/KG	12	0.0001	1.1E-06				
2,3,4,4',5-Pentachlorobiphenyl (114)	1.8E-05	MG/KG	24	0.0005	2.6E-07				
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	2.4E-05	MG/KG	50	0.0001	1.5E-07				
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	1.7E-04	MG/KG	6	0.00001	1.2E-08				
3,3',4,4'-Tetrachlorobiphenyl (77)	3.9E-05	MG/KG	1.4	0.0001	6.7E-09				
2,2',3,5'-Tetrachlorobiphenyl (44)	7.5E-04	MG/KG	0.01						
2,2',4,5'-Tetrachlorobiphenyl (49)	5.1E-04	MG/KG	0.02						
2,4',5-Trichlorobiphenyl (31)	2.1E-04	MG/KG	0.05						
2,3,3',4,4',6-Hexachlorobiphenyl (158)	2.6E-04	MG/KG	4						
2,2',3,3',4,4'-Hexachlorobiphenyl (128)	7.6E-04	MG/KG	9						
2,2',4,4',5,5'-Hexachlorobiphenyl (153)	2.5E-03	MG/KG	15						
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	4.0E-04	MG/KG	15						
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	2.0E-04	MG/KG	21						
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	3.4E-03	MG/KG	23						
2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	9.3E-04	MG/KG	120						
Total					2.4E-04	1.5E-04	2.3E-04	**1.6E+00**	**1.0E+00**

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TABLE 131
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED VERMIVOROUS MAMMAL TISSUE - GREYSTONE EARTHWORMS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Earthworm Central Tendency [a]	Units	Mammal BMF [b] (lipid basis)	TEF	Estimated [c] Tissue Concentration	CBR [d]		Hazard Quotients [e]	
						NOAEL	LOAEL	NOAEL	LOAEL
							TEQ (PCBs)	1.6E+00	1.0E+00
							Total TCDD TEQ	2.0E+00	1.3E+00
							Total	2.0E+00	1.3E+00

Notes:
[a] CT EPCs for earthworm tissue (Table 69 derived from the Site database; only analytes with BMFs presented.
[b] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % otter whole body) presented in Table J-13.
[c] Whole body concentration for mammalian insectivore receptor (mg/kg wet weight) estimated by multiplying the earthworm tissue concentration by the BMF and the ratio of th earthworm percent lipid. The following lipid contents were assumed:

3.6 Average earthworm lipid percent in Greystone Mill Pond.
4.42 Average lipid percentage in 5 otter liver samples (Leonards et al., 1997).

[d] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[e] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 132
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED VERMIVOROUS MAMMAL TISSUE - ALLENDALE EARTHWORMS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Earthworm Central Tendency [a]	Units	Mammal BMF [b] (lipid basis)	TEF	Estimated [c] Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Pesticides/PCBs									
Aroclor, Total	0.0884875	MG/KG	14	na	1.9E+00				
							Total Pesticides/PCBs		
Dioxins					**TEQ**				
2,3,7,8-TCDD	1.6E-04	MG/KG	11	1	2.8E-03				
1,2,3,4,6,7,8-HpCDD	8.6E-05	MG/KG	36	0.01	4.8E-05				
1,2,3,6,7,8-HxCDD	3.5E-06	MG/KG	30	0.1	1.6E-05				
2,3,4,7,8-PeCDF	3.4E-07	MG/KG	54	0.5	1.4E-05				
1,2,3,4,7,8-HxCDF	1.4E-06	MG/KG	57	0.1	1.2E-05				
1,2,3,4,7,8-HxCDD	1.2E-06	MG/KG	9.3	0.1	1.7E-06				
2,3,7,8-TCDF	6.7E-07	MG/KG	0.4	0.1	4.2E-08				
HCX	6.6E-03	MG/KG		0.0002					
1,2,3,7,8-PeCDD	6.5E-07	MG/KG		1					
1,2,3,7,8,9-HxCDD	3.3E-06	MG/KG		0.1					
OCDD	6.0E-04	MG/KG		0.0001					
1,2,3,7,8-PeCDF	2.3E-07	MG/KG		0.05					
1,2,3,6,7,8-HxCDF	1.2E-06	MG/KG		0.1					
2,3,4,6,7,8-HxCDF	7.1E-07	MG/KG		0.1					
1,2,3,4,6,7,8-HpCDF	1.8E-05	MG/KG		0.01					
1,2,3,4,7,8,9-HpCDF	1.0E-06	MG/KG		0.01					
OCDF	4.5E-05	MG/KG		0.0001					
Total					2.9E-03	1.5E-04	2.3E-04	**1.9E+01**	**1.3E+01**
							TEQ (D/F)	**1.9E+01**	**1.3E+01**
PCBs					**TEQ**				
TEQ - Mammals (PCBs)					0.0E+00	1.5E-04	2.3E-04	0.0E+00	0.0E+00
							TEQ (PCBs)	0.0E+00	0.0E+00
							Total TCDD TEQ	**1.9E+01**	**1.3E+01**
							Total	**1.9E+01**	**1.3E+01**

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TABLE 132
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED VERMIVOROUS MAMMAL TISSUE - ALLENDALE EARTHWORMS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Earthworm Central Tendency [a]	Units	Mammal BMF [b] (lipid basis)	TEF	Estimated [c] Tissue Concentration	CBR [d]		Hazard Quotients [e]	
						NOAEL	LOAEL	NOAEL	LOAEL

Notes:
[a] CT EPCs for earthworm tissue (Table 69 derived from the Site database; only analytes with BMFs presented.
[b] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % otter whole body) presented in Table J-13.
[c] Whole body concentration for mammalian insectivore receptor (mg/kg wet weight) estimated by multiplying the earthworm tissue concentration by the BMF and the ratio of th earthworm percent lipid. The following lipid contents were assumed:
2.83 Average earthworm lipid percent in Allendale Mill Pond.
4.42 Average lipid percentage in 5 otter liver samples (Leonards et al., 1997).
[d] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[e] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 133
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED VERMIVOROUS MAMMAL TISSUE - LYMAN MILL EARTHWORMS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Earthworm Central Tendency [a]	Units	Mammal BMF [b] (lipid basis)	TEF	Estimated [c] Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Pesticides/PCBs									
Aroclor, Total	0.041973333	MG/KG	14	na	9.8E-01				
							Total Pesticides/PCBs		
Dioxins					**TEQ**				
2,3,7,8-TCDD	2.9E-05	MG/KG	11	1	5.3E-04				
1,2,3,4,6,7,8-HpCDD	8.7E-05	MG/KG	36	0.01	5.2E-05				
1,2,3,6,7,8-HxCDD	3.4E-06	MG/KG	30	0.1	1.7E-05				
1,2,3,4,7,8-HxCDF	1.6E-06	MG/KG	57	0.1	1.5E-05				
2,3,4,7,8-PeCDF	2.8E-07	MG/KG	54	0.5	1.3E-05				
1,2,3,4,7,8-HxCDD	2.1E-06	MG/KG	9.3	0.1	3.3E-06				
2,3,7,8-TCDF	3.0E-07	MG/KG	0.4	0.1	2.0E-08				
Total					6.3E-04	1.5E-04	2.3E-04	4.2E+00	2.8E+00
							TEQ (D/F)	**4.2E+00**	**2.8E+00**
PCBs					**TEQ**				
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	4.3E-05	MG/KG	350	0.01	2.5E-04				
3,3',4,4',5-Pentachlorobiphenyl (126)	1.2E-05	MG/KG	70	0.1	1.4E-04				
2,3,3',4,4',5-Hexachlorobiphenyl (156)	5.9E-04	MG/KG	30	0.0005	1.5E-05				
2,3',4,4',5-Pentachlorobiphenyl (118)	3.7E-03	MG/KG	15	0.0001	9.2E-06				
2,3,3',4,4'-Pentachlorobiphenyl (105)	1.1E-03	MG/KG	12	0.0001	2.3E-06				
2,3,4,4',5-Pentachlorobiphenyl (114)	5.1E-05	MG/KG	24	0.0005	1.0E-06				
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	2.8E-05	MG/KG	50	0.0001	2.3E-07				
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	2.4E-04	MG/KG	6	0.00001	2.4E-08				
3,3',4,4'-Tetrachlorobiphenyl (77)	7.8E-05	MG/KG	1.4	0.0001	1.8E-08				
2,2',3,5'-Tetrachlorobiphenyl (44)	8.9E-04	MG/KG	0.01						
2,2',4,5'-Tetrachlorobiphenyl (49)	8.1E-04	MG/KG	0.02						
2,4',5-Trichlorobiphenyl (31)	3.0E-04	MG/KG	0.05						
2,3,3',4,4',6-Hexachlorobiphenyl (158)	4.8E-04	MG/KG	4						
2,2',3,3',4,4'-Hexachlorobiphenyl (128)	1.1E-03	MG/KG	9						
2,2',4,4',5,5'-Hexachlorobiphenyl (153)	4.7E-03	MG/KG	15						
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	5.9E-04	MG/KG	15						
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	1.8E-04	MG/KG	21						
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	4.8E-03	MG/KG	23						
2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	1.3E-03	MG/KG	120						

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TABLE 133
CBR-BASED HAZARD QUOTIENTS FOR ESTIMATED VERMIVOROUS MAMMAL TISSUE - LYMAN MILL EARTHWORMS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Earthworm Central Tendency [a]	Units	Mammal BMF [b] (lipid basis)	TEF	Estimated [c] Tissue Concentration	CBR [d] NOAEL	CBR [d] LOAEL	Hazard Quotients [e] NOAEL	Hazard Quotients [e] LOAEL
Total					4.2E-04	1.5E-04	2.3E-04	**2.8E+00**	**1.8E+00**
							TEQ (PCBs)	**2.8E+00**	**1.8E+00**
							Total TCDD TEQ	**7.0E+00**	**4.6E+00**
							Total	**7.0E+00**	**4.6E+00**

Notes:
[a] CT EPCs for earthworm tissue (Table 69 derived from the Site database; only analytes with BMFs presented.
[b] Biomagnification Factors (BMFs - expressed in units of g (lipid % fish)/g (lipid % otter whole body) presented in Table J-13.
[c] Whole body concentration for mammalian insectivore receptor (mg/kg wet weight) estimated by multiplying the earthworm tissue concentration by the BMF and the ratio of th earthworm percent lipid. The following lipid contents were assumed:

2.66 Average earthworm lipid percent in Lyman Mill Pond.
4.42 Average lipid percentage in 5 otter liver samples (Leonards et al., 1997).

[d] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1.
[e] Hazard Quotient is the ratio of the estimated tissue concentration to the NOAEL or LOAEL CBR.
HQs for shaded analytes not included in the HI totals.
na - Not available/applicable.

Prepared by: NAR
Checked by: RAR

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TABLE 134
CBR-BASED HAZARD QUOTIENTS FOR COIs IN FIRE STATION TREE SWALLOW EGGS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Dioxins								
2,3,7,8-TCDD[1]	6 / 6	MG/KG	0.000014	0.000009	1.0E-04	3.0E-04	8.6E-02	2.9E-02
Toxicity Equivalency - Birds	6 / 6	MG/KG	0.000105154	0.000093	1.0E-04	3.0E-04	9.3E-01	3.1E-01
						Total TCDD TEQ	9.3E-01	3.1E-01
						Total	9.3E-01	3.1E-01

Notes:
[a] CT and RME EPCs presented in Tables 118 and 119, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1; see text for procedure used to select values.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL and LOAEL CBRs.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: RAR
Checked by: NAR

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TABLE 135
CBR-BASED HAZARD QUOTIENTS FOR COIs IN GREYSTONE TREE SWALLOW EGGS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Pesticides/PCBs								
4,4'-DDD	3 / 3	MG/KG	0.0096	0.0068		0.009		7.6E-01
4,4'-DDE	3 / 3	MG/KG	0.65315	0.50455	3	30	1.7E-01	1.7E-02
4,4'-DDT	2 / 3	MG/KG	0.00628	0.00543		0.022		2.5E-01
alpha-Chlordane	3 / 3	MG/KG	0.0223	0.0150				
Aroclor, Total	3 / 3	MG/KG	1.8722	1.3509	4		3.4E-01	
Aroclor-1254	3 / 3	MG/KG	1.5123	1.0794	4	5	2.7E-01	2.2E-01
Aroclor-1268	3 / 3	MG/KG	0.35993	0.2715				
Dieldrin	3 / 3	MG/KG	0.02859	0.02304		0.059		3.9E-01
Heptachlor Epoxide	3 / 3	MG/KG	0.0408	0.0287				
Technical Chlordane	3 / 3	MG/KG	0.91843	0.61770				
						Total Pesticides/PCBs	7.8E-01	**1.6E+00**
Dioxins								
2,3,7,8-TCDD[1]	17 / 17	MG/KG	0.000218	0.0000552	1.0E-04	3.0E-04	5.5E-01	1.8E-01
Toxicity Equivalency - Birds	17 / 17	MG/KG	0.000171	0.0000775	1.0E-04	3.0E-04	7.8E-01	2.6E-01
						Total TCDD TEQ	7.8E-01	2.6E-01
						Total	**1.6E+00**	**1.9E+00**

Notes:
[a] CT and RME EPCs presented in Tables 118 and 119, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1; see text for procedure used to select values.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL and LOAEL CBRs.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: RAR
Checked by: NAR

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TABLE 136
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN ALLENDALE TREE SWALLOW EGGS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Pesticides/PCBs								
4,4'-DDD	3 / 3	MG/KG	0.01268	0.0078		0.009		8.7E-01
4,4'-DDE	3 / 3	MG/KG	0.48085	0.29864	3	30	1.0E-01	1.0E-02
4,4'-DDT	3 / 3	MG/KG	0.00449	0.00349		0.022		1.6E-01
alpha-Chlordane	3 / 3	MG/KG	0.0329	0.0165				
Aroclor, Total	3 / 3	MG/KG	1.6811	1.3199	4		3.3E-01	
Aroclor-1254	3 / 3	MG/KG	1.30813	1.1057	4	5	2.8E-01	2.2E-01
Aroclor-1268	3 / 3	MG/KG	0.373	0.214				
Dieldrin	3 / 3	MG/KG	0.0244	0.0181		0.059		3.1E-01
Heptachlor Epoxide	3 / 3	MG/KG	0.04061	0.0301				
Technical Chlordane	3 / 3	MG/KG	0.68141	0.46928				
						Total Pesticides/PCBs	7.1E-01	**1.6E+00**
Dioxins								
2,3,7,8-TCDD[1]	31 / 31	MG/KG	0.0007200	0.000720	1.0E-04	3.0E-04	**7.2E+00**	**2.4E+00**
Toxicity Equivalency - Birds	31 / 31	MG/KG	0.00116	0.000756	1.0E-04	3.0E-04	**7.6E+00**	**2.5E+00**
Toxicity Equivalency (PCB) - Birds	3 / 3	MG/KG	0.000329	0.000221	1.0E-04	3.0E-04	**2.2E+00**	7.4E-01
						Total TCDD TEQ	**9.8E+00**	**3.3E+00**
						Total	**1.0E+01**	**4.8E+00**

Notes:
[a] CT and RME EPCs presented in Tables 118 and 119, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1; see text for procedure used to select values.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL and LOAEL CBRs.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: RAR
Checked by: NAR

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TABLE 137
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN LYMAN MILL TREE SWALLOW EGGS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Pesticides/PCBs								
4,4'-DDD	2 / 2	MG/KG	0.00664	0.00515		0.009		5.7E-01
4,4'-DDE	2 / 2	MG/KG	0.29413	0.22295	3	30	7.4E-02	7.4E-03
4,4'-DDT	2 / 2	MG/KG	0.00693	0.00477		0.022		2.2E-01
alpha-Chlordane	2 / 2	MG/KG	0.0185	0.0107				
Aroclor, Total	2 / 2	MG/KG	1.55881	1.30969	4		3.3E-01	
Aroclor-1254	2 / 2	MG/KG	1.3629	1.1498	4	5	2.9E-01	2.3E-01
Aroclor-1268	2 / 2	MG/KG	0.19591	0.160				
Dieldrin	2 / 2	MG/KG	0.0135	0.0115		0.059		1.9E-01
Heptachlor Epoxide	2 / 2	MG/KG	0.0301	0.0195				
Technical Chlordane	2 / 2	MG/KG	0.72049	0.47632				
						Total Pesticides/PCBs	6.9E-01	**1.2E+00**
Dioxins								
2,3,7,8-TCDD[1]	13 / 13	MG/KG	0.00195	0.00109	1.0E-04	3.0E-04	**1.1E+01**	**3.6E+00**
Toxicity Equivalency - Bird	13 / 13	MG/KG	0.00198	0.00112	1.0E-04	3.0E-04	**1.1E+01**	**3.7E+00**
Toxicity Equivalency (PCB) - Bird	3 / 3	MG/KG	0.000269	0.000197	1.0E-04	3.0E-04	**2.0E+00**	6.6E-01
						Total TCDD TEQ	**1.3E+01**	**4.4E+00**
						Total	**1.4E+01**	**5.6E+00**

Notes:
[a] CT and RME EPCs presented in Tables 118 and 119, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1; see text for procedure used to select values.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL and LOAEL CBRs.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: RAR
Checked by: NAR

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TABLE 138
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN MANTON TREE SWALLOW EGGS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Dioxins								
2,3,7,8-TCDD[1]	4 / 4	MG/KG	0.00071	0.00053	1.0E-04	3.0E-04	**5.3E+00**	**1.8E+00**
Toxicity Equivalency - Bird	4 / 4	MG/KG	0.00072	0.00054	1.0E-04	3.0E-04	**5.4E+00**	**1.8E+00**
						Total TCDD TEQ	**5.4E+00**	**1.8E+00**
						Total	**5.4E+00**	**1.8E+00**

Notes:
[a] CT and RME EPCs presented in Tables 118 and 119, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1; see text for procedure used to select values.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL and LOAEL CBRs.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: RAR
Checked by: NAR

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TABLE 139
CBR-BASED HAZARD QUOTIENTS FOR COIs IN GREYSTONE TREE SWALLOW NESTLING TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Pesticides/PCBs								
4,4'-DDD	5 / 5	MG/KG	0.01973	0.00607		0.009		6.7E-01
4,4'-DDE	4 / 5	MG/KG	0.0246	0.0159		0.1		1.6E-01
4,4'-DDT	4 / 5	MG/KG	0.0040	0.0021		0.022		9.8E-02
alpha-Chlordane	5 / 5	MG/KG	0.0230	0.0117				
Aroclor, Total	5 / 5	MG/KG	0.2840	0.1865				
Aroclor-1254	5 / 5	MG/KG	0.23586	0.14968				
Aroclor-1268	5 / 5	MG/KG	0.04811	0.03678				
Dieldrin	5 / 5	MG/KG	0.00741	0.00508		0.059		8.6E-02
gamma-Chlordane	2 / 5	MG/KG	0.0010	0.0010				
Heptachlor Epoxide	4 / 5	MG/KG	0.01587	0.00776				
Technical Chlordane	5 / 5	MG/KG	0.75550	0.34259				
						Total Pesticides/PCBs	0.0E+00	**1.0E+00**
Dioxins								
2,3,7,8-TCDD[1]	10 / 10	MG/KG	0.000008	0.000008	1.0E-04	2.8E-04	8.3E-02	3.0E-02
Toxicity Equivalency - Birds	10 / 10	MG/KG	0.000016	0.000016	1.0E-04	2.8E-04	1.6E-01	5.7E-02
Toxicity Equivalency (PCB) - Birds	6 / 6	MG/KG	0.000032	0.000028	1.0E-04	2.8E-04	2.8E-01	1.0E-01
						Total TCDD TEQ	4.4E-01	1.6E-01
						Total	4.4E-01	**1.2E+00**

Notes:
[a] CT and RME EPCs presented in Tables 120 and 121, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1; see text for procedure used to select values.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL and LOAEL CBRs.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: RAR
Checked by: NAR

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TABLE 140
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN ALLENDALE TREE SWALLOW NESTLING TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Pesticides/PCBs								
4,4'-DDD	7 / 7	MG/KG	0.064	0.019		0.009		**2.2E+00**
4,4'-DDE	7 / 7	MG/KG	0.064	0.029		0.1		2.9E-01
4,4'-DDT	7 / 7	MG/KG	0.0061	0.0036		0.022		1.7E-01
alpha-Chlordane	7 / 7	MG/KG	0.071	0.020				
Aroclor, Total	7 / 7	MG/KG	1.02	0.57				
Aroclor-1254	7 / 7	MG/KG	0.98	0.54				
Aroclor-1268	7 / 7	MG/KG	0.036	0.030				
Dieldrin	7 / 7	MG/KG	0.0164	0.0098		0.059		1.7E-01
Endosulfan Sulfate	1 / 7	MG/KG	0.0131	0.0034				
gamma-Chlordane	3 / 7	MG/KG	0.0186	0.0054				
Heptachlor Epoxide	7 / 7	MG/KG	0.042	0.018				
Technical Chlordane	7 / 7	MG/KG	0.84	0.52				
						Total Pesticides/PCBs	0.0E+00	**2.8E+00**
Dioxins								
2,3,7,8-TCDD[1]	11 / 11	MG/KG	0.0007581	0.0007581	1.0E-04	2.8E-04	**7.6E+00**	**2.7E+00**
Toxicity Equivalency - Birds	11 / 11	MG/KG	0.00077	0.00077	1.0E-04	2.8E-04	**7.7E+00**	**2.8E+00**
Toxicity Equivalency (PCB) - Birds	6 / 6	MG/KG	0.00027	0.00012	1.0E-04	2.8E-04	**1.2E+00**	4.5E-01
						Total TCDD TEQ	**8.9E+00**	**3.2E+00**
						Total	**8.9E+00**	**6.0E+00**

Notes:
[a] CT and RME EPCs presented in Tables 120 and 121, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1; see text for procedure used to select values.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL and LOAEL CBRs.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: RAR
Checked by: NAR

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TABLE 141
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN LYMAN MILL TREE SWALLOW NESTLING TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Pesticides/PCBs								
4,4'-DDD	6 / 6	MG/KG	0.045	0.012		0.009		**1.3E+00**
4,4'-DDE	5 / 6	MG/KG	0.067	0.033		0.1		3.3E-01
4,4'-DDT	5 / 6	MG/KG	0.0040	0.0014		0.022		6.5E-02
alpha-Chlordane	6 / 6	MG/KG	0.0098	0.0044				
Aroclor, Total	6 / 6	MG/KG	0.91	0.72				
Aroclor-1254	6 / 6	MG/KG	0.87	0.68				
Aroclor-1268	6 / 6	MG/KG	0.064	0.046				
Dieldrin	6 / 6	MG/KG	0.0140	0.0077		0.059		1.3E-01
Endosulfan Sulfate	1 / 6	MG/KG	0.0102	0.0031				
gamma-Chlordane	1 / 6	MG/KG	0.0033	0.0020				
Heptachlor Epoxide	5 / 6	MG/KG	0.0080	0.0047				
Technical Chlordane	6 / 6	MG/KG	0.31	0.24				
						Total Pesticides/PCBs	0.0E+00	**1.8E+00**
Dioxins								
2,3,7,8-TCDD[1]	5 / 5	MG/KG	0.0016	0.0011	1.0E-04	2.8E-04	**1.1E+01**	**3.8E+00**
Toxicity Equivalency - Birds	5 / 5	MG/KG	0.0016	0.0011	1.0E-04	2.8E-04	**1.1E+01**	**3.9E+00**
Toxicity Equivalency (PCB) - Birds	1 / 1	MG/KG	0.0001890	0.0001890	1.0E-04	2.8E-04	**1.9E+00**	6.8E-01
						Total TCDD TEQ	**1.3E+01**	**4.5E+00**
						Total	**1.3E+01**	**6.3E+00**

Notes:
[a] CT and RME EPCs presented in Tables 120 and 121, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1; see text for procedure used to select values.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL and LOAEL CBRs.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: RAR
Checked by: NAR

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TABLE 142
CBR-BASED HAZARD QUOTIENTS FOR COPCs IN MANTON TREE SWALLOW NESTLING TISSUE

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical	Detection Frequency	Units	Medium RME [a]	Central Tendency [a]	CBR [b] NOAEL	CBR [b] LOAEL	Hazard Quotients [c] NOAEL	Hazard Quotients [c] LOAEL
Dioxins								
2,3,7,8-TCDD[1]	4 / 4	MG/KG	0.0005	0.0004	1.0E-04	2.8E-04	**4.5E+00**	**1.6E+00**
Toxicity Equivalency - Birds	4 / 4	MG/KG	0.0005	0.0005	1.0E-04	2.8E-04	**4.5E+00**	**1.6E+00**
						Total TCDD TEQ	**4.5E+00**	**1.6E+00**
						Total	**4.5E+00**	**1.6E+00**

Notes:
[a] CT and RME EPCs presented in Tables 120 and 121, respectively.
[b] Critical Body Residues (CBRs) are obtained from summary of tissue effects data presented in Table G-1; see text for procedure used to select values.
[c] Hazard Quotient is the ratio of the CT concentration to the NOAEL and LOAEL CBRs.
[1] HQs for 2,3,7,8-TCDD are not included in the HI totals, but are presented to show the relative significance of this congener to the overall toxic equivalency.

Prepared by: RAR
Checked by: NAR

TABLE 143
SUMMARY OF SWALLOW STUDY EGG EXPOSURE AND EFFECT DATA

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Geometric Mean TCDD Concentrations in Egg Tissue (pg/g)[a]

	Year				
Area	2000	2001	2002	2003	Geometric Mean
Firestation	ns	ns	5.3	4.2	4.7
Greystone	17	29	66	96	42
Allendale	826	314	432	894	562
Lyman	ns	1013	1127	ns	1069
Manton	ns	ns	ns	516	516

Percent Hatchability[a]

	Year				
Area	2000	2001	2002	2003	Geometric Mean
Firestation	ns	ns	[b]	[b]	-
Greystone	92.0%	77.0%	100.0%	[b]	89%
Allendale	47.0%	51.0%	74.1%	69.9%	59%
Lyman	ns	70.0%	50.0%	32.6%	49%
Manton	ns	ns	ns	100.0%	100%

a. Percent hatchability and tissue concentration data presented in Appendix M.
b. Data not presented because of limited sample sizes and disturbance effects including vandalism and predation.
ns - Not Sampled.

Prepared by: NAR
Checked by: SGH

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TABLE 144
INCREMENTAL RISK SUMMARY FOR TREE SWALLOW EGG TISSUE (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Birds	**7.6E+00**	**2.5E+00**	7.8E-01	2.6E-01	**6.8E+00**	**2.3E+00**
Toxicity Equivalency (PCB) - Birds	**2.2E+00**	7.4E-01			**2.2E+00**	7.4E-01

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Bird	**1.1E+01**	**3.7E+00**	7.8E-01	2.6E-01	**1.0E+01**	**3.5E+00**
Toxicity Equivalency (PCB) - Bird	**2.0E+00**	6.6E-01			**2.0E+00**	6.6E-01

Manton Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Bird	**5.4E+00**	**1.8E+00**	7.8E-01	2.6E-01	**4.7E+00**	**1.6E+00**

Notes:
Risk estimates as calculated and presented in Tables 135 through 138.
Incremental risks calculated for all analytes with NOAEL-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

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TABLE 145
INCREMENTAL RISK SUMMARY FOR TREE SWALLOW EGG TISSUE (Fire Station)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Fire Station			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Birds	**7.6E+00**	**2.5E+00**	9.3E-01	3.1E-01	**6.6E+00**	**2.2E+00**
Toxicity Equivalency (PCB) - Birds	**2.2E+00**	7.4E-01			**2.2E+00**	7.4E-01
Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Fire Station			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Bird	**1.1E+01**	**3.7E+00**	9.3E-01	3.1E-01	**1.0E+01**	**3.4E+00**
Toxicity Equivalency (PCB) - Bird	**2.0E+00**	6.6E-01			**2.0E+00**	6.6E-01
Manton Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Fire Station			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Bird	**5.4E+00**	**1.8E+00**	9.3E-01	3.1E-01	**4.5E+00**	**1.5E+00**

Notes:
Risk estimates as calculated and presented in Tables 134, and 136 through 138.
Incremental risks calculated for all analytes with NOAEL-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

TABLE 146
INCREMENTAL RISK SUMMARY FOR TREE SWALLOW NESTLING TISSUE (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Birds	**7.7E+00**	**2.8E+00**	1.6E-01	5.7E-02	**7.5E+00**	**2.7E+00**
4,4'-DDD		**2.2E+00**		6.7E-01		**1.5E+00**
Toxicity Equivalency (PCB) - Birds	**1.2E+00**	4.5E-01	2.8E-01	1.0E-01	9.7E-01	3.5E-01

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Bird	**1.1E+01**	**3.9E+00**	1.6E-01	5.7E-02	**1.1E+01**	**3.8E+00**
4,4'-DDD		**1.3E+00**		6.7E-01		6.0E-01
Toxicity Equivalency (PCB) - Bird	**1.9E+00**	6.8E-01	2.8E-01	1.0E-01	**1.6E+00**	5.8E-01

Manton Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Bird	**4.5E+00**	**1.6E+00**	1.6E-01	5.7E-02	**4.4E+00**	**1.6E+00**

Notes:
Risk estimates as calculated and presented in Tables 139 through 142.
Incremental risks calculated for all analytes with NOAEL-based HQs[1] greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

[1] LOAEL-based HQs were used when NOAEL-based values were not available.

Prepared by: NAR
Checked by: RAR

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TABLE 147
INCREMENTAL RISK SUMMARY FOR WILDLIFE RECEPTORS - Tree Swallow (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Birds	**2.9E+01**	**2.9E+00**	2.1E-01	2.1E-02	**2.9E+01**	**2.9E+00**

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Birds	**7.8E+00**	7.8E-01	2.1E-01	2.1E-02	**7.6E+00**	7.6E-01
Toxicity Equivalency (PCB) - Birds	**1.3E+00**	1.3E-01	3.3E-01	3.3E-02	9.9E-01	9.9E-02

Manton Pond Reach	Risk Summary				Incremental Risk	
	Manton		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Birds	**5.2E+00**	5.2E-01	2.1E-01	2.1E-02	**5.0E+00**	5.0E-01

Dyerville Reach	Risk Summary				Incremental Risk	
	Dyerville		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Birds	**1.4E+00**	1.4E-01	2.1E-01	2.1E-02	**1.2E+00**	1.2E-01

Notes:
Risk estimates as calculated and presented in Appendix L.
Incremental risks calculated for all analytes with NOAEL-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

TABLE 148
INCREMENTAL RISK SUMMARY FOR WILDLIFE RECEPTORS - Tree Swallow Nestling (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Birds	**2.1E+00**	2.1E-01	1.6E-02	1.6E-03	**2.1E+00**	2.1E-01
Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
None						
Manton Pond Reach	Risk Summary				Incremental Risk	
	Manton		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
None						
Dyerville Reach	Risk Summary				Incremental Risk	
	Dyerville		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
None						

Notes:
Risk estimates as calculated and presented in Appendix L.
Incremental risks calculated for all analytes with NOAEL-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

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TABLE 149
INCREMENTAL RISK SUMMARY FOR WILDLIFE RECEPTORS - Little Brown Bat (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Mammals	**2.2E+02**	**2.2E+01**	**1.3E+00**	1.3E-01	**2.2E+02**	**2.2E+01**
Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Mammals	**5.9E+01**	**5.9E+00**	**1.3E+00**	1.3E-01	**5.8E+01**	**5.8E+00**
Toxicity Equivalency (PCB) - Mammals	**2.4E+00**	2.4E-01	**2.0E+00**	2.0E-01	4.4E-01	4.4E-02
Manton Pond Reach	Risk Summary				Incremental Risk	
	Manton		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Mammals	**4.0E+01**	**4.0E+00**	**1.3E+00**	1.3E-01	**3.9E+01**	**3.9E+00**
Dyerville Reach	Risk Summary				Incremental Risk	
	Dyerville		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Mammals	**9.1E+00**	9.1E-01	**1.3E+00**	1.3E-01	**7.9E+00**	7.9E-01

Notes:
Risk estimates as calculated and presented in Appendix L.
Incremental risks calculated for all analytes with NOAEL-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

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TABLE 150
INCREMENTAL RISK SUMMARY FOR WILDLIFE RECEPTORS - American Woodcock (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Birds	**7.1E+00**	7.1E-01	5.1E-01	5.1E-02	**6.6E+00**	6.6E-01

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Selenium	**1.6E+00**	4.7E-01	6.1E-01	1.8E-01	9.8E-01	2.9E-01
Zinc	**5.8E+00**	6.4E-01	**3.6E+00**	3.9E-01	**2.2E+00**	2.5E-01
Toxicity Equivalency - Birds	**2.5E+00**	2.5E-01	5.1E-01	5.1E-02	**2.0E+00**	2.0E-01
Lead	**1.1E+01**	**1.1E+00**	**1.0E+01**	1.0E+00	**1.4E+00**	1.4E-01
Cadmium	**1.3E+00**	9.4E-02	8.9E-01	6.4E-02	4.1E-01	3.0E-02

Notes:
Risk estimates as calculated and presented in Appendix L.
Incremental risks calculated for all analytes with NOAEL-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

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TABLE 151
INCREMENTAL RISK SUMMARY FOR WILDLIFE RECEPTORS - Shorttailed Shrew (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Mammals	**1.4E+02**	**1.4E+01**	**4.2E+00**	4.2E-01	**1.3E+02**	**1.3E+01**
Aroclor-1254	**1.9E+00**	1.9E-01	6.4E-01	6.4E-02	**1.3E+00**	1.3E-01

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Mammals	**3.8E+01**	**3.8E+00**	**4.2E+00**	4.2E-01	**3.4E+01**	**3.4E+00**
Selenium	**6.4E+00**	**3.9E+00**	**2.0E+00**	**1.2E+00**	**4.5E+00**	**2.7E+00**
Cadmium	**3.4E+00**	3.4E-01	**1.9E+00**	1.9E-01	**1.5E+00**	1.5E-01
Arsenic	**5.4E+00**	5.4E-01	**5.3E+00**	5.3E-01	3.2E-02	3.2E-03

Notes:
Risk estimates as calculated and presented in Appendix L.
Incremental risks calculated for all analytes with NOAEL-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

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TABLE 152
WEIGHT-OF-EVIDENCE INTEGRATION: INSECTIVOROUS WILDLIFE POPULATIONS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Assessment Endpoint 5. Protection and maintenance of insectivorous mammal and bird populations.

A. Do ingestion doses of COPCs in insectivorous wildlife (such as shrew, Indiana bat, American woodCOPCk or tree swallow) exceed Toxic Reference Values (TRVs) or Toxic Equivalencies (TEQs) for adverse effects on survival, growth or reproduction?

B. Do residues of COPCs in eggs and/or tissues of insectivorous wildlife (such as shrew, Indiana bat, American woodCOPCk or tree swallow) exceed benchmarks for adverse effects on survival, growth,reproduction or embryo development?

C. Do field survey data on insectivorous wildlife population indicate presence/absence of ecological integrity?

D. Do mix-function oxidase (MFO) liver enzyme levels in swallow nestlings indicate that they have been exposed to compounds with "dioxin"-like metabolic activity?

Measurement Endpoints[a]

A. Comparison of estimated ingestion doses in insectivorous wildlife with TRVs and toxic equivalencies

B_1. Comparison of measured insectivorous wildlife tissue and/or egg residues with CBR data

B_2. Comparison of estimated insectivorous wildlife tissue and/or egg residues with site-specific CBR data

C_1. Site-specific measurement of reproductive effects in local tree swallow populations

C_2. Site-specific survey of calling amphibians

D. Elevated MFO activity in tree swallow nestling liver tissue

Weight-of-Evidence Integration[b]

	WEIGHT				
RISK/MAGNITUDE	Low	Low - Medium	Medium	Medium - High	High
Yes/High			A_{bat}, A_{shrew}, $B_{2\ bat}$	$B_{1\ bat}$	C_1
Yes/Low			$A_{swallow}$, $B_{2\ swallow}$, $B_{2\ woodcock}$, $B_{2\ shrew}$	$B_{1\ swallow}$	
Undeterminate		C_2	$A_{woodcock}$, D		
No/Low					
No/Very Low					

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TABLE 152
WEIGHT-OF-EVIDENCE INTEGRATION: INSECTIVOROUS WILDLIFE POPULATIONS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Risk Conclusion:

Insectivorous and vermivorous mammal and bird populations that occur within the study area appear to be at substantial risk of harm due to direct exposure to Site-related contaminants in surface water, sediment, floodplain soil and prey. In addition, consumption of contaminated insect and earthworm prey may result in elevated tissue residues in these receptors resulting in adverse reproductive effects (i.e., bioaccumulation hazard).

Notes:
a. Measurement endpoints and assigned weights are discussed in Section 2.6.
b. WOE integration is discussed in Section 8.4.

Prepared by: NAR
Checked by: SGH

TABLE 153
INCREMENTAL RISK SUMMARY FOR WILDLIFE RECEPTORS - Mallard (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
None						
Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
None						
Manton Pond Reach	Risk Summary				Incremental Risk	
	Manton		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
None						
Dyerville Reach	Risk Summary				Incremental Risk	
	Dyerville		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
None						

Notes:
Risk estimates as calculated and presented in Appendix N.
Incremental risks calculated for all analytes with NOAEL-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

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TABLE 154
INCREMENTAL RISK SUMMARY FOR WILDLIFE RECEPTORS - Mallard (Assapumpset)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
None						

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
None						

Manton Pond Reach	Risk Summary				Incremental Risk	
	Manton		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
None						

Dyerville Reach	Risk Summary				Incremental Risk	
	Dyerville		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
None						

Notes:
Risk estimates as calculated and presented in Appendix N.
Incremental risks calculated for all analytes with NOAEL-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

TABLE 155
INCREMENTAL RISK SUMMARY FOR WILDLIFE RECEPTORS - Raccoon: aquatic (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Mammals	**1.2E+01**	**1.2E+00**	5.9E-01	5.9E-02	**1.2E+01**	**1.2E+00**
Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Mammals	**5.4E+00**	5.4E-01	5.9E-01	5.9E-02	**4.8E+00**	4.8E-01
Manton Pond Reach	Risk Summary				Incremental Risk	
	Manton		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Mammals	**7.8E+00**	7.8E-01	5.9E-01	5.9E-02	**7.2E+00**	7.2E-01
Dyerville Reach	Risk Summary				Incremental Risk	
	Dyerville		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	**2.8E+00**	2.8E-01	5.0E-01	5.0E-02	**2.3E+00**	2.3E-01
Toxicity Equivalency - Mammals	**1.8E+00**	1.8E-01	5.9E-01	5.9E-02	**1.2E+00**	1.2E-01
Aroclor-1254	**1.1E+00**	1.1E-01	4.1E-01	4.1E-02	7.4E-01	7.4E-02

Notes:
Risk estimates as calculated and presented in Appendix N.
Incremental risks calculated for all analytes with NOAEL-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

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TABLE 156
INCREMENTAL RISK SUMMARY FOR WILDLIFE RECEPTORS - Raccoon: aquatic (Assapumpset)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Mammals	**1.2E+01**	**1.2E+00**	3.8E-01	3.8E-02	**1.2E+01**	**1.2E+00**
Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Mammals	**5.4E+00**	5.4E-01	3.8E-01	3.8E-02	**5.0E+00**	5.0E-01
Manton Pond Reach	Risk Summary				Incremental Risk	
	Manton		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Toxicity Equivalency - Mammals	**7.8E+00**	7.8E-01	3.8E-01	3.8E-02	**7.4E+00**	7.4E-01
Dyerville Reach	Risk Summary				Incremental Risk	
	Dyerville		Assapumpset			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Aroclor, Total	**2.8E+00**	2.8E-01	1.1E-01	1.1E-02	**2.7E+00**	2.7E-01
Toxicity Equivalency - Mammals	**1.8E+00**	1.8E-01	3.8E-01	3.8E-02	**1.4E+00**	1.4E-01
Aroclor-1254	**1.1E+00**	1.1E-01	9.3E-02	9.3E-03	**1.1E+00**	1.1E-01

Notes:
Risk estimates as calculated and presented in Appendix N.
Incremental risks calculated for all analytes with NOAEL-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

TABLE 157
INCREMENTAL RISK SUMMARY FOR WILDLIFE RECEPTORS - Raccoon: floodplain (Greystone)

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Allendale Pond Reach	Risk Summary				Incremental Risk	
	Allendale		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
None						

Lyman Mill Pond Reach	Risk Summary				Incremental Risk	
	Lyman		Greystone			
Analyte	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
None						

Notes:
Risk estimates as calculated and presented in Appendix N.
Incremental risks calculated for all analytes with NOAEL-based HQs greater than one which, in combination, contribute at least 95% to the total risk, and which exceeds the corresponding reference risk estimate.
Incremental risks for individual analytes are derived by subtracting the upgradient/reference HQs from the exposure area HQ.

Prepared by: NAR
Checked by: RAR

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TABLE 158
WEIGHT-OF-EVIDENCE INTEGRATION: OMNIVOROUS WILDLIFE POPULATIONS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

6. Protection and maintenance of omnivorous mammal and bird populations.

A. Do ingestion doses of COPCs in omnivorous wildlife (such as raccoon, mute swan or mallard) exceed Toxic Reference Values (TRVs) or Toxic Equivalencies (TEQs) for adverse effects on survival, growth or reproduction?

Measurement Endpoint[a]

A. Comparison of estimated ingestion doses in omnivorous wildlife with TRVs and toxic equivalencies

Weight-of-Evidence Integration[b]

	WEIGHT				
RISK/MAGNITUDE	Low	Low - Medium	Medium	Medium - High	High
Yes/High					
Yes/Low			$A_{raccoon\ (A)}$		
Undeterminate					
No/Low					
No/Very Low			$A_{raccoon\ (T)}$ $A_{mallard}$		

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TABLE 158
WEIGHT-OF-EVIDENCE INTEGRATION: OMNIVOROUS WILDLIFE POPULATIONS

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Risk Conclusion:

Omnivorous mammal and bird populations that forage within the study area are not at substantial risk of harm due to exposure to Site-related contaminants in surface water, floodplain soil, and terrestrial prey items. However, omnivorous mammals could be adversely affected as a result of exposure to Site-related contaminants in sediment and aquatic prey. Although the exclusive use of aquatic habitat by omnivorous mammals, such as the raccoon, could result in substantial population-level effects, the spatially and temporally varied diets and exposures of these receptors minimizes the likelihood that demographically significant effects would occur.

Notes:
a. Measurement endpoints and assigned weights are discussed in Section 2.6.
b. WOE integration is discussed in Section 9.4.

Prepared by: NAR
Checked by: SGH

TABLE 159
SUMMARY OF PRINCIPAL RISK UNCERTAINTIES

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Uncertainty Category	Assessment Endpoints Affected[a]	COPC Categories[b]	Likely Direction (under-/over+ estimate risk)[c]	Magnitude of Possible Effect[d]
Exposure Assessment				
Development of EPCs				
Allendale Dam breach in 2001	1a, 2, 3, 4	PBTs	?	+
Estimated fish tissue EPCs for Dyerville	2, 3, 4	PBTs	+++	+++
Fish EPCs based on large fish	2, 3, 4	PBTs	+++	+++
Fish EPCs for Manton/Dyerville based on 3 samples	2, 3, 4	all	?	+
No tissue data for several wildlife receptors	4, 5	PBTs	?	+++
Emerging insect EPCs estimated for Manton and Dyerville	5	dioxins/furans/ PCBs	+++	+
Insectivorous diets assumes to be entirely aquatic in origin within EA	5	dioxins/furans/ PCBs	+++	+
Selection of Endpont Receptors				
Plant receptors not evaluated	-	all	--	+
Wildlife Exposure Parameter				
Use of standard receptor exposure parameters	4, 5, 6	all	?	+
Bioaccumulation Factors				
No TCDD plant uptake factor employed	6	dioxins/furans/ PCBs	---	++
No plant tissue data; literature uptake factors used	6	PBTs, inorganics	?	+
Evaluated Exposures				
No floodplain soil data available for Manton and Dyerville; no evaluation of floodplain soil exposures	5, 6	all	--	++
Effects Assessment				
Toxicity Reference Values				
Use of standard benchmarks	1a, 1b	all	+++	+++
Lack of ingestion dose data	4, 5, 6	pesticides, inorganics	--	+
Lack of CBR data	1a, 1b, 2, 3, 4, 5	pesticides, inorganics	---	++
Extrapolation between laboratory and field	4, 5, 6	all	?	++
TRV extrapolation between receptors	4, 5, 6	dioxins/furans/ PCBs	?	++
Dioxin/furan/PCB congeners				
Interim TEF value for HCX	all	HCX, TEQ	?	+
Use of Fish TEFs for invertebrates	1a, 1b	dioxins/furans	+++	+++
Lack of uptake of HCX in ELS study	all	HCX, TEQ	?	+
Field Studies				
Amphibian call survey not qualitative	5	all	?	+
Limited ichthyological data	2, 3	dioxins/furans	--	+++
Limited emerging insect data	1a, 5	all	?	+
High background mortality in bioassay	1a	all	+++	+
Risk Characterization				
Hazard quotient approach	all	all	?	+

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TABLE 159
SUMMARY OF PRINCIPAL RISK UNCERTAINTIES

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Notes:

a. Assessment endpoints as presented in Table 15
   1a. Protection and maintenance (i.e., survival, growth, reproduction) of aquatic invertebrate communities which are a forage base for fish and wildlife.
   1b. Protection and maintenance (i.e., survival, growth, reproduction) of floodplain invertebrate communities which are a forage base for wildlife.
   2. Protection and maintenance of demersal, omnivorous fish populations as a forage base or sport fishery.
   3. Protection and maintenance of pelagic, piscivorous or semi-piscivorous fish populations as a forage base or sport fishery.
   4. Protection and maintenance of piscivorous mammal and bird populations.
   5. Protection and maintenance of insectivorous mammal and bird populations.
   6. Protection and maintenance of omnivorous mammal and bird populations.

b. COPC categories that are most likely affected by the specific uncertainty: PBT - persistent bioaccumulative toxicants, TEQ - TCDD Toxic Equivalency.

c. Direction of likely effect indicated by the sign:
   Under-estimated risks indicated by "-" sign as follows: "-" - somewhat likely; "--" - likely; "---" - very likely
   Over-estimated risks indicated by "+" sign as follows: "+" - somewhat likely; "++" - likely; "+++" - very likely

d. Estimated magnitude of effect on risk estimates where magnitude ranges from "+" - least to "+++" - greatest; rows shades are the identified uncertainties that could result in risk being substantially under-estimated.

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TABLE 160
RISK/MAGNITUDE SUMMARY

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Assessment Endpoint[1]	Measures of Effect[1]	Inference Weight[1]	Risk/Magnitude
1a. Protection and maintenance (i.e., survival, growth, reproduction) of aquatic invertebrate communities which are a forage base for fish and wildlife populations	A. Comparison of surface water COC concentrations to criteria/guidelines	L-M	Yes/High
	B. Comparison of sediment COC concentrations to benchmarks/guidelines	M	Yes/High
	C. Whole sediment laboratory bioassays	M-H	Yes/High
	D. Comparison of measured COC concentrations in aquatic macroinvertebrates to CBRs	L-M	Yes/Low
	E_1. Aquatic macroinvertebrate community structure/function	M-H	No/Very Low
	E_2. Emerging aquatic macroinvertebrate productivity	L-M	No/Low
	Risk Conclusion		Yes/High[2] No/Low[3]
1b. Protection and maintenance (i.e., survival, growth, reproduction) of floodplain invertebrate ımmunities which are a forage ₑe for wildlife populations	A. Comparison of soil COC concentrations to benchmarks/guidelines	L-M	Yes/High
	B. Comparison of measured COC concentrations in floodplain invertebrates to CBRs	L-M	Yes/High
	C. Floodplain macroinvertebrate community integrity	M	No/Very Low
	Risk Conclusion		No/Low
2. Protection and maintenance of demersal, omnivorous fish populations as a forage base or sports fishery.	A_1. Fish length-weight relationships and condition indices relative to habitat characterization	L-M	No/Low
	A_2. Percent gross lesions in individual fish	M	Yes/Low
	A_3. Demographic structure analysis of dominant species (based on fish scales)	M	No/Very Low
	A_4. Species richness and relative abundance of ichthyoplankton	M	Undeterminate
	B_1. Comparison of measured concentrations or toxic equivalencies in fish tissue to literature derived CBRs	M-H	Yes/High
	B_2. Comparison of modeled concentrations or toxic equivalencies (using BSAFs) in eggs and fish tissue to literature derived CBRs	M	Undeterminate
	B_3. Partial life cycle laboratory water exposure of fish eggs dosed with synthetic mixture emulating DLC composition of Allendale Pond fish tissue.	M	Yes/High
	Risk Conclusion		Yes/High

TABLE 160
RISK/MAGNITUDE SUMMARY

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Assessment Endpoint[1]	Measures of Effect[1]	Inference Weight[1]	Risk/Magnitude
3. Protection and maintenance of pelagic, piscivorous, or semi-piscivorous fish populations as a forage base or sports fishery	A_1. Fish length-weight relationships and condition indices relative to habitat characterization	L-M	No/Low
	A_2. Percent gross lesions in individual fish	M	Yes/Low
	A_3. Demographic structure analysis of dominant species (based on fish scales)	M	No/Very Low
	A_4. Species richness and relative abundance of ichthyoplankton	M	Undeterminate
	B_1. Comparison of measured concentrations or toxic equivalencies in fish tissue to literature derived CBRs	M-H	Yes/High
	B_2. Comparison of modeled concentrations or toxic equivalencies (using BSAFs) in eggs and fish tissue to literature derived CBRs	M	Undeterminate
	Risk Conclusion		Yes/High
4. Protection and maintenance of piscivorous mammal and bird populations	A. Comparison of estimated ingestion doses in piscivorous wildlife with TRVs and toxic equivalencies	M	Yes/Low
	B. Comparison of estimated piscivorous wildlife residues with CBRs	L-M	Yes/High
	Risk Conclusion		Yes/High
5. Protection and maintenance of insectivorous mammal and bird populations	A. Comparison of estimated ingestion doses in insectivorous wildlife with TRVs and toxic equivalencies	M	Yes/Low - High, Undeterminate
	B_1. Comparison of measured insectivorous wildlife tissue and/or egg residues with CBR data	M-H	Yes/Low - High
	B_2. Comparison of estimated insectivorous wildlife tissue and/or egg residues with CBR data	M	Yes/Low - High
	C_1. Measurement of reproductive effects in local tree swallow populations	H	Yes/High*
	C_2. Survey of calling amphibians	L-M	Undeterminate
	D. Measurement of MFO activity in tree swallow nestling tissue	M	Undeterminate
	Risk Conclusion		Yes/High

TABLE 160
RISK/MAGNITUDE SUMMARY

Baseline Ecological Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Assessment Endpoint[1]	Measures of Effect[1]	Inference Weight[1]	Risk/Magnitude
6. Protection and maintenance of omnivorous mammal and bird populations	A. Comparison of estimated ingestion doses in omnivorous wildlife with TRVs and toxic equivalencies	M	No/Very Low[4]
	Risk Conclusion		No/Low

[1] Information obtained from Table 15.
[2] Applies to lentic (but not lotic) habitat.
[3] Applies to lotic (but not lentic) habitat.
[4] Omnivorous mammals could be adversely affected from exposure to Site-related contaminants in sediments and aquatic prey; however, the spatially and temporally varied diets and exposures of these receptors minimizes the likelihood of demographically significant effects.

Prepared by: SGH
Checked by: NAR

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